

Land and Resource Management Plan for the Siskiyou NF

FEIS

Part A

Part B

Part C

Part D

Appendices – Volume I

Part A

Part B

Part C

Part D

Appendices – Volume II

Part A

Part B

Part C

Map

Alternative S

Management Plan

Part A

Part B

Part C

Record of Decision

United States
Department of
Agriculture

Forest Service

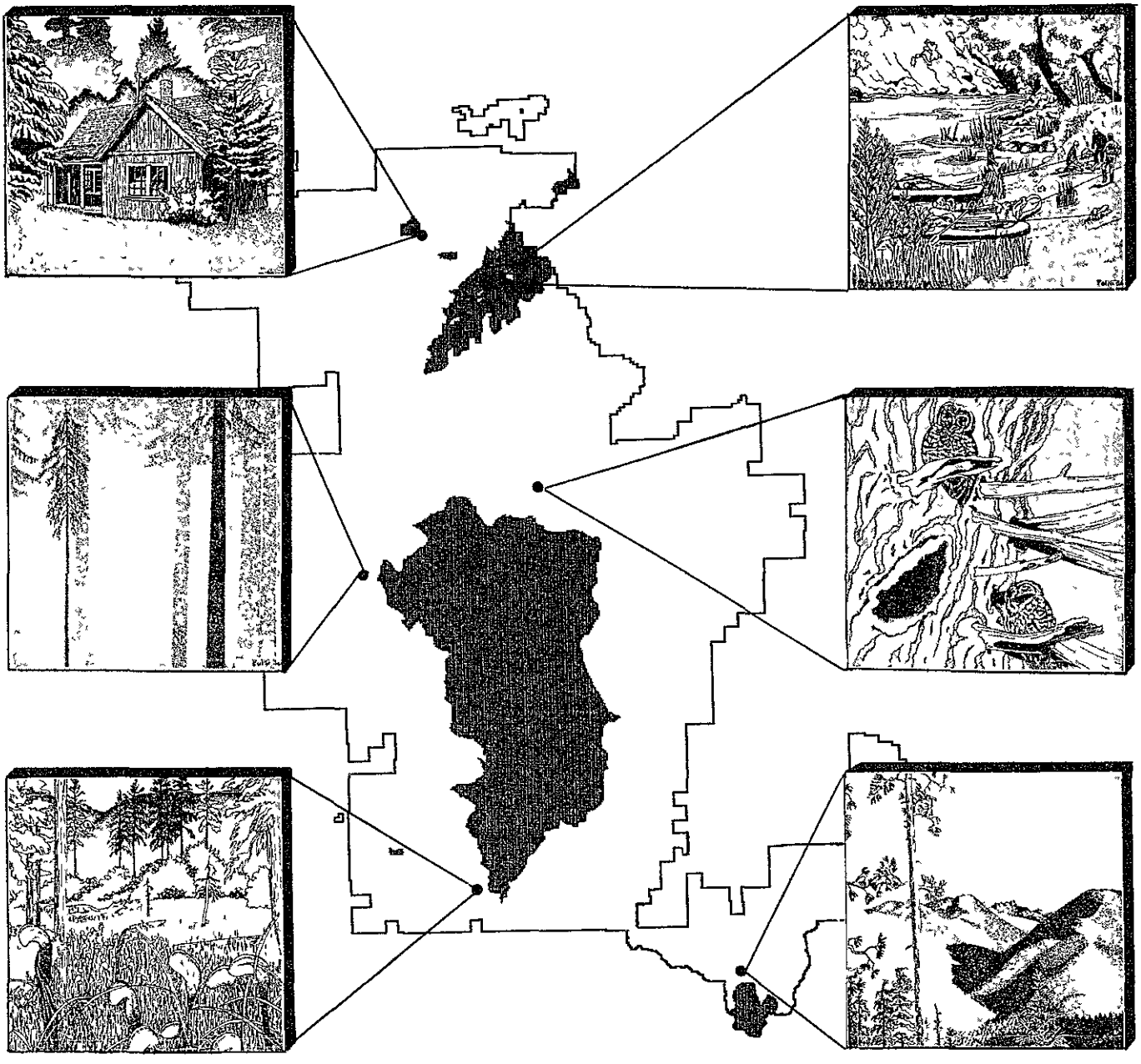
**Pacific
Northwest
Region**

1989

Final Environmental Impact Statement

Land and Resource Management Plan

Siskiyou National Forest



A number of wildlife illustrations were furnished by the Oregon Department of Fish and Wildlife, other illustrations were provided by National Forest personnel and members of the public Special thanks to Jerri Wildfong-Ritter (Siskiyou National Forest), for her many drawings

FINAL ENVIRONMENTAL IMPACT STATEMENT

LAND AND RESOURCE MANAGEMENT PLAN

SISKIYOU NATIONAL FOREST

Coos, Curry, and Josephine Counties in Oregon
Del Norte County in California

March 1989

Lead Agency. USDA Forest Service

Responsible Official: James F. Torrence, Regional Forester
Pacific Northwest Region
USDA Forest Service
319 S W Pine
P.O. Box 3623
Portland, Oregon 97208-3623
(503) 221-2877

For Further Information, Contact: Ronald J. McCormick, Forest Supervisor
Siskiyou National Forest
200 N.E Greenfield Road
P.O. Box 440
Grants Pass, Oregon 97526-0242
(503) 479-5301

ABSTRACT

This Final Environmental Impact Statement describes twelve alternatives for managing the 1,092,302 acres of land administered by the Siskiyou National Forest. Each alternative responds differently to the major issues and concerns identified Alternative NC, No Change, continues management under the 1962 Timber Management Plan without adjustment for requirements of the National Forest Management Act of 1976 (NFMA). Alternative A, Current Direction (No-Action), continues the management of the Forest according to current plans and policies but is updated to meet NFMA requirements. Current management direction, with a timber harvest schedule that departs from the nondeclining flow policy, is depicted in Alternative A-Departure Alternative B responds to the 1980 Forest and Rangeland Renewable Resources Planning Act (RPA) Program Alternative C provides the highest sustainable annual timber harvest yield. Market-oriented outputs with a balance between timber, minerals, developed recreation, and commercial fisheries are emphasized in Alternative D. Identical to D, but maintaining a high level of timber output by decreasing rotation lengths, is Alternative D1. Alternative E emphasizes aesthetic values by promoting the production of goods and services that do not necessarily have established market prices (e.g., soil, water, fish, recreation, scenery) Protection and enhancement of nontimber resources are emphasized in Alternative G Alternative K accommodates the desires of a wide range of user groups and interests, while continuing to supply goods and services vital to economic development. Alternative S (the Preferred Alternative) was developed in response to comments on the Draft Environmental Impact Statement; it incorporates many suggestions from the public, continues the supply of goods and services, and emphasizes the maintenance of a healthy ecosystem for the future Alternative M emphasizes preservation, rather than human use of the Forest's resources

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SUMMARY

INTRODUCTION

This Final Environmental Impact Statement (FEIS) discusses the alternative strategies for future management of the Siskiyou National Forest. The preferred alternative is developed into the accompanying Land and Resource Management Plan (the Forest Plan). The Record of Decision describes the decision to implement the Forest Plan and the rationale for that decision While the Forest Plan will guide the management of the Forest for the next 10 to 15 years, the analysis covers a planning horizon of 150 years to evaluate and display the long-term effects of current actions.

The Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan were released for public review and comment in August, 1987 This FEIS and Forest Plan were developed in response to those comments and incorporates many suggestions made by the public and other agencies Changes that were made between the DEIS and FEIS are described throughout the document and highlighted in sections near the beginning of each chapter

This is a general summary of the entire FEIS It emphasizes the issues and concerns raised by the public, other agencies, and Forest Service personnel regarding management of the Siskiyou National Forest The Summary describes the public response to the DEIS, changes made between the DEIS and FEIS, affected environment, purpose of and need for the proposed action, how the major issues and concerns identified have been formulated into Planning Problems, how 12 widely differing alternatives respond to these Planning Problems, and the environmental consequences of implementing each of the alternatives.

PUBLIC RESPONSE TO THE DEIS

On August 28, 1987 the DEIS and Proposed Forest Plan were released to the public. A total of 750 copies were distributed to government agencies, local libraries, and interested members of the public In addition a "Reviewer's Digest" was sent to hundreds of individuals, and 62,000 copies of a 20-page newspaper insert titled "An Invitation to Comment" were printed and circulated through local newspapers.

The Forest received nearly 17,000 responses to the DEIS during the 150-day review period. The most popular form of response was the form letter (91 percent), followed by the letter or post card (7 percent) Resolutions, petitions, and Forest mailers made up the balance Responses came from 49 states, the District of Columbia, and five foreign countries The bulk of replies came from Oregon (10,469), followed by Illinois (1,601), Texas (1,592), Wisconsin (877), and California (649) Most of the responses were a direct result of campaigns initiated by proponents of a proposed National Park and by Southern Oregon Timber Industries Association.

Each response contained one or more comments. These were analyzed and categorized by type. The Interdisciplinary Team read the comments, considered them in preparing the FEIS, and responded to the comments. The largest group of respondents (23 percent) commented on the broad area of socioeconomics. There are many people concerned about jobs and timber harvest levels, and as a result, community stability. This subject area also includes social considerations, such as the effects on people, families, and communities not directly economic in nature. Respondents are interested in maintaining lifestyles and occupations consistent with family tradition

The second largest group of respondents (18 percent) commented on timber management, an issue which continues to be highly polarized and emotionally charged. Many respondents ask that old-growth forests be protected and unroaded areas preserved. Some feel that the level of harvest is over-optimistic, reforestation is inadequate, and yield table projections show unrealistic growth. Many objected to clearcutting, suggesting that monocultures are being created Others point out the dependence of local

communities on the supply of timber to maintain jobs and social and economic stability They maintain that the Forest is capable of significantly higher timber outputs than were projected in the DEIS

Sixteen percent of respondents commented on the roadless issue, which is also very polarized. Timber and mining interests perceive a critical need to maintain a land base The environmental community feels that the unroaded tracts of low elevation, coastal old-growth Douglas-fir are the last large vestiges of a rapidly vanishing ecosystem.

A large group of respondents (10 percent) commented on the issues of fisheries and water quality. They are concerned about timber harvest dispersion constraints, riparian prescriptions, cumulative effects of sediment, and water temperature Some think that the Forest is not doing enough to protect the fishery and water quality values; others think there is too much being done, resulting in less timber production.

The issues of tourism and recreation were commented on by eight percent of the respondents Many want to develop and enhance the recreational use of the Siskiyou National Forest, a number of people want the Forest to actively contribute to the counties' efforts to encourage tourism Several thousand comments urge the development of a National Park alternative, emphasizing the natural beauty and recreational opportunities on the Forest.

There is broad support among respondents for designation of the inventoried Chetco and North Fork Smith Rivers as Wild and Scenic. Comments went beyond the present scope of the DEIS to include suggestions that other rivers, such as the Elk, Pistol, Winchuck, South Fork Coquille, and Sixes, be added to the National Wild and Scenic River System as well.

CHANGES BETWEEN DRAFT AND FINAL

The tremendous public response to the DEIS provided the Forest with a wealth of suggestions for improvements about how to provide more benefits to the public These ranged from broad conceptual approaches to specific technical changes.

Alternative K was the Preferred Alternative in the DEIS Using Alternative K as a base, the Interdisciplinary Team evaluated suggestions while carefully considering the effects. Alternative S, though not in the DEIS, is a response to public input; it evolved through a series of meetings with the Forest Management Team, and with the Regional Forester Suggestions and comments from the public and other agencies are incorporated in Alternative S, such as adjustments of the timber harvest dispersion constraints which could achieve the desired effect of dispersing activities over time and space with less timber opportunity cost. High value fisheries are given more streamside shade protection by managing six more Planning Basins under the Riparian Prescription C

It was pointed out that fertilization is being used on many Forests to increase timber yields, since on-Forest trials verified its feasibility, fertilization is included in Alternative S Higher levels of capital investments for recreation and more allocations to Partial Retention and Retention visual management in selected high use areas are intended to complement the tourism emphasis of local governments and private industry. Allocation of nearly all of the potential Botanical areas and the increased attention to biological diversity through Standards and Guidelines respond to numerous comments on sensitive plant protection and diversity.

The name of Management Area 6 in the DEIS was "Custodial (Roadless)." A number of people observed that the name did little for clarifying management direction for the areas. Recognizing the tremendous support for maintaining more of the Forest in undeveloped condition to provide primitive and semi-primitive recreation opportunities, the name was changed to "Backcountry Recreation " To accommodate historic use of motorbikes and four-wheel drive roads in some areas, Backcountry Recreation areas in Alternative S include both motorized and non-motorized use.

Many people pointed out that the level of mineral restrictions proposed in the DEIS went beyond the intent of mining legislation This issue was re-evaluated; the level of access restrictions was reduced, and no additional mineral withdrawal is proposed in any alternatives.

Lightning ignited a number of fires on August 30, 1987. Several major fires, including the Silver Fire which received wide publicity, burned over 110,000 acres of the Siskiyou National Forest. About half of that total acreage burned in the Kalmiopsis Wilderness The fire intensity varied greatly, leaving a mosaic of burned and unburned vegetation. The majority of area was not severely burned About 17 percent of the total area that burned at medium and high intensity was tentatively suitable for timber production The Silver Fire Recovery Project FEIS (1988) documented the analysis of resource impacts of the fire and alternatives for salvage of dead trees and resource restoration activities As a result of the Silver Fire Recovery Project decision to salvage fire-killed timber and continuing timber harvest activity since 1984, the amount of inventoried roadless area has been reduced from 314,000 to 284,000 acres. The decision for the Silver Fire Recovery Project, itself, accounts for approximately 19,000 acres of the reduction

Three other actions occurring after issuance of the DEIS affected the outcome of this Forest Plan. The Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (released July 1988) affected only minor changes in the network for northern spotted owl habitat on the Siskiyou National Forest since the DEIS. A few Spotted Owl Habitat Areas were added, but these changes had minimal timber opportunity cost. Proposed vegetative management in the Siskiyou National Forest FEIS and Forest Plan is also consistent with the FEIS for Managing Competing and Unwanted Vegetation (released December 1988). The Omnibus Oregon Wild and Scenic River Act of 1988 was passed just before printing this FEIS One of the key issues deals with Wild and Scenic Rivers, the effects of this recent legislation are discussed below

PURPOSE AND NEED

The purpose of the Forest Plan is to direct all natural resource management activities on the Forest. Preparation of the Land and Resource Management Plan is required by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA), plus the associated Planning Regulations (36 CFR 219).

The preparation of an Environmental Impact Statement disclosing a preferred alternative and a broad range of additional alternatives is required by the National Environmental Policy Act of 1969 (NEPA) and its implementing regulations (40 CFR 1500), and the implementing regulations of NFMA (36 CFR 219). The FEIS is required because the Forest Plan is a major Federal action with a significant effect on the quality of the human environment. For purpose of disclosure under NEPA, this FEIS and the accompanying Forest Plan are treated as combined documents.

The Forest is currently managed through direction provided within the Chetco-Grayback, Rogue-Illinois, Rogue, and Mt. Butler-Dry Creek Unit Plans, the Powers and Illinois Valley District Multiple Use Plans, the Timber Management Plan, and other sources, including the Forest Service Manual, Regional Guide for the Pacific Northwest Region, and numerous environmental documents, laws, regulations, and Executive orders These provide a blend of land uses. Fish and wildlife, developed and dispersed recreation, and the Wilderness resources are emphasized along with timber and minerals management Other values associated with visual quality, old growth, water, and sensitive plants and animals also receive considerable attention

The present plans do not provide the direction to appropriately meet the intent of NFMA These dated plans do not adequately respond to or have the ability to resolve many of the newer issues and concerns. Therefore, the FEIS and Forest Plan have been prepared, with direct involvement of other agencies and the public, to provide totally integrated and detailed management direction with land allocations which are complementary to the intent of multiple-use

THE PLANNING PROCESS

The National Forest Management Act's implementing regulations require that several planning steps be used to develop the FEIS and Forest Plan These planning steps are·

1. Identification of issues, concerns, and opportunities
2. Development of planning criteria
3. Inventory of data and collection of information
4. Analysis of the management situation
5. Formulation of alternatives.
6. Determination of estimated effects of the alternatives.
7. Evaluation of alternatives.
8 Selection of the proposed action
9. Plan implementation.
10. Plan monitoring and evaluation.

AFFECTED ENVIRONMENT

The Siskiyou National Forest is a publicly owned area of great diversity, natural beauty, and productivity. The Forest, situated in southwestern Oregon and northwestern California, consists of 1,092,302 acres. All but 33,000 acres are in Oregon. Another 70,000 acres within the Forest boundary are private and other-Agency administered land. The Forest is about 70 miles long and 30 to 55 miles wide

Located mostly within the Klamath Mountain and Coast Range Geologic Provinces, the terrain is extremely steep and rugged, having been deeply carved by numerous rivers and streams. Elevations on the Forest range from about 100 feet to more than 7,000 feet Several rivers, including the Rogue and Illinois, flow through the Forest, offering white water experience for recreationists and habitat for anadromous (migratory) and native fish

Areas near the crest of the Coast Range receive up to 150 inches of precipitation each year, some coming in the form of snow. Moisture declines markedly to the east, with only 40 inches of precipitation falling on the lower eastern fringes of the Forest.

The geologic variety and a wide difference in precipitation across the Forest yields an unusual diversity in vegetation and an associated richness of wildlife species. The area has been termed a "botanist's paradise " Vegetation changes are dramatic and vary primarily with aspect, elevation, soil, and climate. Grass, shrubs, and scattered pines occur on the serpentine soils, while very productive stands of Douglas-fir and western hemlock are supported on other youthful soils. Many tree species with limited ranges, such as redwood, Port-Orford-cedar, and sugar pine, occur on the Forest Tanoak, Pacific madrone, and other hardwoods are found intermixed throughout the Forest. Where large wildfires burned in the past, stands of hardwoods have replaced Douglas-fir and other species In the higher elevations are stands of mountain hemlock, true firs, and isolated pockets of Alaska yellow-cedar

The diversity of the Forest has led to a great variety of wildlife species An estimated 270 species of fish and wildlife reside within the Forest. These vary from stately elk to the tiny Pacific shrew; from soaring bald eagles to hummingbirds and butterflies with limited ranges; and from plentiful salmon and steelhead to native trout.

Recreation and tourism play a significant part in the economy, life-style, and use of southwestern Oregon. Local counties have chosen tourism as their "Oregon Economic Comeback Strategy," and look for support and participation by their neighboring National Forests in this strategy. This wealth of water, wildlife, and scenery, plus dependably sunny summer weather attracts thousands of recreationists People come to

camp, hike, hunt, fish, view the scenery, raft, take pictures, swim, drive 4-wheel vehicles, ride motorbikes, pan for gold, cut firewood, gather mushrooms, and pick berries

Receiving the greatest amount of recreation use on the Forest are activities which center around the Rogue and Illinois Wild and Scenic Rivers Both private and commercially-guided parties use the rivers Coupled with hiking use along the river trails, thousands of visitors annually enjoy these vestiges of a primitive America In late 1988, the Chetco, Elk, and North Fork Smith were also designated as Wild and Scenic Rivers under the Omnibus Oregon Wild and Scenic Rivers Act.

The Forest manages five Wildernesses totaling 232,495 acres. Managed for their primitive characteristics, these areas contain a variety of ecological types and recreational opportunities. In addition, the Forest has several large inventoried roadless areas.

The Siskiyou National Forest is an important contributor to the production of sawtimber and other wood products. Trees cut by local companies are processed into lumber, plywood, paper, furniture, and firewood. Wood residue is also used for the production of power and heat. The wood products industry has long been an important employer in many communities within and adjacent to the Forest.

The Forest is subject to periodic natural disasters like wildfire, floods, and windstorms. The 1987 fires are a good example of naturally occurring catastrophes. These events require costly mobilization of people and equipment to minimize damage to Forest resources and to rehabilitate impacted areas. Coupled with these problems, a large amount of steep and unstable terrain contributes to the inherent risks and hazards of management.

The great diversity of Forest resources and multiple uses produces an extremely complex management situation. The variety of uses leads to competition for the limited resources. Land allocations, which emphasize various uses, also generate tradeoffs between conflicting interests. The range of possible solutions to these management dilemmas is reflected in the responses to the Planning Problems which characterize each alternative.

ISSUES, CONCERNS, AND OPPORTUNITIES

An extensive and continuing process has been used to identify the issues, concerns, and opportunities. Public meetings, the local news media, newsletters, many personal contacts by Forest Service officials, and the overwhelming response to the DEIS and Proposed LRMP have been used to gather and confirm the issues. In 1979, an interdisciplinary team of specialists prepared the initial set of issues and concerns based on public comments and summarized these into "Planning Problems." This set has been revised as needed in order to keep current with public interests and changes in policies and procedures.

Several issues or aspects of issues have received fresh emphasis since the publication of the DEIS and Proposed Forest Plan. Increased attention has surfaced related to Wild and Scenic Rivers, tourism and recreation, biological diversity, reforestation, and various technical questions regarding timber harvest amounts. The 1987 fires generated much concern and interest which surfaced through the extensive public involvement in the Silver Fire Recovery Project. Most of the key issues and concerns expressed in that project were the same as those that have surfaced over the years in the Forest planning effort.

The Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide has resulted in minor changes in the Standards and Guidelines and the habitat network for northern spotted owls which have been incorporated in this FEIS The revised direction is not substantially changed for the Siskiyou National Forest; changes in the alternatives for this analysis are negligible.

PLANNING PROBLEMS

Many of the issues and concerns are highly interrelated Having more of one thing often requires having more or less of something else, whether desired or not. Nine Planning Problems to be addressed through the evaluation of alternatives were developed from the major issues and concerns Key indicators are measures of how well each alternative responds to Planning Problems The nine Planning Problems and associated key indicators are:

1. How Much Timber Should the Forest Produce?

There is a wide divergence of opinion concerning the production of timber from this Forest. The timber industry is an important part of the local and regional economic base, and the Forest has historically supplied significant amounts of timber. There is concern that current sell program levels of 31.0 million cubic feet (MMCF), or 167.5 million board feet (MMBF) per year), cannot or will not be maintained As a result, local communities will suffer economic hardship. More than any other, the timber issue is intertwined with the other resource issues. Production of timber often conflicts with managing for fish habitat, wildlife habitat, old growth, unroaded recreation, visual quality, and other values

The ability to respond to the timber issue is complicated by the inventory structure existing on the Forest. Standing volume, age class distribution, and the Forest's productive potential combine to create a situation characterized as "deficit inventory." The Forest has the potential to grow timber at a rate higher than can be sustained by the current inventory. To sustain timber flows, the existing inventory must be metered out until the regenerated stands reach harvestable size and age. Intensive management practices can do little to relieve this situation in the short term. Some people believe that the Forest should utilize a variety of technical applications to increase yield including yield table adjustments, short rotations, fertilizer applications to plantations, and other program and model changes.

The key indicators of resolution for this Planning Problem by alternative are the acres suitable for timber production (Management Areas 10-14), the Allowable Sale Quantity (ASQ) for the first decade, the ASQ for the fifth decade (this shows the low point for the departure alternatives), and the Long-Term Sustained Yield (LTSY).

2. How Much Old-Growth Forest Should be Preserved?

Harvest of old-growth trees has become a controversial topic. A large part of the available timber inventory is in mature and old-growth forest stands There is also desire to preserve old growth for wildlife habitat, for aesthetics, to contribute to biological diversity, and for its own intrinsic value. Based on the 1979 inventory with some parts updated through 1984, there are currently 443,000 acres of mature and old-growth trees. Of this, 137,000 acres are reserved in designated areas such as Wilderness and other areas unsuitable for the production of timber.

The key indicators used to measure how the alternatives respond to this problem are the acres of mature and old-growth habitat reserved (protected) through land allocations (primarily Management Areas 1-9), and the old-growth habitat that would remain by the fifth decade The latter is a determinate of the rate at which timber harvest would occur.

3. How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved?

Fish habitat is highly dependent on water quality Water quality is a reflection of the health of the forest and streamside (riparian) areas, and the quality of management and tending of these ecosystems Water temperature and sedimentation are critical to maintenance and protection of the Forest's fisheries habitat. Capability (biologic carrying capacity) of streams and rivers is enhanced primarily through capital

expenditures for improvement projects such as rearing pools and fish ladders. Soil erosion and vegetative cover along streams are extremely important aspects in providing for fisheries and other riparian values Soil productivity is primarily maintained through the application of Standards and Guidelines (set forth in the Forest Plan, Chapter IV) Management of the soil and water resources are highly interrelated with fisheries management on this Forest These resources are considered the same in resolution of this Planning Problem.

Indicators that vary by alternative include Planning Basins assigned to various Riparian Prescriptions, the level of capital investments, acres allocated to Management Areas 1-9 (no programmed harvest), timber harvest dispersion constraints, the anadromous sport fishing user days, pounds of commercial fish catch, and tons of sediment over current conditions. The timber harvest dispersion constraints are applied to the land tentatively suitable for the production of timber in each of the 19 Planning Basins; the constraint varies by alternative.

4. How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Parts of the Rogue and Illinois Rivers that flow through the Forest are designated as National Wild and Scenic Rivers. Two other rivers, the Chetco and North Fork Smith, were inventoried as potential candidates to the Wild and Scenic River System The Elk River was recently determined eligible for potential inclusion. In October, the Chetco, Elk and North Fork Smith Rivers were designated in the Omnibus Oregon Wild and Scenic River Act of 1988. As a result of this bill, the issue has changed slightly since the DEIS; whether or not to recommend designation is no longer a question The issues to be dealt with here are: (1) What *management direction for the Recreation, Scenic, and Wild sections of the five designated river corridors* needs to be established or reaffirmed; and (2) what should management direction be for lands adjacent to the Wild and Scenic River corridors?

Management plans for the newly designated river corridors, as directed by the Act, will have to be prepared within a few years from the date of the legislation. River Management Plans exist for the Rogue and Illinois. Plans which will provide specific measures to implement management objectives for new rivers will not be a product of the Forest Planning process or accompanying decision for the Forest Plan.

The part of this Planning Problem that remains to be resolved deals with management in the viewshed of these rivers outside of the Congressionally designated corridors. The range of allocations to visual management objectives and other Management Areas adjacent to the river corridors will be evaluated.

The key indicator for this Planning Problem pertains to management direction within the viewshed. The area adjacent to (as seen from) the Wild and Scenic Rivers corridors that meets or exceeds the inventoried Visual Quality Objective (VQO) is used to track the response to this question.

5. How Should Sensitive Plant Resources be Managed?

The Forest contains habitat for numerous rare plants. Protecting this habitat often involves limiting disturbance from activities such as timber harvest, road building, and mining. The Standards and Guidelines provide some protection for this habitat under all the alternatives. Land allocations that restrict activities (Management Areas 1-9) would provide additional protection. Key indicators are the acres *allocated to Botanical and Research Natural Areas.*

6. How, and to What Extent, Should Forest Scenic Values be Protected through Visual Resource Management?

The visual resource management issue revolves around the degree of protection scenic values are given, and the costs and impacts of this resource on other activities Timber harvest and road construction often

change the condition of the scenery. Two key indicators are used to evaluate the alternatives. The number of viewsheds allocated to meet the full inventory of Visual Quality Objectives is one. Corollary to this is the total acres assigned to meet or exceed Retention and Partial Retention objectives.

7. How Should Wildlife Habitats on the Forest be Managed?

The Forest is inhabited by more than 250 wildlife species. The controversy in the wildlife question is not found in the desirability of maintaining diverse and healthy populations, but in the management actions needed to accomplish this objective. Vegetation-altering activities such as timber harvest change the character of the habitat and its ability to provide for various species. Activities are often beneficial to some species and detrimental to others. There is a divergence of opinion as to the appropriate balance of habitats that should be maintained, and the acceptable level of effect on timber production resulting from wildlife management prescriptions.

There are several key indicators used to evaluate the alternatives. Potential habitat capability to support spotted owl pairs over time, along with the potential habitat (snags) capable of supporting a given percentage of woodpecker populations over time, are used to track habitat quality and trends. The other indicators are wildlife user days, capital investments, and the area of Special Wildlife Sites allocated.

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

The most polarized issue addressed in this analysis involves the management direction for the inventoried roadless areas. The Forest has 232,000 acres of Wilderness and, as reported in the DEIS, 314,000 acres of unroaded areas outside of Wilderness. Since 1984, continued management under current direction and implementation of the Silver Fire Recovery Project has resulted in some road construction in former roadless areas. There are currently 284,000 acres of unroaded areas This Planning Problem deals with management of the existing Wilderness and with the land allocations and management of the remaining unroaded areas.

Numerous responses to the DEIS addressed this issue. Many people want the unroaded areas to remain in their natural state and provide Primitive and Semi-primitive recreation opportunities, reserve the remaining larger tracts of old-growth forest, protect certain wildlife habitats, and other benefits. Timber and commodity interests see the land base rapidly eroding for the production of timber as additional area is allocated to uses that preclude development. People on both sides of this issue feel that they are continually losing ground.

There are two key indicators for this Planning Problem. The first defines the acres that would remain undeveloped The inventoried unroaded area allocated to Management Areas 1 through 9 where little or no roading exists and management objectives are highly oriented to nondevelopment best provides this indices. The second indicator is the area of recreation opportunities remaining in Primitive and Semi-primitive status

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

There has been increased interest in developing the mineral resources of the Forest during recent years As this interest has grown, with the prospect of added ground-disturbing activities, concern for environmental protection has similarly grown Particular concern is expressed over the potential conflict between mineral development and the protection of unroaded areas, sensitive plants, and visual quality. Some of the unusual geologic sites that are habitat for rare plants are also high in minerals potential.

The indicator used for evaluation is the number of acres available for mineral exploration and development with limited (i.e , low and moderate) restrictions.

MANAGEMENT REQUIREMENTS

The Management Requirements (MR's) are designed to assure compliance with the applicable laws and regulations, specifically 36 CFR 219.27. There are many requirements that are implemented to protect specific resources which do not significantly affect the Forest-wide analysis Those that impose substantive standards and significantly interact with other resources are those for mature and old-growth dependent wildlife species, dispersal of created openings, and maintenance of water quality and riparian areas along perennial streams. The MR's have been designed to provide the protection needed with the least adverse impact on other resources. The development and effects of the MR's are described in Appendix B, Appendix J, and summarized in Chapter II.

The MR level for water quality and riparian management is essentially the same as the current Siskiyou Riparian Policy which has evolved over a number of years as results of field implementation, monitoring, and application of research findings The harvest dispersion constraint MR limits final timber harvest in any Planning Basin to 20 percent of the suitable land base per decade. The objective is to minimize watershed impacts through distributing the effects of activity over both space and time. A side benefit is that the basin constraint further assures that the Forest has the flexibility to meet the opening size restrictions required by NFMA and Regional Guide for the Pacific Northwest. This MR has minimal effect on timber outputs.

The habitat areas for mature and old-growth dependent wildlife species (indicator species are pine marten, pileated woodpecker, and spotted owl) are identified in a network across the Forest to provide dispersion of suitable habitat throughout the planning area. This is the only new MR of significance to other resources installed in this analysis. It has the potential to reduce timber outputs by approximately six to seven percent.

All the alternatives, except the No Change Alternative, meet the MR's and would assure the maintenance of water quality, vegetative diversity, and habitat to sustain viable populations of fish and wildlife. The Forest Service has attempted to base the MR's on the available scientific research, supplemented by experience and professional judgement As knowledge of these resources expands and additional research findings come to light, the Forest Service is prepared to modify management direction including the MR's to stay current with the state-of-the-art in forest resource management.

MANAGEMENT AREAS

A critical part of each alternative design is the recommended land allocation. All lands of the Siskiyou National Forest are assigned to one of 14 Management Areas in each alternative. A Management Area is a category of land with capability to respond to certain issues or to meet specific management objectives (not necessarily contiguous acres) While the objectives for all Management Areas include some multiple uses, they often emphasize one or a few resources and therefore result in dominant use management for some areas In the Management Area descriptions that follow, the acres tentatively suitable for timber production are identified It should be noted that these acres may or may not be selected for timber management in a particular alternative, and that this determination and the suitability inventory itself are subject to review at ten year intervals.

Although many areas have multiple resource values, lands can logically be assigned to only one Management Area (each acre can only be managed under one prescription). In order to systematically assign the land base to Management Areas, a hierarchy was developed based on the level of ground disturbance or vegetation manipulation provided for in each Management Area. The Management Areas are numbered in order of increasing activity from the least ground disturbance and vegetation manipulation to the most. Management Area 1, Wilderness, is the most restrictive. Management Area 14, General Forest, is at the other end of the spectrum with the most road construction and timber management activity, and

the least restrictions on mining Where alternative design results in **overlaps**, the acres **are assigned to the Management Area higher up in the hierarchy** *(the lower number). This precludes double counting* and assures that each acre will have only one set of management direction

Management Area 1 - Wilderness

Wilderness is an essentially undisturbed area where natural processes continue with a minimum of human interference Wildernesses are pristine, scenic landscapes that provide an opportunity for solitude The areas are managed to comply with the requirements of the Wilderness Act of 1964. The size of this Management Area remains fixed by alternative.

Management Area 2 - Wild River

Management Area 2 consists of the "Wild" segments of Wild and Scenic Rivers designated by Congress under the National Wild and Scenic Rivers Act. The Wild designation was reserved for those rivers that are free flowing, free of impoundments and generally inaccessible except by trail These areas are managed to maintain the natural, free-flowing, and primitive character of the rivers and their immediate environment. An inventoried 5,029 acres are in the "Wild" river segments

Management Area 3 - Research Natural Area

Management Area 3 contains distinctive natural ecosystems designated (or proposed) as part of the Research Natural Area Program for scientific and educational purposes Research Natural Areas (RNA's) are sites which typify an undisturbed aquatic or terrestrial ecosystem where natural features are preserved for scientific purposes and natural processes are allowed to dominate. Three existing RNA's remain constant at 1,957 acres in all alternatives. Four additional areas, totaling 2,799 acres (1,505 acres tentatively suitable for the production of timber), are being considered for recommendation to the RNA program in this FEIS.

Management Area 4 - Botanical

Management Area 4 includes the best representations found on the Forest of unusual plants indigenous to southwestern Oregon. There are three existing Botanical Areas totaling 4,475 acres. An additional 24 areas containing a total of 36,917 acres (17,851 tentatively suitable) are being considered for designation in this FEIS. Acres allocated to this Management Area would be managed with emphasis on the protection and enhancement of the rare plant resources; other uses consistent with these goals would be allowed These areas would not have programmed timber harvest; other ground disturbing or vegetation manipulating activities may be significantly restricted.

Management Area 5 - Unique Interest

Management Area 5 protects significant cultural or exceptional geologic sites on the Forest Development or vegetative manipulation for commodity production would not be allowed Thirteen such areas containing 1,705 acres (766 tentatively suitable) are considered for designation

Management Area 6 - Backcountry Recreation

This Management Area contains areas that will be retained in their natural state and will provide motorized and non-motorized recreational and other resource opportunities associated with large unroaded areas Various levels of trail development are prescribed to increase recreation carrying capacity, yet maintain the Primitive and Semi-primitive character of the undeveloped landscape Eighteen unroaded areas are being considered, totaling 314,162 acres (171,844 acres tentatively suitable timber land) Approximately 284,000 acres are inventoried as roadless, any area allocated to Backcountry Recreation that may be partially developed would require restoration to return the area to a natural-appearing landscape over time

Management Area 7 - Supplemental Resource

Areas considered highly productive (or critical) habitat for fish or wildlife, provide a valuable recreational setting, or necessary for the maintenance of high quality watershed conditions, are included in this Management Area designation Many of the Supplemental Resource Management Areas cover the sensitive inner gorge corridors of the larger streams and rivers found throughout the Forest. Management objectives include maintenance of near-natural conditions while permitting limited levels of activity, such as through-road construction or habitat improvement projects. No timber harvest is programmed from these areas, but activity is permitted to salvage or protect stands from disease and insect infestations Thirty-two areas, totaling 76,281 acres (45,312 acres tentatively suitable for the production of timber), are evaluated for Supplemental Resource designation.

Management Area 8 - Designated Wildlife Habitat

Management direction for this designation protects habitat for spotted owls, pileated woodpeckers, and pine martens. These three animals are indicator species for all wildlife inhabitants of mature or old-growth forests. This Management Area includes habitat needed to meet Management Requirement (MR) objectives in all alternatives, except in the No Change Alternative Management direction for this designation includes requirements to maintain those old-growth characteristics necessary for the sustenance of dependent wildlife species. No timber harvest activity is programmed A total of 153,400 acres are necessary to meet MR's that provide viable population levels in perpetuity. Much of this is overlapped by more restrictive Management Areas (e.g., Wilderness) Only 29,363 acres are tentatively suitable for timber production. An additional 57,758 acres (41,074 tentatively suitable) is considered in some alternatives to supplement the MR's.

Management Area 9 - Special Wildlife Site

Management Area 9 consists of special wildlife sites which are important components for overall wildlife habitat diversity. Examples include meadows, ponds, tanoak stands, wet areas, rock bluffs, and other sites frequented by wildlife. Management direction for this area precludes programmed timber harvest activity, but allows site-disturbing activities that are not contrary to the overall objective of preserving the special wildlife habitat A total of 25,004 acres (including 6,994 acres of tentatively suitable land) are considered for designation.

Management Area 10 - Scenic/Recreation River

Management Area 10 currently includes segments of rivers classified as "Scenic" and "Recreational" by the National Wild and Scenic Rivers Act. These rivers and their immediate environment are managed for multiple uses, with the emphasis on recreation and scenic quality. Timber management is planned at a low level where it can be accomplished consistent with meeting these other objectives. Of the 10,317 acres in Scenic/Recreation Rivers, 7,614 acres are tentatively suitable for the production of timber.

Management Area 11 - Riparian

Management Area 11 contains the riparian area along perennial streams within the lands tentatively suitable for timber production The actual width of the riparian area is determined on the ground and varies with site-specific conditions. There are an estimated 175,500 acres of riparian areas Forest-wide with approximately 99,000 acres tentatively suitable for timber production Prescriptions for this Management Area include multiple uses, with primary emphases on watershed, fisheries, and wildlife values. Timber production is limited and permissible where impacts are not unacceptable relative to the primary values.

Management Area 12 - Retention Visual

This Management Area consists primarily of land that is immediately adjacent to, and visible from, major travel routes, rivers and other high use recreation areas Maintenance of scenic quality is emphasized, and

timber would be produced at a low level There are 81,480 acres inventoried with a "Retention" Visual Quality Objective, of which 46,657 are tentatively suitable for timber production Part or all of these acres are assigned to Retention based on the objectives of the alternative being considered.

Management Area 13 - Partial Retention Visual

Management Area 13 consists of land that is visible in the middle to background of major and secondary travel routes, rivers and other high use recreation areas. The total area inventoried as Partial Retention on the Forest is 287,700 acres, of which 194,190 are tentatively suitable for timber production. These areas are managed for multiple uses including recreation, timber production, and wildlife habitat. There is a priority on the maintenance of scenic quality which results in a minor reduction in timber production to allow for accomplishing these visual objectives.

Management Area 14 - General Forest

This Management Area includes forested land which is managed for multiple uses including timber production and the maintenance of many wildlife habitats A number of other uses and land classifications are also included in the General Forest Management Area. These include developed campgrounds, roads, utility corridors, cultural sites, administrative sites, and land unsuitable for the production of timber

ALTERNATIVES

Twelve alternatives were formulated providing a broad range of options to serve as a basis for identifying the alternative that best maximizes net public benefit (NPB) while responding to public issues. Each alternative emphasizes the resolution of one or more Planning Problems through a combination of land allocations, Standards and Guidelines, and capital expenditures. The distribution of National Forest land to one of 14 Management Areas establishes permissible management practices and activity schedules that provide unique combinations of resource outputs, land uses, and environmental effects. Management Area allocations are summarized for each alternative in Table S-1. Outputs and effects that indicate the degree of resolution for each Planning Problem by alternative are displayed in Table S-2

Two alternatives (K-Departure and L), which were presented in the DEIS, have been dropped from full development through the FEIS Other existing alternatives fill a range of resource objectives which these two alternatives emphasized, and there was very little input on them.

Identification of the "Preferred Alternative" was made after careful comparison of all the alternatives on the basis of their resource outputs, environmental effects, implementation costs, and the "tradeoffs" between them The Preferred Alternative is that alternative which best maximizes the Net Public Benefits in an environmentally sound manner Alternative K was the preferred in the DEIS. With Alternative K as a base, Alternative S was developed, considering the comments received on the DEIS, and is the Preferred Alternative in this FEIS.

Alternative NC - No Change

The "No Change" alternative was developed in response to an appeal brought by the Northwest Forest Resource Council in 1986 The substance of the appeal was that a "true no-action alternative representing current management plans" was not included in Forest Plan EIS's The purpose of Alternative No Change (NC) is to continue the levels of goods and services as set out in plans formulated and approved prior to the passage of the NFMA, specifically the 1962 Timber Management Plan This alternative does not comply with all provisions of NFMA and the regulations promulgated by the Secretary of Agriculture to implement NFMA, and could not be implemented or used in future management of the Forest under the Forest Plan without Congressional and/or Secretary of Agriculture action to change the law or regulations.

Alternative A - Current Direction

This is the "No Action" alternative required by the NEPA. It would continue the present course of action established in plans and policies formulated and approved prior to passage of the NFMA that are consistent with present laws and regulations. Relatively high levels of timber production, combined with maintenance of inventoried Visual Quality Objectives and moderate levels of fish and wildlife, are emphasized

Alternative A - Departure

Using the same land allocations and management direction as Alternative A, timber production would be further emphasized through a harvest scheduling plan that departs from the policy of nondeclining yield to maintain the current timber program for the next two decades. Average annual timber harvest levels in subsequent decades would decline.

Alternative B - RPA

This alternative is designed to meet the RPA production targets displayed in the Regional Guide (1984) Very high levels of timber production would be emphasized during the first two decades through departures from nondeclining yield Large expenditures in capital improvements for fisheries would be necessary to realize program objectives, while big-game wildlife objectives would be achieved using the forage that results from timber harvest activity

Alternative C

Timber management opportunities would be emphasized in this alternative, producing current levels of timber volume on a nondeclining yield basis Under implementation of NFMA regulations, Alternative C would have the highest amount of land selected as suitable for timber production, and the highest LTSY Hunting and roaded recreation opportunities would be enhanced as a result of the timber program. Land allocations for other resource objectives would be among the lowest of the alternatives considered.

Alternative D

Goods and services having established market prices would be emphasized in this alternative. Intensive timber production would utilize 98 percent of the land suitable for timber production. A moderate increase in anadromous fish would be achieved by applying prescriptions that provide additional stream protection

Alternative D1

This alternative is identical to Alternative D, except timber harvest rotation lengths would be shortened. The culmination of mean annual increment (CMAI) requirement would be relaxed to allow harvest of trees that are as much as 20 years younger than the normal rotation age of 100 years. Average annual timber harvest volumes would increase approximately 10 percent relative to Alternative D

Alternative E

Aesthetic values of the Forest would be emphasized in this alternative by promoting goods and services which do not necessarily have established market values Land allocations displayed in Table S-1 reflect the subordinate role of timber production in this alternative. Land allocations that would benefit old growth, anadromous fish, Wild and Scenic Rivers, sensitive plants, visual quality, and roadless recreation would be among the highest of any alternative considered. Former inventoried roadless areas (RARE II), for example, would remain undeveloped

Alternative G

This alternative is designed to promote the health and productivity of the Forest's water-related resources, particularly rivers and streams associated with the Illinois drainage Alternative G would preserve many existing unroaded areas and favors management governed by high Visual Quality Objectives to maintain the area's reputation for natural beauty and to accommodate recreation-oriented industries Low to moderate levels of timber production would be provided by a land allocation that would emphasize wildlife diversity and travel corridors, preservation of old growth, enhancement of water quality for fisheries, and protection of sensitive plants This was the Preferred Alternative in the DEIS

Alternative K

This alternative is designed to minimize the tradeoffs between competing goods and services by capitalizing on the multi-product nature of various land allocation possibilities The preservation of aesthetic values, for example, would be limited to areas of high recreational value, but would be achieved by utilizing land allocations that provide some development opportunities. High levels of anadromous fish would be provided along with moderate levels of timber, old growth, wildlife habitat, and protection of sensitive plants

Alternative M

This alternative would preserve the Forest as it is today by limiting all development activities to those portions of the Forest currently under active management. Timber management would utilize rotation lengths of 250 years, and harvest activity would occur only on lands accessible from existing roads Land allocations for this alternative would yield the fewest development opportunities, and the greatest level of protection for old growth, Wild and Scenic Rivers, visual quality and unroaded areas, of any alternative considered.

Alternative S

This alternative is designed in response to public input through incorporating numerous suggestions from agencies, groups, and individuals. Alternative S would continue to supply goods and services vital to National and local economies while providing a healthy ecosystem for the future. Achievement of that objective would require the Forest to capitalize on the multi-product nature of land allocations that minimize tradeoffs between goods and services High levels of anadromous fish and sensitive plant habitat would be provided, as well as moderately high levels of timber, mature and old-growth wildlife habitat, and unroaded recreation opportunities.

Table S-1. Acreage in Management Areas by Alternative

Management Area No.-Name	ALTERNATIVE										
	No Change	A and A-Departure	B	C	D	D1	E	G	K	M	S
1-Wilderness	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495
2-Wild River	3,120	3,120	2,043	2,043	2,043	2,043	3,120	3,120	2,043	3,120	5,029
3-Research Natural Area	3,249	3,249	3,349	3,349	3,349	3,349	4,693	4,693	4,704	4,693	4,608
4-Botanical	1,067	1,067	5,648	5,648	5,648	5,648	24,267	35,658	7,296	35,658	16,275
5-Unique Interest	0	0	395	395	395	395	1,568	1,333	1,595	1,333	2,015
6-Backcountry Recreation	0	0	0	0	0	0	301,737	150,431	13,691	296,520	108,092
7-Supplemental Resource	29,589	29,589	13,739	1,285	13,739	13,739	27,680	50,453	39,498	36,144	21,412
8-Designated Wildlife Habitat	5,082	52,053	52,885	55,109	52,885	52,885	39,242	70,858	59,477	53,125	47,354
9-Special Wildlife Site	6,261	5,883	9,195	9,477	9,195	9,195	7,547	8,640	14,581	7,029	27,450
10-Scenic/Recreation River	15,248	13,642	9,526	9,526	9,526	9,526	6,192	5,963	3,557	5,850	10,317
11-Riparian	122,279	110,465	111,749	115,743	111,749	111,749	62,337	72,483	102,944	56,139	89,206
Prescription B	(84,517)	(81,318)	(48,747)	(83,528)	(48,770)	(44,664)	(0)	(0)	(69,895)	(0)	(39,836)
Prescription C	(0)	(0)	(33,044)	(0)	(33,059)	(30,276)	(0)	(45,212)	(6,161)	(0)	(27,130)
Prescription M	(37,762)	(29,147)	(29,958)	(32,215)	(29,920)	(36,809)	(62,337)	(27,271)	(26,888)	(56,139)	(22,240)
12-Retention Visual	50,715	46,050	7,678	0	7,678	7,678	19,622	23,060	10,280	17,479	9,717
13-Partial Retention Visual	229,802	218,545	94,282	86,551	94,282	94,282	116,281	149,830	129,323	109,448	131,822
14-General Forest 1/	393,395	376,144	549,318	570,681	549,318	549,318	245,521	283,285	470,818	233,269	386,510
TOTAL NATIONAL FOREST LAND	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302

1/ Alternative M includes 97,661 acres not accessible from existing roads and with no programmed timber harvest

Table S-2. Indicators of Responsiveness to Planning Problems. Alternatives are Ranked in Order of Decreasing PNV

ALTERNATIVE	National Indicators					Local Indicators					Planning Problems																						
	PNV (MM $)	Avg. Ann. Net Receipts 1st Dec (MM $)	Avg. Ann. Net Receipts 5th Dec. (MM $)	Avg. Ann. Noncash Ben. 1st Dec. (MM $)	Avg. Ann. Noncash Ben 5th Dec. (MM $)	1st Dec. Payments to Counties (MM $)	1st Dec. Change in Jobs compared to: Historical Conditions (75 84)	Current Direction (Alt. A)	1st Dec. Change in Income Compared to: Historical Conditions (75 84)	Current Direction (Alt. A) (MM $)	Selected Suitable Area (M Acres)	1st Dec. Avg. Soil Volume (MMCF)	Long-Term Sustained Yield (MMCF)	1 Total Old Growth Preserved (M Acres)	Old Growth 5th Decade (M Acres)	2 Fish User Days (M WFUD'S)	Accelerated Forest Sedimentation (M tons/dec -Mean Dec. 1 5)	3 Adjacent Area Meeting VQO (M Acres)	Botanical Areas (M Acres)	4 Research Natural Areas (M Acres)	Preservation VQO (M Acres)	5 Retention VQO (M Acres)	Partial Retention VQO (M Acres)	Met or Exceed P Retention VQO (M Acres)	Wildlife User Days (M WFUD's) 1st Dec /Yr	6 Old Growth Hab 5th Dec. (M Forest)	Area Remaining Unroaded (M Acres) 1/	7 Minerals: Access Area with Limited P (Low and Moderate) Restrict (M Acres)	8	9					
Max.PNV	1,278	37.8	48.1	8.8	10.7	N/C	N/C	N/C	N/C	N/C	567	32.4	51.9	164	N/C	74	N/C	N/C	4 5	2.0	342	0	0	0	69.0	N/C	27.8	820					
B	1,241	43 0	25.0	8.8	10.8	16.4	1,230	650	28.7	14.9	558	36 8	54.8	171	175 8	72	990	147.8	9.1	3.3	350	18	106	474	94.3	16.0	36.5	798					
D1	1,214	38.2	29.8	8.6	10.4	14.8	880	300	20 7	6.9	550	33.2	49.0	171	172.6	69	942	147.8	9.1	3.3	350	18	106	474	85.8	15.8	36.5	798					
NC	1,214	36.0	41.1	8.6	10.2	13.8	660	80	15.7	1.9	576	31.0	54.2	153	184.6	67	964	165.6	4 5	3.2	319	72	259	650	77.3	16.9	27.8	786					
C	1,197	32.1	45.3	8.6	10.2	14.2	830	250	18.2	4 4	566	31 8	57.0	166	184 6	68	1,076	145.7	9.1	3.3	342	10	98	450	93.3	16.9	30.7	810					
D	1,160	31.6	42.0	8 5	10.1	13.5	640	60	15.0	1.2	560	30.4	54.8	171	191 2	69	970	147.8	9.1	3 3	350	18	106	474	87.1	17.5	36.5	798					
A Dep	1,160	35.8	35.4	8.6	10.2	13.9	680	100	16.1	2.3	558	31.2	52.7	174	193.3	67	962	168.1	4.5	3 2	354	66	247	667	84.2	17.7	47.2	787					
A	1,150	34.1	37.8	8.6	9 9	13.4	580	0	13.8	0.0	557	30.1	52.7	174	193.3	67	944	168.1	4.5	3.2	354	66	247	667	83.6	17.7	47 2	787					
S	1,131	31.9	34.4	9.1	11.0	12.9	560	-20	13.0	-1.1	505	29.0	48 0	198	208 6	72	828	156.8	19 6	4.6	488	21	148	657	97.1	19.1	146 5	755					
K	1,083	29.0	35 8	8.7	10.3	12.4	380	-200	9.0	-4 8	529	27.8	48.8	185	199 9	71	800	143.7	10.7	4 8	402	15	145	562	83.1	18.3	70.0	768					
G	844	20 1	20.5	8 6	10.5	8.8	-300	-880	-6.4	-20.2	406	20.5	38.7	254	249.0	70	614	174.5	39.0	4.8	585	31	165	781	78 6	22 8	178 1	732					
E	679	13.2	12.6	8.7	10.4	6.8	-700	-1,280	-15.3	-29.1	287	16 2	32 2	273	296 0	70	510	183.2	27.6	4.8	705	26	116	847	75.5	27.1	284.2	765					
N	272	1 4	0 9	8.7	10.5	2.7	-1,650	-2,230	-38.8	-52.6	207	6.1	22.2	290	356.1	69	174	183.7	39.0	4 8	726	23	109	858	60.0	32.6	347.5	747					

1/ Alternative N includes 98,000 acres of General Forest which was not selected suitable for timber harvest.

Full titles of planning problems:

1 How Much Timber Should the Forest Produce?
2 How Much Old growth Forest Should be Preserved?
3 How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved?
4 How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?
5 How Should Sensitive Plants Resources be Managed?
6 How, and to What Extent, Should Forest Scenic Values be Protected *Through Visual Resource Management*?
7 How Should Wildlife Habitats on the Forest be Managed?
8 How Will Management Direction Affect Recreation Opportunities in the Wildernesses and Unroaded Areas?
9 How Should Mineral Resources of the Forest be Developed in Coordination with Management of Other Resources?

ENVIRONMENTAL CONSEQUENCES AND MITIGATION

Projected consequences of the alternatives are arranged by the problems of timber supply, old-growth preservation, fish habitat, water quality, and soil productivity Other problems include Wild and Scenic Rivers, sensitive plant habitat, scenic values, wildlife habitat, primitive recreation opportunities, and development of mineral resources. The quantitative measures are displayed for each alternative in Table S-2. Mitigation is accomplished primarily through land allocations, capital investments, and Standards and Guidelines. These provide means to avoid or minimize impacts, rehabilitate and restore resources, or preserve and maintain opportunities.

TIMBER SUPPLY

Alternatives K, S, A, D, NC, A-Departure, C, D1, and B would have first decade timber outputs progressively greater than the historical average harvest from 1974-1985. Alternatives B and D1 would have first decade timber outputs significantly higher than the current situation. Associated with the outputs would be increased Present Net Value (PNV), jobs, income, payment to counties, and revenue to the U.S. Treasury. Increased sediment production and significantly decreased land allocations preserving mature and old growth would also be a result of increased timber outputs.

Alternatives G, E, and M would have progressively fewer timber outputs than the historical average harvest. Alternatives E and M would have very significant decreases in timber outputs. Associated with the decreased outputs would be decreased. PNV, jobs, payments to counties, and revenue to the U S Treasury Additional allocations to the more restrictive Management Areas would result in reductions in sediment and a higher amount of mature and old-growth forests

OLD-GROWTH PRESERVATION

Alternatives G, E, and M would have progressively more areas where programmed timber harvest is excluded from mature and old-growth stands Alternatives E and M would have very significant amounts of mature and old-growth reserves More opportunities for Primitive recreation, pristine scenic vistas, and increased old-growth wildlife habitat would be consequences associated with these alternatives Reduced amounts of harvest with subsequent declines in payments to counties, reduced revenue to the U S Treasury, and reduced game wildlife benefits would also be consequences of preserving the old-growth stands.

Alternatives S, K, A, A-Departure, D, D1, B, C, and NC would have progressively less old growth reserved. The designated Wildernesses, and designated Wild and Scenic Rivers would provide most of the reserved mature and old-growth stands for these alternatives, with some area contributed through allocations to Backcountry Recreation in Alternatives S and K. The difference between the amount of mature and old growth in existence today and that which would be retained in a particular alternative is an impact which cannot be avoided if the objectives of an alternative are going to be satisfied

FISH HABITAT, WATER QUALITY, AND SOIL PRODUCTIVITY

Fish production is primarily a function of the fisheries capital investment program and riparian management prescriptions. Taken together, these factors would contribute to the highest levels of anadromous fish in Alternatives B, S, and K Moderate levels would be provided in Alternatives G, M, E, D, and D1 Alternatives A, A-Departure, C, and NC would have the lowest outputs Riparian conditions, at a minimum, would be maintained through the application of the Standards and Guidelines

The amount and concentration of soil erosion is primarily a function of the road construction, area harvested, and the basin-specific timber harvest dispersion constraints Soil erosion, loss of productivity, or reduction by construction of roads and other facilities represents a permanent, long-term loss. There

is nearly a linear relationship between acres harvested and the amount of sediment produced Alternatives G, E, and M would produce the least amount of sediment due to limited road construction and timber harvest Alternatives B, D, and C would produce greater amounts of sediment because of the greater level of activity Alternative C would produce the largest amount of sediment and highest peaks of sediment due to high harvest levels, a large hardwood conversion program, and the least restrictive basin harvest constraints Alternatives NC, A, A-Departure, K, S, and D1 would be within the mid-range of sediment outputs

WILD AND SCENIC RIVERS

River Management Plans for the Rogue and Illinois Wild and Scenic Rivers will not be affected through the range of alternatives. The Omnibus Oregon Wild and Scenic Rivers Act (1988) was passed just before release of this FEIS. As a result, this Planning Problem is reduced to the question of land allocation decisions and activities adjacent to Wild and Scenic Rivers' corridors Alternatives were designed in the DEIS to offer an array of management options for Wild and Scenic Rivers, and the rivers are allocated in the FEIS as originally designed. Any alternative selected would be brought into conformance with the recent legislation prior to harvest

Alternatives which assign at least the full inventory of Visual Quality Objectives in areas adjacent to Wild and Scenic Rivers and allocate greater amounts of land to Management Areas 1-9 provide the highest level of benefits to the Wild and Scenic River resource Alternatives M, E, and G would be the most complementary. Progressively less benefits would be provided by NC, A and A-Departure, S, and K, although the natural/near natural character of the river corridors will be maintained

Alternatives B, D, and D1 would reduce visual quality due to timber harvests adjacent to the Rogue and Illinois River corridors. Alternative C would have the most significant impact on visual quality adjacent to the Wild and Scenic Rivers by allocating the maximum amount of land to General Forest where the Visual Quality Objective of Modification would be applied.

As the visual quality along Wild and Scenic Rivers would be managed at increasingly higher levels, less amount of timber would be produced Subsequent consequences would include reduced payments to counties, reduced revenue to the U.S Treasury, and reduced economic values of the alternative. Where the visual quality is maintained at a higher level, the recreational experience on and adjacent to the rivers would be of higher quality with more natural-appearing views

SENSITIVE PLANT HABITAT

Designation of Research Natural Areas (RNA's) and Botanical Areas protects sensitive plant habitat from site-disturbing activities. The three existing RNA's and three existing Botanical Areas provide for scientific study and educational use in a protected environment Four new areas are considered for RNA designation, while 24 areas are potential Botanical Area candidates. No timber harvest would be programmed from the existing or candidate areas Mineral accessibility would also be slightly limited due to restrictions placed on mining operations within these two land allocations.

As the acreage of Botanical Management Areas increases, the probability of adverse effects on sensitive plant populations decreases. Alternatives S, E, G, and M would have progressively more acreage included in Botanical Areas Alternatives A, A-Departure, and NC would have no new candidate areas allocated, while the rest of the alternatives have about the same mid-range levels of new areas

In addition to the Botanical Areas, four RNA's would be proposed under different alternatives. Alternatives A and A-Departure would have one additional RNA proposed, while Alternatives B, C, D, and D1 propose two Alternatives E, G, K, S, and M would include all four additional RNA's which also include representatives of many plant communities on the Forest.

FOREST SCENIC VALUES

The preservation of natural-appearing scenery generally would increase as lands are allocated to the first nine Management Areas. Timber production would decrease as lands are allocated to Partial Retention, Retention, and Preservation status.

Alternative M would provide the most natural forest setting with an extended harvest rotation of 250 years and a lower harvest level. Alternative E would be similar to M in land allocation, however, harvest rotations are shorter in Partial Retention Visual and General Forest Management Areas so that visual impacts are greater on that part of the Forest. Both alternatives would have large amounts of natural-appearing views due to large amounts of land allocated to the Backcountry Recreation.

Alternatives G and S would have less area of natural-appearing views due to progressively less land allocated to the Backcountry Recreation Management Areas Alternatives A, A-Departure, D, C, D1, and B would have natural-appearing views mainly in designated Wildernesses, and along Wild and Scenic Rivers. However, Alternatives NC, A, and A-Departure would provide the most land in Retention and Partial Retention Visual Management Areas which provide high quality scenery throughout all the major travel routes on the Forest. Alternative K would reduce visual management with high quality scenery oriented only to the high recreation use areas

WILDLIFE HABITAT

The amount of old-growth habitat declines with increased harvest levels Alternatives M, E, G, and S would provide the most habitat suitable for old-growth species; Alternatives K, A, A-Departure, D, C, D1, and B would provide progressively less old-growth habitat. Alternative NC would provide the least because of the absence Management Requirements (MR's) for old-growth wildlife habitat All other alternatives would sustain viable populations of dependent species through the maintenance of MR's

Deer and elk forage, and opportunities for wildlife-viewing would increase with increased harvest levels Alternatives C, B, D1, and D would provide the most forage within the first decade. Alternatives A-Departure, NC, A, and K provide progressively less. Alternatives S, G, E, and M would provide the least deer and elk forage, and opportunities for wildlife recreational use.

UNROADED RECREATIONAL OPPORTUNITIES

Recreational opportunities for Primitive and Semi-primitive Non-motorized experiences would increase as the land allocated to Backcountry Recreation becomes larger. Alternatives S, G, M, and E would have progressively greater amounts of land allocated to the Backcountry Recreation Management Area Alternatives K, NC, A, A-Departure, D, C, D1, and B would have Primitive recreation opportunities mainly limited to existing Wildernesses, and Wild and Scenic Rivers.

As the opportunities for Primitive Non-motorized recreation increase, more old-growth habitat would be preserved, more sensitive plant habitat would be reserved, and risk to the water and soil resources would be minimized. The opportunities for dispersed motorized recreation, timber production, payment to counties, revenue to the U.S. Treasury, and employment opportunities would decrease as the opportunities for Primitive recreation increase.

Surplus capacity presently exists for Primitive recreational use However, the development of several unroaded areas would displace existing Primitive recreational use to other less desirable areas Potential development would occur in Alternatives NC, A, A-Departure, B, C, D, and D1, and to some extent in Alternative K.

MINERAL ACCESSIBILITY

Mineral accessibility is primarily a function of the area of land allocated to management categories where mineral restrictions apply. Alternative C would have fewest restrictions, followed closely by B, D, A, A-Departure, and NC. Slightly greater restrictions would be in Alternatives K and S. Alternatives M, E, and G would have the greatest restrictions primarily due to greater acreage allocated to Management Areas which either do not provide for road development or severely limit access

The alternatives that restrict mining activities the most could increase costs of mining operations and difficulty of access. The alternatives that would have fewer restrictions for mining could provide opportunities for easier access and more economically efficient mining operations

NET PUBLIC BENEFIT

Net Public Benefit (NPB) is the overall long-term value to the Nation of all outputs and positive effects, (called "benefits"), less all associated Forest inputs and negative effects, (called "costs"), resulting from management. Many "priced" benefits and all financial costs of management can be measured in dollars However, other "nonpriced" public concerns, benefits, and negative effects cannot be fully valued in economic terms. One purpose of this document is to identify these benefits and costs so that a judgement can be made about which alternative provides the mix of goods and services that most closely maximizes NPB while responding to expressed public concerns.

The future value to society of this Forest will depend upon the mix of economic and other values that are produced and the costs of managing the Forest to produce these values. Judgements about the various mixes associated with each alternative may differ. Understanding competitive and complementary relationships among alternatives provides a useful starting point

Emphasizing responses to issues that focus on nonpriced outputs reduces net economic values principally because of reductions in the land base for timber production. Land allocations to the Backcountry Recreation, Supplemental Resource, Research Natural Area, Botanical, Unique Interest, and Designated Wildlife Habitat Management Areas would reduce the area for programmed timber harvest While not reducing the land base, allocations to Riparian, Retention Visual, and Partial Retention Visual Management Areas limit the amount of timber that can be produced over time

All alternatives except Alternative M would provide for economic growth in payments to counties and receipts to the U S Treasury over the 150-year planning horizon Alternatives B, C, D, and D1 would increase levels above historical conditions for the first decade provided all outputs are consumed. Alternatives NC, A, A-Departure, S, and K would provide payments approximately equal to historical conditions Alternatives G, E, and M would result in progressively and significantly lower levels of timber harvest and associated benefits in the first decade.

The mixes of outputs, land allocations, and management emphasis of the various alternatives will be judged differently depending on community and individual social values Although changes in management activities and physical conditions would be phased in gradually, alternatives that provide the biggest change in development or preservation of the timber resource are likely to lead to the greatest conflicts within communities

PRESENT NET VALUE

The primary measure of economic efficiency used by the Forest Service is PNV. It is the sum of the benefits minus the sum of the costs for the 150-year planning horizon, discounted to the present at the rate of four percent per year Table S-3 displays PNV and total discounted benefits and costs for the alternatives and the Max PNV Benchmark. The alternatives are listed in order of decreasing PNV. Generally, both discounted costs and discounted benefits decrease as PNV decreases All three variables are directly related to the level of timber harvest. As the amount of timber harvested increases, PNV, discounted benefits, and discounted costs all increase (and, conversely, decrease as timber harvest declines). PNV and level of timber harvest would range from a maximum in Alternative B to a minimum in Alternative M.

Table S-3. Present Net Value, Discounted Costs, and Discounted Benefits, with Incremental Changes between Alternatives (MM $ discounted at 4 percent for 15 periods). Alternatives are ranked in order of decreasing PNV.

Alternative	PNV	Change	Costs	Change	Benefits	Change
Max PNV Benchmark	1,278		785		2,062	
		-37		+15		-21
B	1,241		800		2,041	
		-27		-8		-35
D1	1,214		792		2,006	
		0		-61		-61
NC	1,214		732		1,946	
		-17		+85		+68
C	1,197		817		2,013	
		-37		-37		-73
D	1,160		780		1,940	
		0		-37		-37
A-Departure	1,160		743		1,903	
		-10		-7		-18
A	1,150		736		1,885	
		-19		-24		-42
S	1,131		712		1,843	
		-48		-3		-51
K	1,083		709		1,792	
		-239		-132		-371
G	844		577		1,421	
		-165		-60		-225
E	679		517		1,196	
		-407		-187		-594
M	272		330		602	



CHAPTER I

PURPOSE OF AND NEED FOR ACTION

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Chapter I
PURPOSE OF AND NEED FOR ACTION
INTRODUCTION

The Siskiyou National Forest has proposed and analyzed several alternatives for managing the Siskiyou's land and resources. This chapter presents the purpose of, and the need for, proposing these alternatives.

There is widespread public interest in the resources of the National Forests and diverse viewpoints on how they should be managed. The purpose of this analysis and disclosure is to examine the Forest resources and, in full awareness of these viewpoints, recommend a course of action to best guide the management of these resources in the future; and display the environmental impacts associated with this action This Final Environmental Impact Statement (FEIS) describes a range of alternatives for future management of the Siskiyou National Forest and discloses the environmental consequences, including significant impacts, of implementation The management alternatives considered include a Preferred Alternative, i e , the Proposed Action.

The alternatives suggest various means of: (1) addressing local, regional, and National public issues and management concerns, (2) providing for the use and protection of Forest resources; and (3) fulfilling National legislative requirements Each alternative generates a different mix of goods and services which the Siskiyou National Forest is capable of producing For this Plan, multiple use and sustained yield become the guiding principles

Each alternative was evaluated to determine its potential to provide a sustained yield of goods and services in a way that would meet multiple-use objectives and best maximizes long-term net public benefits (NPB) while responding to the Planning Problems. NPB represents the cumulative net value of all Forest outputs and activities, whether assigned a dollar value or not This is an overall goal and its determination is dependent on the degree of resolution for each of the Planning Problems identified later in this chapter For a full explanation of the analytic concepts used in addressing this problem (net public benefits, present net value, and net subjective value), see Appendix B. The Preferred Alternative is that alternative which, in the considered opinion of the Forest Service, would best meet these objectives

The Preferred Alternative, as modified by the Record of Decision, is the basis for the accompanying *Land and Resource Management Plan* (LRMP, or the Forest Plan), which is a separate document The purpose of the Forest Plan is to guide future natural resource management activities on the Siskiyou.

The preparation of an Environmental Impact Statement (EIS) that discloses the proposed action and its alternatives is required by the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's (CEQ) Regulations for implementing NEPA (40 CFR 1500 et seq), and the implementing regulations of the National Forest Management Act of 1976 (NFMA) (36 CFR 219). Preparation of the Forest Plan is required by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by NFMA, plus the associated National Forest System Land and Resource Planning Regulations (36 CFR 219). For purposes of disclosure under NEPA, this FEIS and the accompanying Forest Plan are treated as combined documents In addition, the FEIS (1988) for the Silver Fire Recovery Project is incorporated by reference.

The EIS is required because the implementation of the Forest Plan is a major Federal action significantly affecting the quality of the human environment Its purpose is to provide decisionmakers with an environmental disclosure sufficiently detailed to aid in the selection of management direction for the Forest. Equally important, its purpose is to make information on the alternative environmental impacts available to the public, and to encourage public participation in the development and refinement of that information

The Record of Decision (ROD) accompanies this FEIS and Forest Plan The ROD identifies the selected alternative that will be implemented, and provides the accompanying rationale for the decision

Due to the length and complexity of this FEIS, Appendices, and accompanying Forest Plan, reader aids are provided to help in searching for the presence and location of given subjects. The TABLE OF CONTENTS is at the beginning of the FEIS to provide information on how the documents are organized and their general content The ACRONYMS AND GLOSSARY defining terms, units, and abbreviations is located after the last chapter; an INDEX to key subjects is also provided there. A list of references cited in the FEIS is also provided (LITERATURE CITED). For additional assistance, please contact the Forest Supervisor's planning staff (telephone number and address are on the Abstract preceding this Chapter)

CHANGES BETWEEN DRAFT AND FINAL

The Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan were released to the public on August 28, 1987. Chapter I in the DEIS differs from the FEIS Chapter I in several ways Changes that have occurred since the DEIS was published are incorporated in this (FEIS) chapter including the 1987 fires, inventory update, public involvement during the Silver Fire Recovery Project, the Silver Fire Recovery FEIS, and the three newly designated rivers under the Omnibus Oregon Wild and Scenic Rivers Act of 1988. This chapter also provides discussion of the public involvement in Forest planning following the release of the DEIS and public attention to some aspects of the planning issues including reforestation, biological diversity, Wild and Scenic rivers, tourism and recreation, and various technical questions related to timber harvest amounts Discussion under **PLANNING PROBLEMS** gives more information on the issues which were ratified and those receiving fresh emphasis.

The Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (USDA 1988b) that addresses spotted owl guidelines has been completed since the publication of the Siskiyou DEIS The changes in direction have been incorporated in this FEIS resulting in minor changes in the Standards and Guidelines and the habitat network The revised direction is not substantially changed for the Siskiyou, and changes in the alternatives for this analysis are negligible The EIS for Managing Competing and Unwanted Vegetation (USDA 1988c) was also released since the DEIS, the plan assumes that all methods of managing competing vegetation are available and is consistent with the analysis in this FEIS and Forest Plan for the Siskiyou National Forest

NATIONAL, REGIONAL, AND FOREST PLANNING

As required by RPA, NFMA, and the related implementing regulations cited above, the Forest Service uses a three-level, integrated planning process At the National level, the RPA Program establishes long-range resource objectives that are based on the present and anticipated supply of, and demand for, various resources. Portions of each of the National resource objectives included in the RPA Program are distributed to each of the nine Forest Service Regions

At the Regional level, a Regional Guide is developed This guide distributes the Region's portion of RPA National objectives to each National Forest within the Region The Regional Guide also establishes Regional management standards and guidelines The Pacific Northwest Regional Guide (USDA 1984b) provides this direction for the Siskiyou National Forest Standards and guidelines for management of spotted owl habitat are established in the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (USDA 1988b) The EIS for Managing Competing and Unwanted Vegetation (USDA 1988c) provides direction for vegetation management for the Pacific Northwest Region

At the Forest level, a proposed Forest Plan is prepared. Ranges of different resource objectives form the basis for alternatives considered in the EIS for the Plan, one of these alternatives incorporates the tentative RPA Program resource objectives displayed in the Regional Guide The Forest Plan includes direction provided by RPA, NFMA (including the implementing regulations) and the Regional Guide

The planning process is a continuously repeating process Information from the Forest level flows up to the National level, is incorporated into the RPA Program, and then flows back to the Forest level The RPA Program and Regional Guide are updated every five years The Forest Plan analysis considers a 150-year planning horizon to ensure that management plans can be implemented over the long term, and to disclose and evaluate long-term environmental consequences

The alternatives presented in this document contain management direction for the Plan period. The Forest Plan period covers the next 10 to 15 years. NFMA regulations define the Plan period as one decade, while the law permits a 15-year maximum Within the Plan period, conditions on the Forest will be reanalyzed every 5 years, and under certain circumstances, the Plan may be revised

Management actions, outputs, and environmental effects for several decades beyond the Plan period are also discussed for the alternatives The purpose of these discussions is twofold (1) To present to decisionmakers and the public a long-term analysis of the management necessary for each alternative to achieve and maintain, in perpetuity, a high level of regular periodic outputs of various resources without impairment to the productivity of the land. This analysis also provides an estimate of the level of long-term outputs for each alternative. (2) Program development for RPA requires information for four decades beyond the Plan period In order for the analysis of alternatives for an RPA program to link with actual conditions and local issues at the Forest level, a complete estimate of outputs, costs, and effects for the RPA time horizon is imperative.

The projection of effects and attributes of the alternatives beyond the Plan period, although required by law, does not legally bind the Forest to action beyond the Plan period The Forest Service is required to revise the Plan within 15 years of its adoption; this revision may establish different long-term goals with different projected effects and outputs

The Planning Steps leading to the development of the DEIS and Proposed Land and Resource Management Plan are·

1 Identification of issues, concerns, and opportunities
2 Development of planning criteria.
3. Inventory data and information collection.
4 Analysis of the management situation.
5. Formulation of alternatives.
6. Estimated effects of alternatives
7. Evaluation of alternatives

(Refer to Appendices A and B for a detailed description of the process used in Planning Steps 1 through 6) *Planning Records*, the documents and files which chronicle the first seven planning actions, are available for review at the Forest Supervisor's Office in Grants Pass, Oregon. The planning records are referenced in the text and appendices of this FEIS and Forest Plan

Government agencies and the public were consulted for comments on the DEIS and the accompanying proposed Forest Plan. Comments received have been used to evaluate the results of the first seven planning steps and modify, where necessary, the Preferred Alternative and Forest Plan. Appendix K describes the public involvement process between the DEIS and FEIS, it also displays the comments received and the Forest's response to those comments.

This FEIS will be used by the Regional Forester as the information base for a Record of Decision. The ROD will be made available to the public Issuance of the ROD will complete Planning Step 8 and initiate the last two Planning Steps

8. Selection of the Preferred Alternative and documentation of its proposed implementation in the Forest Plan.
9 Plan implementation
10. Monitoring and evaluation

Figure I-1 displays the major steps of the Forest Planning Process

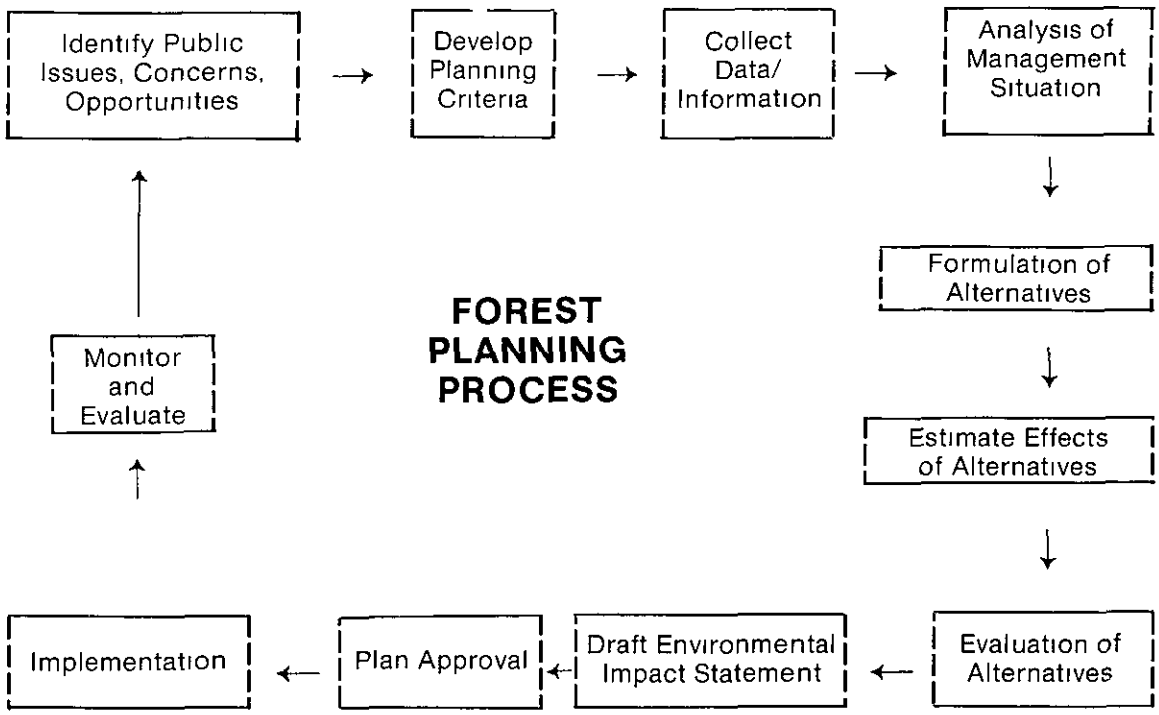


Figure I-1. Forest Planning Process

Upon implementation, the FEIS and Forest Plan will be used for "tiering" in accordance with the CEQ regulations. Tiering means that the environmental analyses conducted for site-specific projects and implemented under the direction of the Forest Plan will refer to the FEIS, Forest Plan, and associated documents Information will be used from them to help narrow discussions and concentrate on issues pertinent to the project This will help minimize repetition of information contained in documents having broader authority or coverage Project scoping, public and other agency involvement, and the ensuing environmental analyses will then be able to focus on issues unique to those projects and site conditions.

The Forest Plan supersedes or incorporates all previous land and resource management plans prepared for the Siskiyou National Forest Upon implementation, Forest management activities will comply with the Forest Plan. Appropriated budgets may alter the schedule of activities. In addition, all permits, contracts, and other instruments for the use and occupancy of National Forest System Lands and resource uses must be in conformance with the Forest Plan. Such documents shall be revised where needed as soon as practicable, subject to valid existing rights. This updating will generally be done within three years

The NFMA regulations guiding the development of Forest Plans state, "...if in a particular case, special area authorities require the preparation of a separate special area plan, the direction in any such plan may be incorporated into the Forest Plan without modification " For this reason, the Rogue National Wild and Scenic River Management Plan (Federal Register, July 7, 1972) and Illinois Wild and Scenic River Management Plan (1985) will be incorporated unchanged in all Forest Plan alternatives

Major wildfires impacted parts of the Forest during the review period of the DEIS and draft Forest Plan Rehabilitation and timber salvage opportunities were evaluated in a separate environmental analysis Full public involvement and scoping were used in addressing the major issues surrounding the management of the fire area and recovery of burned timber. The Silver Fire Recovery Project FEIS is incorporated by reference in this FEIS.

The Forest planning process will be used to provide the mandated direction for the Wildernesses which have separate area management plans. The Rogue River National Forest is the lead Forest to complete the Red Buttes Wilderness Plan. The Klamath National Forest will carry the lead on the Siskiyou Wilderness Plan

OVERVIEW OF FOREST

The Siskiyou National Forest is located in the Klamath Mountains and Coast Range of southwestern Oregon (Josephine, Curry, and Coos Counties), with a small segment of the Forest extending into northwestern California (Del Norte County) The Siskiyou contains 1,162,030 acres within its boundaries, 69,728 acres of which are privately owned or managed by other government agencies The FEIS and Forest Plan apply only to National Forest System lands

The Forest Supervisor's Office is in Grants Pass, Oregon Ranger District offices are in Grants Pass (Galice Ranger District), Cave Junction (Illinois Valley Ranger District), Brookings (Chetco Ranger District), Gold Beach (Gold Beach Ranger District), and Powers (Powers Ranger District). These locations are shown on the Vicinity Map (Figure I-2), district boundaries are shown on the Ranger District Map (Figure I-3).

The topography of the Forest is very mountainous, with elevations ranging from 100 feet to over 7,000 feet. It is characterized by a variety of landforms ranging from knife ridges and deep canyons to flat ridgetops and rounded sideslopes The Forest is drained by many fast-flowing rivers characterized by steep-sided inner gorges

Principal Forest resources include very productive timber lands, high quality anadromous fisheries, five Wild and Scenic Rivers, a wide variety of plant and animal life, five Wilderness areas, a road system, diverse mineral deposits, and a wide range of recreational opportunities.

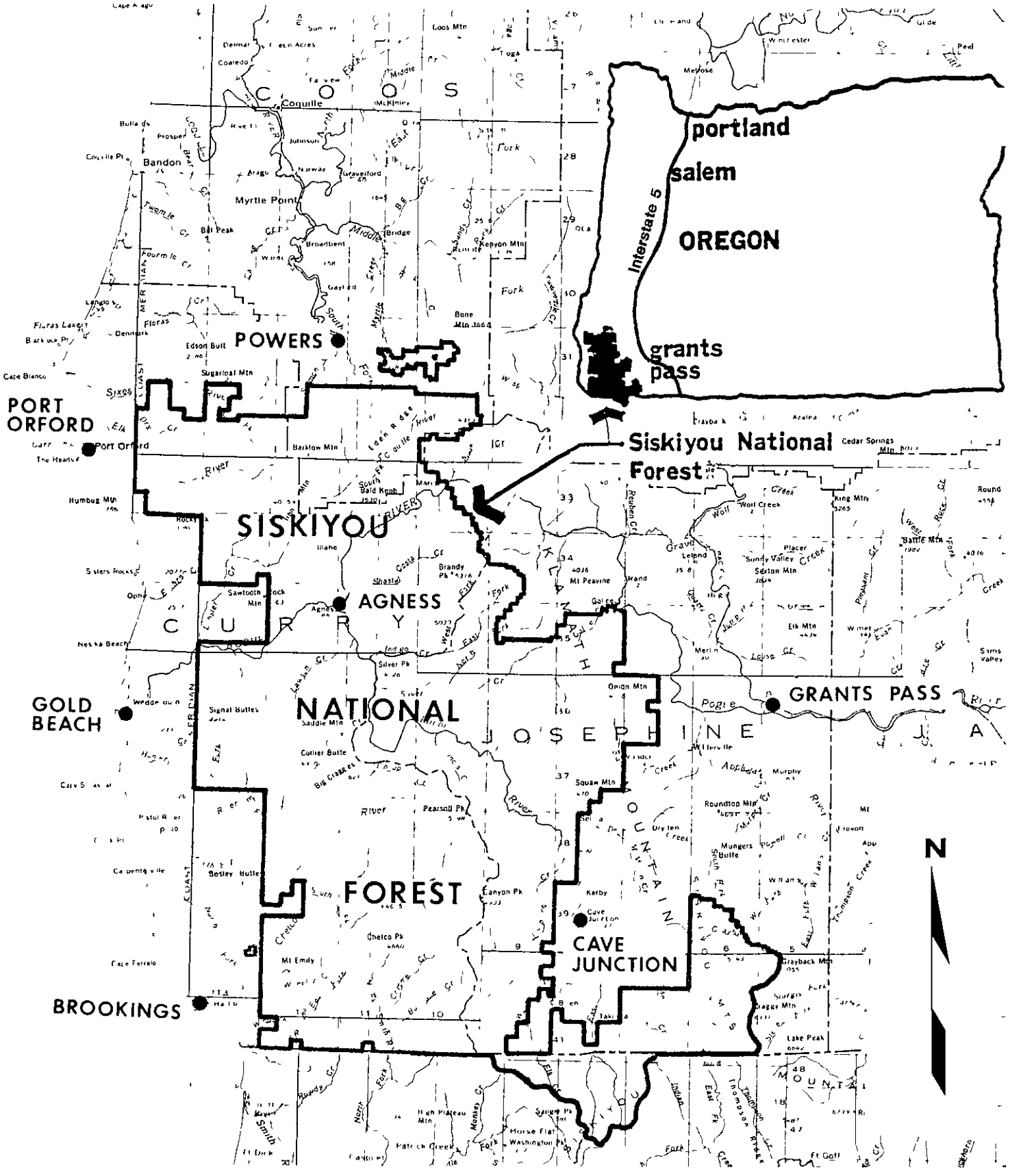


Figure I-2 Siskiyou National Forest Vicinity Map

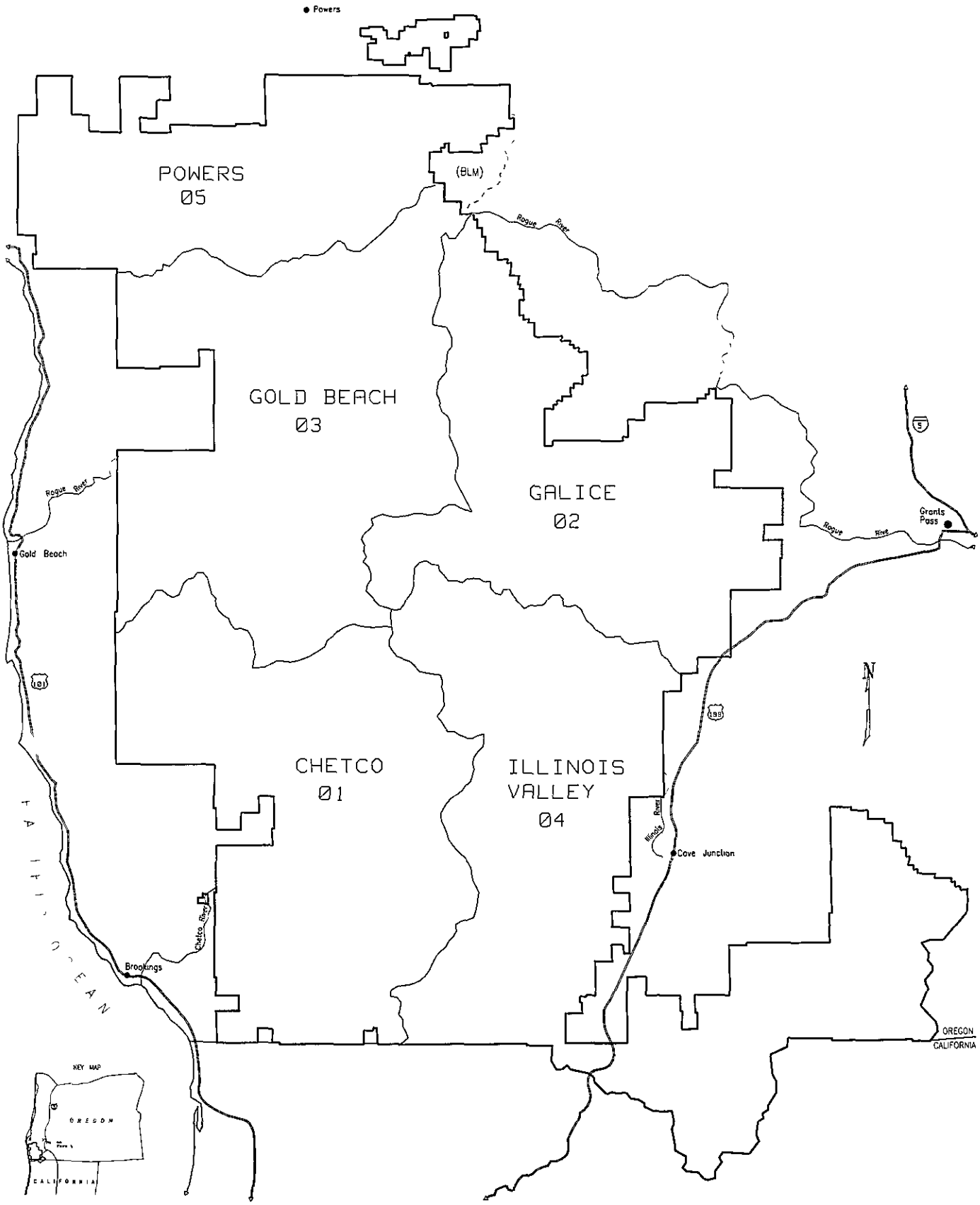


Figure I-3 Ranger District Map

The four counties that are most interrelated with the Siskiyou National Forest are Jackson, Josephine, Coos, and Curry The total population of the local four-county area is approximately 271,000 County populations range from a high of 132,500 in Jackson County, to a low of 17,000 in Curry County (Figure I-4)

The dominant employer in the area is the lumber and wood products sector. Timber outputs from the Siskiyou National Forest account for an estimated 2,500 jobs in the total employment picture. The timber industry accounted for 15 percent of total employment in the four-county area in 1983 This proportion has been declining for the past several years. Concurrently, electronics, light manufacturing, and service industries are accounting for a greater share of total employment.

Recreation and tourism also contribute to local jobs and economic stability Total developed and dispersed recreation use is approximately 700,000 visitor days annually. An additional 67,000 sport fishing user days are attributable to Forest resources, and 76,000 wildlife user days occur on the Forest In total, these Forest resources support 847,000 user days and account for an estimated 1,000 jobs. A detailed description of the affected environment is in Chapter III.

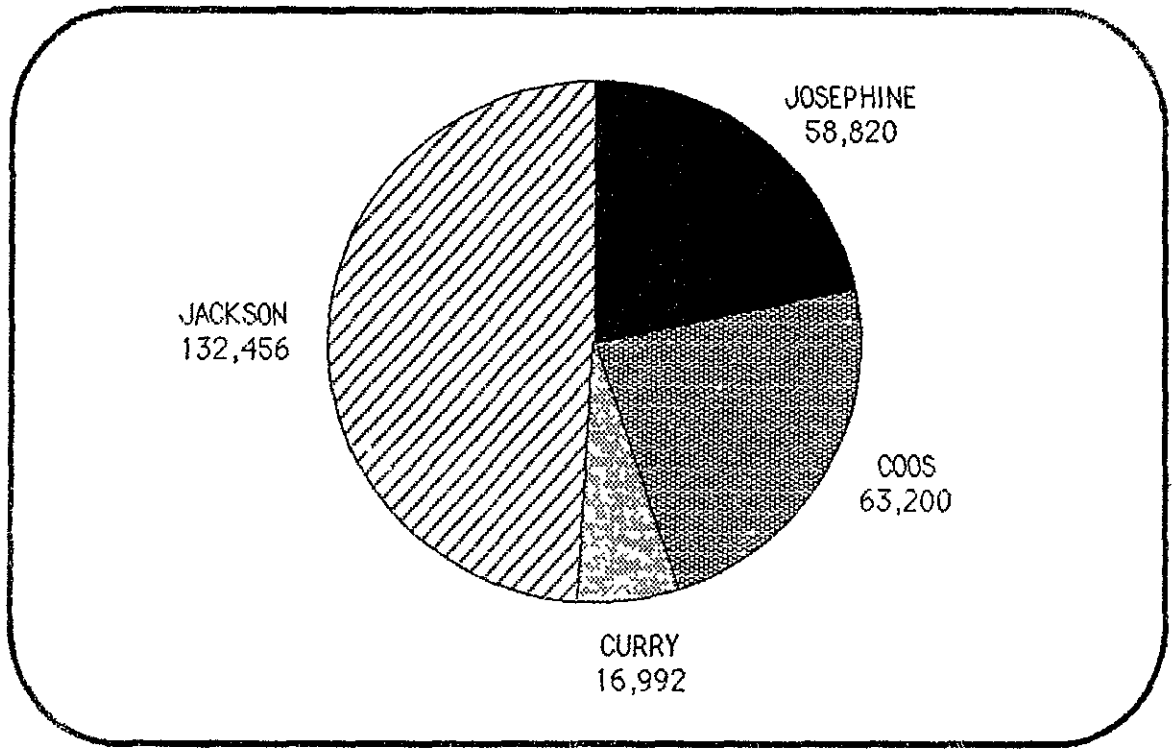


Figure I-4 Population by County - 1980 Census

ISSUES, CONCERNS, AND OPPORTUNITIES

DEVELOPMENT AND CONFIRMATION

The Siskiyou National Forest consists of complex natural systems that can be managed for different mixes of resource outputs, land uses, and environmental conditions. The public has differing views on how the Forest should be managed, each viewpoint emphasizes a different combination of outputs, uses, and conditions Because all the resources, uses, and conditions of a Forest are ecologically and economically interrelated, a management emphasis for certain resource outputs will result in changes in other Forest resources. These tradeoffs occur as a direct result of the implementation of management schemes which emphasize selected resource outputs, land uses, and environmental conditions at the expense of other potential outputs, uses, and conditions. There are practical and natural limits to what a Forest can provide

The Issues, Concerns, and Opportunities (ICO's) are identified to provide the context for analyzing the Forest's potential to provide the various mixes of outputs, uses, and conditions that are encompassed by differing public views. A public *Issue* is a subject or question of widespread public interest relating to management of the National Forest resources

A management *Concern* is an issue, problem, or condition which constrains the range of management practices identified by the Forest Service in the planning process.

A third component influencing alternatives comes from the various resource use and development *Opportunities* suggested by both the public and Forest Service. These opportunities give rise to many of the issues and concerns identified here. The opportunities to preserve or develop and use the resources of the National Forest are the focus of many of the Agency's programs, and are the principal focus of the management alternatives developed here. Because there are both public issues and management concerns about these opportunities, most of them are incorporated within the discussion of issues and concerns. The opportunities that have been identified are listed and discussed in Appendix A.

Identification of the ICO's has been a critical step in the planning process This information has been collected and refined throughout the entire planning effort. This process began in 1979 when a potential list of ICO's was developed from previous public comments on Forest management problems and several Forest Service employee and public meetings. In early 1980, the ICO's were published as a Forest Plan Report and sent to a wide variety of interested citizens and groups, and local, state, and Federal agencies in Oregon and California.

The ICO's have changed somewhat with time As new events occurred and local, regional, and National goals and policies changed, the ICO's were modified accordingly. This confirmation was essential in order to keep the lengthy planning process updated and the analysis tracking with current conditions and views. Additional information on how the ICO's were collected, evaluated, and selected for inclusion in the planning analysis is presented in Appendix A.

The ICO's for Forest planning were ratified again through extensive public comment received after publication of the DEIS and proposed Forest plan. The Forest received a total of 16,983 responses (with 17,277 signatures) during the 150-day review period The normal 90-day public review period was extended twice. The first extension was related to the impacts of the fires on the Forest's ability to meet with all the public. The second extension came in response to local officials' requests.

Several issues or aspects of ICO's received fresh emphasis. Numerous meetings with interested agency officials, groups, and individuals have continued to clarify ICO's Appendix K describes the public involvement process between the DEIS and FEIS, it also displays public comments received and the Forest response to the comments In addition, Appendix K lists the names of those who commented, and

photocopies of letters received from elected officials, local, state, and Federal agencies, and Native American groups

1987 FIRES

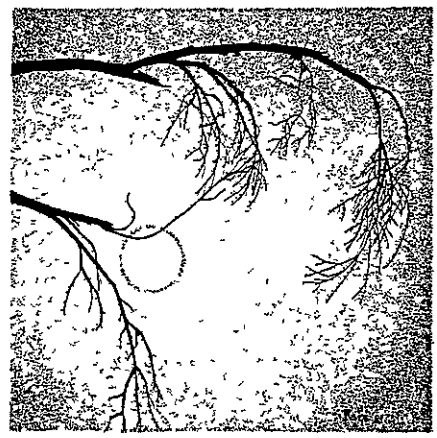
Lightning ignited several fires on August 30, 1987, two days after release of the DEIS and proposed Forest Plan for public review. The Silver, Galice, and Longwood Fire Complexes involved a total area on the Siskiyou National Forest of approximately 110,000 acres. Planning for salvage of fire-killed timber and resource restoration occurred on these fire areas Public involvement in this planning process was extensive, especially on the Longwood and Silver Fires, numerous meetings and workshops were held with interested people

The public involvement process during the Silver Fire Recovery Project was one of the most comprehensive in Forest Service history Nearly 28,000 responses to the Silver Fire Recovery Project DEIS were received. With the exception of the issue of "rapid timber recovery," public interest was focused on similar ICO's (or aspects of issues) as those described in the Planning Problems below The Silver Fire Recovery Project FEIS and ROD was released in July, 1988. An amendment to the 1989 Appropriations Act modified the implementation of the project plan in the Bald Mountain area

The effects of the fires on various resources are described in Chapter III, Affected Environment, 1987 Fires The effects, viewed from a Forest-wide perspective, are not significant. Approximately three percent of the land base suitable for the production of timber was impacted. The maximum effect on the Forest's potential to produce timber is about 2 MMBF in ASQ The intensive survey work needed for the project provided an update of some inventory information, including tentatively suitable land and timber inventory. Inventory update information is also given in Chapter III.

Wildlife species or habitat for either plant or animal, including the spotted owl habitat network proposed in the DEIS, do not appear to be seriously affected Fisheries and watershed effects include increased stream temperature and sedimentation, with a corresponding reduction in smolt from Silver and Indigo drainages of one half of one percent of total Forest production

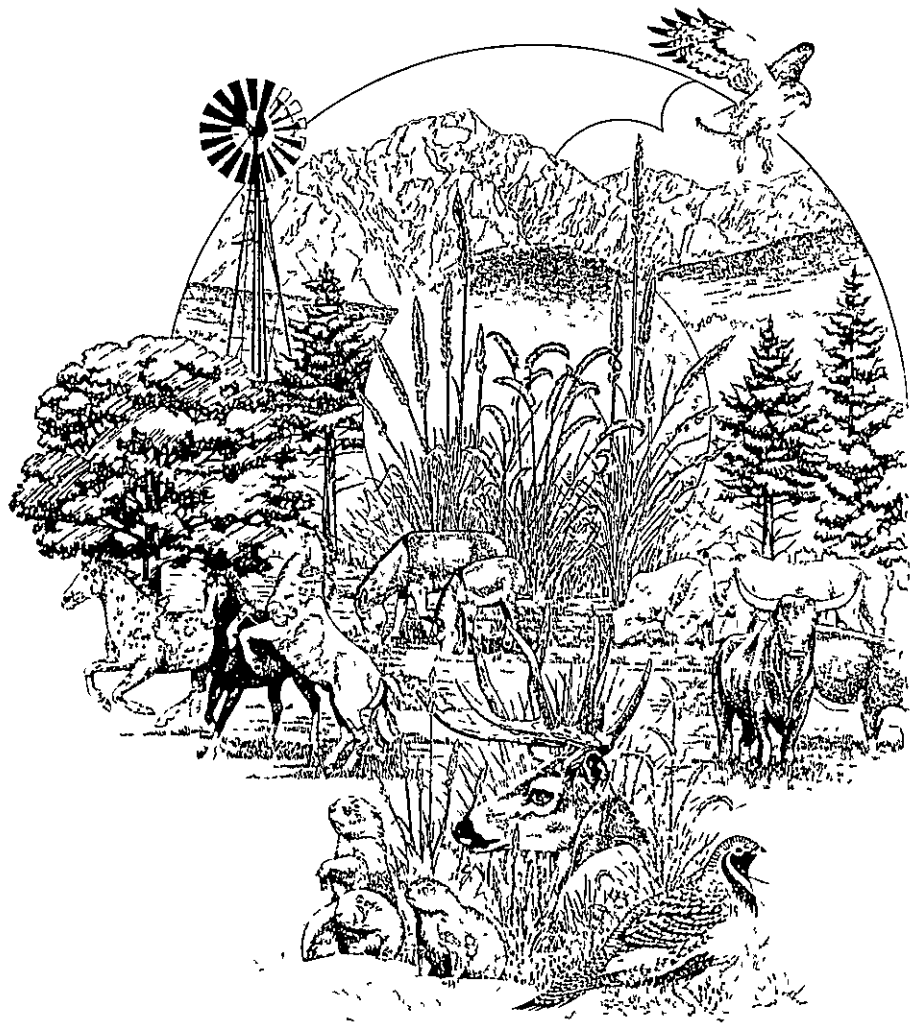
While fire itself does not appreciably change recreation opportunities, timber harvest and associated road construction of the Silver Fire Recovery Project will reduce the unroaded acres Forest-wide by approximately seven percent. A roadless inventory update for changes resulting from both the Silver Fire and other Forest activities between 1984 and present is provided in Appendix C - Roadless Areas



PLANNING PROBLEMS

The central tasks in Forest planning are the development of alternative ways of managing the National Forest and the determination of the implications of these management alternatives for the Forest environment and its potential for supplying human needs. The differing emphases on goods, services, uses, and environmental conditions that various concerned communities, groups, and individuals desire, as well as the physical, biological, and legal limits of Forest management, are reflected in the ICO's that thread through the entire planning process. The ICO's have been analyzed and grouped or restated in the following Planning Problems and posed as questions that can be used to guide the development of alternatives The alternatives are then evaluated to determine how well they respond to these Planning Problems in an attempt to resolve the conflicts and identify the best course for land and resource management.

Appendix A documents the development of the following Planning Problems from the ICO's The resources that these questions address are more fully described in Chapter III



KEY INDICATORS

The measure of the Forest's ability to respond to each Planning Problem is referred to as a Key Indicator Indicators include the outputs, uses, or conditions that can be measured or described to gauge the response of the various alternatives, these are displayed in Table I-1

Table I-1 Key Indicators of Planning Problem Resolution

PLANNING PROBLEMS/ Key Indicators	Unit of Measure
1 TIMBER PRODUCTION	
Selected Suitable Area	M Acres
First Decade Volume	MMCF
Fifth Decade Volume	MMCF
Long-Term Sustained Yield (LTSY)	MMCF
2 OLD-GROWTH FOREST	
Reserved Area 1/	M Acres
Available at End of Fifth Decade	M Acres
3 SOIL, WATER, AND FISHERIES	
Management Areas 1 through 9	M Acres
Riparian Prescriptions C and M 2/	M Acres
Capital Investments 3/	M $
Harvest Dispersion Constraint 4/	Number of Basin
Anadromous Sport Fish User Days	M WFUD's
Commercial Fish	M Pounds
Average Annual Sediment 5/	M Tons
4 WILD AND SCENIC RIVERS	
Adjacent Area Meeting VQO's 6/	M Acres
5 SENSITIVE PLANTS	
Research Natural Area	M Acres
Botanical Area	M Acres
6 VISUAL RESOURCES	
Viewsheds Meeting VQO's 7/	Number
Meets or Exceeds Partial Retention 8/	M Acres
7 WILDLIFE HABITAT	
Spotted Owl Capability 9/	Pairs
Woodpecker Habitat Capability 10/	Percent
Wildlife User Days	M WFUD's
Capital Investments	M $
Special Wildlife Sites	M Acres
8 WILDERNESS AND UNROADED	
Unroaded Condition - Management Area 1 through 9 11/	M Acres
ROS--Primitive and Semi-primitive	M Acres
9 MINERALS	
Area Accessible with Limited Restriction 12/	M Acres

1/ Mature and old-growth forest reserved (protected) in Management Areas 1 through 9 (MA 1-9) plus unsuitable acres in Management Areas 10 through 14 (MA 10-14), from 5 3 acre cells.
2/ Riparian Prescriptions M (Minimum Level) and C; both exceed the Management Requirement (MR) level for water quality as reflected in Prescription B
3/ The combination of capital investments from fisheries habitat and soil and water resource improvement projects, includes appropriated and K-V funds, both enhancement and mitigation work represented
4/ Timber harvest dispersion ("basin") constraints are applied to planning basins, they are individually tailored based on Planning Basin values, characteristics, and activity level, they constrain activity more than the MR of 20 percent
5/ Total average annual sediment output, includes background natural plus existing road loss rates, along with accelerated rates accounted for in the alternatives, calculation does not include other prior disturbances (harvest units or old burns)
6/ Area adjacent to (as seen from) existing or potential Wild and Scenic Rivers that meet or exceed their inventoried VQO's
7/ Viewsheds which meet or exceed the inventoried VQO's
8/ Area meeting or exceeding Partial Retention (Partial Retention plus Retention plus Preservation)
9/ Potential habitat capability to support spotted owl pairs over time (long term)
10/ Potential habitat capable of supporting a given percentage of woodpecker populations over time (long term)
11/ Inventoried unroaded area allocated to Management Areas 1 through 9 (MA 1-9) where little or no roading exists and management objectives are highly oriented to nondevelopment
12/ Area accessible to mineral exploration, development, and extraction with limited (low to moderate) restrictions imposed by other resource protection needs or standards

1. How Much Timber Should the Forest Produce?

Many individuals and groups feel that the Forest should help sustain regional and local economies by maintaining or increasing annual timber harvests. Along with this they feel that the land base available for commercial timber production should be conserved and not allocated to competing uses, and that intensive timber management practices should be applied on these lands to maximize timber yields On the other hand, there is concern about the effects of timber management on other resources, such as plant, animal, fisheries, and water quality. Concerns are also expressed by those who commented on the DEIS about our ability to provide for biological diversity and maintain species richness and distribution over time and space Some focus on reforestation success, growth and yield potential, and sustaining harvest levels in the future. Many feel that the amount of timber harvest should be reduced to benefit wildlife and recreation resources, and to preserve natural ecosystems.

The expectations from timber interests Nationally, regionally, and locally are that the Forest should continue to supply a significant amount of timber. Historically, the Forest has sold approximately 35 million cubic feet (MMCF) of timber annually The current sell program is 31 2 MMCF According to the Pacific Northwest Region's distribution of timber targets for the 1980 RPA program, the Forest's share of the timber supply should be about 37 MMCF per year (or 200 MMBF per year). Recent analysis of resource potentials indicates the Forest can only supply up to 33 MMCF per year (or 185 MMBF per year) in the first decade and maintain a nondeclining flow harvest schedule Thus, the timber supply potential on the Forest is lower than expectations, and lower than what past projections have indicated.

The ability to respond to the timber issue is complicated by the inventory structure existing on the Forest Standing volume, age class distribution, and the Forest's productive potential combine to create a situation characterized as "deficit inventory". The Forest has the potential to grow timber at a rate higher than can be sustained by the current inventory until the managed plantations reach harvestable ages Many of the natural stands on the Forest are slow growing mature trees with significant amounts of the growing space occupied by unmerchantable vegetation This condition results in relatively low volumes per acre compared to the potential of the sites. As these stands are regenerated, the timber growth increases dramatically. However, to sustain timber flows, the existing inventory must be metered out until these regenerated stands reach harvestable size and age. There are few stands in intermediate age classes, consequently, the critical period of scheduling the existing inventory is approximately 70 to 80 years Intensive management practices can do little to relieve this situation in the short term

Some of those who commented on the DEIS believe that the Forest should utilize a variety of technical applications to increase yield. These include adjustments to the yield tables, changes in the board foot/cubic foot conversion ratio, utilizing shorter rotations, applying fertilizer to plantations, selecting other programs or models to predict yields, and so forth.

This problem also encompasses the question of whether the Forest should harvest timber on a nondeclining flow schedule, or harvest at a higher level in the near future and plan for a decline in harvest volume in future decades. Departing from nondeclining flow could help sustain local economies by supplying a higher level of National Forest timber during a period when harvests from private lands are expected to be at low levels. Opponents to departure claim that this only shifts the burden of an inevitable decline to the future and increases the risk of adverse environmental impacts by harvesting at the higher level.

More than any other issue, the timber issue affects and is affected by the resolution of other resource issues. Sometimes this relationship is complementary, and sometimes competitive For example, timber harvesting may enhance deer and elk habitat (through forage production in harvest units), but reduce the amount of wildlife habitat available for species dependent on mature conifer forest.

The most significant effect of other resource uses on timber is the allocation of land to uses that exclude or greatly restrict timber management. Managing for fish habitat, mature forest wildlife habitat, soil protec-

tion, water quality, wilderness, unroaded recreation, Botanical areas, and Research Natural Areas all reduce the number of acres available for timber management Another significant effect on timber production occurs when management emphasis results in reduced yield from certain acres This occurs when rotations are lengthened (visual management emphasis), or when harvest is constrained to a fraction of the volume in the stand (streamside management emphasis).

This Planning Problem involves allocation of Forest land to timber production and the selection of management intensities, including harvest schedules and treatments such as commercial thinning and site preparation Potential timber production of lands allocated to other purposes must also be considered. Factors that vary by alternative include the number of acres selected for timber harvest (selected suitable), long-term sustained yield (LTSY), allowable sale quantity (ASQ), and the number of acres on extended rotation lengths or reduced yields.

Resolution of this problem also involves the consideration of opportunities to convert shrub and hardwood stands to timber-producing conifer stands There are approximately 48,000 acres of tentatively suitable timber land presently growing predominantly hardwood trees Even though the hardwood volume is considerable, particularly on the better sites, most of this volume is unmerchantable or of low value in today's market and only minimal amounts are accessible for fuelwood Conversion to conifers could increase commercial timber production by bringing acres under management. However, large amounts of residue are created, and there is concern that potentially useful material may be wasted In addition, hardwood stands contribute to the biological diversity of the Forest and provide habitat for various animal species. Many people feel that these stands should be maintained in their natural conditions to fill this role and provide for nonmarket values.

Another element in this Planning Problem is the cost, hazards, utilization factors, and environmental impacts of treating residues created by timber harvest or stand conversion Limits are needed for acceptable risks associated with residue treatments Better utilization, for firewood and other forms of energy, could aid in reducing the amount requiring disposal Disposal activities often involve the application of prescribed fire which can affect air, water quality, and soil productivity.

2. How Much Old-Growth Forest Should be Preserved?

Conflicts over the management of old-growth trees and forests have increased dramatically during the last decade. Interest has grown in preserving old growth for various reasons including· providing habitat for certain species of wildlife, maintaining the aesthetic quality of large old trees and forests, and retaining portions of the Forest in these older stages as part of the natural biological diversity of the area Some people also feel that centuries-old living trees should not be felled and converted to wood products for human use.

On the other side of this conflict is the feeling that enough old growth has already been designated for preservation, and that the remaining available stands, and the land they occupy, should be included in the base for timber management. Nearly all of the stands currently available for harvest on the Forest are in the mature or old-growth category They contain the highest volumes per acre and the highest quality wood for manufacturing Another aspect is the potential wood production that is not captured as long as these lands are occupied by slow-growing old stands. The old-growth stands generally produce little net growth, and in some cases, there is a net loss due to decay and mortality

Added to this, there is debate as to the adequacy of the Forest's inventory which surfaced through comments to the DEIS Some believe that the criteria for defining old growth is flawed; that a primary determinate should be age The specificity of the inventory is stated as being too broad to accurately differentiate "true" old growth from older, undisturbed stands of trees. The failure to come to agreement on differing criteria confounds this aspect of the old-growth question The inventory information available for the Forest was not developed to specifically identify old growth. Available data on the vegetation

condition has been used to assess the location and extent of old growth on the Forest. This data does not have the resolution to stratify stands with old-growth characteristics from other mature stands Therefore, although the majority of acres classed as mature and old growth do exhibit old-growth characteristics, some areas do not These small inclusions of other classes does not render the overall areas unsuitable as old-growth habitat.

The inventory (updated to 1985) indicates 443,000 acres of mature and old growth exist on the Forest, 99,000 acres are in areas dedicated to management that will preserve the old-growth character except for those changes resulting from natural processes (i e , Wilderness, Wild River, Research Natural Areas, and Botanical Areas); another 38,000 acres are in areas unsuitable for timber management that would not be programmed for harvest The alternatives vary by the amount of additional old growth included in land allocations that would retain the old-growth character, and by the rate of harvest of those acres that would be available for timber management.

3. How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved?

Fish habitat is highly dependent on water quality. Water temperature and sedimentation are critical to the maintenance and protection of the fisheries habitat Soil erosion, slope stability, and vegetative cover along streams are extremely important in providing for fisheries and other riparian values. Management of the soil and water resources (termed "watershed management") is closely tied with fisheries management As a result, these interrelated resources are considered in the same Planning Problem. Many people who made comments on the DEIS are concerned about fisheries and water quality.

The Siskiyou National Forest contains some of the most valuable salmon and steelhead habitat in the United States Both sport and commercial fishing interests are highly concerned with the fish production capability of rivers and streams, and feel that the Forest should be managed to enhance fish habitat and increase production. The health and productivity of fish habitat depends on good watershed management

Timber harvesting, roading, and mining activities have the potential to adversely affect fish habitat. Many feel that these activities should be precluded or curtailed on parts of the Forest to ensure protection of the fish and watershed resources. Others believe that these resources can be protected through application of available management practices without substantially reducing timber or mineral outputs.

Approximately 1,150 miles of salmonid-bearing streams, including 600 miles of suitable anadromous habitat, are administered by the Forest. With a few exceptions, most available habitat on the Forest is fully utilized by the fish that return to spawn. The quantity and quality of spawning gravel is considered adequate throughout the Forest, providing spawning habitat for production of approximately 65,000 wildlife and fish user days (WFUD's) in the sport fishery and 880,000 pounds in the commercial harvest

Management of fish habitat is the responsibility of the Forest Service, while fish populations are managed by the Oregon Department of Fish and Wildlife (ODFW) and the California Department of Fish and Game. ODFW program goals emphasize the increased production of "wild" (non-hatchery) salmonid stocks Capital expenditures for habitat improvement are the most effective means of achieving ODFW program goals in the short term. The catch attributable to Forest outputs could be increased to approximately 105,000 WFUD's and 1 3 million pounds of salmonid harvest through larger capital investments

Factors affecting the fisheries resource over which the Forest has little influence are the management of the annual fish harvest, including the off-shore catch, and the withdrawal of stream water for domestic and irrigation use The most severe withdrawals occur are on private lands in the Deer Creek and Illinois Valley.

In addition to management practices to avoid sedimentation and provide high quality water, there is also concern for maintaining or enhancing soil productivity Activities can result in soil compaction, displace-

ment, or erosion Additionally, biological, chemical, and other physical changes, such as loss of soil organics, can occur with activity Approaches to this problem range from removing land from consideration for timber harvest or mining, to applying management practices designed to protect the soil when implementing such projects

Resolution of this fish and watershed problem involves a mix of land allocation, capital investments, and application of standards and guidelines. Allocations to different Riparian management prescriptions, and the allocation of higher risk lands and inner gorge areas to Management Areas where no timber harvest is programmed, are complementary to fish and watershed resources Scheduling capital investments can be utilized for both mitigation and enhancement; and resource protection can be met through applying standards and guidelines in project phases of planning, location, design, implementation, and monitoring. The application of site-specific practices, or Best Management Practices (BMP's), can help to meet State water quality standards for protecting and maintaining the identified beneficial uses

Factors that vary by alternative include basins allocated to various Riparian prescriptions, allocations to Management Areas that have no programmed harvest, the level of capital investment, timber harvest dispersion constraints, sport fishing WFUD's, pounds of commercial catch, and sediment

4. How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Parts of the Rogue and Illinois Rivers that flow through the Forest have received designation as National Wild and Scenic Rivers. Two other rivers, the Chetco and North Fork Smith, were inventoried as potential candidates to the Wild and Scenic River System. The Elk River had just recently been evaluated as eligible for potential inclusion In October, the Chetco, Elk, and North Fork Smith Rivers were designated in the Omnibus Oregon Wild and Scenic River Act of 1988. Additional information and description of the designated rivers are provided in Chapter III.

As a result of increased interest and public comment on the DEIS, several other rivers were evaluated in July 1988 for eligibility. These included the Elk, Pistol, South Fork Chetco, South Fork Coquille, South Fork Sixes, and Winchuck Rivers. Except for the Elk, the other five were determined not to be eligible for possible addition to the National Wild and Scenic River System The Elk River was determined eligible primarily for its outstandingly remarkable anadromous fishery

There are diverse opinions on the appropriate levels of use for these rivers along with management of the surrounding lands The level of use affects the amount of contact between users and has the potential to detract from the quality of the recreation experience. Activities such as timber harvest could affect the recreational setting if allowed within sight and sound of the rivers. Some feel strongly that such activities would seriously degrade the quality of the river environments, while others feel that these practices could be accomplished in ways that would be compatible with all values in the river corridors.

As a result of the Omnibus Oregon Wild and Scenic River Act of 1988, this Planning Problem now includes two elements (1) What management direction for the Recreation, Scenic, and Wild sections of the five designated rivers needs to be established or reaffirmed?, and, (2) What should management direction be for lands adjacent to Wild and Scenic River corridors?

Levels of permissible use and the distribution among various user groups is the most often cited controversy affecting management of the designated Wild and Scenic Rivers on the Forest. Use and capacity will not be addressed in this analysis A five-agency management group, including the Forest Service, is responsible for determining use capacities on the Rogue River to sustain the values for which it was nominated User capacities and distribution for the Illinois River were determined through development of the River Management Plan referenced earlier.

For this analysis, land management decisions within the actual river corridors are limited to the assignment of visual management objectives for site-disturbing activities, trail development, and the specification of Standards and Guidelines Standards and Guidelines are designed to achieve the goals and objectives of the Wild and Scenic Rivers Act

Management Plans exist for both the Rogue and Illinois Rivers However, as a result of the very recent legislation, river management plans will have to be prepared for the three new Wild and Scenic Rivers. River Management Plans are required to be developed for the Chetco, Elk, and North Fork Smith Rivers under the provisions of the Wild and Scenic Rivers Act, 1968 The management plans will state· general principles for any land acquisition which may be necessary; the kinds and amounts of public use which the river area can sustain without impact ot the values for which it was designated; and specific management measures which will be used to implement the management objectives for each of the various river segments and protection of their features Management plans for these rivers may establish varying degrees of intensity for the protection and development, based on special attributes of the rivers.

Recreational experiences and water quality and quantity can be affected by management activities adjacent to Wild and Scenic River corridors. Land management decisions for areas within the watershed, the viewshed, or corridors of the designated rivers must take into account possible repercussions on the values for which each river segments is classified

Resolution of this problem involves the recommendations for future management of the three newly designated rivers The river management plans and accompanying recommendations will be prepared later, and are not part of the Forest Plan. The key indicator for this Planning Problem, therefore, is the allocation of inventoried VQO's and other Management Areas adjacent to the river.

5. How Should Sensitive Plant Resources be Managed?

The Forest is habitat for numerous rare plants. There is a considerable amount of interest in protecting these plants from disturbance which could result from activities such as road construction, timber harvest, and mining. There is also concern that some species need protection from plant collectors Many people feel that unique habitat areas contribute to overall biological diversity and that concentrations of rare plants should be designated as Botanical areas or Research Natural Areas (RNA's); activities that could disturb plants would be precluded in these areas Others feel that the plant populations should be managed through "on-the-ground" project location and design, without removing or greatly restricting lands for timber management or mineral development.

The management of sensitive plant habitat is addressed through the alternatives by the allocation of various sites to Botanical or RNA designations. Currently there are three Botanical areas and three RNA's dedicated on the Forest. There are 24 candidate Botanical areas and four candidate RNA's under consideration in this analysis. Details of each site are provided in Appendix F.

Key indicators for the development and evaluation of alternatives are the acres allocated to these Management Areas. Sensitive plants and their habitat will also be addressed through standards to guide project design.

6. How, and to What Extent, Should Forest Scenic Values be Protected through Visual Resource Management?

As timber harvest and road construction activities occur, changes in the scenic resource become more apparent. The visual resource management issue revolves around the degree of protection scenic values are given and the costs and impacts of visual resource management on other activities. Activities that alter the vegetation can change the character of the Forest's recreational setting Many people find alteration of the natural setting objectionable and feel that the Forest should be managed to retain all, or a large

degree, of the natural forest character; and that any activities such as harvest units should be designed so they do not dominate the view from any roads, trails, or sites used by recreationists On the other side of this question are those who feel that major portions of this Forest do not warrant a high level of visual protection due to the common character of the landscape and relatively low levels of recreation use Primary concerns are the reductions in annual timber harvest and associated costs of implementing visual *management objectives*

The Forest has been inventoried according to the visual management system and stratified by potential Visual Quality Objectives (VQO's) based on the character and variety of the landscape, viewer sensitivity, and distance from the viewer The least restraining visual objective on management of National Forest land is termed Maximum Modification, which allows activities to dominate the characteristic landscape The next objective is Modification which also allows activities to be dominant to some degree Objectives of Retention and Partial Retention require activities to be subordinate to the characteristic landscape, or not visually evident to the casual Forest visitor The Preservation objective (generally used in areas not available for timber harvest) prohibits most management activities and allows for natural changes only The visual resource and inventory are explained in more detail in Chapter III.

The inventoried VQO's are used as a guideline for current management. This planning analysis considers options of adopting these inventoried objectives as standards for management on all or part of the Forest The Forest has been stratified into 44 viewsheds of contiguous areas that are viewed from specific travelways or viewpoints and would be logically managed to meet consistent objectives. These viewsheds vary in scenic qualities and type of use, and are prioritized accordingly (e.g., Oregon Caves viewshed is considered high priority).

The alternatives include options for allocation of lands to meet inventoried VQO's, including Retention and Partial Retention, by viewshed. Viewsheds not allocated to meet inventoried VQO's would be managed at the next lower objective In addition, allocations to management that have no programmed timber harvest would meet or exceed the inventoried objectives.

The key indicators used in the development and assessment of alternatives are the specific viewsheds that meet the inventoried VQO's and acres allocated that meet or exceed Partial Retention

7. How Should Wildlife Habitats on the Forest be Managed?

The Forest is inhabited by more than 250 wildlife species. Wildlife habitat management is the responsibility of the Forest Service, while populations are managed by the Oregon Department of Fish and Wildlife and the California Department of Fish and Game. In recent years, management considerations between the agencies have broadened to encompass nongame species in addition to those commonly hunted, fished, or trapped. Environmental legislation over the past two decades has continued to emphasize the cooperative relationship between the agencies and the need to provide suitable habitat that will sustain all populations

The controversy in the wildlife question is not found in the desirability of maintaining diverse and healthy populations, but in the management actions needed to accomplish this objective Many people responding to the DEIS are concerned about vegetation-altering activities, such as timber harvest, which change the character of the habitat and its ability to provide for various species Activities are often beneficial for some species and detrimental for others Populations, such as big game, benefit from increased forage produced in harvest units, while populations of species dependent on mature or old-growth forest may decline Cavity-nesting species are also impacted by removal of snags and hollow trees There is a divergence of opinion as to the appropriate balance of habitats that should be maintained, and the acceptable level of effect on timber production resulting from wildlife management prescriptions

Several wildlife species groups have been identified to address their habitat needs These groups include (1) species dependent on specialized habitat conditions, such as cavity-nesting bird populations, (2) species requiring a particular seral stage, such as grass/forb or old growth, (3) popular game species, and (4) threatened, endangered, and sensitive species Eight indicator species have been selected to represent critical habitat needs Environmental consequences for each indicator species are used to assess the effect an alternative would have on the species group Other indicators used in tracking resolution of this problem are allocations to Special Wildlife Sites, capital investments, and wildlife user days (WFUD's).

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

The most polarized issue addressed in this analysis involves the management direction for those areas not yet developed by roads. The Forest has 232,000 acres of Wilderness. The inventory of unroaded areas outside of Wilderness in the 1984 data base was 314,000 acres as reported in the DEIS. Since 1984, continued management under current direction and implementation of the Silver Fire Recovery Project have resulted in some road construction in the former roadless areas. Currently, there are 284,000 acres of unroaded areas outside of Wilderness; adjusted boundaries and current acreages are displayed in Appendix C This Planning Problem deals with management of the existing Wilderness and allocation and management of remaining unroaded areas.

People on both sides of the unroaded issue feel that they are continually losing ground Timber and commodity interests see the land base for production eroding as additional areas are periodically designated for uses that preclude development for commodity production Since 1978, Wilderness on the Forest has been increased from 77,000 to 232,000 acres. Many feel allocation of any additional land to uses that do not allow development would be unwarranted and unacceptable

On the other side, those who would prefer that land and forest areas remain in their natural state see options dwindle as new roads are constructed in previously undeveloped areas. Development has been deferred in these areas in recent years while various reviews have been conducted, but it seems that major portions of these areas may be roaded in the next few years if the lands are allocated to uses that include timber management. Many feel that all or part of these lands should remain undeveloped and be managed to provide benefits not available in areas where timber harvest and roading are permitted

Wilderness and unroaded areas provide the only Primitive and Semi-Primitive Non-motorized recreation experiences on the Forest. Under current management direction, a great amount of the currently unroaded area is expected to be developed within the next two decades, thus leaving existing Wildernesses to supply Primitive and Semi-Primitive Non-motorized recreation. Based on projected increases in use, by the year 2020 demand is expected to exceed the capacity of the Wildernesses to provide these forms of recreational experience.

Management options in the Wildernesses range from closure of existing trails and campsites to actions that increase capacity and disperse users Trail development, maintenance, or improvement, and the use of fire as a management tool are the principal mechanisms for changing the use and capacity while maintaining opportunities for quality experiences.

The alternatives vary by the management direction and capital investment schedules for the Wildernesses Alternatives also vary by, and are evaluated by, the location and number of acres of unroaded areas allocated to management that would maintain their undeveloped status Another key indicator is the area remaining in Primitive and Semi-Primitive status The analysis of individual unroaded areas is documented in Appendix C.

In response to the DEIS, many people expressed that more recreation opportunities should be offered throughout the Forest (in addition to unroaded areas). A variety of activities should be provided to satisfy

the multiple types of public recreation They are interested in enhancing opportunities through capital investments in trails and other facilities. Many would like to see the Forest work more closely with counties and other agencies and groups to provide more recreation and tourism in the area

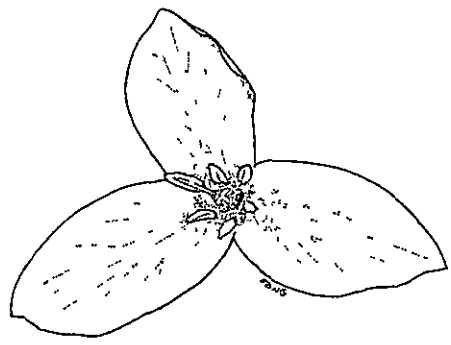
9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Interest in developing the mineral resources of the Forest has been increasing during recent years As this interest grows, the prospect of ground-disturbing activities increases. Accompanying this is a heightened concern for environmental protection. The role of the Forest Service is to manage the surface resources by cooperating with the minerals industry in the application of mineral extraction and land restoration technology, or to recommend withdrawal of lands from mineral entry where warranted.

Minerals and mining interests are concerned about how much of the Forest will be available and accessible for development of the mineral resources. Future options could be limited by the amount of the Forest remaining unroaded, and by areas allocated to other uses not complementary to mineral development

Concern also exists for protecting resource values that may be disturbed during exploration, development, or extraction of minerals Particular concern is expressed over the potential conflict between mineral development and the protection of sensitive plants and visual quality. Some of the unusual geologic sites that are habitat for sensitive plants are also high in potential mineral values. The Forest's mineral potential and pattern of use are described in Chapter III.

The alternatives vary primarily in the number of acres allocated to uses that include road access that would result in more efficient mineral exploration or extraction, and in the emphasis placed on other resources A key indicator in resolution of this problem is the area remaining available for development with limited (i e , low and moderate) restrictions imposed by other resource considerations.



ISSUES NOT ADDRESSED IN PLANNING PROBLEMS

HERBICIDE USE

This issue is outside the scope of this analysis It will not be considered for resolution here. It has been and will continue to be dealt with in separate environmental analyses and NEPA documents at the Regional and Forest levels. Any additional consideration of this issue would be through similar processes at the Regional level, or through Forest environmental analyses tiered to the Pacific Northwest Region's FEIS for Managing Competing and Unwanted Vegetation (USDA-Forest Service, 1988c)

During implementation of the Forest Plan, timber harvest and growth will be monitored Stand condition and performance (with or without the availability of chemical release) will be evaluated and the harvest level adjusted appropriately

ROADS

The road management issue is not treated as a Planning Problem. It is, however, dealt with in each alternative through application of the Standards and Guidelines and general direction for road standards and closures. Incorporation of the Standards and Guidelines and management direction is designed to be consistent with the theme of the alternative. The Forest will continue to strive to build and maintain roads at the lowest cost, subject to meeting management objectives for the particular road Management direction, including closures, for specific roads will be determined at the project level The issue concerning roading the undeveloped areas is addressed in Planning Problem #8.

PLANNING RECORDS

AVAILABILITY

All of the documents and files that chronicle the Forest planning process, including the environmental analysis of the Siskiyou National Forest, are available for review at the Supervisor's Office in Grants Pass, Oregon These documents and files (known as "Planning Records") contain the detailed information and decisions used in developing this FEIS and Forest Plan. The planning records are referenced at appropriate points in the text and appendices of this FEIS and Forest Plan.

READING GUIDE

This FEIS is composed of four chapters (one volume) and nine appendices (two volumes). Chapter I, *Purpose of and Need for Action*, describes the issues, concerns, and opportunities (presented as Planning Problems) that this Environmental Impact Statement is designed to address. The evolution of the Planning Problems, beginning with the identification of ICO's, is detailed in Appendix A.

Alternative ways of addressing or resolving the Planning Problems are described in Chapter II (titled, *Alternatives, Including the Proposed Action*) The number of acres proposed for each Management Area, the dollars invested, and standards and guidelines are the principal means used to resolve the Planning Problems. Each Management Area has a unique prescription and set of standards and guidelines (defined in Appendix D) designed to achieve specific management objectives in an environmentally sound manner. Chapter II, therefore, describes alternative ways of managing the land to produce different mixes of goods, services, and Forest conditions relative to the Planning Problems

The land and resources, as they physically exist today, are described in Chapter III, *Affected Environment* The kind of environmental conditions or modifications necessary to satisfy current demands, wants and desires (as reflected in the Planning Problems) are discussed along with the physical capability of the Forest to achieve the necessary desired future condition

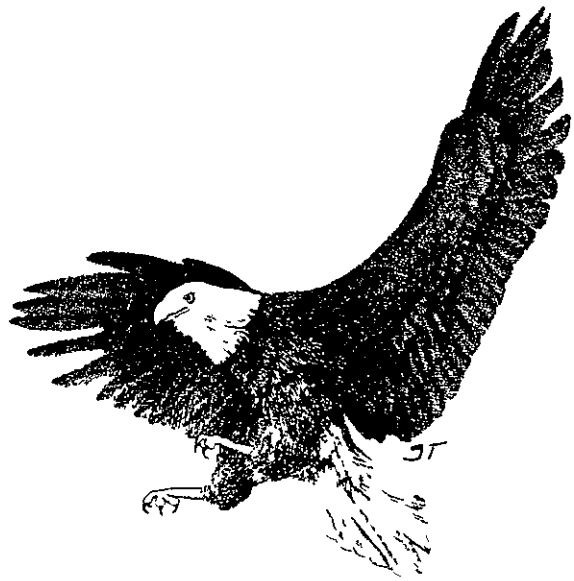
Environmental impacts on the land and resources are disclosed in Chapter IV (titled, *Environmental Consequences*) Both short- and long-term consequences that would result from the implementation of the various alternatives are presented for each component of the environment. This is the scientific and analytic portion of the FEIS

A summary of the most important environmental consequences that the public, other agencies, and decisionmaker need to be aware of in making an informed decision is presented in comparative form in Chapter II. A description of each alternative is also included It may be convenient to study only Chapters I and II to understand both the issues and alternative ways of satisfying the Planning Problems

Readers wishing to understand the basic facts and assumptions underlying the disclosures made in Chapter II should study Chapters III and IV Detailed information, including inventory information and analytic procedures employed in the analyses are presented in the appendices to the FEIS.

The reader will find it useful to consult the Management Area maps when reviewing this FEIS (a large map of each alternative was provided in the DEIS package; a few sets are still available at the Supervisor's Office). A new map showing Management Areas for the Preferred Alternative S is enclosed with the FEIS

The Land and Resource Management Plan (LRMP or Forest Plan) that accompanies this FEIS represents the implementation plan for the Preferred Alternative Information relevant to and directing management activities on the Siskiyou National Forest is compiled in the Forest Plan, along with management objectives, monitoring needs, and other pertinent aspects. This final Land and Resource Management Plan will direct the Forest's management activities for the next 10 to 15 years



CHAPTER II

ALTERNATIVES, INCLUDING THE PROPOSED ACTION

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Chapter II
ALTERNATIVES, INCLUDING THE PROPOSED ACTION
INTRODUCTION

This chapter is the heart of the Environmental Impact Statement. Alternative ways of managing the Forest's land and resources are described in this chapter. Outputs and environmental effects associated with the alternatives are also displayed in a comparative format to give the decisionmaker and the public a clear basis for choice among the available options A description of how the alternatives were developed, including a summary of the planning steps and analysis leading up to alternative development, is also presented in this chapter.

The alternatives considered in this Final Environmental Impact Statement display different ways of managing the lands and resources of the Siskiyou National Forest They differ from each other in the land uses and management practices that would occur on different parts of the Forest in different time periods. Each alternative is a unique combination of land allocations, management prescriptions, and activity schedules. As a result, each alternative generates a different mix of goods and services, and a different combination of resource outputs, land uses, and environmental effects.

An even distribution of reasonable alternatives, which covers a broad range of possible actions, was formulated. Alternatives were designed to explore a variety of ways to respond to the Forest's Planning Problems. From this range, the Regional Forester has a basis for selecting the alternative that comes nearest to maximizing net public benefits

There are three main parts to this chapter. First, there is a summary of the analysis that was conducted in the process of developing the alternatives (a more detailed description of this process is presented in Appendix B, Description of the Analysis Process). Next, the purpose and emphasis of each alternative is described, followed by a response to each of the Planning Problems (introduced in Chapter I). Alternatives are rigorously evaluated in the final part of the chapter, using a comparative format that examines the alternatives based on the information and analysis presented in Chapter III, Affected Environment, and Chapter IV, Environmental Consequences.

Included is information on resource outputs, environmental effects, land allocations, and economic costs and benefits for each alternative Detailed information is presented in tabular form, with narrative to describe relevant differences between the alternatives

CHANGES BETWEEN DRAFT AND FINAL

Numerous changes have occurred in this chapter as a result of public and agency comments on the DEIS, continuing management of the Forest, the 1987 fires, and Congressional designation of three Wild and Scenic Rivers in late 1988

Several changes have been made in analysis processes The calculation of nonconsumptive wildlife user days has been modified to be a function of recreational demand instead of big game forage as it was in the DEIS Acres of mineral access restrictions have been modified to correspond to revised management direction First decade board foot volume projections have been adjusted to more closely reflect the volume expected to be harvested in the first decade. Salvageable dead timber volume has been calculated from the inventory and included as a component of timber harvest projections Numerous data entries have been corrected or modified to better display the differences between alternatives or the environmental consequences associated with alternatives.

The documentation of the methods selected to accomplish the Management Requirements (MR's) has been modified to address the tradeoffs associated with the various methods instead of the sensitivity

analysis presented in the DEIS Appendix J has also been modified to discuss tradeoffs of various methods of meeting MR's, the sensitivity analysis has been relegated to the planning records

As a result of public input and management concerns over protection of the water resource and its related soil and fisheries resources, we have highlighted current management practices designed to protect and enhance water quality under "Best Management Practices" (BMP's) in Standards and Guidelines for the Forest Plan These are described in detail in Appendix F of the Forest Plan

The "Alternative at a Glance" tables that accompanied each alternative description in the DEIS have been dropped. The data is included in other tables in a comparative format.

The section "Alternatives Considered But Eliminated From Detailed Study" has been expanded to provide a better explanation of several items. It also includes discussion of some alternatives that were suggested between the Draft and Final, and alternatives fully evaluated in the Draft, but eliminated from detailed study in the Final Alternatives K-Departure and L in the DEIS have been eliminated from detailed study.

Based on public and agency comments, Alternative S was developed and is identified as the new Preferred Alternative. It is within the range of alternatives considered in the Draft.

Management Area 6, "Custodial (Roadless)," has been modified and renamed "Backcountry Recreation" to better reflect the management objectives for this prescription In addition, the individual areas under this allocation can be qualified as either motorized or non-motorized

A section has been added at the end of this chapter to relate the effects of the 1987 fires to the alternatives in this analysis.

The Omnibus Oregon Wild and Scenic Rivers Act of 1988 has implications for most of the alternatives considered in this analysis. This Act was passed by Congress just as these documents were in the final stages of preparation for printing. The need for analysis of suitability and disclosure of the effects and outputs of Forest Service recommendations on the inventoried and eligible rivers has been eliminated by the Act

A number of changes, including several mentioned in this section, are discussed in the section, "Features Common to all Alternatives."

ALTERNATIVE DEVELOPMENT PROCESS

The primary purpose of alternative development is to formulate a broad range of options as a basis for identifying the alternative that comes nearest to maximizing net public benefit (NPB) (36 CFR 219.11(f)). An analytic process is used to develop alternatives that reflect a range of resource output and expenditure levels, distributed between the minimum and maximum resource potentials identified in the analysis process (36 CFR 219 12 (e) and (f)) Alternatives are formulated in a manner that facilitates the evaluation of a number of economic parameters, including effects on costs and benefits, present net value, and analyses of opportunity costs and tradeoffs among alternatives Ultimately, and most importantly, the collection of alternatives demonstrates different ways of responding to the Planning Problems in a cost efficient manner

By managing the Forest resources in different ways, various objectives can be achieved which respond to the many issues and concerns This differing management can vary by what, where, and when it is done. The result is a combination of management activities, management areas, and schedules which define a unique combination of resource outputs and environmental conditions for each alternative The merits of an alternative are evaluated based upon the NPB that the alternative achieves, and how it responds to the public issues

Present net value (PNV) is the quantitative component of NPB. It is the discounted value of all priced benefits less all priced costs. Timber benefits and costs, quantitatively valued aspects of recreation, human use of wildlife and fisheries, and range are included in PNV calculations. It is also recognized that some values, such as the preservation of old growth and roadless areas, the protection of spotted owls and rare plants, the achievement of Retention and Partial Retention Visual Quality Objectives, and the fostering of local social stability may not be adequately represented by quantitative measures. These and others need to be taken into account while responding to issues. In addition to the measured economic benefits, the nonpriced outputs and effects, such as the protection of sensitive species and the preservation of cultural values or Research Natural Areas, are also considered in assessing the merits of an alternative.

NPB reflects both quantified and nonquantified net benefits of the alternatives and represents the overall value to the nation of all outputs and positive effects (benefits) less all of the associated inputs and negative effects (costs) of producing priced and nonpriced goods and services from National Forest lands (36 CFR 219.3). Thus, NPB represents the sum of net priced outputs and the net value of nonpriced outputs. Forest planning alternatives are formulated to examine different combinations of goods and services, both quantitatively and qualitatively valued, to find that mix which best maximizes NPB while responding effectively to public issues

DESCRIPTION OF THE ANALYSIS PROCESS

Several of the planning steps presented in Chapter I deal with the analysis process The Issues, Concerns, and Opportunities (ICO's) identified in the scoping process provide information on which resources are important to the public, and in many cases where they are located on the Forest The analysis process is designed to inventory these resources, determine their productive potential, and quantify their interrelationships. There are two major parts of the analysis process; one is the physical inventory of the Forest resources and their productive potential, the other is the identification of optional management strategies or prescriptions that may be applied to the land base. Combinations of the physical inventory (land base) and the various prescriptions are then used to form alternatives for managing the Forest. Figure II-1 illustrates the analysis process and may facilitate understanding the following discussion. The numbered references within parentheses in the text are keyed to the elements in the flowchart.

The first step in the analysis process was to collect the resource inventories (1). This information was collected on a common map base, with different map layers developed for various resources and inventory components. Inventories of the character, potentials, and limitations of the Forest were conducted. Areas of the Forest with similar physical and biological characteristics were stratified into "capability areas" (2). These homogeneous areas are expected to have a somewhat uniform response to any particular management prescription Criteria used to identify capability areas include land and vegetative characteristics, as well as unique attributes important to the resolution of issues and concerns. This phase resulted in the identification of more than 40 layers of land attribute and management opportunity delineations

The next step was to aggregate the thousands of individual areas, resulting from overlaying the capability area layers, to form a manageable number of areas with similar characteristics This resulted in the creation of 317 unique Analysis Areas (3). Each Analysis Area is composed of sites with similar vegetation and other resource characteristics, management opportunities, and responses to management activities. Analysis Areas are not geographically contiguous, but they provide a manageable number of unique types of areas on which to analyze resource allocation and scheduling options and their effects.

Any particular area often has the potential to be managed in a variety of ways to meet various resource objectives with differing degrees of responsiveness to the ICO's. To analyze and present these options, management strategies (4) were defined for 14 Management Areas, each with specific resource objectives (The individual Management Areas are defined later in this chapter and include, for example, Wilderness, Designated Wildlife Habitat, and Retention Visual categories.) Each Management Area has general

management requirements to meet the specific resource objectives and satisfy environmental concerns. Most analysis areas have the capability to meet the resource objectives of more than one Management Area For example, a particular piece of land may have the capabilities to produce the results associated with Designated Wildlife Habitat, Retention Visual, or General Forest, and would be a candidate for all three. Because of this, the aggregate of the Management Area candidates far exceeds the total Siskiyou National Forest acres.

Some elements of management direction are fixed to assure that the basic objective for each Management Area will be achieved Other elements have more flexibility while still meeting the overall objectives To analyze this potential and identify the most efficient management for each analysis area, prescription options or intensities (5) were developed within the Management Areas For example, in the Partial Retention Visual Management Area the management requirements needed to meet the visual objectives are fixed, but within these requirements several optional prescriptions for timber management were developed A mathematical estimate of the economic costs and resource yields associated with each prescription is generated to identify the most efficient prescriptions, and for scheduling activities and outputs The analysis required by 36 CFR 219 14(b), known to some as the "Stage II suitability analysis," is documented in Appendix B, "Most Efficient Intensities " The intensities identified along with other options and timing choices are used in the modeling process to find the most efficient Forest-wide solutions.

To analyze the potential land allocations to the various Management Areas, logical units of contiguous acres were mapped and termed Special Areas (6). These Special Areas were identified from the capability area mapping and from public input gathered in the scoping process. Each Special Area is a discrete unit that can be identified on the ground. Collections of these then become the Management Areas (7) which are not contiguous units, but which would be managed under the same management direction.

Several parts of the process come together in the design of alternatives (8) For each alternative, the land is assigned to Management Areas based on the specific theme and objectives for that alternative This is done by identifying those special areas which can best meet the objectives and respond to the issues while minimizing the effects on other resources. The analysis areas are then linked with the prescriptions and intensities (several choices in some cases) appropriate within the Management Areas.

The alternative designs are entered into the Forest planning model (FORPLAN) (9) along with economic benefits and costs, and any other constraints (10) needed to assure that alternative results will be feasible and environmental considerations are represented. FORPLAN is a linear programming model that is used to analyze many of the management objectives and how they interact. More detailed explanation of the FORPLAN model can be found in "FORPLAN Version 2: An Overview" (Johnson and others 1986), and a more general discussion of the use of analysis and models in forest management can be found in "Forest Management" (Davis and Johnson 1987) Given the land allocation represented by Management Areas and the possible activities represented as prescription intensities with various timing choices, the FORPLAN model can find the most efficient set of prescriptions and activity schedule for each alternative

The final step is to display the FORPLAN results (11) in a comparative format for each alternative These results include the prescriptions and land allocations, the schedule of management activities and resource outputs, and some environmental effects. Additional environmental effects are based on the FORPLAN results and are included with the effects of the alternative.

Appendix B of this FEIS describes the entire analysis process in detail, including the models which were used in the process Readers are encouraged to refer to that appendix for a more complete discussion than is presented here.

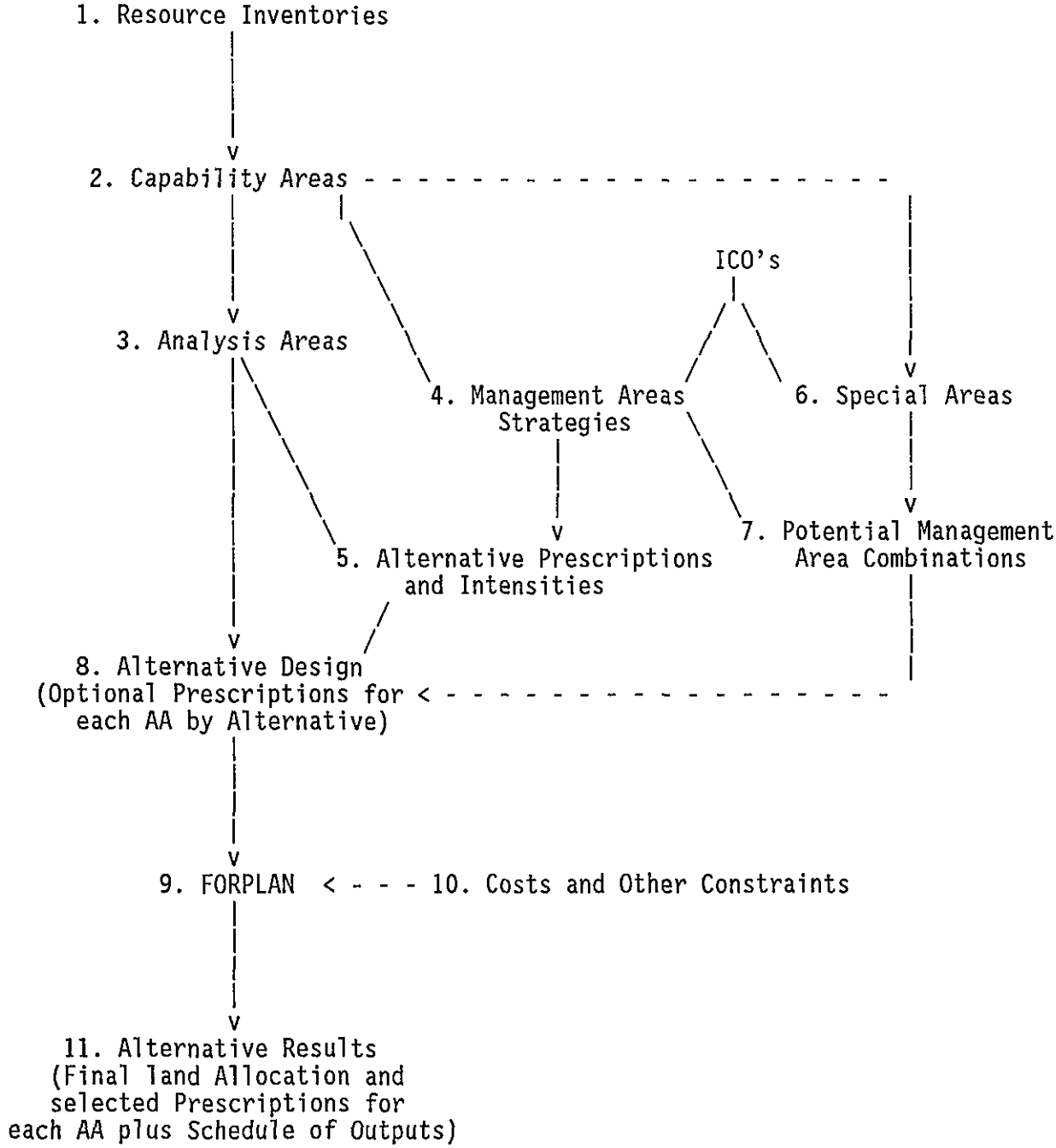


Figure II-1 Analysis Process For Alternative Development

ANALYSIS OF THE MANAGEMENT SITUATION

The analysis of the management situation was a major phase in the planning process. Results of the analysis are detailed in Appendix B, Analysis Prior to Development of Alternatives. A brief summary is presented in this chapter.

There are two primary purposes for the analysis of the management situation. First, to determine the Forest's maximum capability to produce single resources (supply potentials) that satisfy the Planning Problems, and to maximize economic efficiency Second, to assess the need to change current management direction in light of these supply potentials and their relationship to the Planning Problems

MANAGEMENT REQUIREMENTS

The Management Requirements (MR's) are designed to meet the requirements of applicable laws and regulations, specifically those of 36 CFR 219.27 NFMA regulation (36 CFR 219.12) specifies that certain MR's be included in the planning process. The methods to meet these MR's include developing standards, guidelines, and appropriate management practices for inclusion in multiple-use management prescriptions; assignment of management prescriptions and intensities containing specific practices to analysis areas in FORPLAN, and applying specific constraints in FORPLAN (see Appendix B).

The Management Requirements used in this analysis are designed to.

- Conserve soil and water resources.
- Minimize serious or long-lasting hazards from flood, wind, wildfire, erosion, or other natural physical forces.
- Reduce serious, long-lasting hazards or damage from pest organisms
- Protect riparian areas
- Maintain diversity of plant and animal communities.
- Provide adequate fish and wildlife habitat to maintain viable populations.
- Conform with multiple-use laws.
- Prevent the destruction or adverse modification of critical threatened and endangered species habitat.
- Ensure roads are designed to standards appropriate to planned uses
- Revegetate temporary roads within ten years
- Maintain air quality
- Harvest timber only on lands that can be restocked within five years after final harvest.
- Adhere to clearcut size limits

Direction has been evolving and guidance has been given to the Forest through several documents at the National and Regional levels This direction has been packaged along with supporting information in following documents issued in June 1986: *A Report on Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service*, and, *A Background Document on the Development and Review of Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service* The appendices of the latter document incorporate previous letters and documents containing pertinent direction. A summary of information presented in these documents is presented in Appendix J of this FEIS. Information is presented there to close the gap between the regulations and the application of MR's at the Forest level.

The discussion here concentrates on those MR's applied on the Siskiyou that (1) impose substantive standards, (2) can be incorporated in the analysis, and (3) are likely to have an impact on the analysis There are many other requirements that the Forest must meet which are not discussed here including substantive requirements that do not have significant impacts when viewed on a Forest scale, as well as procedural requirements Examples of substantive requirements that are not discussed here include those

for cultural resources, and those for threatened and endangered species These requirements are part of the Standards and Guidelines. While significant in themselves, they do not have significant affects on the Forest-wide analysis.

The MR's with significant interactions with other resources are those for mature and old-growth dependent wildlife species, dispersal of created openings, and maintenance of water quality and riparian areas along perennial streams Development of individual prescriptions and constraints to satisfy these minimum resource needs is documented in Appendix B and the Planning Records The requirements are based on guidelines in the direction documents referenced above and the Regional Guide for the Pacific Northwest Region, as amended by the Supplemental EIS for Spotted Owl Guidelines. Specific requirements for the Siskiyou were developed by the interdisciplinary team and are designed to accomplish each objective with minimum adverse impacts on other resources

Analysis of wildlife species groups found on the Forest indicates that, although a number of them require some management considerations, only those dependent on mature and old-growth habitat require modification of management that could significantly affect other resources. The indicator species for these groups are spotted owl, pine marten, and pileated woodpecker To perpetuate these species over their present range, a network of suitable habitat areas have been identified Each area would provide habitat for one pair of animals and distances between habitats would be conducive to dispersal of young. To minimize the opportunity costs to the timber program, habitat areas were collocated (more than one species in the same area) wherever possible, and areas were adjusted to lands not suitable for timber production.

Total habitat protected over time to meet the Management Requirement amounts to 159,949 acres. This includes 106,090 acres in Wilderness and other designated areas, or in areas unsuitable for timber management Only 36,712 acres are tentatively suitable for timber production. Prescription options of protecting these areas with no programmed timber harvest versus managing enough acres with a long timber rotation to provide equivalent suitable habitat were examined For this planning period, habitat areas will be designated with no programmed timber harvest This would have the least impact on the timber harvest schedule and would be the most efficient for implementation and monitoring The analysis supporting this conclusion is documented in Appendix J and in Appendix B, under DEVELOPMENT OF MANAGEMENT REQUIREMENTS. The designated habitat areas to satisfy the MR's for mature and old-growth wildlife species are included in all alternatives except the No Change Alternative (NC).

Dispersion of created openings is represented in the analysis through application of constraints on the amount of timber harvest that could occur per decade in any one planning basin (the Forest is divided into 19 planning basins, or major watersheds, for analysis purposes; these are described in Chapter III under **SOIL AND WATER**). This constraint also accomplishes the dispersion of activities to avoid concentrating the risk of soil and watershed impacts (landslides, soil erosion, and stream sedimentation) inordinately within some drainages. Openings created by timber harvest were limited to 20 percent of the suitable land base per decade by planning basin. This level of constraint was identified through iterative analysis as the point where a reduction in Forest-wide timber outputs begins to occur. While this constraint does not have a significant effect in itself, it was applied in conjunction with Riparian Prescription B, and the Standards and Guidelines which direct management practices, to accomplish the MR's for soil, water, and fish

The most critical factor for fish habitat in Siskiyou streams is summer water temperature Under current conditions, summer water temperatures reach critical thresholds for salmonid production If stream temperatures increase above these levels, salmonid production declines rapidly The Interdisciplinary Team examined various options for management of riparian areas and the associated implications for the fisheries resource Options examined range from total protection of the riparian area to allowing timber harvest without special consideration for retaining vegetation, with multiple-use prescriptions in between.

Three levels of multiple-use prescriptions were examined for the Riparian Management Area: Prescriptions A, B, and C These prescriptions varied in the amount of vegetation removal allowed, with Prescription A allowing the most removal and Prescription C the least. Stream temperature modeling was done for each of the three options using stream shading as the independent variable, and the relationship between changes in stream shading and the removal of timber from the riparian areas Prescription A would reduce shading to levels that would cause critical stream temperatures to exceed State Water Quality Standards for the established beneficial uses. The projected increase in water temperature under this prescription would have significant adverse impacts on the anadromous fisheries on most major streams on and immediately downstream of the Forest. Prescription B would maintain stream temperatures and is considered the minimum protection needed to meet the Management Requirement (MR) to protect water quality and fish habitat through management of riparian areas. This MR is met or exceeded in all alternatives.

Riparian Prescription B is the same as the current Siskiyou Riparian Policy. This 1979 policy has evolved over a number of years through incorporating results of implementation evaluations, monitoring, and application of research findings on new methods and practices The stream temperature modeling has been facilitated by work pioneered on the Siskiyou using a solar pathfinder to correlate changes in the vegetation (growth or removal) with changes in actual stream shade during critical times of the year. The riparian policy has developed with the involvement of experienced resource professionals from all disciplines and has been the object of numerous field reviews attended by professionals from all levels of the Forest Service, as well as university faculty members, representatives from the timber industry, State of Oregon personnel, and other interested publics. The Siskiyou's riparian policy for streamside management is considered state-of-the-art in multiple-use management in an area with high resource values, challenging terrain, and competing and conflicting values.

Although not Management Requirements per se, timber policy requirements are also included in most alternatives These constraints require that stands of timber shall generally have reached the culmination of mean annual increment (CMAI) prior to final harvest, and that timber harvest shall be scheduled to sustain a nondeclining yield (NDY).

Timber and economic opportunity costs associated with both timber policy constraints and implementation of the MR's are displayed in Table II-1 To establish the maximum effects of each constraint or group of constraints, FORPLAN runs are compared to a base run that has none of these constraints. The base run establishes the highest possible PNV that could be produced by the Forest without these constraints, and the associated timber outputs. With the addition of each successive constraint, PNV and first decade Allowable Sale Quantity (ASQ) are reduced. Long-Term Sustained Yield (LTSY) is also generally reduced as constraints are added with the exception of the CMAI constraint which increases LTSY. Without the CMAI constraint, stands are harvested at younger ages to sustain higher harvest levels in early decades at the expense of long-term production.

Table II-1. Summary of Effects of Timber Policy and Management Requirements on PNV (MM$) and Timber Outputs (MMCF)

Benchmark or FORPLAN Specification	PNV MM $	ASQ MMCF	LTSY MMCF
Unconstrained Base Run	2,061	74 4	56 5
With CMAI	1,994	66 4	62 7
With CMAI and NDY	1,814	39 8	58 2
CMAI and NDY plus Soil, Water, and Fish MR's	1,586	34 6	54 6
CMAI and NDY plus Wildlife MR's	1,670	37 1	55 5
All Timber Policy and MR Constraints (PNV Benchmark)	1,491	32 4	51 9

The tradeoffs associated with the MR's are determined by comparing the run including the timber policy constraints with a run including the MR's for soil, water, and fish (harvest dispersion and riparian management), with another run including the wildlife MR's, and then with a run including all of the MR's. Addition of the timber harvest dispersion and riparian management MR's reduce the ASQ by 13 percent, primarily as a result of the Riparian Management Areas The wildlife MR's reduce the ASQ by seven percent when taken alone. When all of the resource MR's are applied together, ASQ is reduced by 19 percent. It should be noted that this is not a reduction from the current situation, but from the base run The wildlife MR's are the only significant change from current management. The incremental effect of adding the wildlife MR's on top of the riparian is less than six percent

The requirements for spotted owl habitat were developed based on the direction in the Regional Guide for the Pacific Northwest Region (USDA Forest Service 1984b) as amended by the Supplement for Spotted Owl Guidelines (USDA Forest Service 1988b). The Final Supplement to the EIS (SEIS) for an Amendment to the Pacific Northwest Regional Guide was prepared in response to an appeal filed in July 1984, by the National Wildlife Federation, et al. The appellants challenged the direction in the Regional Guide for treating spotted owl habitat in Forest Planning. Appendix H of Forest Plan DEIS described the relationship of the Draft SEIS for the Regional Guide and this analysis. The Final SEIS does not substantially change the direction for the Siskiyou from the original direction in the Regional Guide (this is not true, however, for all Forests); Appendix H is dropped from this analysis, but is available in the planning records.

Appendix J was prepared in response to decisions of the Chief of the Forest Service and the Deputy Assistant Secretary of Agriculture regarding an appeal brought by the Northwest Forest Resource Council on September 18, 1986 The appeal centered on direction from the Regional Forester to incorporate Minimum Management Requirements (MMR's) into Forest Plan alternatives. Appellants requested that the appropriateness of the MR's be examined through the environmental impact statement process. Appendix J that accompanied the DEIS documented a sensitivity analysis intended to address an issue raised concerning uncertainty about the information The sensitivity analysis contained in Appendix J of the DEIS has been relegated to the planning records and replaced with the current Appendix J which presents a comparison of the opportunity costs of the various methods considered to meet the MR's.

The MR's examined in Appendix J are those for protection of fish habitat and water quality, and those designed to maintain viable populations of species using mature and old-growth conifer habitat. Alternative methods for achieving these requirements considered by the Forest Service are presented along with the opportunity costs in terms of timber and PNV. Implications associated with the alternative methods for accomplishing the MR are also presented, as well as the rationale for the method selected and relationship to the alternatives in this FEIS.

The Forest Service has attempted to base the MR's on the available scientific research, supplemented by experience and professional judgment MR's are designed to provide those minimum levels of resource protection required while minimizing the adverse impacts to other values As knowledge of these resources builds and additional research findings come to light, the Forest Service is prepared to modify management direction, including the MR's, to stay current with the state-of-the-art in forest resource management. Information on the proposed MR's was presented in the DEIS to provide reviewers the opportunity to comment on their adequacy, suggest refinements or modifications, or suggest alternative methods of meeting the requirements that may give a better balance of resource benefits. Reviewers criticized the processes used by the Forest Service to develop MR's claiming that appropriate public involvement and review processes were not followed; or simply asserted that requirements identified are either not needed, or not adequate Few substantive comments offering factual information or informed opinion on specific proposed requirements were received.

BENCHMARKS

"Benchmarks" are presented and discussed several times in this chapter The major purpose of benchmarks was to determine the maximum physical capability of the Forest to produce various resource outputs related to the Planning Problems Collectively, the benchmarks defined the range within which alternatives could be constructed (also known as "decision space"). They were also used to provide information on maximum biological potential of the Forest and the economic implications of various management strategies.

Nine benchmark levels were developed to define resource supply potentials and economic relationships on the Forest. Production capabilities were determined for a minimum level of management, for maximum output (or condition) of single resources, and for a set of multiple resource outputs that maximize present net value (NFMA regulation 219 12e) A level was also established from which the costs and effects of applying regulation and policy constraints were measured. The computer model FORPLAN was used to help determine the resource supply potentials. All benchmarks include the MR's.

Benchmark descriptions are summarized in this section A detailed discussion and the results of the benchmarks may be found in Appendix B.

Maximum Present Net Value Benchmark

This benchmark established the mix of resource uses and outputs that results in the greatest difference between total discounted costs and total discounted benefits over a 150-year planning horizon using market and assigned nonmarket values. This benchmark provides the reference point for determining economic opportunity costs in other benchmarks and alternatives

Maximum Timber Benchmark

The maximum capability of the Forest to produce timber in a manner consistent with the Management Requirements (36 CFR 219 27) was determined by this benchmark Timber production was maximized in the first decade, for fifteen decades, then "rolled over" under a "Max PNV" objective function to achieve the timber objective in a cost efficient manner The physical capabilities of the Forest to satisfy the first and last Planning Problems, concerning timber and minerals, respectively, are determined through this benchmark The initial benchmark did not include fertilization as a management practice; in response to the public review of the DEIS and additional analysis, an option on this benchmark which includes fertilization as a management practice has been developed

Maximum Visuals Benchmark

The purpose of this benchmark was to analyze the potential for producing other resource outputs and services while meeting all of the inventoried Visual Quality Objectives (VQO's) on the Forest. Maximum tradeoffs for complete resolution of Planning Problem #6 were determined through this benchmark

Maximum Unroaded Benchmark

This benchmark was designed to analyze the potential for producing other resource outputs and services while maintaining all presently unroaded areas in their unroaded condition. The maximum physical capacity of the Forest to satisfy non-motorized recreation demand (Planning Problem #8) was determined by this benchmark, as well as the Forest's ability to satisfy Planning Problem #2 concerning the preservation of old growth

Maximum Recreation Benchmark

This benchmark determined the potential for utilizing all of the land classified as Primitive (Recreation Opportunity Spectrum classification) on the Forest Recreation capacity was maximized by assigning all inventoried roadless areas to an unroaded status and allocating 25 Supplemental Resource Management Areas to a dispersed recreation emphasis The most extreme environmental consequences associated with complete resolution of Planning Problem #4, concerning Wild and Scenic Rivers, were identified through this benchmark.

Maximum Fish/Watershed Benchmark

The purpose of this benchmark was to establish the highest reasonable level of anadromous fisheries outputs Management activities designed to improve overall watershed conditions were included in this benchmark The Forest's ability to satisfy Planning Problem #3 was determined in this benchmark (although strategies for additional capital investment opportunities were identified and included in some alternatives).

Maximum Wildlife Benchmark

This benchmark was designed to achieve a desirable mixture of wildlife habitats. This benchmark emphasizes a balance of all habitat types. Planning Problems #5 and #7 were addressed through this benchmark.

Maximum Level Benchmark

This benchmark defined the minimum costs of public landownership and the resource outputs which are incidental to Forest management This benchmark served as a reference point to develop and/or test alternative outputs and costs which result from Forest Service management activities. This benchmark is displayed in order to provide a reference to the minimum level considered when a comparison of alternatives is made.

Current Direction Benchmark

This benchmark defined the level of goods and services that the Forest could produce if current management direction is followed with no budget constraint Given information from the benchmarks discussed above, the results of this benchmark served as the basis for determining the need to change management direction

RANGE OF ALTERNATIVES

The benchmarks presented in the previous section were used to develop alternatives that represent a range of resource outputs for addressing and responding to the Planning Problems Upper and lower production levels for these outputs also established the range of possible options available to the decisionmaker for resolving the Planning Problems. For example, the timber and minimum level benchmarks show that the timber base sale levels can range from a minimum of zero to a maximum of 34 million cubic feet (MMCF) per year in the first decade when timber policy constraints apply Thus, without relaxing the timber policy constraints, the most the Forest can do to satisfy the first Planning Problem is produce an average of 34 MMCF of timber per year

The degree of flexibility that the decisionmaker has in responding to the Planning Problems is referred to as "decision space." In most cases, benchmarks were not carried forward as alternatives because they were responsive to only one of several resource issues. Alternatives were designed to span the benchmark range while meeting policy constraints such as riparian protection, MR's for anadromous fish, and other multiple-resource objectives.

REQUIRED ALTERNATIVES

Based on the information generated by the analysis of the management situation, and the analytic limits and reference points identified by the various benchmarks, the Interdisciplinary Team began construction of alternatives which could be implemented on the Forest. Among the alternatives formulated were several alternatives that are required by regulation, and National and Regional direction. The required alternatives are listed and briefly described here.

- No Change. This alternative has been developed in response to decisions made regarding an appeal brought by the Northwest Forest Resource Council on May 19, 1986 The substance of the appeal was that a "true no action alternative representing current management plans" was not included in Forest Plan EIS's because the Current Direction alternative included MR's developed to implement the requirements of NFMA The No Change Alternative (NC) has been developed to represent the existing timber management plans without inclusion of measures needed to fully comply with all the provisions of NFMA and regulations promulgated by the Secretary of Agriculture to implement NFMA.

- No Action. This is the alternative of "No Action" required by the Council on Environmental Quality (CEQ) regulations (40 CFR 1502.14) and by the NFMA Planning Regulations (36 CFR 219.12 (F)) This alternative would continue the management of the Forest as defined by existing direction in approved management plans, continuation of existing policies, standards, and guidelines, and, to the extent possible, production of current levels and mixes of resource outputs. This alternative does not always show the same outputs as the current plans, however, because more recent inventories are used to predict the results of implementation. Should the decision in this action elect to continue with current direction, all MR's required by NFMA would be implemented Alternative A is the No Action Alternative in this FEIS

- Current Direction· Because the definition of no action described above is the continuation of current direction, Alternative A is also the "Current Direction" alternative in this analysis.

- Emphasis on Market Opportunities: Alternative D has an emphasis on outputs that have an established market price (e g , timber, commercial fish, developed recreation opportunities, minerals). Management for other resources will be at economically and environmentally feasible levels consistent with the emphasis on market-oriented outputs

- Emphasis on Nonmarket Opportunities: Alternative E emphasizes water, fish and wildlife, recreation, and other amenity values Management for other resources will be at economically and environmentally feasible levels consistent with the emphasis on amenity values

- Emphasis on the Current RPA Program· This alternative will determine how the current (1980) RPA program distributed to the Forests through the Pacific Northwest Regional Guide can best be implemented Alternative B is the current "RPA" program alternative in this FEIS.

- Emphasis on Nondevelopment and Intensified Management: Alternative E incorporates a large portion of the roadless areas on the Forest as undeveloped while continuing commodity production at a high level in those areas already roaded.

"DEPARTURE" ALTERNATIVES

Two alternatives (Alternatives A-Departure and B) are "departure" alternatives. They have the same land allocation and resource management prescriptions as the "parent" alternative that they are based upon. However, the timber harvest schedule has been modified to depart from nondeclining flow of timber. Management under a departure schedule would result in higher volumes of timber harvested in the next 10 to 20 years, but have lower volumes of timber available 20 to 50 years in the future.

OTHER ALTERNATIVES

Additional alternatives, including those necessary to respond to the full range of public issues, management concerns, and resource use and development opportunities, were formulated to reflect a broad range of resource outputs and expenditure levels Collectively, the alternatives satisfy 36 CFR 219.12(f)(1) which requires alternatives to "be distributed between the minimum resource potential and the maximum resource potential" in order to adequately analyze a "full range" of management options.

The design of several alternatives was the result of public input. Alternatives C, D1, G, and M were generated from information received at public meetings held at three separate locations around the Forest on November 17, 1984. Many elements of other alternatives incorporate the suggestions received during scoping prior to release of the DEIS, as well as similar comments received during the review period. Alternative S was developed following the review of the DEIS and incorporates numerous suggestions from comments on the Draft

Figure II-2 displays several key indicators that are part of the respective alternative design or results. This figure serves to illustrate the range of alternatives considered and the distribution through the decision space. Maximums and minimums for each key indicator illustrate the concept of the decision space The figure graphically demonstrates the range of options available to the decisionmaker, and the full range of alternatives considered in this FEIS.

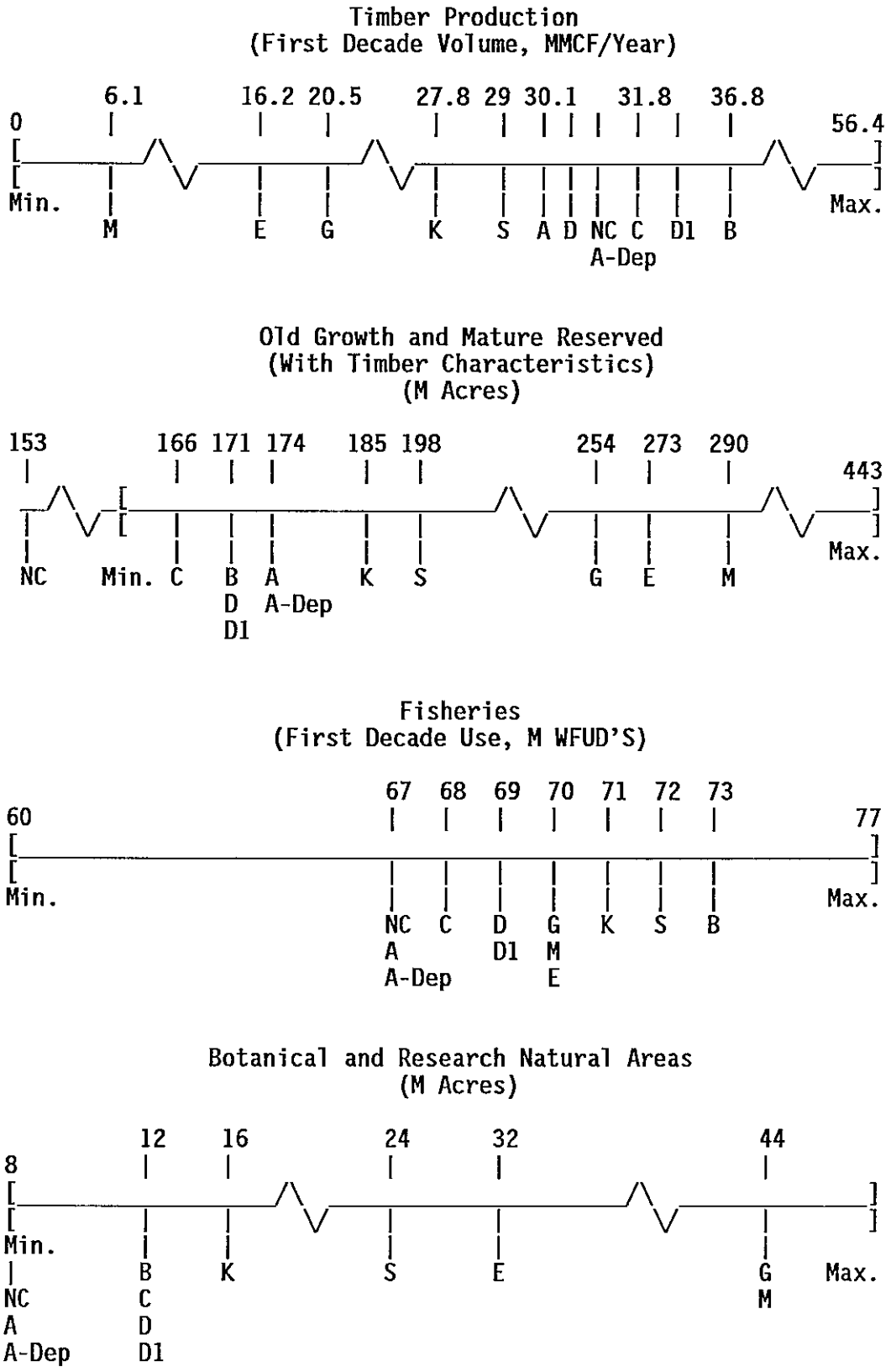
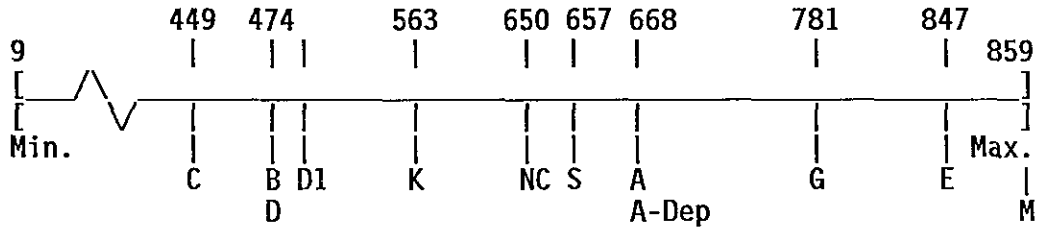
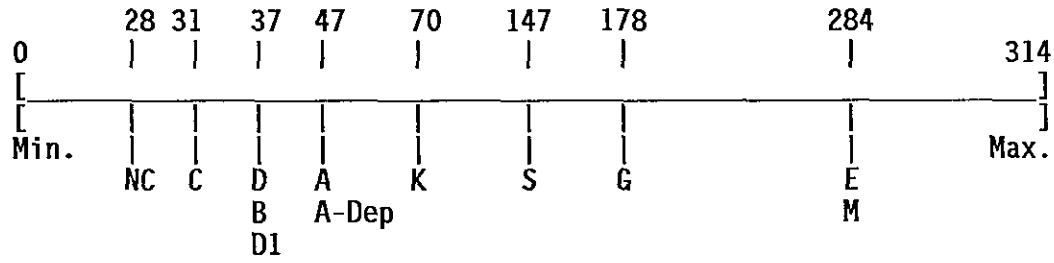


Figure II-2 Response to Key Indicators by Alternative within the Decision Space Defined by the Benchmarks and Subsequent Analysis

Visual Resources
(Preservation, Retention and Partial Retention VQO's)
(M Acres)



Inventoried Unroaded Areas Assigned to
Unroaded Management Prescriptions
(M Acres)



Present Net Value
(MM $, 150 Year Planning Horizon)

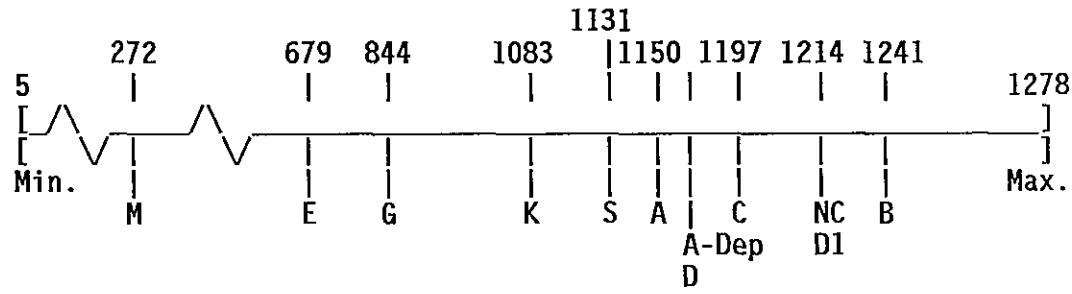


Figure II-2. Response to Key Indicators by Alternative within the Decision Space Defined by the Benchmarks and Subsequent Analysis (Continued)

ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

Many alternative means of addressing issues, concerns, and opportunities were considered in the preliminary stages of alternative formulation Various sets of constraints that could apply to all alternatives, as well as benchmarks and fully developed alternatives, were evaluated in the process Twelve alternatives, including administratively required alternatives, were ultimately selected for detailed study in this FEIS This section describes approaches to issue resolution that were considered, but eliminated from detailed study The purposes of these alternative approaches are described below, along with the accompanying rationale for their elimination from detailed study

DESIGNATED AREAS

Several areas of the Forest have received special designation by Congress. These include five Wild and Scenic Rivers (Rogue, Illinois, Elk, Chetco, and North Fork Smith) and five Wildernesses (Kalmiopsis, Wild Rogue, Grassy Knob, Siskiyou, and Red Buttes). Three Research Natural Areas (Coquille River Falls, Port Orford Cedar, and Wheeler Creek) and three Botanical Areas (Babyfoot, Big Craggies, and York Creek) were designated by the Chief of the Forest Service and are not subject to review in this round of Forest Planning. Although there has been considerable public debate about some of the areas, there seems to be a widespread base of support for the present designations; no alternatives were developed that recommend changes in the status of these areas.

PARK ALTERNATIVES

Several alternatives have been proposed by individuals (or groups) for areas surrounding the Rogue, Illinois, and Smith Rivers for possible designation as National Parks These alternatives were considered but eliminated from detailed study for a number of reasons

Although the CEQ regulations do provide for agencies to "include all reasonable alternatives not within the jurisdiction of the lead agency" (40 CFR 1502.14), alternatives which place lands currently administered by the Forest Service into the hands of other jurisdictions, whether public or private, were not reasonable considering the scope of this (Forest Plan) proposal. The purpose of the Forest Plan, as explained in the planning regulations, is to "provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long-term net public benefits in an environmentally sound manner" (36 CFR 219.1(a)) National Parks are, by law, not managed under the principles of multiple use and sustained yield

Consideration of possible inclusion in the National Park system has been specifically assigned by Congress to the Secretary of Interior, designation of a National Park requires Congressional legislation At one time (November 4, 1985), the National Park Service suggested study of a potential "wild rivers national park" in an area encompassing the portions of the lower Rogue and Illinois Rivers, but withdrew its proposal (July 22, 1986) and has not expressed further interest. Another proposal by Oregon Natural Resources Council was examined in detail by the National Park Service's Pacific Northwest Regional Director. In a letter of October 2, 1987, Director Odegaard stated, "The Forest Service has done a thorough job of planning for their management actions in the Siskiyou area and I now see no need to pursue any additional studies " It is remote and speculative that Congress would designate a National Park in the very near future However, Congress has repeatedly urged the completion of Forest Plans. Nothing would preclude the National Park Service from preparing a legislative environmental impact statement, with Forest Service cooperation, just as nothing precludes Congress from designating a National Park in the future.

In response to public comments, several aspects of what National Parks offer the public were seriously considered by the Forest Suggestions for increased emphasis in tourism and recreation opportunities

have resulted in increased cooperative efforts with local government, State, and other Federal agencies A number of capital investment projects were developed (see the LRMP, Appendix B). Two of the alternatives developed for detailed study (Alternatives E and G) include land allocations to the Backcountry Recreation and other Management Areas that, when combined with the Wildernesses, resemble the boundaries of several National Park proposals Environmental consequences associated with those alternatives are disclosed in this EIS Complementary to park proponents' interests, considerably more unroaded area would be allocated to Backcountry Recreation in the new Preferred Alternative (S) In addition, increased emphasis was given to visual allocations along more heavily used recreation travel routes.

DEPARTURES

Departure alternatives are developed if a timber harvest schedule different from that needed to assure nondeclining yield can be used to respond to a particular issue or concern. This would allow harvesting more timber in the near future with a reduction in decades three through five. Proponents of departure scheduling suggest that the short fall in future decades could be offset by timber from private lands currently stocked with immature stands Two departure alternatives are evaluated in this FEIS, Alternative A-Departure and Alternative B. The DEIS also evaluated Alternative K-Departure based on the Preferred Alternative of the Draft. This departure option was subsequently dropped as described later in this section. A departure option for the Preferred Alternative of the FEIS has not been developed for reasons similar to those for dropping Alternative K-Departure. Other departure alternatives could have been developed and examined in detail, but none were identified that would have added to the resolution of the issues and concerns, or provided ways to better meet multiple-use objectives Additionally, there was little public mandate per response to the DEIS to create additional departure alternatives or analysis.

ALTERNATIVES WITH SHORT ROTATIONS

Use of rotations shorter than culmination of mean annual increment (CMAI) of growth for intensively managed timber stands has been suggested by individuals and organizations A variation suggested is to project short rotations for only part of the Forest (existing plantations) on a one-time-only basis. The effect of such an approach during the planning period (10 to 15 years) would be similar to that of a departure from nondeclining yield Timber would be harvested at a higher rate, relative to the suitable land base, in the near future similar to a departure; the difference being that instead of a reduction in harvest level in the future, this option would schedule stands to be harvested at ages prior to CMAI to fill in the gap and maintain nondeclining flow.

In Section 6(m) of the National Forest Management Act of 1976 requires the Forest Service to "insure that, prior to harvest, stands of trees throughout the National Forest System shall generally have reached the culmination of mean annual increment of growth..." Section 6(m) also provides "exceptions to these standards for the harvest of particular species of trees in management units after consideration has been given to the multiple uses of the forest including, but not limited to, recreation, wildlife habitat, and range .." Requirements for the exception to the CMAI standard are found in 36 CFR 219.16, "Alternatives which incorporate exceptions to these standards shall be evaluated if it is reasonable to expect that the overall multiple use objectives would be better attained."

Alternative D1 develops this option for detailed study and comparison purposes. Additional alternatives or variations of this theme, including applying short rotations to existing plantations only, were considered but eliminated from detailed study The primary effect of, and motivation for, using shorter rotations would be increased timber harvest levels. Analysis of the use of short rotations (including Alternative D1) has not clearly shown that overall multiple-use objectives would be better attained, leaving some question as to whether or not such an alternative would meet the requirements of law and regulations. NEPA provides for evaluation of a reasonable alternative even though it would necessitate Congressional action Alternative D1 evaluates the use of short rotations and provides information on the associated effects

sufficient to assess this option It also provides the basic information necessary to consider the effects of variations on the short rotation theme Developing alternatives in detail with variations of this option applied selectively to sub-strata of the Forest would not provide significant new information.

BENCHMARKS

Benchmarks (summarized in the Alternative Development Process section of this chapter, and described in detail in Appendix B) resemble alternatives in many ways. Benchmarks generally do not include integrated, multi-resource objectives, and only a limited number of environmental consequences were predicted for them They were not developed with the intent that they be implementable. Several benchmarks were modified slightly and are now included as full alternatives. Others did not help in providing a full range of outputs and effects, or could not be made implementable, and were dropped from further consideration A description of the disposition of each benchmark follows:

- Minimum Level. This benchmark proposed only maintenance of the basic resources of the Forest While it does represent an extreme point of non-use of resources, it does not satisfy many of the issues and concerns, particularly those related to developed recreation use, dispersed motorized recreation use, and timber harvest Alternative M is near this end of the nondevelopment spectrum, yet does satisfy many more of the Planning Problems.

- Maximum Present Net Value: This benchmark emphasized timber harvest activity at the expense of most other program activities Other than the rate of hardwood conversion, the results were very similar to the Max Timber benchmark.

- Current Direction This benchmark was the basis for Alternative A. It was modified slightly to include operational feasibility requirements for roading, and to achieve a representative mix of site classes during harvest activity.

- *Maximum Timber· This benchmark formed the basis for Alternative C, after the addition of operational* constraints necessary for implementation and minor allocations for other uses

- Recreation: This benchmark was modified by the addition of operational requirements Further adjustments were made which increased the outputs of fish and wildlife with little effect on recreation outputs These adjustments resulted in Alternative E, which provides high levels of recreation The Recreation benchmark was not brought forward as a separate alternative

- Wildlife· A preliminary alternative was developed based on the specifications of this benchmark It was dropped from further consideration, however, because it was similar to Alternative G and other alternatives which address options of providing a range of habitat mixes

- Fish The elements of this benchmark which contribute to high quality fish habitat were brought forward into several alternatives. The fish benchmark was not brought forward as a separate alternative.

PRELIMINARY ALTERNATIVES

The following alternatives were developed and evaluated, but subsequently dropped from detailed consideration for the reasons indicated Maps and additional information are available in the process records

- Habitat Diversity (Alternative F) This alternative was developed from the optimum wildlife habitat benchmark It was dropped from detailed study because it was similar to Alternative G which does

a better job of addressing other Planning Problems, and because Alternative M better provides for old-growth dependent species.

- Maximum Fish (Alternative H). This alternative was developed to produce high levels of fish outputs while sustaining a high to moderate level of timber production Many of the elements were duplicated in other alternatives and it was dropped from detailed study.

- Selected Amenity (Alternative I)· This alternative attempts to respond to a wide range of user groups and interests. The design of the land allocation, which was an attempt to satisfy the desire for undeveloped areas with the least impact on commodity production, concentrated the undeveloped allocations in areas unsuitable for timber. This did not result in a logical delineation to respond to Planning Problem #8 dealing with the unroaded areas, and offered little else not included in other alternatives

- Economic Efficiency (Alternative J): This alternative was intended to emphasize management options that maximize present net value It was quite similar to the Maximum Present Net Value benchmark, the Maximum Timber benchmark, and Alternative C

- Variations of Alternative K· Several minor variations of the land allocations along the northern boundary of the Kalmiopsis Wilderness were considered for Alternative K. They were dropped for the same reasons as presented above for Alternative I

DEIS ALTERNATIVES

Two alternatives developed in detail in the DEIS were eliminated from evaluation in the FEIS.

- Alternative K-Departure This alternative was developed to maintain the current level of timber outputs while managing the Forest under the land allocations of Alternative K This alternative does not offer any better way to meet multiple-use objectives and did not get significant support in the public review. Departing from nondeclining yield does not have a broad base of support, and those who do suggest departure do not support the land allocations of Alternative K

- Alternative L. This alternative received little positive support in the public review The element that was commented on favorably (retention of unroaded areas) is represented with some modification in Alternative S

ADDITIONAL WILDERNESS DESIGNATION

Another possible area for alternative development would have involved proposing additional areas for Wilderness designation. When Congress passed both the Oregon and California Wilderness Acts in 1984, it included language which stated that "the Department of Agriculture shall not be required to review the wilderness option prior to the revision of the [Forest] plans..." There has been no designation on the Forest since 1984. Alternatives such as E, G, K, M, and S provide for the option of future Wilderness designation through maintaining all or large portions of the existing inventoried roaded areas. Therefore, no alternatives proposing additional Wilderness on the Forest were considered for further analysis. Readers wanting detailed information about the unroaded areas on the Forest, and the tradeoffs involved in managing them, should refer to Appendix C.

Alternative levels of trail development are considered for the Wildernesses. Additional levels, particularly at the high end of the development spectrum, could have been considered There has been no expressed public interest for this type of development in the Wildernesses, no alternatives proposing this course of action were considered

ALTERNATIVES WITH MORE DETAILED IMPLEMENTATION

The planning process could have developed additional implementation direction for the alternatives Individual timber sales, wildlife improvement projects, and recreational developments at campgrounds could all have been planned If this additional planning had been included, however, an already complex process would have become unwieldy. The time and money required to conduct the process would have expanded dramatically, and the amount of information needed to understand the process would have increased in the same proportions. Additionally, by the time many of the projects were scheduled for implementation, site conditions and other planning particulars may have become stale

The Forest Service instead chose to make this a programmatic FEIS. Additional environmental analyses will be conducted as the decisions in this process are implemented. If a site-specific environmental analysis identifies conflicts with the decisions made in Forest planning, an amendment or supplement to the Forest Plan may be required. If the site-specific environmental analysis identifies significant adverse effects on the quality of the human environment not addressed in this analysis, a site-specific EIS would be prepared

For these reasons, the Forest chose not to include specific actions to implement most of the alternative decisions in this planning process

EVERGREEN ALTERNATIVE

This alternative was proposed by the Southern Oregon Timber Industries Association (SOTIA), and was supported by a large number of people who responded to the DEIS. It proposed a blend of land allocations generally falling between Alternatives C and K, with spotted owl habitat designated to meet MR's left in the base for the calculation of the timber Allowable Sale Quantity Most elements of this alternative are incorporated in the range of alternatives in some way. The exception is the suggestion that the Forest Service manage the designated wildlife habitat for spotted owls, but continue to count it in the base for calculation of the timber harvest level. This suggestion has been considered, but rejected on the basis that once allocated to resource management that precludes timber harvest, lands are considered unsuitable for timber production. If future analysis and decisions result in those lands becoming suitable, the harvest level could be recalculated and the Forest Plan amended

Even though the Evergreen Alternative is not developed for detailed study in its entirety, each of the elements suggested were considered in the development of Alternative S. The more significant elements that are built into Alternative S include fertilization of managed stands; a slight increase in area allocated to visual resource management objectives, added protection for the Rogue River corridor; adjusted timber harvest dispersion constraints; inclusion of the inventoried Research Natural Areas, increased recreation site and trail development; and a high level of capital investments for fish habitat

Alternative S goes beyond the recommendations in the Evergreen Alternative for some land allocations. It includes recommendations for the inventoried Botanical and Supplemental Resource Management Areas over the number recommended by the Evergreen Alternative

A number of elements are included in other alternatives and were considered as Alternative S was developed, but were not included in the alternative design The Evergreen Alternative proposes rotations shorter than CMAI While this option is evaluated in Alternative D1, the Forest Service has not incorporated it in other alternatives for reasons discussed above in the section, "Alternatives With Short Rotations " It was also suggested that wildlife habitat be designated, but counted in the base for ASQ calculations as described above. In conjunction with the Evergreen Alternative, SOTIA also suggests a number of technical changes These have been carefully evaluated and some are incorporated in Alternative S, some are not.

GREGORY ALTERNATIVE

This alternative was developed by Gregory Forest Products, Inc , of Glendale, Oregon It is based on Alternative A of the DEIS with adjustments to the land allocations and additional emphasis on intensive timber management practices The elements of this alternative are found within the range of the alternatives; several have been incorporated in newly developed Alternative S. Key suggestions for changes in the technical analysis that effect timber production were similar to those suggested by SOTIA's Evergreen Alternative Suggestions for fertilization and adjustment of the harvest dispersion constraints have been incorporated in Alternative S; others, such as short rotations or elimination of Management Area 6 have not. However, the management emphasis in Management Area 6 has been measurably changed as a result of their (and others) input. Additional suggestions are responded to more specifically in Appendix K.

STATE OF OREGON ALTERNATIVE

This alternative was developed by the State of Oregon with a public review process separate from the review conducted by the Forest Service. Compared to Alternative K, the State Alternative would: increase slightly the allocations in Backcountry Recreation Management Area, increase the visual management protection along selected travel routes and most trails; increase the Visual Quality Objective of Partial Retention as seen in the middle ground from the Rogue River to Retention, recommend the three candidate rivers for Wild and Scenic designation; approximately double the Botanical areas; allocate six high value fisheries planning basins to Riparian Prescription C; and add Supplemental Resource Management Areas to the mainstem and principal tributaries of Elk River

The State's recommendation also includes a number of technical corrections and refinements to improve the analysis and reliability of resource output projections, and emphasizes intensification of timber management for areas where the management objectives include timber production. Specific recommendations include the use of fertilization as a management practice, and earlier final harvest of the existing plantations (shorter rotations). The State Alternative would also refine the harvest dispersion constraints used in Alternative K to achieve the desired result of minimizing the risk of cumulative watershed effects, with less opportunity cost to timber.

Alternative S has many similarities to the alternative recommended by the State of Oregon. Many of the recommendations are incorporated in Alternative S and only vary by degree. Alternative S, however, would substantially increase the allocations to Backcountry Recreation and the visual allocations in several areas, although it does not upgrade the inventoried Partial Retention in the Rogue River viewshed to Retention, nor does it allocate the Coquille River foreground to Retention. It would make the same refinement in the harvest dispersion constraints; include fertilization; and allocate five of the six planning basins identified in the State Alternative plus two additional to Riparian Prescription C. It would not allocate the additional Supplemental Resource Areas in the Elk River Watershed A number of technical corrections and refinements suggested by the State have been incorporated in the analysis.

Many elements of the State's recommendation have been included in the Preferred Alternative (S), and other elements are included in various forms throughout the range of alternatives The State Alternative in its original form was not developed for detailed study.

ALTERNATIVES CONSIDERED IN DETAIL

The alternatives considered in detail demonstrate different ways of managing the land and resources of the Forest Each is a combination of land uses, management practices, and activity schedules which results in a unique combination of resource outputs, land uses, and environmental conditions Each alternative has a set of goals and objectives designed to respond to the Planning Problems in a different way Table II-7 (following the presentation of alternative descriptions) summarizes the response of each alternative to all of the Planning Problems

MANAGEMENT AREAS

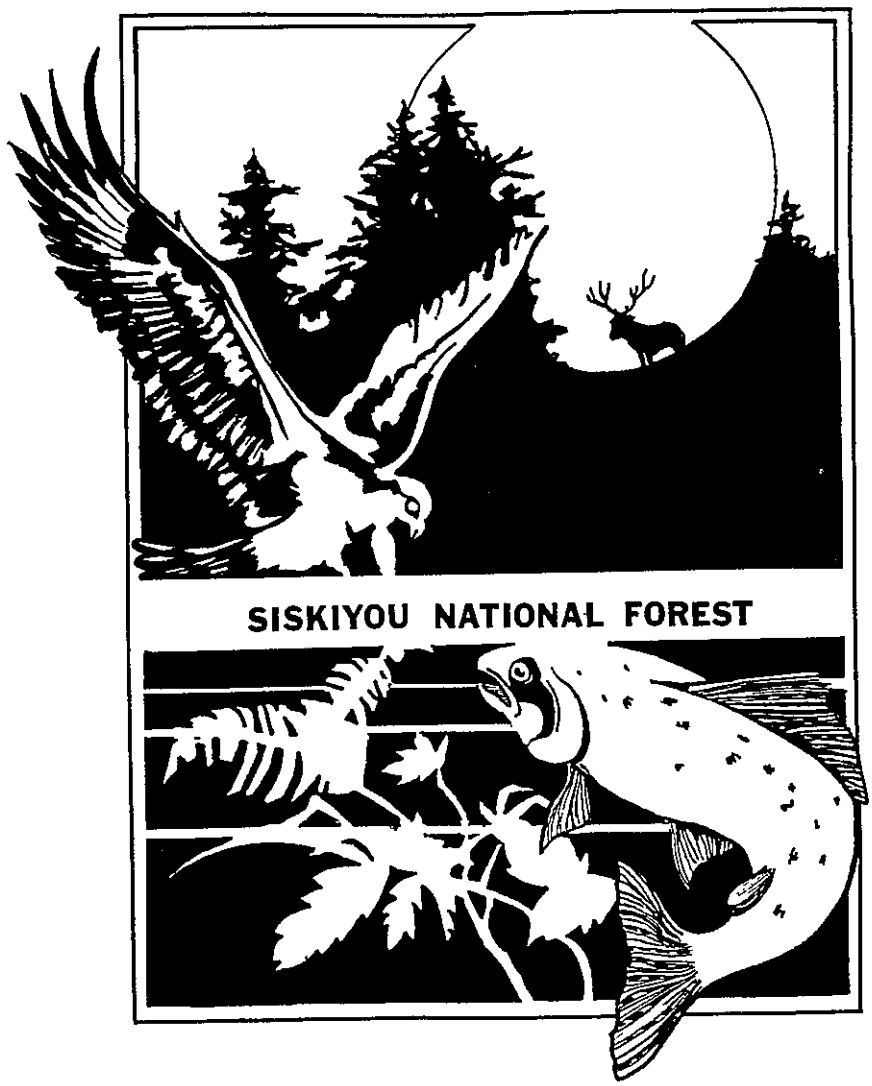
A critical part of each alternative design is the recommended land allocation. All National Forest System lands are assigned to several or all of the 14 Management Areas in each alternative. A Management Area is a category of land where a given prescription or set of prescriptions may be applied to meet specific management objectives (not necessarily contiguous acres). While the objectives for all Management Areas include some multiple uses, they often emphasize one or a few resources and therefore result in dominate use management for some areas. Prescriptions are management practices selected and scheduled for application on a specific area or land allocation to attain multiple use and other goals and objectives (36 CFR 219.3). The alternative design includes assignments of land areas to Management Areas, then FORPLAN is given the choice of prescriptions compatible with the Management Area to select and schedule those which can most efficiently satisfy the objectives and constraints of the alternative. In the Management Area descriptions that follow, the acres tentatively suitable for timber production are identified. It should be noted that these acres may or may not be selected for timber management in a particular alternative, and that this determination and the suitability inventory itself are subject to review at ten year intervals.

The direction for a Management Area is defined by the set of prescriptions with associated objectives, and standards and guidelines that apply to that area. Standards and guidelines deal with potentially adverse environmental effects, and attempt to mitigate them by avoiding, minimizing, or rectifying impacts. Some of these standards were developed by the Interdisciplinary Team specifically to respond to environmental conditions on the Forest. Others are adopted from the Regional Guide and the NFMA regulations (36 CFR 219 27) Additional mitigation is provided by the application of Best Management Practices (BMP's) which are described as the primary mechanism to enable the achievement of water quality standards. The specific Standards and Guidelines are presented in the Forest Plan, and in Appendix D of this FEIS in the case of those that vary from the Preferred Alternative. The BMP's can be found in Appendix F of the Forest Plan

Although many areas have multiple resource values, lands can logically only be assigned to one Management Area (each acre can only be managed under one prescription) Many overlaps occur throughout the Forest, e g , the existing Illinois Wild River runs through the Kalmiopsis Wilderness, which also includes the existing York Creek Botanical Area. In many cases, the more restrictive management prescriptions will also meet the objectives of the other areas overlapped. In our example above, the management direction for Wilderness would also be satisfactory for the Wild River and Botanical Area, however, the Wild River or Botanical Area prescriptions would not meet the requirements for Wilderness management

In order to systematically assign the land base to Management Areas, a hierarchy was developed based on the level of ground disturbance or vegetation manipulation provided for in each Management Area The Management Areas are numbered in order of increasing activity from the least ground disturbance and vegetation manipulation to the most. Management Area 1, Wilderness is the most restrictive, Management Area 14, General Forest is at the other end of the spectrum with the most road construction and timber management, and the least restrictions on mining and other activities Where alternative design results in

To analyze and evaluate alternative land allocations, it was necessary to identify logical areas that could be assigned to various Management Areas under different alternatives. Areas with attributes of significance for specific resources were mapped and labeled as "special areas" for the analysis It may be noted that there are no special areas for timber This is not an oversight, nor a de-emphasis of the timber resource All acres tentatively suitable for timber production start out in the General Forest Management Area and FORPLAN is allowed to select the prescriptions which produce the highest timber outputs, subject to basic multiple-use constraints. To develop a full range of alternatives and examine the various ways of responding to the issues, differing levels and combinations of the special areas are subtracted from the General Forest and assigned to Management Areas which emphasize other resources.



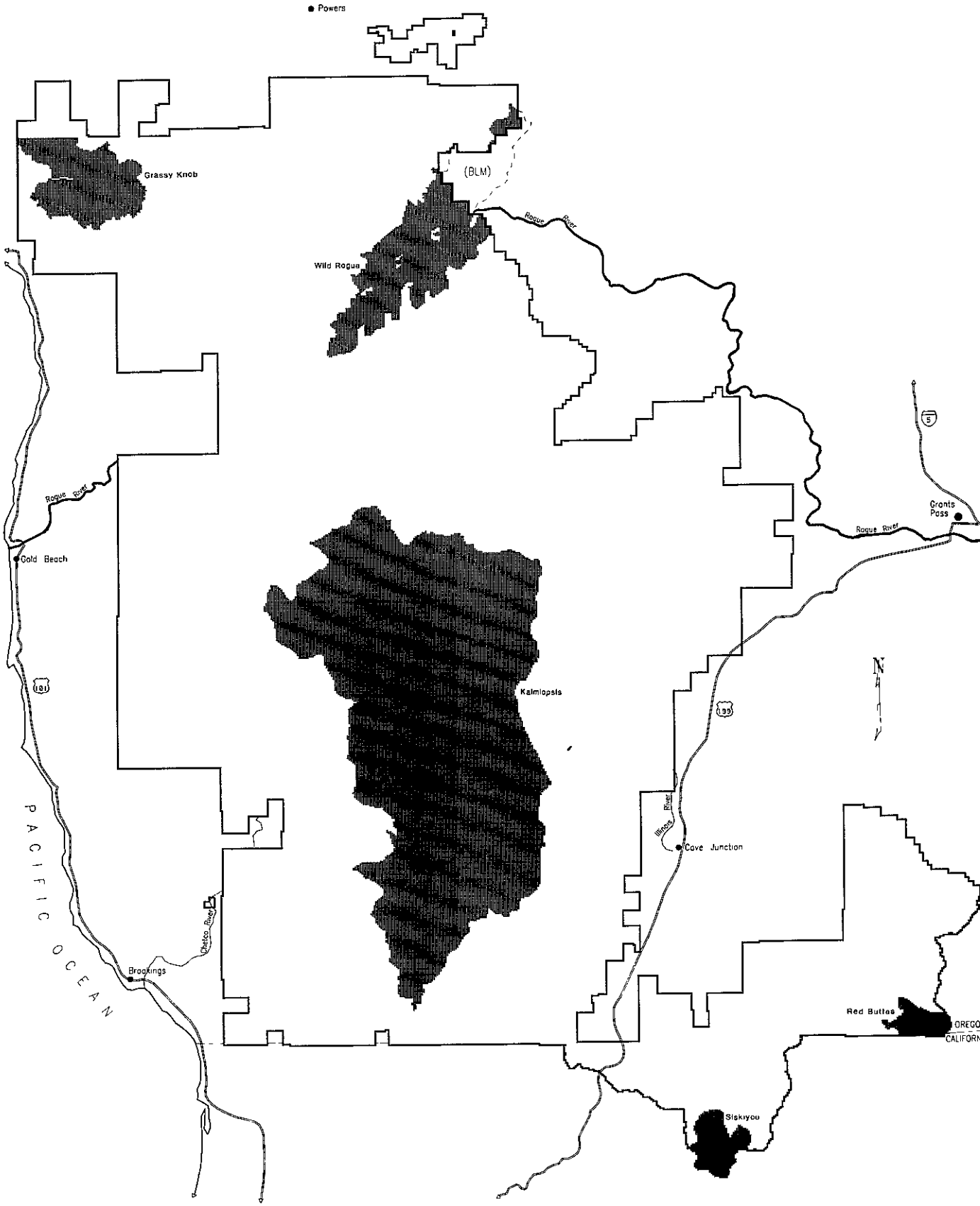


Figure II-3. Wilderness Management Area Map



MANAGEMENT AREA 1 WILDERNESS

Wilderness is essentially undisturbed area where natural processes continue with a minimum of human interference. Wildernesses are pristine, scenic landscapes that provide an opportunity for solitude. The Wildernesses on the Siskiyou are characterized by deep, rugged canyons containing clear rushing streams The steep, heavily vegetated slopes generally terminate in knife-like ridges. The areas are managed to comply with the requirements of the Wilderness Act of 1964. The size of this Management Area (232,495 acres) does not change by alternative. It consists of five Wildernesses. Kalmiopsis, Grassy Knob, and portions of Wild Rogue, Red Buttes and Siskiyou

Figure II-3 displays a map of each location, and Table II-3 shows the acres associated with each area.

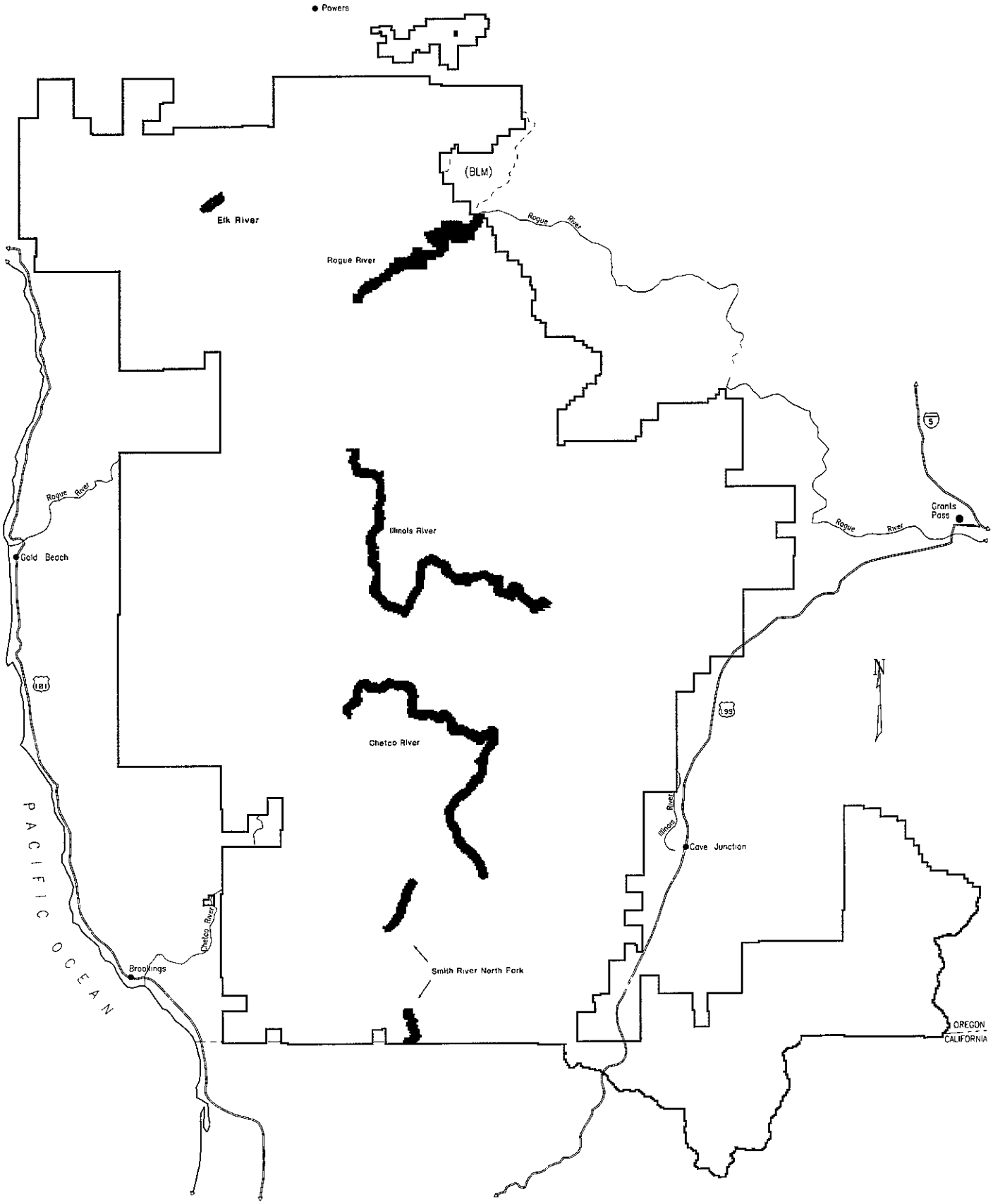


Figure II-4 Wild River Management Area Map



MANAGEMENT AREA 2 WILD RIVER

Management Area 2 consists of the "Wild" segments of the Rogue, Illinois, Chetco, North Fork Smith, and Elk Rivers which were designated by Congress under the National Wild and Scenic Rivers Act. The Wild designation was reserved for those rivers that are free flowing, free of impoundments, and generally inaccessible except by trail. This Management Area includes 27,128 acres of National Forest Land

Figure II-4 displays a map of each area's location, and Table II-3 shows how each river was treated by alternative Note: **The North Fork Smith, Chetco, and Elk Rivers were designated by the Omnibus Oregon Wild and Scenic River Act of 1988 following the time that the alternatives for this EIS were developed and analyzed. Any alternative selected for implementation would be modified to include all of these rivers.**

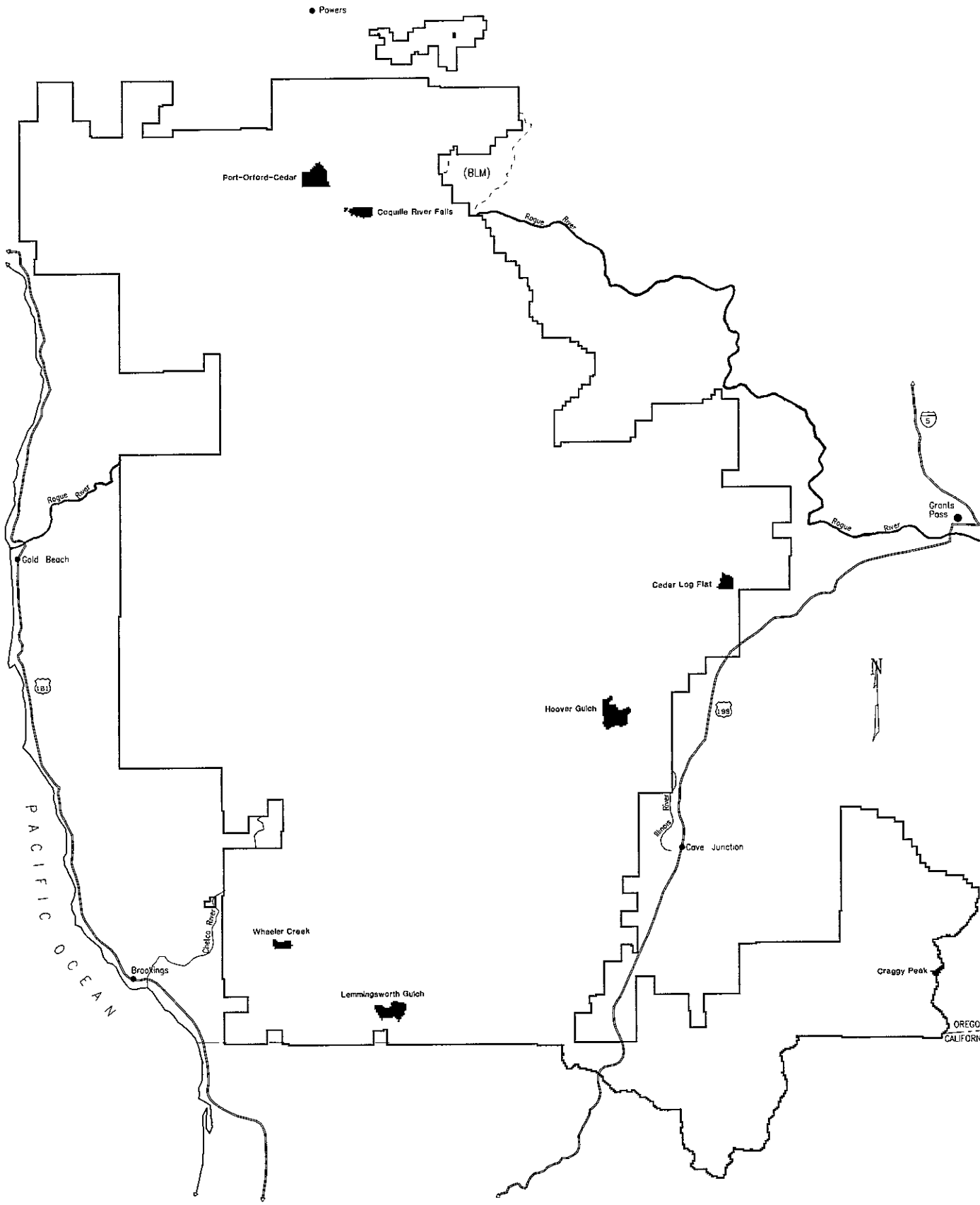
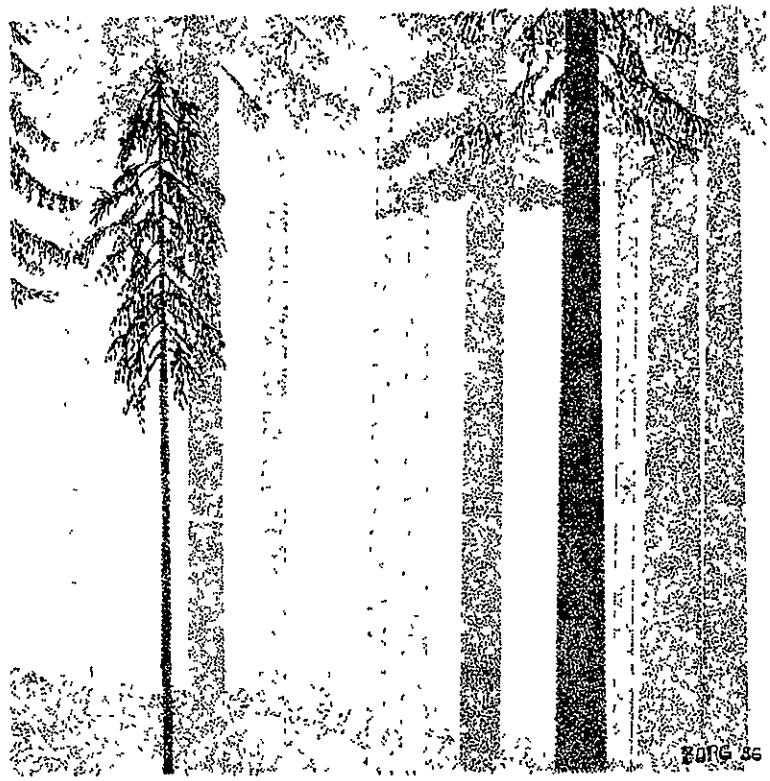


Figure II-5 Research Natural Area Management Area Map



MANAGEMENT AREA 3 RESEARCH NATURAL AREA

Management Area 3 contains distinctive natural ecosystems designated (or proposed) as part of the Research Natural Area Program for scientific and educational purposes Research Natural Areas (RNA's) are sites which typify an undisturbed aquatic or terrestrial ecosystem where natural features are preserved for scientific purposes and natural processes are allowed to dominate Three existing RNA's (Coquille River Falls, Port Orford Cedar, and Wheeler Creek) were established by the Chief of the Forest Service and remain constant at 1,957 acres in all alternatives. Four additional areas, totaling 2,799 acres (1,505 tentatively suitable timber land), are being considered for recommendation to the RNA program in this FEIS: Hoover Gulch, Lemmingsworth Gulch, Cedar Log Flat, and Craggy Peak.

Figure II-5 displays a map of each location, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative.

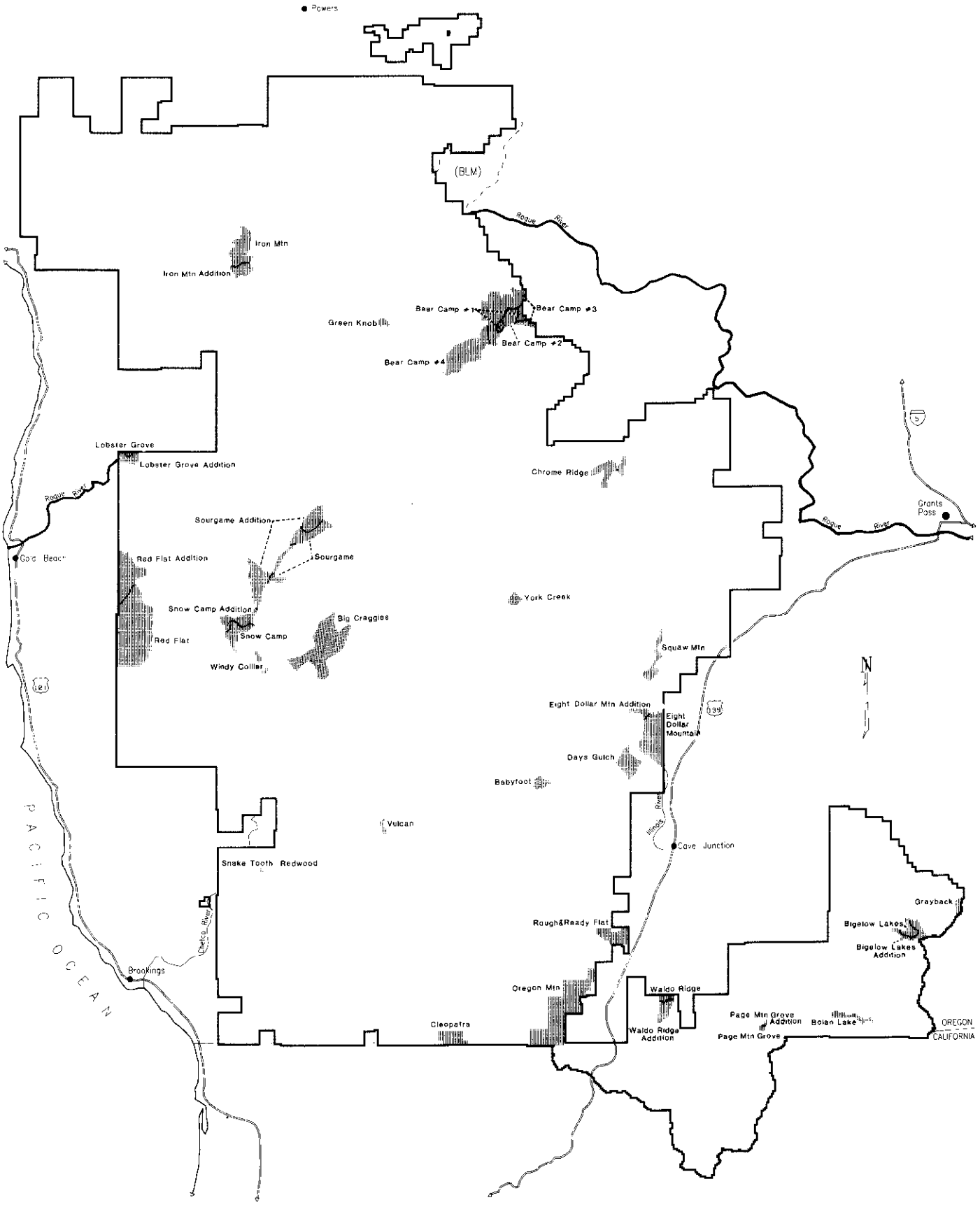


Figure II-6. Botanical Management Area Map



MANAGEMENT AREA 4 BOTANICAL

Management Area 4 includes the best representations found on the Forest of unusual plants indigenous to southwestern Oregon There are three existing Botanical Areas totaling 4,475 acres, two of which (Big Craggies and Babyfoot Lake) have portions outside of Wilderness. Nineteen additional sensitive plant areas are considered for designation in this FEIS. All 19 contain a total of 35,596 acres (16,462 acres tentatively suitable timber land). Five old-growth sites are also considered, they contain 1,321 acres (1,067 acres tentatively suitable timber land) Acres allocated to this Management Area would be managed with emphasis on the protection and enhancement of the rare plant or unique old-growth resources; other uses consistent with these goals would be allowed. These areas would not have programmed timber harvest, and other ground-disturbing or vegetation-manipulating activities may be significantly restricted

Figure II-6 displays a map of each area's location, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative

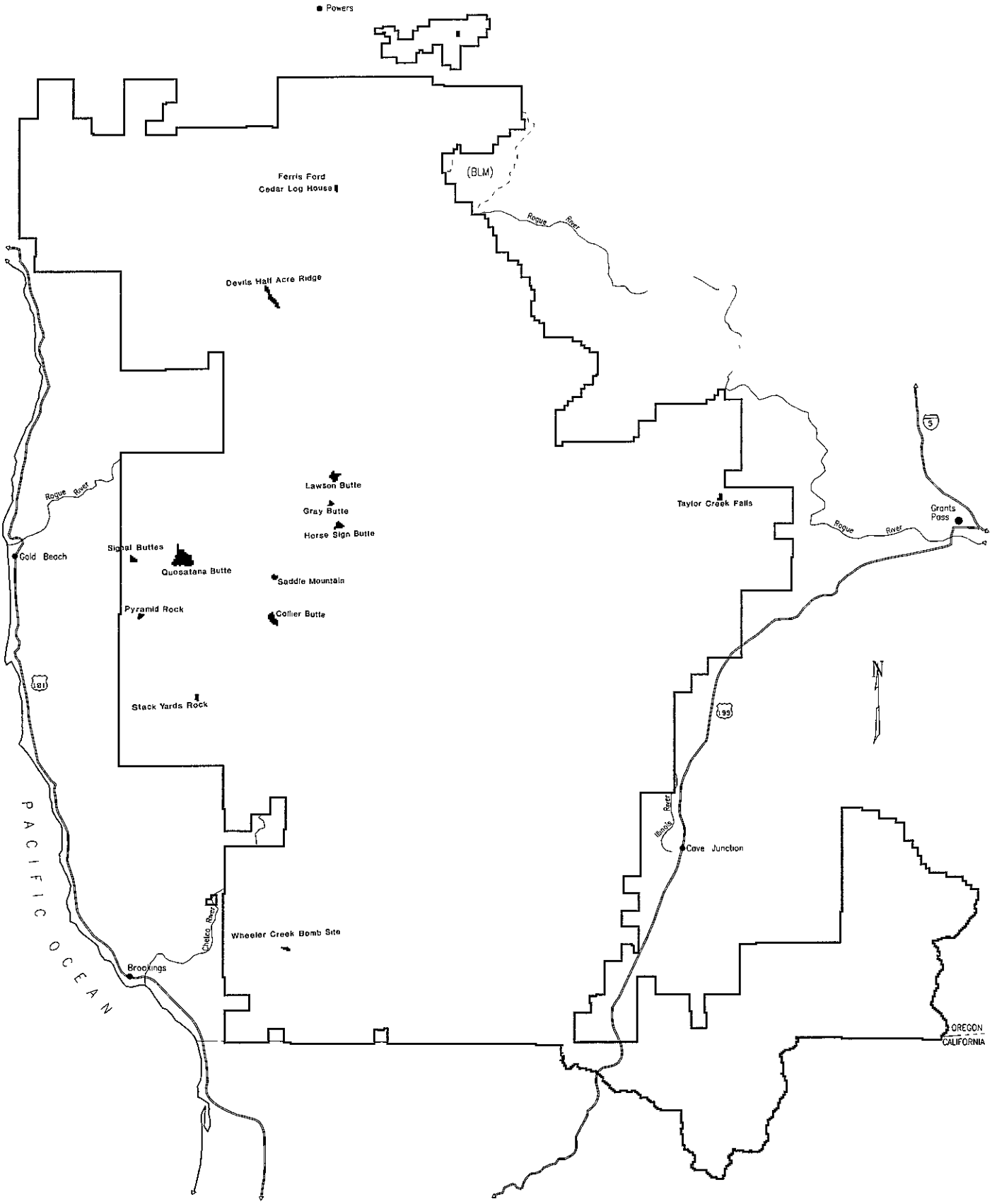


Figure II-7 Unique Interest Management Area Map



MANAGEMENT AREA 5 UNIQUE INTEREST

Management Area 5 protects significant cultural or exceptional geologic sites on the Forest. Development or vegetation manipulation for commodity production would not be allowed Cultural sites include historic structures or locations of historically significant events Geologic sites consist of prominent or unusual rock buttes or waterfalls. Thirteen such areas are considered for designation in this FEIS. Wheeler Creek Bomb Site, Collier Butte, Devils Half Acre Ridge, Gray Butte, Horse Sign Butte, Lawson Butte, Pyramid Rock, Quosatana Butte, Saddle Mountain, Signal Buttes, Stack Yards Rock, Taylor Creek Falls, and Ferris Ford Log House These areas contain 1,705 acres (766 acres tentatively suitable timber land).

Figure II-7 displays a map of each area's location, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative

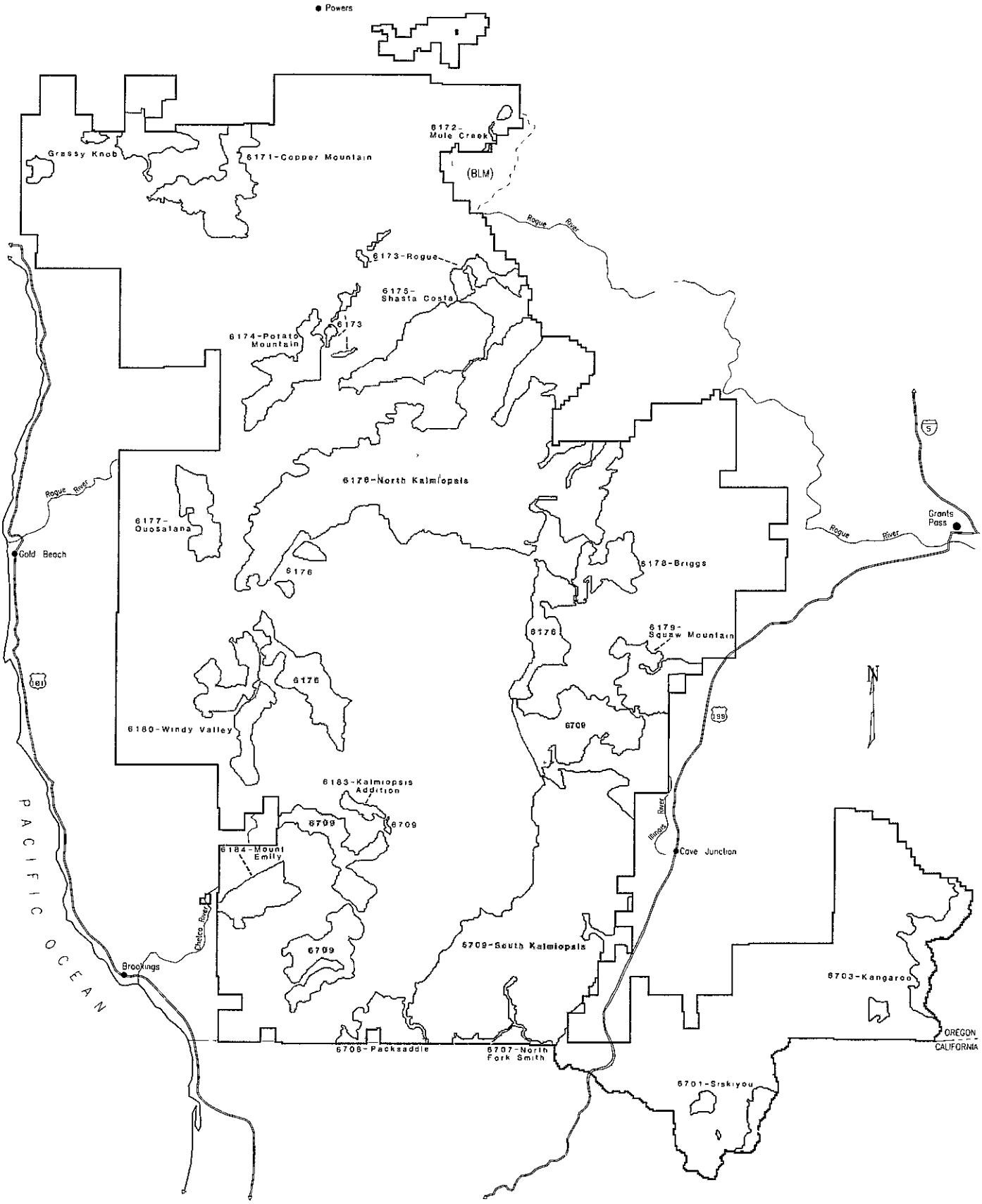


Figure II-8. Backcountry Recreation Management Area Map



MANAGEMENT AREA 6 BACKCOUNTRY RECREATION

This Management Area contains areas that will be retained in their natural state and will provide recreational and other resource opportunities associated with large unroaded areas. Candidates for Management Area 6 consist of the inventoried roadless areas on the Forest which are at least 5,000 acres in size and/or adjacent to existing Wilderness These areas are in a natural state and essentially unaffected by human activity. In areas that have been partially developed as a result of continuing management activities under current direction, a restoration program would be implemented to return the area to a near-natural condition over time Various levels of trail development are prescribed for these areas to increase recreation carrying capacity, and still maintain Primitive and Semi-primitive character. The Management Area prescription is designed to provide motorized recreation opportunities in designated areas, and in other areas to exclude the use of motorized equipment and emphasize non-motorized recreation opportunities. Eighteen areas are being considered, totaling 314,000 acres (171,844 acres tentatively suitable timber land).

Figure II-8 displays a map of the location of each, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative

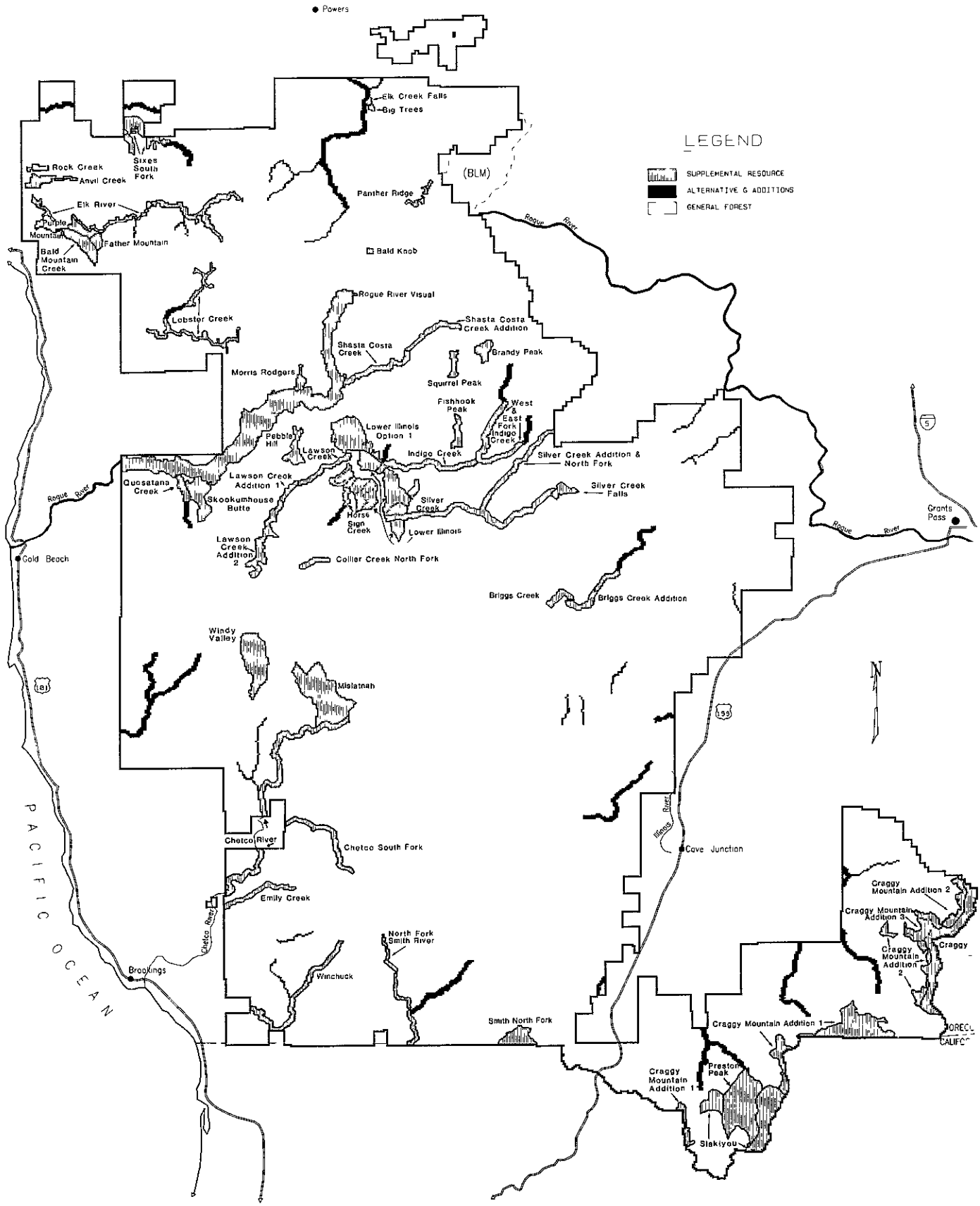


Figure II-9. Supplemental Resource Management Area Map



MANAGEMENT AREA 7 SUPPLEMENTAL RESOURCE

Areas considered highly productive habitat for fish or wildlife, have strong recreational attributes or values, or are necessary for the maintenance of sensitive watershed conditions are provided in this Management Area designation. Management objectives include maintenance of near-natural conditions while permitting limited levels of activity, such as through-road construction or habitat improvement projects. No timber harvest is programmed from these areas, but activity is permitted to salvage or protect stands from disease and insect infestations. These areas are considered supplemental to the Siskiyou Riparian Ecosystem Policy and other direction designed to protect or enhance water quality plus wildlife and fisheries habitat. Forty-two areas, totaling 76,281 acres (45,312 acres tentatively suitable timber land), are considered for Supplemental Resource Management Area designation in this FEIS.

Figure II-9 displays a map of each area's location, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative

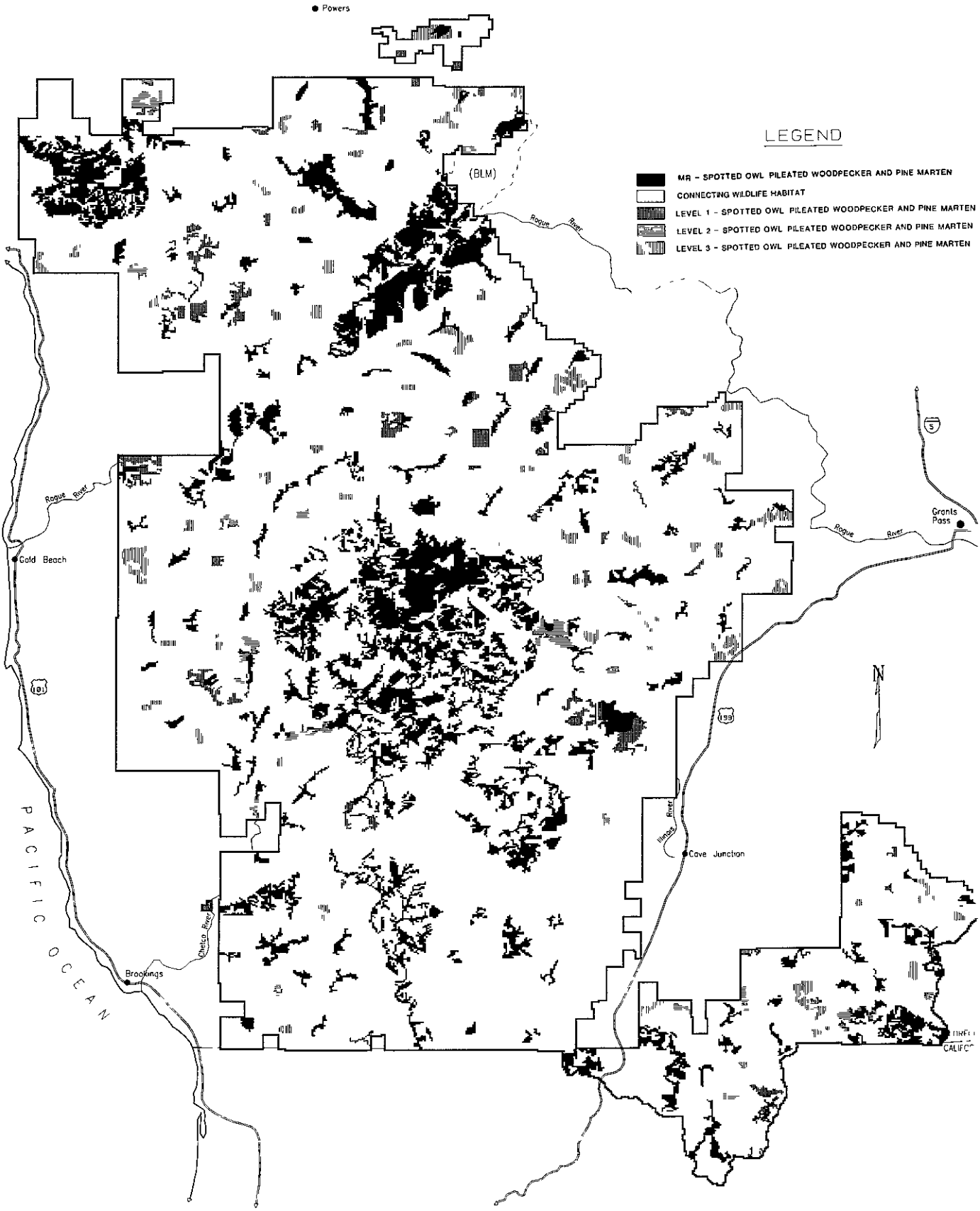
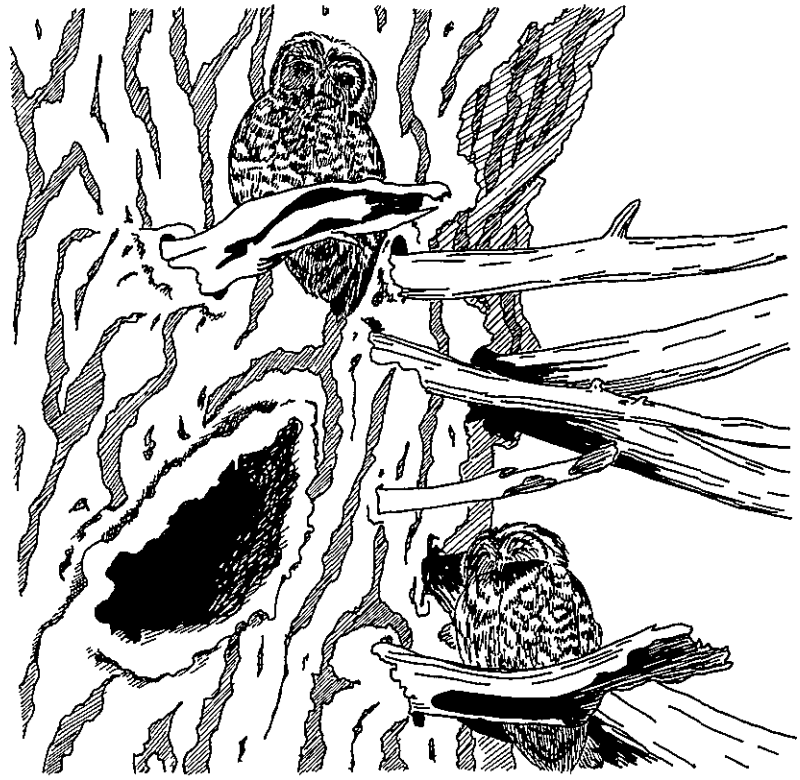


Figure II-10 Designated Wildlife Habitat Management Area Map



MANAGEMENT AREA 8 DESIGNATED WILDLIFE HABITAT

Management direction for this designation protects habitat for spotted owls, pileated woodpeckers, and pine martens. These three animals are indicator species for all wildlife inhabitants of mature or old-growth forests. This Management Area includes habitat needed to meet Management Requirement (MR) objectives Management direction for this designation includes requirements to maintain those mature and old-growth characteristics necessary for the sustenance of dependent wildlife species. No timber harvest activity is programmed for this area and ground-disturbing activities are limited to occasional road construction or habitat improvement projects Salvage is not permitted unless it is necessary to prevent disease or insect infestations. Total habitat protected over time to meet the Management Requirement amounts to 159,949 acres This includes 106,090 acres in Wilderness and other designated areas, or in areas unsuitable for timber management. Only 36,712 acres are tentatively suitable for timber production. Another 39,672 acres (36,911 acres of tentatively suitable timber land) are considered in some alternatives in addition to the level needed to meet MR's.

Figure II-10 displays a map of each area's location, and Table II-3 shows the acres associated with each candidate area and how they were allocated by alternative

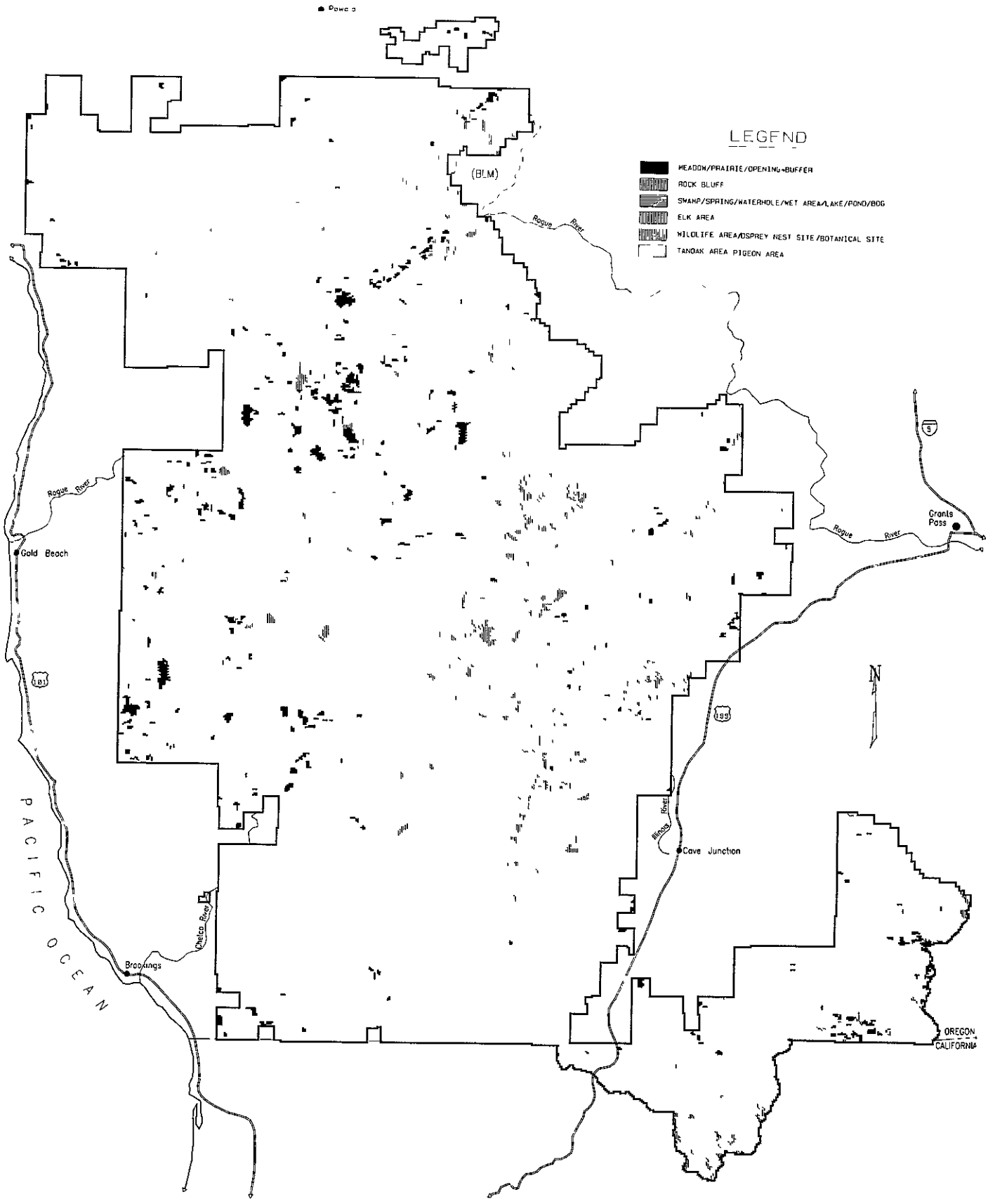
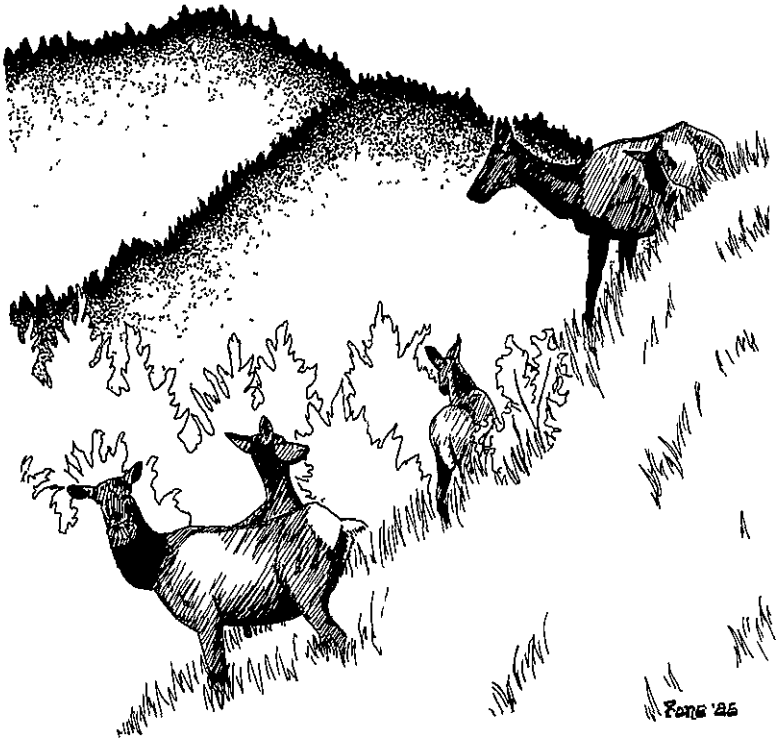


Figure II-11 Special Wildlife Site Management Area Map



MANAGEMENT AREA 9 SPECIAL WILDLIFE SITE

Management Area 9 consists of special wildlife habitat sites which are important components for overall wildlife habitat diversity Examples include meadows, lakes, tanoak stands, wet areas, rock bluffs, and other areas frequented by wildlife. Management direction for this area precludes programmed timber harvest activity but allows site-disturbing activities that are not contrary to the overall objective of preserving special wildlife habitats A total of 46,019 acres (including 13,264 acres of tentatively suitable timber land) are considered for designation in this FEIS.

Figure II-11 displays a map of each area's location, and Table II-3 shows the acres associated with each site type and how they were allocated by alternative

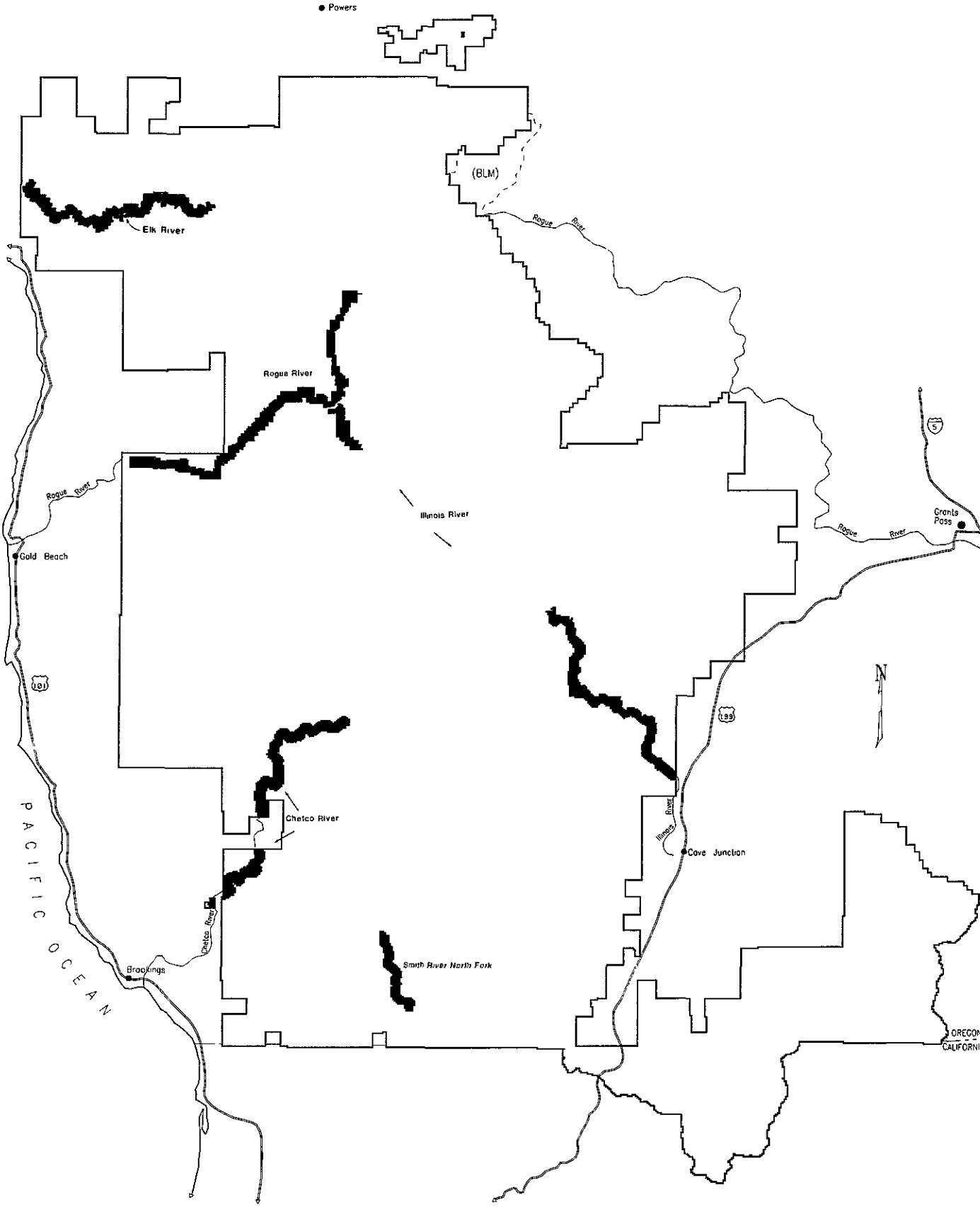


Figure II-12 Scenic/Recreation River Management Area Map



MANAGEMENT AREA 10 SCENIC/RECREATION RIVER

Management Area 10 includes segments of the Rogue, Illinois, Chetco, North Fork Smith, and Elk Wild and Scenic Rivers, and adjacent corridors of land classified as "Scenic" and "Recreational " The Chetco, North Fork Smith, and Elk were recently designated Wild and Scenic in the Omnibus Oregon Wild and Scenic Rivers Act of 1988. These areas are managed for multiple uses with emphasis on recreation and scenic quality, and protection of their "outstandingly remarkable" values. Timber management is planned at a low level where it can be accomplished consistent with meeting these other objectives. A Scenic river must be of high scenic quality, free of impoundments, and have a largely undeveloped shoreline, but can be accessed in places by roads The Recreation classification applies to those river segments which are readily accessible by public roads and have undergone substantial modification of the scenery from human causes These existing designated areas total 23,931 acres.

Figure II-12 displays a map of each area's location, and Table II-3 shows how each river was treated by alternative Note: **The North Fork Smith, Chetco, and Elk Rivers were designated by the Omnibus Oregon Wild and Scenic River Act of 1988 following the time that the alternatives for this EIS were developed and analyzed. Any alternative selected for implementation would be modified to include all of these rivers.**

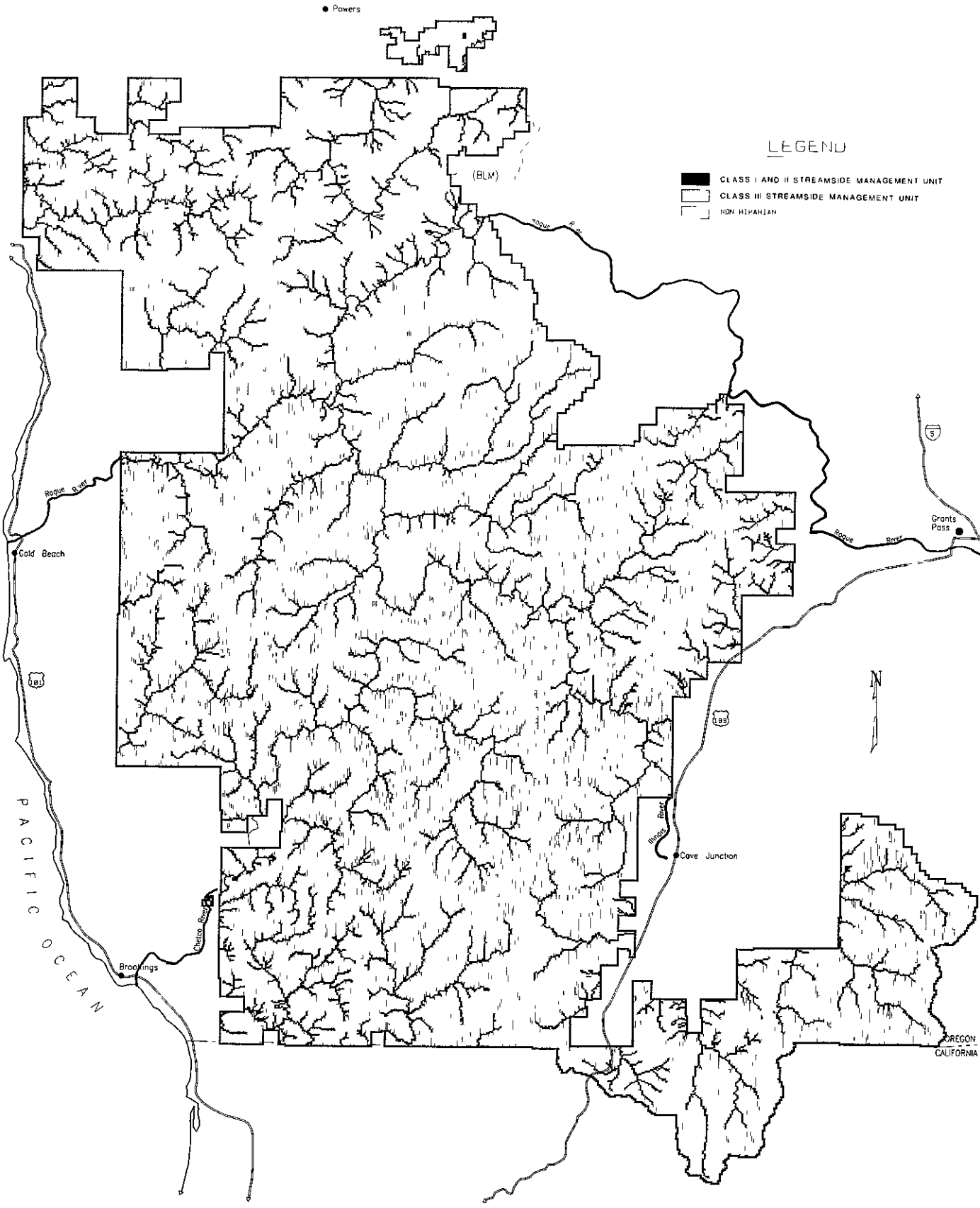


Figure II-13 Riparian Management Area Map



MANAGEMENT AREA 11 RIPARIAN

Management Area 11 contains the riparian area along perennial streams. The minimum area of consideration for management of the riparian area is 100 feet measured horizontally from each side of all Class I, II and III streams The actual width of the riparian zone is determined on the ground and varies for site-specific conditions For the purpose of this analysis, Riparian Management Areas are modeled as the area 150 feet measured horizontally from each side of all Class I and II streams, and 100 feet each side along Class III streams. There are an estimated 175,500 acres of riparian areas Forest-wide with approximately 99,000 acres tentatively suitable for timber production. Within this Management Area there are three prescription themes that are assigned to individual planning basins by alternative. Two include multiple uses with the emphasis on watershed and fisheries values and limited timber production. Prescription B is designed to manage vegetation to maintain water temperature, while Prescription C manages vegetation to reduce water temperature and improve watershed conditions over time. The third option is Minimum Level (M) which programs no timber harvest that would remove stream shade producing vegetation. While riparian areas are overlapped by Management Areas 1 through 10, they are never assigned to Management Areas 12 through 14 since this would not meet the MR's for watershed and fisheries protection.

Figure II-13 displays a map of riparian areas and Table II-3 shows the acres associated with each riparian area and the prescription by alternative

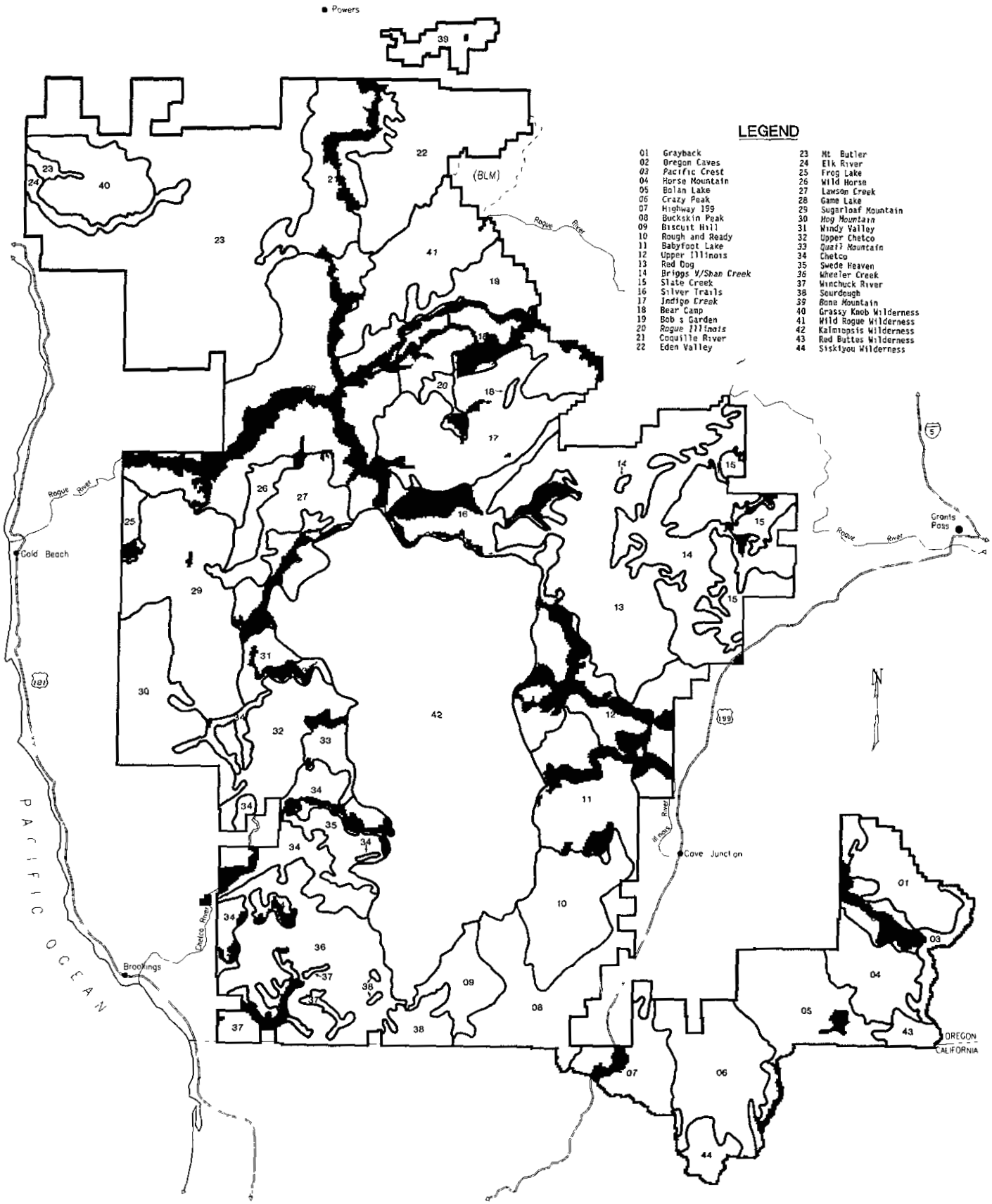


Figure II-14 Retention Visual Management Area Map



MANAGEMENT AREA 12 RETENTION VISUAL

Management Area 12 consists primarily of land that is immediately adjacent to, and visible from, major travel routes, rivers, and other high use recreation areas. The inventory also reflects viewer sensitivity to significant landscapes located along Wilderness access routes, Wild and Scenic river corridors, and in areas viewed from major recreation trails Maintenance of scenic quality is emphasized in this Management Area Timber would be produced at a low level Management activities, including timber harvest, would be designed to not be visually evident to the casual Forest visitor. There are 81,480 acres inventoried with a "Retention" Visual Quality Objective, of which 46,657 are tentatively suitable for timber production. Part or all of these acres are assigned to Retention based on the objectives of the alternative being considered.

Figure II-14 displays a map of each area's location, and Table II-3 shows the acres associated with each viewshed area and how they were allocated by alternative.

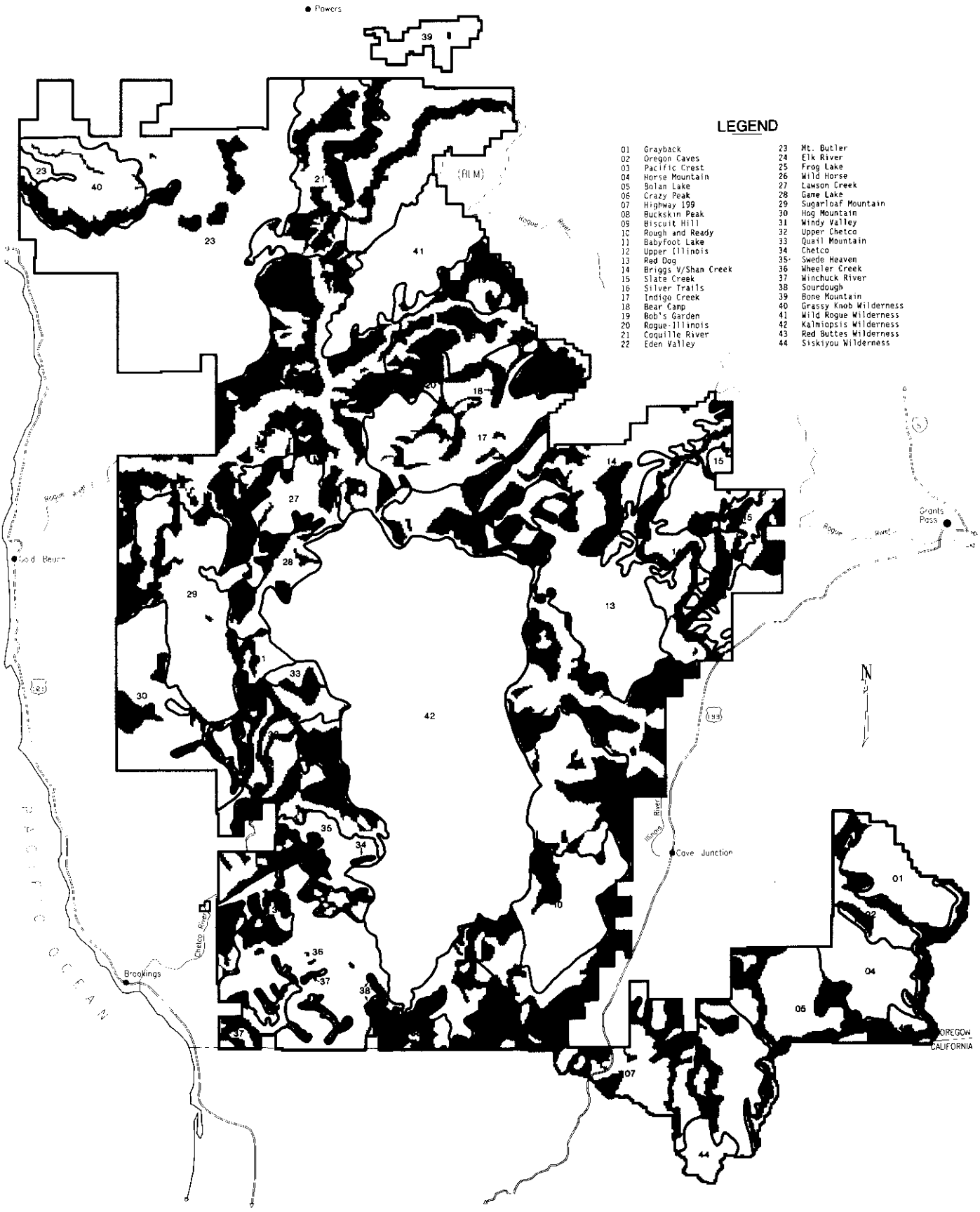


Figure II-15. Partial Retention Visual Management Area Map



MANAGEMENT AREA 13 PARTIAL RETENTION VISUAL

Management Area 13 consists of land that is visible in the middle to background of major and secondary travel routes, rivers and other high use recreation areas The total area inventoried as Partial Retention on the Forest is 287,700 acres of which 194,190 are tentatively suitable for timber production. These areas are managed for multiple uses including recreation, timber production, and wildlife habitat There is a priority on the maintenance of scenic quality and there is a minor reduction in timber production to allow for accomplishing these visual objectives Management activities are evident, but are designed to be visually subordinate to the characteristic landscape. The assignment of part or all of the inventoried Partial Retention acres is done by viewshed and is based on the objectives of the alternative.

Figure II-15 displays a map of each viewshed's location, and Table II-3 shows the acres associated with each viewshed and how they were allocated by alternative.

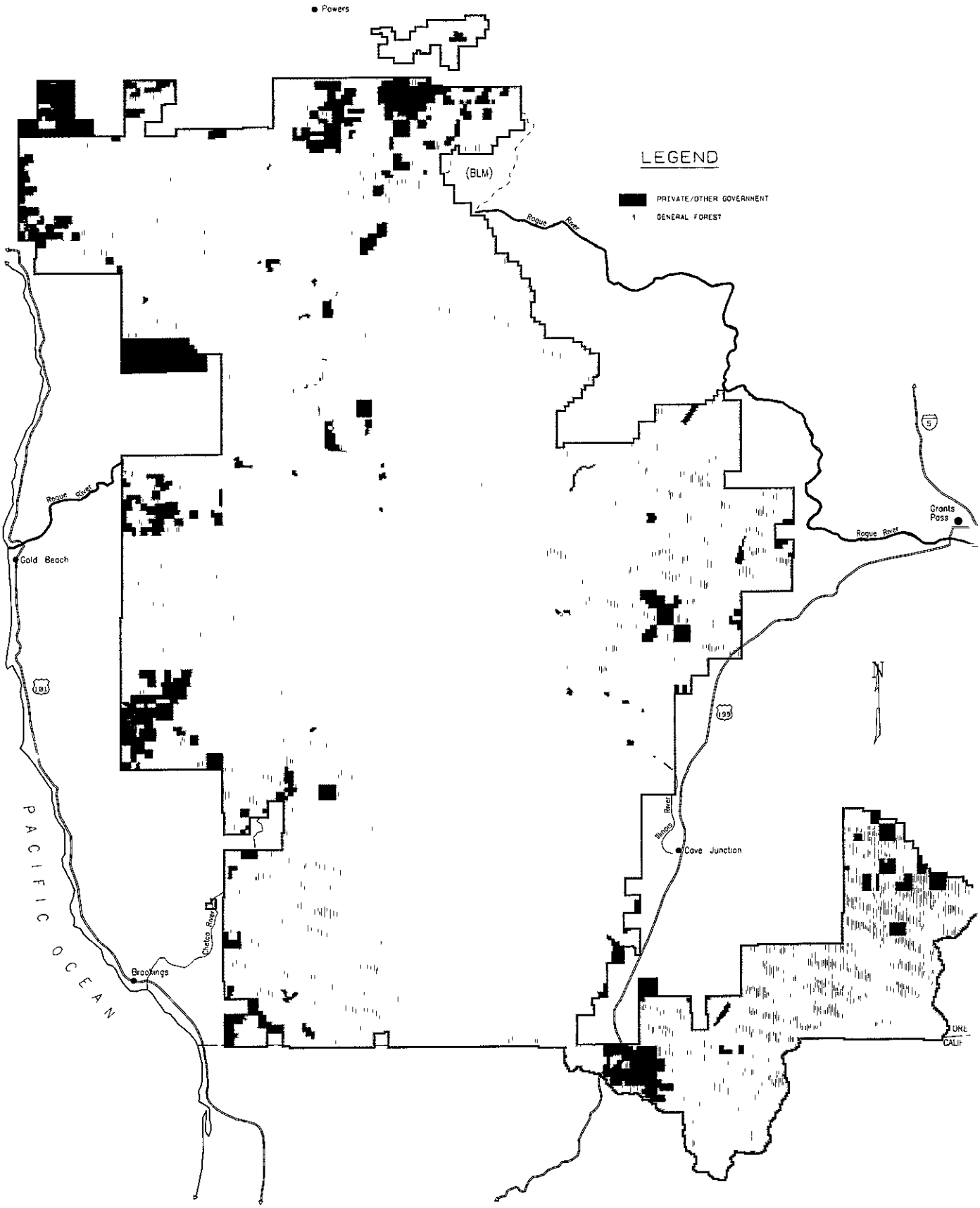
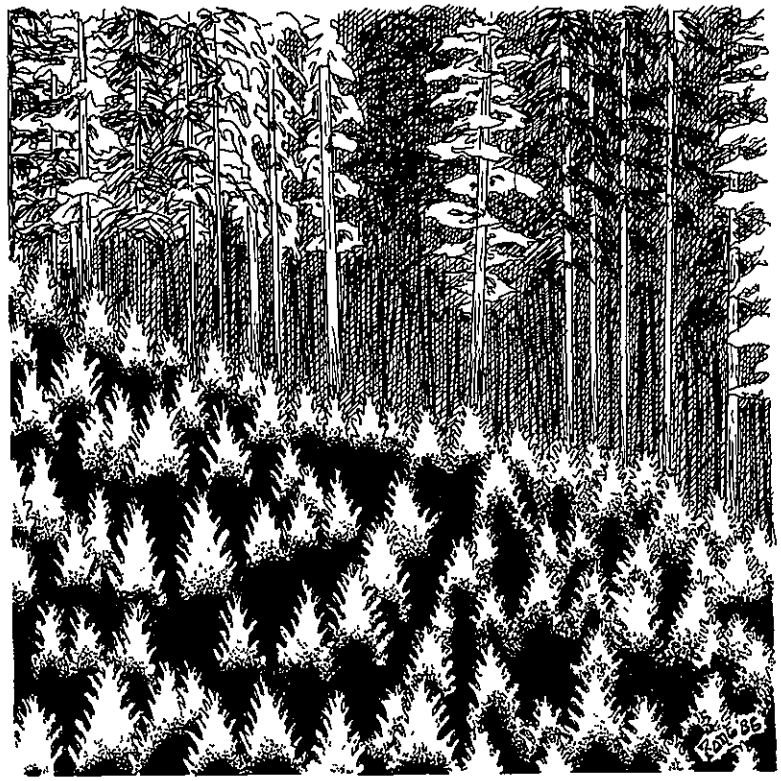


Figure II-16. General Forest Management Area Map



MANAGEMENT AREA 14 GENERAL FOREST

This Management Area includes forested land which is managed for multiple uses including timber production and the maintenance of many wildlife habitats. A number of other uses and land classifications are also included in the General Forest Management Area developed campgrounds, roads, utility corridors, cultural sites, administrative sites, and unsuitable timber land. Silvicultural activities may include timber harvest, precommercial and commercial thinning, fertilization, and reforestation. Wildlife species that use early seral stages, such as deer and elk, benefit from the mosaic of harvest units that provide forage opportunities in close proximity to hiding cover Approximately 565,000 acres of the tentatively suitable timber land could be allocated to this Management Area.

Figure II-16 displays a map of the potential General Forest land

OUTPUTS ASSOCIATED WITH ALTERNATIVES

Management of the Forest under the different alternatives will result in various land uses, resource outputs, and environmental effects Differences among alternatives generally represent the specific goals and objectives of the alternative. The causes and relationships governing the resource outputs and environmental effects are discussed in Chapter IV, Environmental Consequences. Summaries of the outputs and effects are reported in the **Comparison of Alternatives** section of this chapter and as part of the alternative description All of the significant land uses, environmental effects, and resource outputs are presented by alternative and by time period

Displayed outputs are estimates based on inventory samples and models representing the relationships of interacting factors found in the forest environment Inventory sample surveys are seldom designed to have confidence intervals tighter than plus or minus 10 percent due to the cost associated with substantially increasing the sample size for minor increases in reliability; representations in models are also never perfect This is pointed out here because outputs are often presented in a form implying precision not supported by the data While the numbers may not be precise, they are good relative projections of expected outcomes and are valid measures of comparison between alternatives. They also serve as reasonable projections for the environmental consequences displayed in Chapter IV, particularly when viewed as a relative comparison with other alternatives, including continuation of the current level of activity

FEATURES COMMON TO ALL ALTERNATIVES

Features common to all alternatives are described in the section below. (Land allocations common to all alternatives, such as existing Wilderness, RNA, and Wild and Scenic River designations were presented above and are not repeated here.) Following this section, the alternatives selected for detailed study are presented These alternatives represent a broad range within the decision space defined by the benchmarks

Timber

The final determination of timber harvest method will be made on a site-specific level for each project. All alternatives would employ combinations of the silvicultural systems applicable on this Forest Options of designing alternatives using a single system (either even-aged or uneven-aged) were not built into the alternatives due to the tremendous physical and biological variation found within the Forest and the multiple objectives associated with each alternative. Clearcut, shelterwood, seed tree, single-tree selection, and group selection harvest methods are all available tools under each alternative. The Standards and Guidelines (Chapter IV of the LRMP) indicate the system generally appropriate for given combinations of site and stand conditions, and management goals and objectives FEIS, Appendix G presents a discussion of the various systems, comparisons of their effects, and rationale for uses under different conditions. The systems indicated as most appropriate for the broad categories presented should be those most often used, however, it is not intended that other systems should not be used when site-specific conditions warrant. The final selection of a silvicultural system for a specific site is left for the silvicultural prescription. This is consistent with Criterion 6 of Section I-1 of the Standards and Guidelines in the Regional Guide for the Pacific Northwest Region (USDA Forest Service 1984b).

Logging systems will also be matched to the site specific conditions, and systems will be selected to meet the resource objectives at the least cost Specific areas suitable for only some systems have not been identified by alternative. All systems will be available, including helicopter, and will be used where appropriate The cost data used in the analysis includes allowances for this mix of logging systems in the timber program.

Timber management intensities, which define the levels of practices such as precommercial and commercial thinning, were developed to portray different investment levels and management strategies Once the allocations and constraints necessary to accomplish the objectives of the alternative were installed, the FORPLAN model was allowed to select from the full range of prescription intensities to find the most efficient level of timber management for those Management Areas with programmed timber production The solutions tend to have the same mix of intensities with a high or moderate level on medium and high sites, and moderate or extensive level on low sites.

The herbicide issue has been and will continue to be dealt with in separate environmental analyses and NEPA documents at the Regional level All alternatives in this Forest Plan EIS assume the continued use of the full range of alternative treatment methods including manual, mechanical, prescribed fire, biological, and chemical methods. If chemical tools are not available in the future it may be necessary, regardless of the alternative, to adjust projected costs or the proposed levels of timber outputs Timber stand condition and performance (with or without the availability of chemical release) will be evaluated and any needed adjustments in the harvest level made during implementation and monitoring (see Chapter V of the LRMP).

When given the option, the FORPLAN model schedules timber management on most suitable acres of the Forest; there is little potential to increase ASQ as a result of future market conditions. Two categories of land that have potential not utilized by FORPLAN are the separate suitability component (SSC) lands, and those lands currently stocked with hardwood species. The Forest Plan contains the flexibility to manage these lands under changing market conditions without amendment or revision.

The SSC lands do not have programmed timber harvest, but site specific opportunities may be scheduled in accordance with Standard and Guideline 6-2(7) of the Forest Plan. These lands (18,713 acres) are insignificant in terms of the Forest-wide analysis for timber production. They are very low site and their total potential contribution to ASQ, if all were in full yield allocations, would only be about 1 MMBF. The net effect of these lands on ASQ would be less than one percent of any alternative On the average, these lands would not be selected for timber management if entered into the FORPLAN model; however, there is considerable variation in the vegetation conditions existing on these sites. The site-by-site evaluation will provide the flexibility to take advantage of opportunities such as overstory removal harvests that require low investment and cannot be identified with the resolution of our current inventory.

Lands currently stocked with noncommercial species or hardwoods are not always selected by the FORPLAN model. Because the current ASQ is most dependent on the existing volume available, the ASQ effect of operating on these lands is negligible. Bringing these lands into production through the harvest of hardwood stands and replanting with conifers does have the potential to increase future timber outputs, and supply fuelwood or other products in the short-term. To evaluate the environmental consequences of taking advantage of such opportunities, levels of operation ranging from zero to 14,000 acres per decade were installed in the alternatives. These acres are included in the suitable land base whether selected by FORPLAN or not. Whether or not these acres will actually be treated will depend on site-specific conditions and market demand for hardwoods (see Standard and Guideline 6-13 in the Forest Plan).

Fish, Soil, and Water

Fisheries habitat capability is maintained at or above present levels in all of the alternatives. One determinant of this is the assignment of riparian management prescriptions. These prescriptions govern the amount of harvest allowed in the areas adjacent to streams (they are more fully described in Appendix B). Their effect on fish habitat is primarily through changing the quantity of stream shading, and thus effecting water temperature There are three variations of the riparian prescription. Riparian Prescription B maintains existing water temperatures. Both Riparian Prescription C and allocation to Minimum Level of management (no programmed timber harvest) would increase shade over time, resulting in cooler summer water temperatures and consequently, improve fish production. Minimum level prescription (M) applies to all riparian areas in Wilderness.

Management activities in all alternatives would be governed by Standards and Guidelines (Appendix D, and LRMP, Chapter IV) and Best Management Practices (LRMP, Appendix F) specifically designed to protect site productivity, water quality, and fisheries. Best Management Practices (BMP's) are specifically designed to protect water quality, as required by Section 208 of the Clean Water Act. General BMP's will be selected and tailored for site-specific conditions to arrive at project-level BMP's for the protection of water quality. The process and practices are discussed in the BMP Appendix (LRMP, Appendix F)

Areas which have active landslides or risk irreversible soil loss are designated unsuitable and have no programmed timber harvest

Wildlife

A number of areas are allocated to wildlife use in all of the alternatives These include. existing meadows, swamps and springs, and osprey nest sites.

The alternatives and benchmarks, except the No Change Alternative, were developed using procedures described in Chapter 3 of the Regional Guide for the Pacific Northwest Region (USDA Forest Service 1984b) as amended by the Supplement for Spotted Owl Guidelines (USDA Forest Service 1988b). Specifically, these procedures provide the direction for development of methods to achieve the Management Requirements described previously in this Chapter and in Appendices B and J

Wild and Scenic Rivers

The DEIS was designed to evaluate a range of options for designation of Wild and Scenic Rivers. As the FEIS was being prepared for printing, Congress passed the Omnibus Oregon Wild and Scenic Rivers Act of 1988. The Act designates the inventoried rivers evaluated in the DEIS (Chetco and North Fork Smith), and the Elk River which was determined to meet eligibility criteria following the release of the DEIS. Most of the alternatives as defined in this FEIS do not include management direction for these rivers under the Wild and Scenic designation Any alternative selected would be brought into compliance with the Act prior to implementation. Also as a result of this legislation, Planning Problem #4 has been modified to address management of the lands adjacent to river corridors, but not the question of recommendations for designation or further study. Appendix E, which was devoted to the detailed evaluations of the recommendations for the individual rivers, has been dropped from this FEIS; pertinent information from that appendix can be found in the Planning Record

Minerals

Mineral exploration and development would be facilitated by retaining approximately 75 percent of the Forest in an accessible category in all alternatives. The access restriction category for each Management Area is selected based upon an assessment of the effect of limitations imposed on mineral development. Since the nature and level of mineral activity can vary from casual prospecting to mine development, the actual degree of restriction would only be defined through evaluation of site-specific proposals. The Forest may make recommendations for additional withdrawal from mineral entry when mitigation of a projects effect on resource values will not reduce impacts to an acceptable level.

CHANGES BETWEEN DRAFT AND FINAL COMMON TO ALL ALTERNATIVES

Several changes in analysis processes and features common to all alternatives have occurred as a result of the review of the DEIS, or changes in circumstances which affects the analysis or decision space (Changes in the Preferred Alternative are described in a later section in this chapter) The noteworthy changes are mentioned in this section. Analysis changes are explained in more detail in Appendix B

Management Area 6 has been changed from "Custodial (Roadless)" to "Backcountry Recreation " The change in the name better reflects the management intent of these proposed allocations The Management

Area Prescription has also been revised slightly, particularly related to relaxing restraints that were applied to mineral access and motorized forms of recreation

The Standards and Guidelines pertaining to mineral development and exploration have been revised The Draft Forest Plan implied unrealistic restrictions on mineral activities. These have been revised to correspond more closely with legal authority and probable limitations on exploration and development operations where necessary to protect other resource values.

The analytical procedures used to project nongame wildlife use (measured in Wildlife/Fish User Days - WFUD's) have been modified in response to public input In the DEIS, the nongame wildlife use was assumed to be equal to the game use and was projected based on expected changes in deer habitat For this FEIS, the nongame use is projected similar to the demand for recreation assuming that the change in the level of wildlife viewing is a function of the change in the human population - not the change in wildlife habitat. An error was also identified in the calculation of deer habitat capability. Habitat capability was underestimated by about 25 percent This has been corrected and all affected tables and text have been revised. This error was consistent in all alternatives and benchmarks so relative differences remain the same

The Final Supplement to the Environmental Impact Statement (FSEIS) for an Amendment to the Pacific Northwest Regional Guide was completed in 1988. This amends the Spotted Owl Guidelines used by the Forest to define habitat needs to achieve MR's As discussed in the section on Management Requirements, the changes did not substantially affect the habitat proposed for designation on the Siskiyou. There are some minor changes in the location of habitat areas that would be incorporated in any alternative selected for implementation. Appendix H of the DEIS, which provided information on the relationship of the concurrent analyses on the Regional Guide Amendment and the Forest Plan, has been dropped from this FEIS.

In response to requests for more detailed information on implementation techniques and mitigation measures used to maintain or protect watershed values, a list of Best Management Practices (BMP's) has been prepared. The BMP's are described in Appendix F of the Forest Plan.

Continued management of the Forest under current direction and implementation of the Silver Fire Recovery Project have changed the character of some of the unroaded area originally inventoried in the RARE II process (total acres have changed from 314,000 acres to 284,000 acres since the last planning inventory update in 1984) If an alternative is selected that allocates some of the area that has been roaded or harvested to Management Area 6 (Backcountry Recreation), these areas would be managed to restore the natural character and roadless recreation opportunities.

Wildfires burned over a large part of the Forest in late 1987. The changes in environmental conditions resulting from these fires and subsequent timber salvage projects relative to the Forest Planning analysis are described in Chapter III. Though the changes in conditions do not significantly affect the analysis here or the comparison of alternatives, there is a lot of interest in the relationship of the fires to the Forest Plan. A section discussing the implications of the 1987 fires has been added at the end of this chapter, and Chapters III and IV.

A number of the changes have implications for minor inventory adjustments The 1987 fires changed the vegetation in burned areas; the intensive field work done in association with the Silver Fire Recovery Project identified additional areas unsuitable for timber management, there are new Wild and Scenic Rivers; and the revised spotted owl habitat guidelines result in an adjustment of the habitat needed for MR's. These adjustments are not accounted for in the alternative outputs and effects displayed in this FEIS. Any alternative selected for implementation would need to have these "fine tuning" adjustments made. The Forest Plan is developed from the Preferred Alternative with these adjustments

BACKGROUND ON THE NO CHANGE AND NO ACTION ALTERNATIVES

THE "NO CHANGE" ALTERNATIVE

This alternative has been developed in response to decisions made regarding an appeal brought by the Northwest Forest Resource Council on May 19, 1986 The appeal centered on a decision by the Regional Forester to "require inclusion of Minimum Management Requirements (MMR's) in the Current Direction Alternative for each Forest Plan " The substance of the appeal was that a "true no-action alternative representing current management plans" was not included in Forest Plan EIS's In response to this, a No Change alternative has been developed to represent the existing timber management plan, and consequently does not comply with all provisions of the National Forest Management Act (NFMA) and regulations promulgated by the Secretary of Agriculture to implement NFMA

The following provisions of NFMA or other laws or regulations are among those not explicitly complied with in the current timber management plan represented by the No Change Alternative:

36 CFR 219.14 - Timber resource land suitability. requires identification of lands not suited for timber production based on risk of irreversible resource damage; lack of assurance of reforestation within five years; or withdrawal by Act of Congress, Secretary of Agriculture, or Chief of Forest Service

36 CFR 219 15 - Specifies a process for choosing vegetation management practices. Also, ties to 36 CFR 219 27 which identifies required resource protection and silvicultural practices.

36 CFR 219 16 - Requires that all alternatives identify decadal timber harvest levels and long-term sustained yield levels, consistent with the requirements of the RPA program and Regional guide.

36 CFR 219.18 - Requires that Wilderness management direction be provided, including actions needed to limit or distribute visitor use and measures desirable to protect the wilderness or adjacent areas from wildfire, insects or disease

36 CFR 219 19 - Provides for viable populations of vertebrate wildlife species, the selection and monitoring of management indicator species, cooperation with wildlife management agencies, and protection of habitat critical to threatened or endangered species.

36 CFR 219 21 - Requires that recreation resources be addressed, including supply and demand of various recreation opportunities, coordination with State agencies, and off-road vehicle use

36 CFR 219.22 - Requires that mineral exploration and development in the planning area be addressed, including existing uses, the potential for future development, and access requirements.

36 CFR 219 23 - Requires full consideration of water and soil resources including estimates of current water uses, instream flow requirements, protection of water quality, watershed condition, and protection of wetland and floodplain values.

36 CFR 219 24 - Requires inventory, evaluation, and protection of cultural and historic resources, identification of opportunities for cultural resource interpretation, and coordination with other agencies

36 CFR 219.25 - Requires that Forest Plans provide for the establishment of Research Natural Areas

36 CFR 219.26 - Provides for consideration of plant and animal community diversity.

36 CFR 219.27 - Identifies specific Management Requirements to be used in the development analysis, approval, implementation, monitoring, and evaluation of forest plans for activities including; silvicultural practices, resource protection, vegetative manipulation, protection of riparian areas, protection of soil and water, and maintenance of diversity.

The Timber Management Plan upon which the No Change Alternative is based was developed in 1962. The plan was not an integrated resource plan, and consequently did not address all resource uses and outputs The original plan was based on yield tables and resource relationships which do not reflect the latest scientific techniques and information and do not reflect the standards in the NFMA regulations. Unit Plans developed during the 1970's provided new standards and management objectives which were applied to on-the-ground management. The Timber Management Plan has been amended following Congressional designations (Wilderness additions), but there has not been reconciliation of the Timber Management Plan with Unit Plan direction and requirements of NFMA.

The Timber Management Plan calculated a "Biological Potential," or the maximum amount of sustainable wood fiber obtainable by application of intensive management practices, to acres classified as commercial forest land. The needs of other forest uses are not incorporated. A "Potential Yield" was then calculated which represents the sustainable output of wood fiber available after the needs of other forest uses have been deducted from the Biological Potential. The Potential Yield of the 1962 Timber Management Plan was 191 MMBF on an annual basis. Amendments have adjusted this figure downward to 167.5 MMBF as parts of the land base have been allocated to uses that preclude timber harvest (i.e., Wilderness and Wild Rivers). Nonchargeable salvage is sold in addition to the Potential Yield since this material was not included in the yield calculations. The amount of nonchargeable salvage included in the program has been approximately 5 MMBF annually. The Potential Yield and the amount sold is displayed for each year from 1963 to 1987 in Table II-36. The Potential Yield was based primarily on the timber resource, and although there was some recognition of other forest uses, did not constitute the integrated resource management planning required by NFMA.

The other forest uses allowed for in the computation of the Potential Yield are not specifically identified. This leaves some room for speculation as to how much or what part of the current considerations for other resource management might be assumed to be represented in the Potential Yield figure. Analysis of the capability of the Forest to produce the Potential Yield of the timber management plan using the latest inventory data and timber yield tables and integrating the direction of the unit plans, as well as the requirements of all laws and regulations, indicates that the Potential Yield of 167.5 MMBF plus the nonchargeable salvage could not be maintained (salvage is included in the current inventory). Consequently the timber sale level of the timber management plan, and thus the No Change Alternative, would not be feasible under existing laws and regulations and current unit plan direction

Although the No Change Alternative is defined as carrying forward the direction and analysis (including the inventory and yield table information) from the timber management plan, the Siskiyou has used current data and the FORPLAN model to represent this alternative for evaluation and comparison purposes This is only possible because of the closeness of the timber output levels predicted by two very different analyses (The timber management plan used different yield tables with different utilization standards, different inventory data, different land stratification, different definitions for timber land suitability, and a simple formula to compute the Potential Yield.) By not including the MR for mature and old-growth wildlife habitat, it is possible to meet all other MR's and direction from unit plans, and maintain the timber outputs of the existing Timber Management Plan. This is true on the Siskiyou only because the projected timber outputs using the current analysis are not substantially different from the previous analysis.

The No Change Alternative presented in this document is formulated to maintain the timber outputs of the 1962 Timber Management Plan, but includes all of the direction in current Unit Plans. Maintaining the direction of the current Unit Plans also results in all of the MR's being met except the requirement for mature and old-growth wildlife habitat needed to comply with 36 CFR 219 19 and 36 CFR 219.27. The No Change Alternative could not be implemented or used in future management of the Forest under the Forest Plan without Congressional and/or Secretary of Agriculture action to change the law or regulations If the No Change Alternative were to be implemented without such action, the alternative would have to be amended or revised to comply with the law and regulations.

THE NO ACTION ALTERNATIVE

The Current Direction alternative (Alternative A) is the "No Action" alternative required by NEPA (40 CFR 1502 14) and NFMA (36 CFR 219 12 (f)(7)). The NFMA regulations state:

> At least one alternative shall reflect the current level of goods and services provided by the unit and the most likely amount of goods and services expected to be provided in the future if current management direction continues Pursuant to NEPA procedures, this alternative shall be deemed the "no action" alternative

Alternative A would carry forward current management direction, and is made implementable by adding the MR's necessary to comply with laws and regulations as described earlier in this chapter The levels of goods and services associated with this alternative are those most likely to be provided in the future under this direction In the case of timber outputs, this would mean a change from the 172 5 MMBF (Potential Yield plus salvage) to an ASQ of 169 6 MMBF on a non-declining yield schedule.

One additional variation is provided with Alternative A-Departure which departs from the non-declining yield policy to maintain the current level of timber outputs while installing the MR's With this alternative current management direction would continue, all laws and regulations would be complied with, and the current levels of goods and services would be expected to continue for the next two decades. The level of timber harvest would decline in the third and fourth decades to compensate for the higher level harvested in the first two decades.

THE PREFERRED ALTERNATIVE

A Preferred Alternative is identified in this chapter The selection of the Preferred Alternative was made after careful comparison of all the alternatives on the basis of their resource outputs, environmental effects, implementation costs, and the "tradeoffs" between them The Preferred Alternative was selected from all those formulated as the one which best maximized the NPB in an environmentally sound manner. Alternative K was identified as the preferred in the Draft EIS With Alternative K as a base, Alternative S was developed considering the public and other agency comments received on the DEIS After the Forest Supervisor reviewed the Interdisciplinary Team's evaluation, Alternative S was selected as the Preferred Alternative in this Final EIS.

The Preferred Alternative (S) incorporates many suggestions made by reviewers of the Draft proposal Suggestions were evaluated by the Interdisciplinary Team and incorporated where they offered methods of increasing total benefits the Forest could provide, or indicated a resource management preference having potential to further resolve public issues The more substantial elements in the formulation of Alternative S, relative to Alternative K, are described in this section

The timber harvest dispersion constraints in Alternative K were criticized as imposing an unwarranted opportunity cost to timber These constraints specific to each planning basin were designed to disperse activities over time and space, without substantially reducing the overall level of activity The specific factors for each planning basin in Alternative K ranged from 9 to 13 percent of the land base suitable for timber

to be harvested per decade Further analysis indicates that these constraints can be refined to be more specific to individual watershed conditions, better fit the present FORPLAN model formulation, and achieve the desired effect with less timber opportunity cost The factors used in Alternative S range from 7 to 17 percent for the individual planning basins.

Numerous comments were received pointing out the high values of the Forest's fishery resource which is supported by the water resource and stream habitat, and the social and economic importance of this resource to local communities Alternative S would allocate seven of the high fish value planning basins to be managed under the Riparian Prescription C, affording additional protection to the stream shade. As a result, a net improvement is projected in fish habitat capability. This is compared to only one planning basin being assigned to Prescription C in Alternative K out of a Forest total of 19 basins

Allocations to Supplemental Resource Management Areas along major streams is also increased slightly in Alternative S relative to Alternative K. This additional stream corridor protection (Lobster Creek, and East and West Fork Indigo Creeks) is in response to protection needs in specific areas indicated by the public.

There is tremendous support for maintaining more of the Forest in an undeveloped condition to provide Primitive and Semi-primitive recreation opportunities, as well as reserves of old-growth conifer forest and other values associated with large undeveloped areas The allocations to Backcountry Recreation Management Area have been significantly increased in Alternative S. To accommodate historic use described in public comments, specific Backcountry Recreation areas would be managed for Semi-primitive Motorized recreation to allow four-wheel drive and motorbike travel on primitive roads and trails existing in these areas

A related concern raises the question of the appropriateness of intensive timber management and road development in some areas with very steep slopes and rocky soils Alternative S would designate some areas for "extensive" management; keeping them in the timber management base, but projecting a less intensive management schedule and logging by helicopter without major road development. The total area, however, is quite limited in extent.

The Siskiyou is recognized as one of the most botanically diverse and interesting Forests in the Nation. Alternative S would allocate several more Botanical Areas to management and added protection of sensitive and rare plant habitat. Detailed comments on specific areas provided the information to refine boundaries of some candidate Botanical Areas in Alternative S.

It was pointed out that fertilization is being used as a management practice on many Forests and other ownerships to increase timber yields Further analysis and results of fertilization trials indicate that fertilization is feasible on the Siskiyou. Fertilization has been included in Alternative S as a management practice to be used on intensively managed timber stands.

Alternative K reduced allocations in several areas with management emphasis on visual quality Many, including local governments and agencies, thought it went too far and failed to identify specific areas of the Forest with outstanding scenic quality or higher recreation use The allocations to Retention and Partial Retention Visual Management Areas are increased in Alternative S to include some of the specific travel corridors that have substantial recreation opportunities and scenic values.

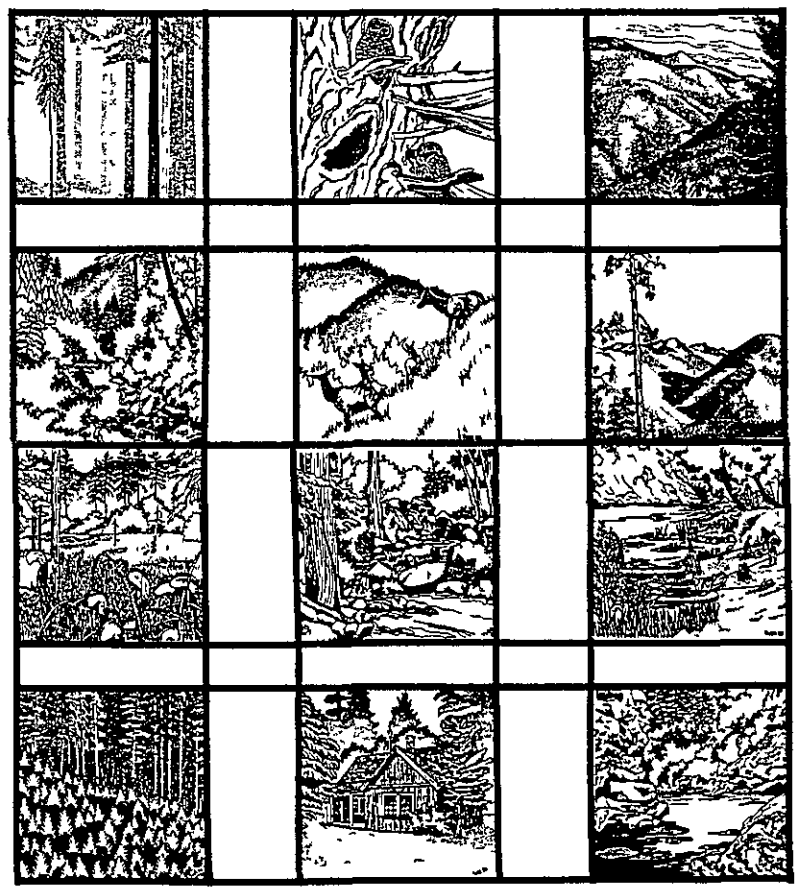
Interest in recreation and tourism has increased in recent months. The counties in southwestern Oregon have identified "tourism" as the focus for their strategy as part of the Oregon Comeback, other reviewers point out the importance of, and potential for, the tourist industry. In response, Alternative S would program higher levels of capital investments to complement the emphasis of State and local governments and private industry. In addition, some land allocations have been increased, such as the visual and Backcountry Recreation allocations mentioned above, that are complementary to this emphasis

Interest in Wild and Scenic Rivers also increased substantially in 1988. In addition to the two inventoried rivers considered in the DEIS (North Fork Smith and Chetco), several others including the Elk River were suggested for inclusion in the National System Analysis of the attributes of the suggested new rivers to be considered indicates that only the Elk meets the eligibility requirements for Wild and Scenic designation. Alternative S would have recommended designation of the inventoried rivers and further study for the Elk -- a moot point now since all were designated in the Omnibus Oregon Wild and Scenic Rivers Act of 1988 shortly before these documents went to print.

ALTERNATIVE DESCRIPTIONS

Descriptions of the 12 alternatives considered in detail are presented in this section. Primary goals and objectives, model design, and an overview of unique environmental consequences introduce each alternative. The *goals* section describes the theme of the alternative and the specific purpose behind its formulation. The *design* section discloses those elements of the alternative that were designed and input to the model by the Forest Service. The *overview* section is a synopsis of the important results and environmental consequences that are unique to the alternative. Following this brief three-part introduction, the alternative's response to each Planning Problem is discussed in some detail.

Quantitative and qualitative summaries of the alternatives are presented in a comparative format in tables that follow this section. Appendix I contains alternative-specific tables which show the number of acres allocated to each Management Area, and the contribution each Management Area makes to the resolution of each Planning Problem. The disposition of each geographically unique land area across all alternatives is included in Table II-3, along with basic attribute information such as size and suitability of each individual area. A map of Alternative S is distributed with these documents. Maps of the other alternatives were distributed with the DEIS and are unchanged. Additional maps are available on request. (There is no map labeled for Alternative NC, but it is essentially the same as Alternative A, except it has very few acres in Management Area 8, Designated Wildlife Habitat.)





ALTERNATIVE NO CHANGE

ALTERNATIVE NO CHANGE

GOALS

The purpose of Alternative No Change (NC) is to continue the levels of goods and services as set out in plans formulated and approved prior to the passage of the National Forest Management Act, specifically the 1962 Timber Management Plan. This alternative does not comply with all provisions of NFMA and the regulations promulgated by the Secretary of Agriculture to implement NFMA, and could not be implemented or used in future management of the Forest under the Forest Plan without Congressional and/or Secretary of Agriculture action to change the law or regulations

DESIGN

Timber production would be maintained at the level of the Potential Yield of the 1962 timber management plan. Available suitable timber land inventory was updated to meet current standards The wildlife MR's, which were not required by law when previous plans were completed, are not included A moderate amount of hardwood conversion would be allowed

The full range of inventoried VQO's from the Unit Plans would be achieved Riparian areas would be managed under current Siskiyou riparian policy (Prescription B)

OVERVIEW

Alternative design specifications would have the following results Timber outputs would be sustained at 31 0 MMCF, or at the current Potential Yield level (167.5 MMBF) plus nonchargeable salvage Much of the Forest, with the exception of existing Wilderness, would eventually be roaded and developed Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Scenic quality would be high as the entire complement of inventoried VQO's from the land use plans would be allocated in all 44 viewsheds

Approximately 35 percent of the Forest's presently standing mature and old-growth would be protected in this alternative. The wildlife MR's for mature and old-growth dependent species are not included in this alternative. Big-game hunting opportunities would be maintained at a level slightly higher than currently available Fishing opportunities would be maintained

1. How Much Timber Should the Forest Produce?

Alternative NC would result in the average annual production of 31 0 MMCF (173 MMBF) of chargeable and nonchargeable timber volume per year during the first decade. Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 54 2 MMCF. Final harvest would generally occur when the timber stands reach CMAI (approximately 100 years)

Timber production would be supported by a land base of 576,000 acres (selected suitable), which includes 37,053 acres of standing hardwood. Hardwood conversion would be limited to no more than 7,500 acres per decade, subject to market conditions Final harvest would occur on an average of 4,518 acres per year during the first decade and increase to 5,572 acres per year by the fifth decade Appendix I, Table I-1 (NC) displays the Management Areas that provide timber management opportunities.

2. How Much Old-Growth Forest Should be Preserved?

Alternative NC would reserve 152,990 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-2 (NC), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000

acres of mature and old-growth that currently exist, 394,510 would remain at the end of the first decade. Except for isolated tracts, riparian, and other small areas, all unprotected mature and old-growth would be removed by the tenth decade.

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Management objectives for fish, water quality, and soil productivity would be designed to maintain existing conditions Land characterized by riparian vegetation would be managed to maintain water quality and fish habitat Vegetative disturbance in the riparian areas that are in the base for timber management would be controlled by Riparian Prescription B, which is designed to maintain existing water temperatures. Appendix I, Table I-3 (NC) shows how riparian habitat would be affected by the various Management Area designations

The current level of capital investment is proposed in this alternative. Approximately $451,400 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Management activities would be designed to protect Wild and Scenic River attributes All viewsheds surrounding the Wild and Scenic Rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's. Land within 1/4 mile of either side of the Chetco and North Fork Smith Rivers would be managed under two management areas, the interior 1/8 mile would be managed in the Supplemental Resource Management Area, while the remaining land would be allocated to its respective Wild or Scenic/Recreation Management Area

Appendix I, Table I-4 (NC) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes. Those that contribute to maintenance of water quality and visual quality in Wild and Scenic River corridors are indicated

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards. Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV) RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants One new RNA is proposed in current management plans in addition to the three existing areas (for a total of 3,249 acres) resulting in the preservation of 14 ecotypes No new Botanical areas would be recommended for addition to the three that presently exist (4,476 acres).

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-5 (NC) Specific descriptions and attributes of each individual site are included in Appendix F of the FEIS

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing activities to meet the inventoried VQO's on the entire Forest (1,092,302 acres). All (44) viewsheds considered would be governed by their respective inventoried VQO's.

Appendix I, Table I-6 (NC) shows the number of acres in each VQO category by Management Area Approximately 318,625 acres would have an unmodified appearance (Preservation). While management activities would be evident, but visually subordinate (Partial Retention) on 258,622 acres, another 72,323 acres would be managed where activities are not evident to the casual Forest visitor (Retention) The remaining area (442,732 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

The wildlife MR's for mature and old-growth dependent species are not included in this alternative Wildlife habitat would be managed to provide a mix of seral stages. A small number of Special Wildlife Sites (6,261 acres) are prescribed.

Appendix I, Table I-7 (NC) shows a variety of land allocations that contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds. Approximately 54,815 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status Approximately 53 percent of the Forest (576,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd of 30,800 animals for the first five decades.

There would be no capital investments for wildlife habitat improvements in this alternative.

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

None of the existing unroaded areas would be maintained in an unroaded status in this alternative. Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally in existing Wildernesses

Primitive and Semi-primitive recreational capacity would be slightly increased in the Wilderness by constructing 0 3 miles ($9,700) of trail during the first decade. Overall, 261,505 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest Appendix I, Table I-8 (NC) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 76 percent of the Forest (825,852 acres) in an accessible category. Approximately 95 percent of accessible acres (786,041 acres) have low to moderate restrictions which would not limit mining activities. Approximately five percent (39,811 acres) have access restrictions in the high category which could make many types of mining activity uneconomical Appendix I, Table I-9 (NC) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in Chapter IV of the LRMP for each Management Area



ALTERNATIVE A

ALTERNATIVE A

GOALS

The purpose of Alternative A is to continue management direction as set out in plans formulated and approved prior to the passage of the National Forest Management Act, and included in existing policies, standards, and guidelines. This is the "No Action" alternative required by NEPA.

DESIGN

Timber production would be maintained at the highest practical level under current land allocations and subject to nondeclining flow. Timber merchantibility standards, yield tables, and inventory data are updated to current or proposed standards. Available and suitable timber land inventory was updated to meet current standards. A moderate amount of hardwood conversion would be allowed. The wildlife MR's, which were not required by law when previous plans were completed, are included Fewer special resource areas for sensitive plants, wildlife, and fisheries would be allocated than in many of the other alternatives.

The entire complement of VQO's from the land use plans would be achieved. Visual and water quality of Wild and Scenic Rivers will be maintained. Riparian areas within lands in the timber base would be managed under current Siskiyou riparian policy (Riparian Prescription B).

OVERVIEW

Alternative design specifications would have the following results. Timber outputs would be sustained slightly below the current level. Much of the Forest, with the exception of existing Wilderness and areas without programmed timber harvest, would eventually be roaded and developed. Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Non-motorized recreation experiences would also be enhanced through trail construction in the Wildernesses.

The entire complement of inventoried VQO's from the land use plans would be allocated This includes all 44 viewsheds Scenic quality would be high

Approximately 39 percent of the Forest's presently standing mature and old-growth would be protected in this alternative Wildlife populations dependent on mature or old-growth habitat would be maintained above viable levels

Big-game hunting opportunities would be maintained at a level slightly higher than currently available Fishing opportunities would be maintained.

1. How Much Timber Should the Forest Produce?

Alternative A would result in the average annual production of 30 1 MMCF (168 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 52.7 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years).

Timber production would be supported by a land base of 557,000 acres (selected suitable), which includes 37,053 acres of standing hardwood. Hardwood conversion would be limited to no more than 7,500 acres per decade, subject to market conditions. Final harvest would occur on an average of 4,505 acres per year during the first decade and increase to an average of 5,401 acres per year by the fifth decade Appendix I, Table I-10 (A, A-Departure) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative A is designed to reserve 173,754 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-11 (A, A-Departure), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 392,970 will remain at the end of the first decade of harvest activity Except for isolated tracts, riparian, and other small areas, unprotected mature and old-growth would be removed by the tenth decade

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Management objectives for fish, water quality and soil productivity would be designed to maintain existing conditions. Allocation of 327,456 acres (30 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas. In other areas, these values would be protected though the application of Standards and Guidelines and Best Management Practices (BMP's) The impacts of timber harvest would be mitigated by distributing activities through time and space. This is represented in the alternative design by limiting timber harvest in the model to 20 percent of each planning basin per decade.

Land characterized by riparian vegetation would be managed to maintain water quality and fishery habitat Vegetative disturbance in the riparian area in the timber base would be controlled by Riparian Prescription B Riparian Prescription B is designed to maintain existing water temperatures. Appendix I, Table I-12 (A, A-Departure) shows how riparian habitat would be affected by the various Management Area designations

The current level of capital investment is proposed in this alternative Approximately $455,100 per year would be spent on fish, soil and water resource projects.

4 How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes. All viewsheds surrounding the Wild and Scenic Rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's. Land within 1/4 mile of either side of the Chetco and North Fork Smith Rivers would be managed under two Management Areas, the interior 1/8 mile would be allocated to the Supplemental Resource Management Area, while the remaining land would be allocated to its respective Wild or Scenic/Recreation River Management Area

Appendix I, Table I-13 (A, A-Departure) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes. Those that contribute to maintenance of water quality and visual quality are indicated.

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV) RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants. One new RNA is proposed in addition to the three existing areas (for a total of 3,249 acres) resulting in the preservation of 14 ecotypes. No new Botanical areas would be recommended for addition to the three that presently exist (4,476 acres)

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-14 (A, A-Departure). Specific descriptions and attributes of each individual site are included in Appendix F of the FEIS.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing activities to meet VQO's on the entire Forest (1,092,302 acres). All (44) viewsheds considered would be governed by their respective inventoried VQO's.

Appendix I, Table I-15 (A, A-Departure) shows the number of acres in each VQO category by Management Area. Approximately 356,603 acres would have an unmodified appearance (Preservation) While management activities would be evident, but visually subordinate (Partial Retention) on 246,281 acres, another 65,536 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (423,882 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

Designated Wildlife Habitat Management Areas would be allocated to meet MR's for wildlife inhabiting mature and old-growth forest A small number of Special Wildlife Sites (5,883 acres) are prescribed. In total, approximately 173,754 acres of mature and old-growth forest wildlife habitat would be maintained

Appendix I, Table I-16 (A, A-Departure) shows a variety of land allocations that contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds Approximately 54,719 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status Approximately 51 percent of the Forest (557,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd size of 30,800 animals for the first five decades.

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres.

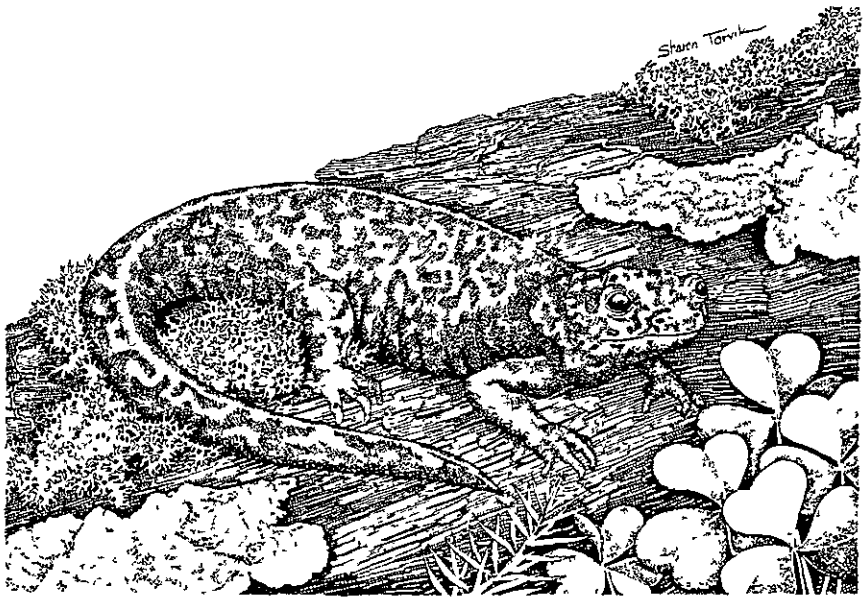
8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

None of the existing unroaded areas would be maintained in an unroaded status in this alternative. Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally in existing Wildernesses

Primitive and Semi-primitive recreational capacity would be slightly increased in the Wilderness by constructing 0 3 miles ($9,700) of trail during the first decade. Overall, 261,505 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest. Appendix I, Table I-17 (A, A-Departure) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 76 percent of the Forest (825,403 acres) in an accessible category Approximately 95 percent of accessible acres (786,705 acres) have low to moderate restrictions which would not limit mining activities Approximately five percent (38,698 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-18 (A, A-Departure) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in Chapter IV of the LRMP for each Management Area







ALTERNATIVE A-DEPARTURE

ALTERNATIVE A-DEPARTURE

The goals and design of this alternative are identical to Alternative A with the exception of the timber harvest schedule. This alternative is designed to maintain the current level of timber output in the first two decades of the planning period, using the same land allocations as Alternative A. Departing from the nondeclining yield policy, timber outputs would decline by three percent in the third decade, and by six percent in the fourth and fifth decades. The description below includes only those planning problems where this alternative differs; other elements are identical to Alternative A.

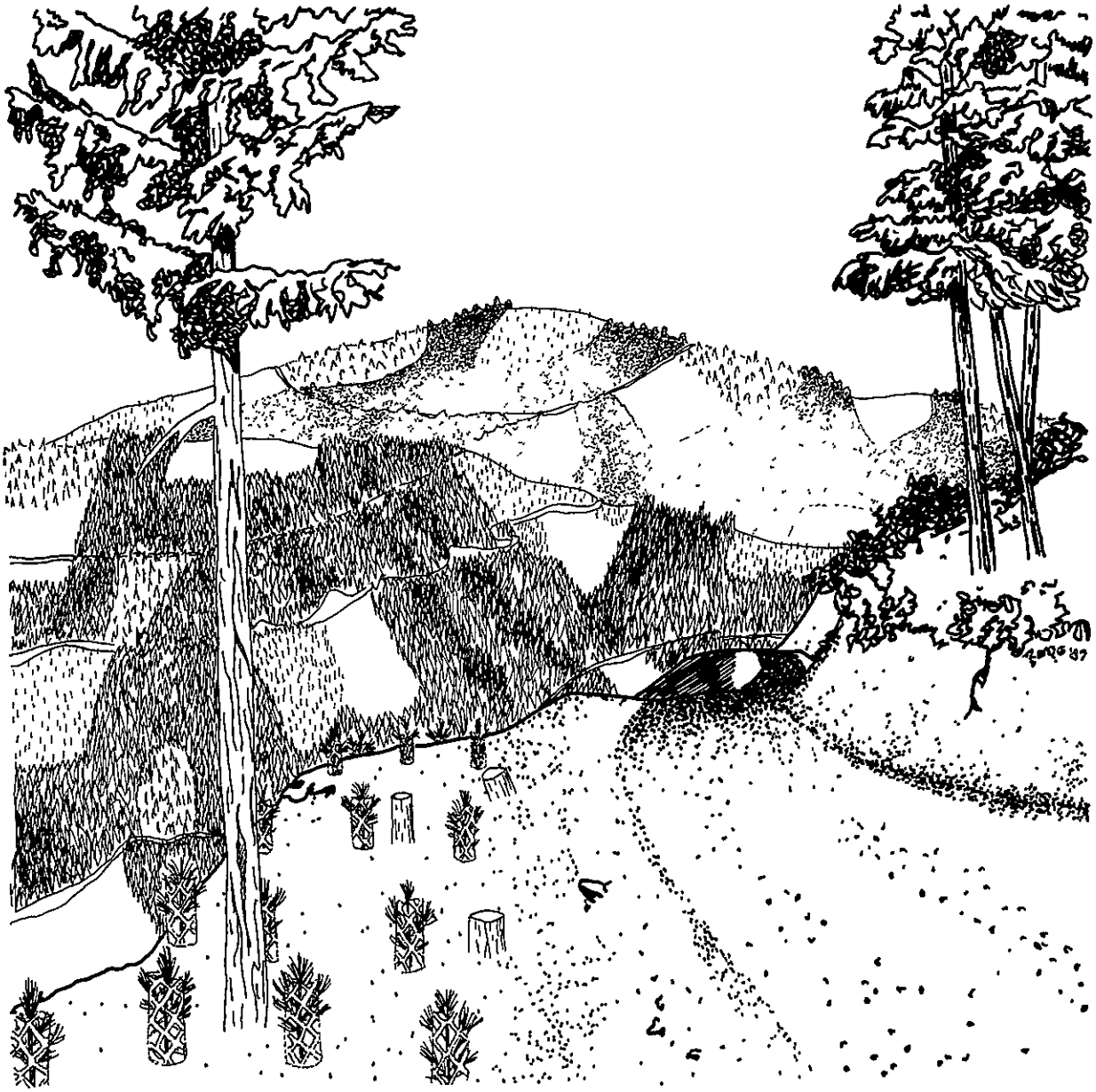
1. How Much Timber Should the Forest Produce?

Alternative A-Departure would result in the average annual production of 31.2 MMCF (174 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first two decades. Departing from a policy of nondeclining flow, average annual sale offerings would gradually decline in the third decade to 30.3 MMCF, and 29 4 MMCF in the fourth and fifth decades The LTSY of 52.7 MMCF would be achieved by the eleventh decade Harvest would generally occur when the timber stands reach CMAI (approximately 100 years).

Timber production would be supported by a land base of 557,000 acres (selected suitable), which includes 38,585 acres of standing hardwood. Hardwood conversion would be limited to no more than 7,500 acres per decade, subject to market conditions. Final harvest would occur on an average of 4,697 acres per year during the first decade, increasing to 5,429 acres per year by the fifth decade Appendix I, Table I-10 (A, A-Departure) displays the Management Areas that provide timber management opportunities.

2. How Much Old-Growth Forest Should be Preserved?

Alternative A-Departure is designed to reserve 173,754 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-11 (A, A-Departure), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 391,050 will remain at the end of the first decade of harvest activity Except for isolated tracts, riparian, and other areas, all unprotected mature and old-growth will be removed by the tenth decade.



ALTERNATIVE B

ALTERNATIVE B

GOALS

The purpose of this alternative is to evaluate how the current (1980) Forest and Rangeland Renewable Resources Planning Act (RPA) production targets for goods and services, as set out in the Regional Guide, can best be implemented. This alternative would meet, or attempt to meet, all assigned targets simultaneously The 1980 RPA targets emphasize high commodity production (wood fiber and fish) with *moderate levels of developed and dispersed recreation, and nongame and big-game wildlife habitat*

DESIGN

The land allocation emphasizes fish and timber. Timber production is set at the RPA target for the first two decades This would require a departure from nondeclining flow since this level cannot be sustained over the planning horizon (The base alternative is Alternative D described later in this section.) Timber outputs are allowed to drop over the third, fourth, and fifth decades, then increase in subsequent decades. A high *rate of hardwood conversion would be allowed. All MR's are included. A number of areas with special* resource values such as sensitive plants, unique ecosystems, and wildlife habitat would be allocated to Management Areas which have no programmed timber harvest.

Riparian areas in the timber base in six planning basins with high fisheries potential would be allocated to Riparian Management Prescription C; the remaining basins would be allocated to Prescription B. The full range of inventoried VQO's would be achieved only in the highest priority viewsheds.

OVERVIEW

Alternative design specifications would have the following results. This alternative is the most extreme departure of all the alternatives and would produce the highest timber output in the first two decades. Much of the Forest, with the exception of existing Wilderness and areas without programmed timber harvest, would eventually be roaded and developed. Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Non-motorized recreation experiences would also be enhanced through trail construction and reconstruction in the Wildernesses Primitive and Semi-primitive Non-motorized recreation experiences would generally be found only in the Wildernesses by the second decade. The scenic quality of the Forest would be highly modified; a natural appearance would be maintained in only the three most highly valued travel corridors and viewsheds.

Approximately 39 percent of the Forest's presently standing mature and old-growth would be protected in this alternative. Wildlife populations dependent on mature or old-growth habitat would be maintained above viable levels Big-game hunting opportunities would exceed those currently available throughout the planning period, because of the changes in the cover/forage ratio resulting from the timber harvest schedule. Fishing opportunities would be somewhat enhanced through protection of high value fish habitat and high capital investment expenditures

1. How Much Timber Should the Forest Produce?

The RPA target for timber outputs is 40 MMCF (including nonchargeable volume) per year for the first five decades. Alternative B will result in the average annual production of 36.8 MMCF (205 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage, and an additional 4 MMCF of nonchargeable volume, for the first two decades. A departure from nondeclining flow policy is required because this level of output cannot be sustained beyond the second decade In the third, fourth, and fifth through seventh decades, harvest volumes would drop to 33 0 MMCF, 28.0 MMCF, and 25 MMCF, respectively Harvest volumes would begin to increase in the eighth decade, and reach LTSY (54.8 MMCF) in the tenth decade Harvest would generally occur when the timber stands reach CMAI (approximately 100 years)

Timber production would be supported by a land base of 558,000 acres (selected suitable), which includes 38,885 acres of standing hardwood. Hardwood conversion would be limited to no more than 14,000 acres per decade, subject to market conditions Final harvest would occur on an average of 5,562 acres per year during the first decade, decreasing to 4,364 acres per year by the fifth decade. Appendix I, Table I-19 (B) displays the Management Areas that provide timber management opportunities.

2. How Much Old-Growth Forest Should be Preserved?

Alternative B is designed to reserve 170,954 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-20 (B, D and D1), existing mature and old-growth would be harvested more rapidly in the first two decades of this alternative than in others Of the 443,000 acres of mature and old-growth that currently exist, 378,170 will remain at the end of the first decade of harvest activity Except for isolated tracts, riparian, and other small areas, all unprotected mature and old-growth would be removed by the tenth decade.

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Management objectives for fish, water quality and soil productivity would be designed to maintain existing conditions Allocation of 327,456 acres (30 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas. In other areas, these values would be protected thought the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space This is represented in the alternative design by limiting timber harvest in the model to 20 percent of each planning basin per decade

The watershed condition would be maintained in pristine areas and improved in those areas which are now degraded Allocation of 319,749 acres (29 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas Land surrounding rivers and streams (13,739 acres) with exceptional salmon and steelhead rearing capabilities would be allocated to the Supplemental Resource Management Area. In other areas, these values would be protected though the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space. This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 9 to 12 percent per decade in six high fish-producing planning basins and constraints of 20 percent per decade in 12 of the 19 planning basins.

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat. Vegetative disturbance in the riparian area within the timber base would be controlled by Riparian Prescriptions B or C Prescription C would be applied on the six high fish-producing basins, it is designed to produce a 2-degree decrease in summer water temperature by the third decade Riparian Prescription B, designed to maintain existing water temperatures, is applied to the remaining basins Appendix I, Table I-21 (B) shows how riparian habitat would be affected by the various Management Area designations.

A high level of capital investment is proposed in this alternative. Approximately $650,000 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes. All viewsheds surrounding the Rogue and Illinois Wild and Scenic Rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's. Land within 1/8 mile of either side of the Chetco, North Fork Smith, and Elk Rivers would be allocated to the Supplemental Resource

Management Area which minimizes site-disturbing activity. Viewsheds surrounding these rivers would not be managed to meet their inventoried VQO's, except for Partial Retention areas around the Chetco River.

Appendix I, Table I-22 (B, D and D1) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes Those that contribute to maintenance of water quality and visual quality are indicated.

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards. Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV). RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants. Two new RNA's are proposed in addition to the three existing areas (for a total of 3,349 acres). A total of 16 ecotypes would be preserved on the Forest Seven new Botanical areas would be recommended for addition to the three that presently exist for a total of 9,056 acres.

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-23 (B, D and D1). Specific descriptions and attributes of each individual site are included in Appendix F of the FEIS.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing to meet VQO's on 473,998 acres Eight entire viewsheds (of the 44 considered) would be governed by their respective inventoried VQO's, three of which encompass heavily used recreation travel corridors. the Upper Illinois, Oregon Caves, and Highway 199

Appendix I, Table I-24 (B and D) shows the number of acres in each VQO category by Management Area. Approximately 349,707 acres would have an unmodified appearance (Preservation). While management activities would be evident, but visually subordinate (Partial Retention) on 106,123 acres, another 18,168 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (618,304 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

Designated Wildlife Habitat Management Areas would be allocated to meet MR's for wildlife inhabiting mature and old-growth forest. In total, over 170,954 acres of mature and old-growth forest wildlife habitat would be maintained Allocations to the Special Wildlife Site (9,195 acres), RNA's (3,349 acres), and Botanical (5,648 acres) Management Areas would contribute to overall habitat diversity, but represent relatively open vegetative types

Appendix I, Table I-25 (B and D) shows a variety of land allocations that would contribute to overall wildlife habitat diversity Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 20 percent of the maximum population of cavity-nesting birds Approximately 48,620 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status. Approximately 51 percent of the Forest (558,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd size of 31,300 animals for the first five decades

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $110,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 4,550 acres

8 How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

None of the existing unroaded areas would be maintained in an unroaded status in this alternative. Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally in existing Wildernesses.

Primitive and Semi-primitive recreational capacity would be increased in the Wilderness by constructing 21.0 miles ($315,000) and reconstructing 7 0 miles ($111,900) of trail during the first decade. Overall, 261,485 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest. Appendix I, Table I-26 (B) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 76 percent of the Forest (826,628 acres) in an accessible category Approximately 97 percent of accessible acres (798,248 acres) have low to moderate restrictions which would not limit mining activities Approximately three percent (28,380 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-27 (B, D and D1) displays the level of restriction affecting acres within each Management Area Specific Standards and Guidelines affecting mineral exploration and development are defined in Chapter IV of the LRMP for each Management Area





ALTERNATIVE C

ALTERNATIVE C

GOALS

Alternative C is designed to provide the highest sustainable annual timber harvest yields (subject to nondeclining yield) from the Forest

DESIGN

Timber production would be relatively unconstrained beyond MR's, general multiple use considerations, and nondeclining flow. A high rate of hardwood conversion would be allowed The wildlife MR's are included

Only the highest priority viewsheds have VQO's allocated and in these areas, the Retention acres are reduced to Partial Retention The only acres managed for Retention would be in the designated Wild and Scenic Rivers. Riparian areas in the timber base would be managed under Riparian Prescription B.

OVERVIEW

Alternative design specifications would have the following results. This alternative would achieve current timber outputs without departing from nondeclining flow. It would achieve this by allocating the most acres to timber production, with reduced visual management and other resource allocations Much of the Forest, with the exception of existing Wilderness and areas without programmed timber harvest, would eventually be roaded and developed. Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Non-motorized recreation experiences would also be enhanced through trail construction in the Wildernesses. Primitive and Semi-primitive Non-motorized recreation experiences would generally be found only in the Wildernesses by the second decade. The scenic quality of the Forest would be highly modified in this alternative, although a near-natural appearance would be maintained in the four most heavily used travel corridors and viewsheds. Developed recreation opportunities would remain what they are today.

Approximately 37 percent of the Forest's presently standing mature and old-growth would be protected in this alternative. Wildlife populations dependent on mature or old-growth habitat would be maintained above viable levels. Big-game hunting opportunities would exceed those currently available throughout the first five planning periods, because of changes in the cover/forage ratio resulting from the timber harvest schedule Fish habitat would be managed to maintain existing capability

1. How Much Timber Should the Forest Produce?

Alternative C would result in the average annual production of 31.8 MMCF (177 MMBF) of chargeable timber volume plus one percent chargeable salvage during the first decade. Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 57.0 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years).

Timber production would be supported by a land base of 566,000 acres (selected suitable), which includes 40,704 acres of standing hardwood Hardwood conversion would be limited to no more than 14,000 acres per decade, subject to market conditions. Final harvest would occur on an average of 6,713 acres per year during the first decade, decreasing to 6,072 acres per year by the fifth decade Appendix I, Table I-28 (C) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative C is designed to reserve 166,063 acres having mature and old-growth forest characteristics. With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-29 (C), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 369,650 would remain at the end of the first decade of harvest activity Except for isolated tracts, riparian, and other small areas, all unprotected mature and old-growth will be removed by the tenth decade.

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be managed to maintain minimum viable population levels of native fish Allocation of 309,801 acres (28 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas In other areas, these values would be protected thought the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space. This is represented in the alternative design by limiting timber harvest in the model to 20 percent of each planning basin per decade.

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat Vegetative disturbance in the riparian areas in the timber base would be controlled by Riparian Prescriptions B Riparian Prescription B is designed to maintain existing water temperatures. Land surrounding two (of thirty) rivers and creeks with exceptional salmon and steelhead rearing capabilities (Lawson and Emily Creeks) would be allocated to the Supplemental Resource Management Area, where no timber harvest would occur. Appendix I, Table I-30 (C) shows how riparian habitat would be affected by the various Management Area designations

A high level of capital investment is proposed in this alternative Approximately $664,600 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

A limited amount of protection would be afforded Wild and Scenic River values in this alternative. Viewsheds surrounding the Chetco, North Fork Smith, and Elk Rivers would not be managed to meet their inventoried VQO's, except for inventoried Partial Retention areas around the Chetco River. The influence of management activities on the Rogue and Illinois Wild and Scenic River corridors would be evident as no lands are allocated to the Retention Management Area in this alternative. Allocations to the RNA's (1,291 acres), Botanical (2,880 acres), and Designated Wildlife Habitat (7,334 acres) Management Areas would provide the only unaltered landscapes within the viewsheds of the rivers.

Appendix I, Table I-31 (C) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes Those that contribute to maintenance of water quality and visual quality are indicated

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV) RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants Two new RNA's (Hoover Gulch and Craggy Peak) would be proposed in addition to the three existing areas (for a total of 3,349 acres) resulting in the

protection of 16 ecotypes Seven new Botanical areas would be recommended for addition to the three that presently exist for a total of 9,056 acres

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-32 (C). Specific descriptions and attributes of each individual site are included in Appendix F of the FEIS.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

This alternative would provide the most modified visual appearance of any alternative considered. Visual management objectives would be achieved by designing activities to meet VQO's on 449,093 acres Five viewsheds (of the 44 considered) in established Wildernesses would be governed by their respective inventoried VQO's, none of which encompass heavily used recreation travel corridors. Management of Forest scenic values would be limited to high recreation use travel corridors and viewsheds No viewsheds, outside of Wildernesses, would be managed to meet their respective inventoried visual objectives All inventoried Retention and Partial Retention acres in four viewsheds (Rogue-Illinois, Oregon Caves, Upper Illinois, and Chetco) would be managed for Partial Retention.

Appendix I, Table I-33 (C) shows the number of acres in each VQO category by Management Area Approximately 342,016 acres would have an unmodified appearance (Preservation) While management activities would be evident, but visually subordinate (Partial Retention) on 97,551 acres, another 9,526 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (643,209 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background.

7. How Should Wildlife Habitats on the Forest be Managed?

Allocations to the Special Wildlife Site (9,477 acres), RNA's (3,349 acres), and Botanical (5,648 acres) Management Areas would contribute to overall habitat diversity, but represent relatively open vegetative types Designated Wildlife Habitat (55,109 acres) Management Areas that meet MR's would be included in this alternative

Appendix I, Table I-34 (C) shows a variety of land allocations that contribute to overall wildlife habitat diversity Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 20 percent of the maximum population of cavity-nesting birds. Approximately 48,620 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status. Approximately 52 percent of the Forest (566,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd of 33,000 animals for the first five decades.

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres

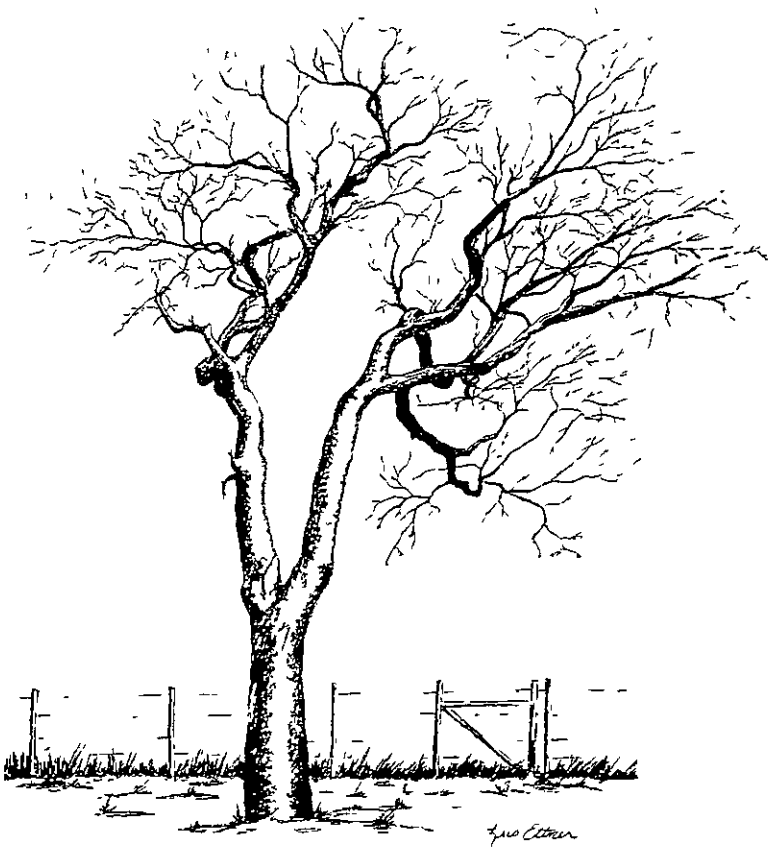
8 How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

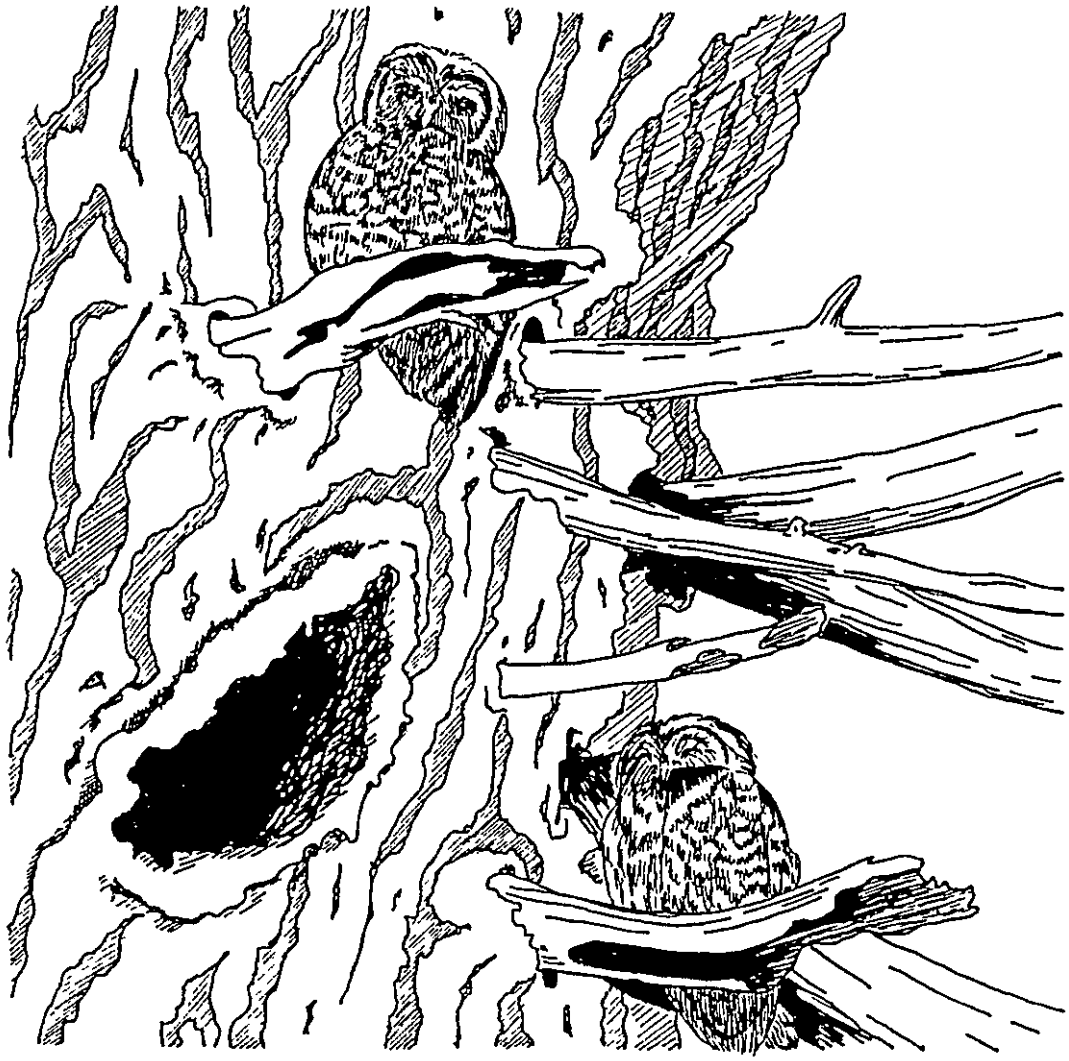
None of the existing unroaded areas would be maintained in an unroaded status in this alternative Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally in the existing Wildernesses

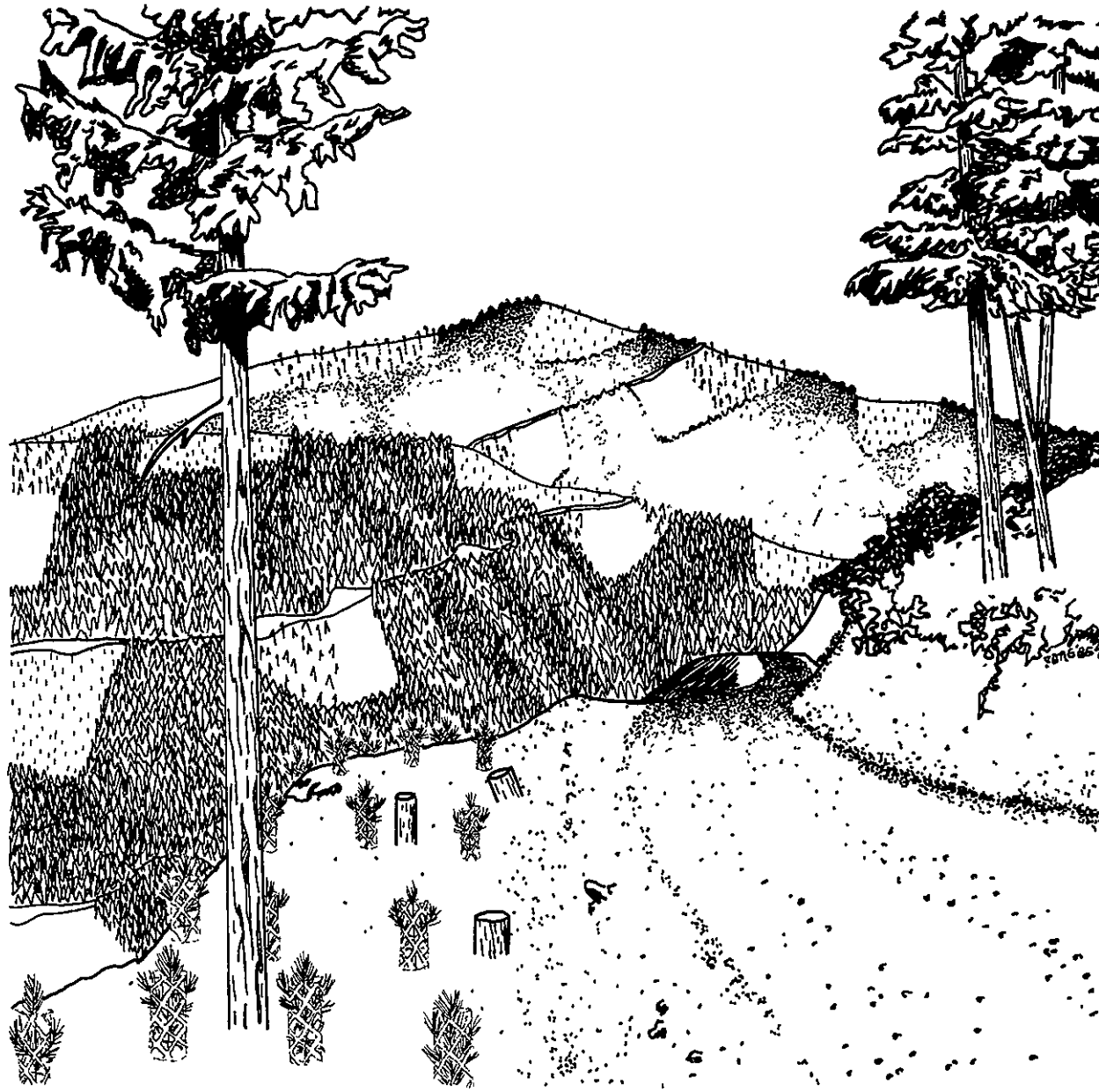
Primitive and Semi-primitive recreational capacity would be increased in the Wilderness by constructing 47.0 miles ($757,500) and reconstructing 7 0 miles ($111,900) of trail during the first decade Overall, 263,079 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest. Appendix I, Table I-35 (C) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 76 percent of the Forest (826,967 acres) in an accessible category Approximately 98 percent of accessible acres (809,649 acres) have low to moderate restrictions which would not limit mining activities Approximately two percent (17,318 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-36 (C) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in Chapter IV of the LRMP for each Management Area.







ALTERNATIVE D

ALTERNATIVE D

This is the base alternative for the departure that forms Alternative B The primary objective of Alternative D is to emphasize the production of goods and services having established market prices (timber, minerals, developed recreation, and commercial fisheries). The alternative is designed to provide a balance of these commodity outputs for all resources (i.e., one commodity-producing resource is not subordinate to another). The acre allocations are the same as Alternative B, as are most other elements The primary difference is that Alternative D is subject to the nondeclining flow timber harvest constraint

The description below includes only those Planning Problems where this alternative differs, other elements are identical to Alternative B

1. How Much Timber Should the Forest Produce?

Alternative D would result in the average annual production of 30.4 MMCF (170 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 54.8 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years)

Timber production would be supported by a land base of 560,000 acres (selected suitable), which includes 40,023 acres of standing hardwood Hardwood conversion would be limited to no more than 14,000 acres per decade, subject to market conditions Final harvest would occur on an average of 5,570 acres per year during the first decade, decreasing to 5,093 acres per year by the fifth decade Appendix I, Table I-37 (D) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

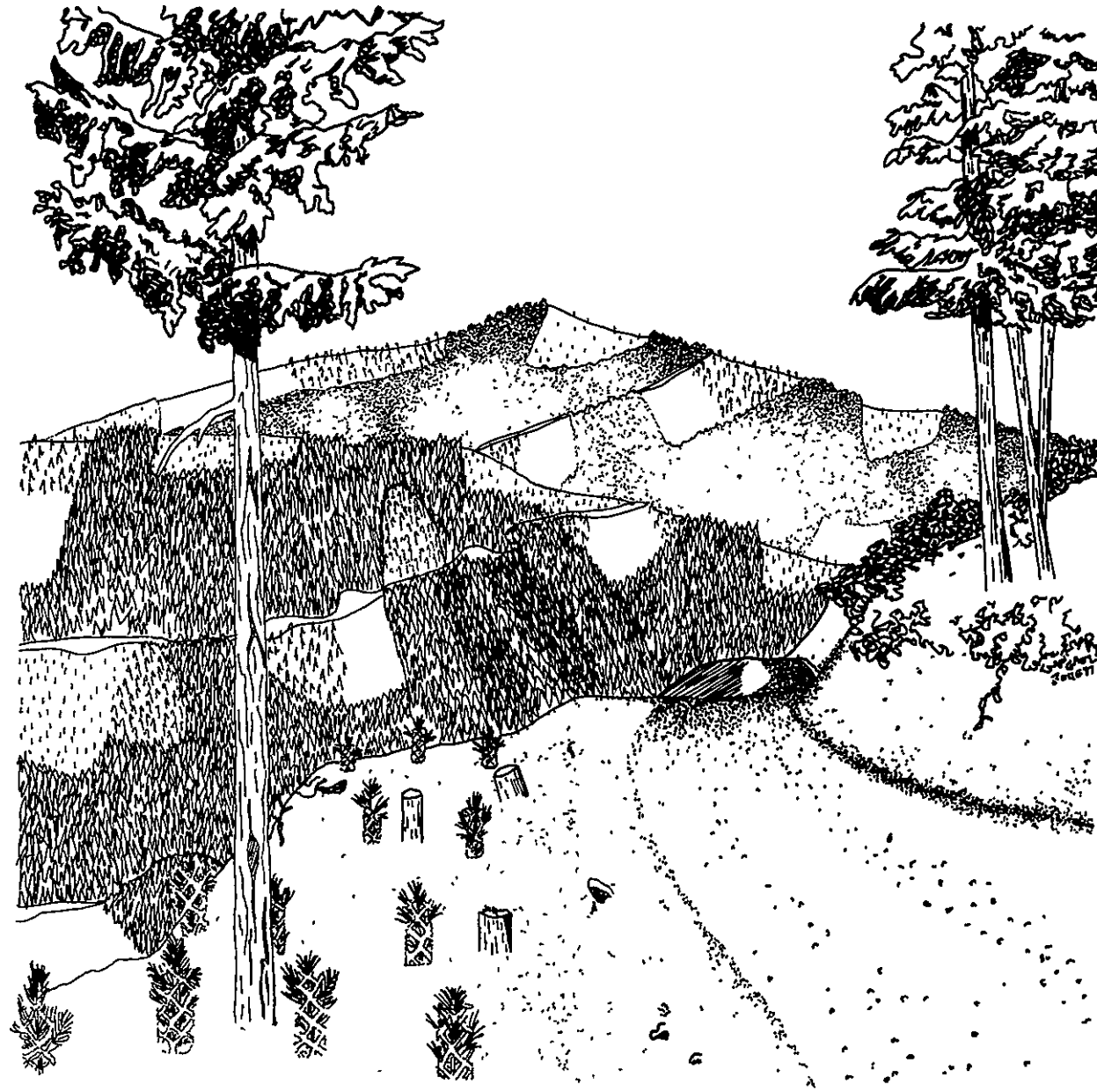
Alternative D is designed to reserve 170,954 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-20 (B, D and D1), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 382,580 will remain at the end of the first decade of harvest activity Except for isolated tracts, riparian, and other areas, most unprotected mature and old-growth will be removed by the tenth decade

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Alternative D would be similar to Alternative B except capital investments would be approximately $595,600 per year spent on fish, soil and water resource projects

7. How Should Wildlife Habitats on the Forest be Managed?

This alternative is essentially the same as Alternative B except the nondeclining flow timber schedule would result in more even production of forage through time A low level of capital investment is proposed in this alternative because wildlife-related recreation is not considered a commodity. Approximately $28,000 per year would be prescribed to complete an average of 96 structural improvements and treat about 225 acres



ALTERNATIVE D1

ALTERNATIVE D1

This alternative is identical to Alternative D, except the CMAI requirement on timber harvest rotation is replaced with a provision which allows timber to be harvested as much as 20 years prior to the normal rotation age (this may not be in compliance with the intent of NFMA). The purpose of this alternative is to maintain a high level of timber output, by decreasing rotation lengths, under a nondeclining flow schedule.

Timber management activities would be intensive and apparent to the Forest visitor Trees would be smaller in diameter at the time of final harvest, and the future Forest in areas with programmed timber harvest might have more of a "tree farm" appearance than in the other alternatives.

The description below includes only those Planning Problems where this alternative differs, other resources and Forest conditions are the same as those described for Alternative D (and B)

1. How Much Timber Should the Forest Produce?

Alternative D1 would result in the average annual production of 33.2 MMCF (185 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 49.0 MMCF. Harvest would generally occur an average of 20 years prior to age when stands reach CMAI *This results in an average rotation length of about 80 years for this alternative.*

Timber production would be supported by a land base of 550,000 acres (selected suitable), which includes 39,440 acres of standing hardwood. Hardwood conversion would be limited to no more than 14,000 acres per decade, subject to market conditions. Final harvest would occur on an average of 5,251 acres per year during the first decade, increasing to 5,335 acres per year by the fifth decade. Appendix I, Table I-39 (D1) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative D1 is designed to reserve 170,954 acres having mature and old-growth forest characteristics. With the exception of the preserved areas displayed by Management Area in Appendix I, Table I-20 (B, D and D1), existing mature and old-growth would be metered out to accommodate the harvest sale schedule. Of the 443,000 acres of mature and old-growth that currently exist, 383,650 would remain at the end of the first decade of harvest activity. Except for isolated tracts, riparian, and other areas, all unprotected mature and old-growth would be removed by the tenth decade.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Appendix I, Table I-41 (D1) shows the number of acres in each VQO category by Management Area These show slight differences due to the way FORPLAN selected acres for timber harvest, however, the viewsheds allocated are the same as for Alternatives B and D

7. How Should Wildlife Habitats on the Forest be Managed?

Similar to Alternative D except the higher harvest level would result in slightly higher carrying capacity for big game, and the capital investment level would be approximately $56,000 per year prescribed to complete an average of 191 structural improvements and treat about 449 acres

Appendix I, Table I-42 (D1) shows the variety of land allocations that contribute to overall wildlife habitat diversity



ALTERNATIVE E

ALTERNATIVE E

GOALS

Alternative E emphasizes the aesthetic values of the Forest by promoting the production of goods and services that do not necessarily have established market prices (e g , soil, water, fish, recreation, and scenery).

DESIGN

Land allocations and management decisions in undeveloped areas generally favor preservation Areas with special resource values such as sensitive plants, unique ecosystems, wildlife habitat, and backcountry recreation opportunities would be allocated to Management Areas which have no programmed timber harvest. Timber would be produced on remaining lands after other resource objectives have been met No hardwood conversion would be allowed. The wildlife MR's are included

The full range of inventoried VQO's would be allocated in all viewsheds. The riparian areas would not have a programmed timber harvest, Minimum Level prescription (Prescription M) applies to all riparian areas.

OVERVIEW

Alternative design specifications would have the following results Timber management activities would be intensive and apparent to the Forest visitor on the roaded areas of the Forest However, fewer areas would be roaded than in any other alternatives, except M. Primitive and Semi-primitive Non-motorized recreation experiences would be emphasized. Many new trails would be constructed in the Wilderness and Backcountry Recreation Management Areas Developed recreation opportunities would also increase substantially over what they are today.

Forest visitors would find natural and near-natural landscapes throughout much of the Forest. All of the VQO's would be met or exceeded in this alternative.

Approximately 62 percent of the Forest's presently standing mature and old-growth would be protected in this alternative Biological diversity would be promoted through· (1) allocations to maintain older seral stages and natural processes (primarily in Wilderness, Research Natural Areas, Backcountry Recreation, Botanical, Supplemental Resource and Designated Wildlife Habitat Management Areas), and (2) management direction (Standards and Guidelines). Wildlife populations dependent on mature or old-growth habitat would be maintained at approximately three times their minimum levels Big-game hunting opportunities would decline from what they are today.

Fish habitat would be enhanced through the allocation of riparian areas to Riparian Prescription M (no timber harvest programmed), and through capital investments

1. How Much Timber Should the Forest Produce?

Alternative E would result in the average annual production of 16.2 MMCF (90 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade. Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 32.2 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years).

Timber production would be supported by a land base of 287,000 acres (selected suitable). No standing hardwoods are included in the timber base in this alternative Final harvest would occur on an average of 2,890 acres per year during the first decade, decreasing to 2,560 acres per year by the fifth decade. Appendix I, Table I-43 (E) displays the Management Areas that provide timber management opportunities.

2. How Much Old-Growth Forest Should be Preserved?

Alternative E is designed to reserve 273,070 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-44 (E), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 414,100 would remain at the end of the first decade of harvest activity. Except for isolated tracts, riparian, and other small areas, all unprotected mature and old-growth would be removed by the tenth decade

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures Allocation of 642,349 acres (59 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in these areas In other areas, these values would be protected thought the application of Standards and Guidelines and BMP's. The impacts of timber harvest would be mitigated by distributing activities through time and space. This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 9 to 13 percent per decade specific to each planning basin

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat. No harvest activity would occur on riparian vegetation surrounding Class I, II, and III streams in any basin. Land surrounding all 30 rivers and creeks with exceptional salmon and steelhead rearing capabilities would be allocated to the Supplemental Resource Management Area where no programmed timber management activities would occur Forest wide, approximately 175,493 acres of riparian vegetation would be protected in its existing state. Appendix I, Table I-45 (E) shows how riparian habitat would be affected by the various Management Area designations.

A low level of capital investment is proposed in this alternative. Approximately $388,300 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes. All viewsheds surrounding the Wild and Scenic Rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's. Land within 1/4 mile of either side of the Chetco, North Fork Smith, and Elk Rivers would be managed under two Management Areas. The interior 1/8 mile would be allocated to the Supplemental Resource Management Area; the remaining land would be allocated to their respective Scenic/Recreation River Management Area

Appendix I, Table I-46 (E) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes Those that contribute to maintenance of water quality and visual quality are indicated.

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV). RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants Four new RNA's are proposed in addition to the three existing areas (for a total of 4,756 acres) resulting in the protection of 25 ecotypes. Sixteen new Botanical areas would be recommended in addition to the three that presently exist for a total of 27,726 acres

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-47 (E). Specific descriptions and attributes of each individual site are included in the FEIS, Appendix F

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing activities to meet VQO's on the entire Forest All 44 viewsheds considered would be governed by their respective inventoried VQO's.

Appendix I, Table I-48 (E) shows the number of acres in each VQO category by Management Area. Approximately 704,686 acres would have an unmodified appearance (Preservation) While management activities would be evident, but visually subordinate (Partial Retention) on 116,281 acres, another 25,814 acres would be managed where activities are not evident to the casual Forest visitor (Retention) The remaining area (245,521 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

The combination of land allocations and capital expenditures prescribed in this alternative provides a wide range of effective habitat conditions. Among the significant land allocations are all the Special Wildlife Sites, and the four Supplemental Resource Management Areas with high wildlife value (Fishhook Peak, Morris Rodgers Creek, Pebble Hill, and Windy Valley) Designated Wildlife Habitat that meets MR's is prescribed along with an additional 18,086 acres of habitat that occur in small blocks and serve as "stepping stones" between a number of Designated Wildlife Habitat areas. In total, over 273,070 acres of mature and old-growth forest wildlife habitat would be maintained

Appendix I, Table I-49 (E) shows a variety of land allocations that contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds Approximately 58,260 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status Approximately 26 percent of the Forest (287,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd of 21,600 animals for the first five decades.

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species. Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally through allocation to Backcountry Recreation Management Areas, and in existing Wildernesses. Primitive and Semi-primitive recreational capacity would be increased in the Backcountry Recreation and Wilderness areas by reconstructing 18 1 miles ($25,000) of trail during the first decade. Overall, 343,498 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest. Appendix I, Table I-50 (E) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 75 percent of the Forest (824,579 acres) in an accessible category. Approximately 93 percent of accessible acres (765,086 acres) have low to moderate restrictions which would not limit mining activities. Approximately seven percent (59,493 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-51 (E) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in the LRMP, Chapter IV, for each Management Area.







ALTERNATIVE G

ALTERNATIVE G

GOALS

Alternative G emphasizes the protection and enhancement of the Forest's nontimber resources. The alternative is designed to encourage the health and productivity of the Forest's water-related resources, particularly rivers and streams associated with the Illinois River drainage With the objective of maintaining the area's reputation for natural beauty and increasing recreation-oriented industries, Alternative G would preserve many existing unroaded areas and favors management governed by high VQO's.

DESIGN

Timber production would be at a moderate level. A limited amount of hardwood conversion would be allowed The wildlife MR's are included. A number of areas with special resource values such as sensitive plants, unique ecosystems, wildlife habitat, and backcountry recreation opportunities would be allocated to Management Areas which have no programmed timber harvest The full range of inventoried VQO's would be allocated for all viewsheds Riparian areas in the timber base for all planning basins would be managed under Prescription C

OVERVIEW

Alternative design specifications would have the following results Timber management activities would be intensive and apparent to the Forest visitor on the roaded areas of the forest Much of the Forest, with the exception of existing Wilderness and areas without programmed timber harvest, would eventually be roaded and developed Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Non-motorized recreation experiences would also be enhanced through trail construction in the Wilderness and Backcountry Recreation Management Areas. Forest visitors would find natural and near-natural landscapes throughout much of the Forest All of the VQO's would be met or exceeded in this alternative

Approximately 57 percent of the Forest's presently standing mature and old-growth would be protected in this alternative. Biological diversity would be promoted through: (1) allocations to maintain older seral stages and natural processes (primarily in Wilderness, RNA's, Backcountry Recreation, Botanical, Supplemental Resource and Designated Wildlife Habitat Management Areas), and (2) management direction (Standards and Guidelines) Wildlife populations dependent on mature or old-growth habitat would be maintained at approximately three times their minimum levels. Big-game hunting opportunities would decline from what they are today. Fish habitat would be enhanced through the allocation of all riparian areas to Riparian Prescription C.

1. How Much Timber Should the Forest Produce?

Alternative G would result in the average annual production of 20 5 MMCF (114 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade. Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 38 7 MMCF Harvest would generally occur when the timber stands reach CMAI (approximately 100 years)

Timber production would be supported by a land base of 406,000 acres (selected suitable), which includes 24,000 acres of standing hardwood Hardwood conversion would be limited to no more than 4,000 acres per decade, subject to market conditions. Final harvest would occur on an average of 3,495 acres per year during the first decade, decreasing to 3,095 acres per year by the fifth decade. Appendix I, Table I-52 (G) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative G is designed to reserve 253,966 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-53 (G), existing mature and old-growth would be metered out to accommodate the harvest sale schedule. Of the 443,000 acres of mature and old-growth that currently exist, 407,510 will remain at the end of the first decade of harvest activity. Except for isolated tracts, riparian, and other small areas, most unprotected mature and old-growth will be removed by the tenth decade.

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures Watershed conditions would be maintained in pristine areas and improved in those areas presently degraded Allocation of 557,681 acres (51 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas In other areas, these values would be protected thought the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 9 to 13 percent per decade specific to each planning basin

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat Vegetative disturbance in the riparian area in the timber base would be controlled by Riparian Prescription C. Prescription C would be applied on all Class I, II, and III streams; it is designed to produce a two-degree decrease in summer water temperature by the third decade Land surrounding all 30 rivers and creeks with exceptional salmon and steelhead rearing capabilities would be allocated to the Supplemental Resource Management Area with no programmed timber harvest Appendix I, Table I-54 (G) shows how riparian habitat would be affected by the various Management Area designations.

A low level of capital investment is proposed since most fish habitat needs would be satisfied through land allocations. Approximately $429,200 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes. All viewsheds surrounding the rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's Land within 1/4 mile of either side of the Chetco, North Fork Smith, and Elk Rivers would be managed under two Management Areas. The interior 1/8 mile would be allocated to the Supplemental Resource Management Area, while the remaining land would be allocated to their respective Recreation and Scenic Management Area

Appendix I, Table I-55 (G) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes. Those that contribute to maintenance of water quality and visual quality indicated

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV). RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants Four new RNA's are proposed in addition to the three

existing areas (for a total of 4,756 acres) resulting in the protection of 25 ecotypes. Twenty-five new Botanical areas would be recommended for addition to the three that presently exist for a total of 39,001 acres.

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-56 (G) Specific descriptions and attributes of each individual site are included in the FEIS, Appendix F.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing activities to meet the VQO's on the entire Forest. All 44 viewsheds considered would be governed by their respective inventoried VQO's.

Appendix I, Table I-57 (G) shows the number of acres in each VQO category by Management Area Over 584,952 acres would have an unmodified appearance (Preservation) While management activities would be evident, but visually subordinate (Partial Retention) on 164,680 acres, another 31,309 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (311,361 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

The combination of land allocations and capital expenditures prescribed in this alternative would provide a wide range of effective habitat conditions Among the significant land allocations are all the Special Wildlife Sites (8,640 acres) and the four Supplemental Resource areas with high wildlife value (Fishhook Peak, Morris Rodgers Creek, Pebble Hill, and Windy Valley) Designated Wildlife Habitat Management Areas that exceed MR's by 57,000 acres are proposed along with an additional 18,086 acres of habitat that occur in small blocks and serve as "stepping stones" between individual Designated Wildlife Habitat Areas In total, 253,966 acres of mature and old-growth forest wildlife habitat would be maintained.

Appendix I, Table I-58 (G) shows a variety of land allocations that would contribute to overall wildlife habitat diversity Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds. Approximately 58,260 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status. Approximately 37 percent of the Forest (406,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd of 24,500 animals for the first five decades

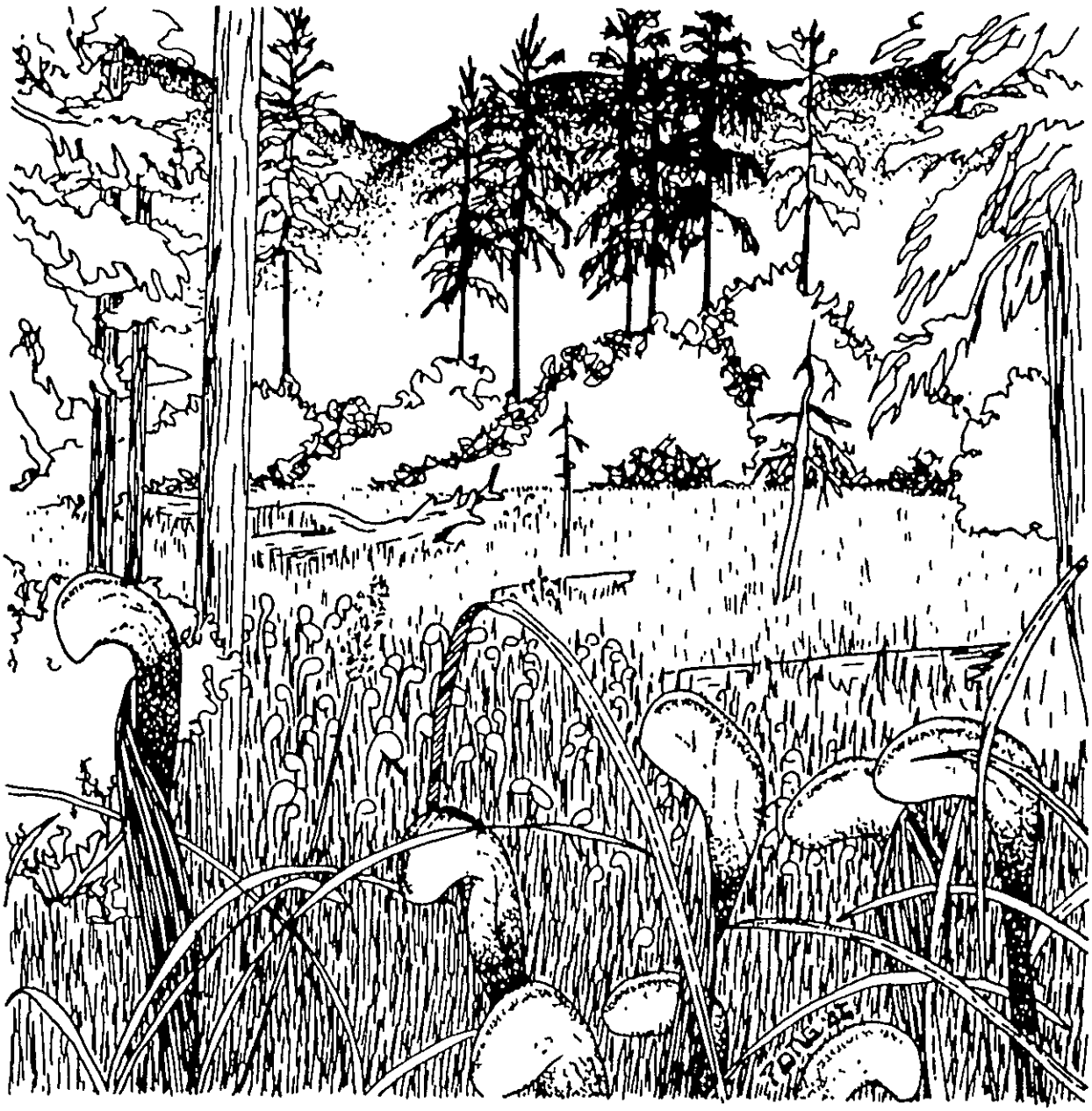
Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres.

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally through allocation to Backcountry Recreation Management Areas, and in existing Wildernesses. Primitive and Semi-primitive recreational capacity would be increased in the Backcountry Recreation and Wilderness areas by constructing 21 5 miles ($336,000) and reconstructing 7.0 miles ($59,500) of trail during the first decade. Overall, 342,490 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest Appendix I, Table I-59 (G) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed In Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 75 percent of the Forest (824,343 acres) in an accessible category Approximately 89 percent of accessible acres (732,177 acres) have low to moderate restrictions which would not limit mining activities Approximately 11 percent (92,166 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-60 (G) displays the level of restriction affecting acres within each Management Area Specific Standards and Guidelines affecting mineral exploration and development are defined in the LRMP, Chapter IV, for each Management Area





ALTERNATIVE K

ALTERNATIVE K

GOALS

The purpose of Alternative K is to address the desires of a wide range of user groups and interests, while continuing to supply goods and services vital to the maintenance of local and National economic development Achievement of the objective requires that the Forest capitalize on the multi-product nature of land allocations that minimize tradeoffs between goods and services

DESIGN

Timber production would be at a moderate to high level. A moderate amount of hardwood conversion would be allowed. The wildlife MR's are included A number of areas with special resource values such as sensitive plants, unique ecosystems, wildlife habitat, and backcountry recreation opportunities would be allocated to Management Areas which have no programmed timber harvest

The full range of inventoried VQO's would be allocated in the high priority viewsheds Some of the moderate priority viewsheds would have the inventoried Retention areas allocated to Partial Retention. The prescription for riparian areas in the timber base would be Prescription C in one planning basin, the remaining planning basins would be allocated to Prescription B.

OVERVIEW

Alternative design specifications would have the following results. Timber outputs would be sustained at approximately 90 percent of the current level Much of the Forest, with the exception of existing Wilderness and areas without programmed timber harvest, would eventually be roaded and developed Motorized recreation opportunities would be enhanced, as roads are constructed for timber management. Non-motorized recreation experiences would also be enhanced through trail construction in the Wilderness and Backcountry Recreation Management Areas. Viewsheds most important to recreational use would be maintained in a natural or near-natural condition

Approximately 42 percent of the Forest's presently standing mature and old-growth would be protected in this alternative Biological diversity would be promoted through: (1) allocations to maintain older seral stages and natural processes (primarily in Wilderness, RNA's, Backcountry Recreation, Botanical, Supplemental Resource and Designated Wildlife Habitat Management Areas); and (2) management direction (Standards and Guidelines). Wildlife populations dependent on mature or old-growth habitat would be maintained above viable levels Big-game hunting opportunities would be similar to those currently available Fish habitat would be enhanced through the allocation of one high value fisheries basin to Riparian Prescription C, and through a high level of capital investments

1. How Much Timber Should the Forest Produce?

Alternative K would result in the average annual production of 27 8 MMCF (155 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade. Governed by a policy of nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 48 8 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years).

Timber production would be supported by a land base of 529,000 acres (selected suitable), which includes 34,838 acres of standing hardwood Hardwood conversion would be limited to no more than 7,500 acres per decade, subject to market conditions Final harvest would occur on an average of 4,520 acres per year during the first decade, decreasing to 4,217 acres per year by the fifth decade Appendix I, Table I-61 (K) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative K is designed to reserve 184,690 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-62 (K), existing mature and old-growth would be metered out to accommodate the harvest sale schedule Of the 443,000 acres of mature and old-growth that currently exist, 392,230 would remain at the end of the first decade of harvest activity. Except for isolated tracts, riparian, and other small areas, all unprotected mature and old-growth would be removed by the tenth decade

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures Watershed conditions would be maintained in pristine areas and improved in those areas presently degraded Allocations of 375,380 acres (34 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas. In other areas, these values would be protected though the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 9 to 13 percent per decade specific to each planning basin

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat Vegetative disturbance in the riparian area in the timber base would be controlled by Riparian Prescriptions B or C Prescription C would be applied on the Elk/Sixes watershed basin; it is designed to produce a two-degree decrease in summer water temperature by the third decade. Riparian prescription B, designed to maintain existing water temperatures, is applied in the remaining basins Appendix I, Table I-63 (K) shows how riparian habitat would be affected by the various Management Area designations.

A high level of capital investment is proposed in this alternative Approximately $589,800 per year would be spent on fish, soil and water resource projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, *Preserve, and Enhance Wild and Scenic River Attributes?*

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes in both established and eligible Wild and Scenic Rivers. All viewsheds surrounding Rogue and Illinois Wild and Scenic Rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's Land within 1/8 mile of either side of the Chetco and North Fork Smith Rivers would have allocations to minimize site-disturbing activities and maintain river values. Viewsheds surrounding the rivers would not be managed to meet their inventoried VQO's, except for Partial Retention areas around the Chetco River

Appendix I, Table I-64 (K) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes. Those that contribute to maintenance of water quality and visual quality are indicated.

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV) RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants Four new RNA's are proposed in addition to the three

existing areas (for a total of 4,756 acres) resulting in the protection of 25 ecotypes. Eight new Botanical areas would be recommended for addition to the three that presently exist for a total of 10,689 acres.

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-65 (K) Specific descriptions and attributes of each individual site are included in the FEIS, Appendix F

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing activities to meet VQO's on 560,822 acres Nine viewsheds (of the 44 considered) would be governed by their respective inventoried VQO's, four of which encompass heavily used recreation travel corridors: the Upper Illinois, Rogue-Illinois, Oregon Caves, and Highway 199

Appendix I, Table I-66 (K) shows the number of acres in each VQO category by Management Area Approximately 402,268 acres would have an unmodified appearance (Preservation). While management activities would be evident, but visually subordinate (Partial Retention) on 145,436 acres, another 15,118 acres would be managed where activities are not evident to the casual Forest visitor (Retention) The remaining area (529,480 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

The combination of land allocations and capital expenditures prescribed in this alternative would provide a wide range of effective habitat conditions. Among the significant land allocations would be all the Special Wildlife Sites, and three of the four Supplemental Resource areas with high wildlife value (Fishhook Peak, Morris Rodgers Creek, Pebble Hill, and Windy Valley) Designated Wildlife Habitat Management Areas would be allocated to meet MR's for wildlife inhabiting mature and old-growth forest along with an additional 18,086 acres of habitat that occur in small blocks and serve as "stepping stones" between individual Designated Wildlife Habitat Management Areas. In total, 184,690 acres of mature and old-growth forest wildlife habitat would be maintained

Appendix I, Table I-67 (K) shows a variety of land allocations that contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds. Approximately 52,062 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status Approximately 48 percent of the Forest (529,000 acres) would provide an adequate combination of cover and forage for deer to sustain an average herd of 28,000 animals for the first five decades.

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres.

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally through allocation to Backcountry Recreation Management Areas, and capital investments in existing Wildernesses. Primitive and Semi-primitive recreational capacity would be increased in the Backcountry Recreation and Wilderness areas by constructing 15 0 miles ($255,500) and reconstructing 7.0 miles ($59,500) of trail during the first decade Overall, 269,500 acres of unroaded Primitive and Semi-primitive

recreation opportunities would be provided on the Forest. Appendix I, Table I-68 (K) shows the number of acres in each Management Area that would provide unroaded Primitive and Semi-primitive recreational opportunities

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 76 percent of the Forest (826,109 acres) in an accessible category. Approximately 93 percent of accessible acres (768,115 acres) have low to moderate restrictions which would not limit mining activities Approximately seven percent (57,994 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-69 (K) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in the LRMP, Chapter IV, for each Management Area







ALTERNATIVE M

ALTERNATIVE M

GOALS

Alternative M emphasizes preservation and natural processes rather than human use of the Forest's resources It would preserve the remaining natural areas on the Forest, and emphasizes old-growth wildlife habitat, and the preservation of old-growth timber stands

DESIGN

Timber production would be subordinate to other resource allocations Areas managed for timber production would have a minimum rotation length of 250 years. New access roads would not be built No hardwood conversions would be allowed. Riparian areas would not have programmed timber harvest. The wildlife MR's are included. Areas with special resource values such as sensitive plants, unique ecosystems, wildlife habitat, and backcountry recreation opportunities would be allocated to Management Areas which have no programmed timber harvest The full range of inventoried VQO's would be allocated in all viewsheds

OVERVIEW

Alternative design specifications would have the following results Management activities would be much less apparent to the Forest visitor in this alternative than in any of the other alternatives Forest visitors would find natural landscapes throughout all of the Forest All of the VQO's would be met or exceeded. Less of the Forest would be accessible by vehicle, as some existing roads would be closed to protect wildlife, and no new roads would be constructed All of the existing unroaded and undeveloped areas would remain in a roadless condition

Trees would be harvested at an average age of 250 years, instead of 80-100 years as in the other alternatives. Forest timber outputs would be less than 20 percent of what they are today. Approximately 25 percent more old-growth timber would exist at the end of the planning period (fifteenth decade) than is in existence now

Recreation would not be emphasized Some new trails would be constructed in the Kalmiopsis and Wild Rogue Wildernesses No trail construction would occur in the unroaded areas. Developed recreation opportunities would be decreased substantially over what they are today, as the little-used sites would be closed

Approximately 65 percent of the Forest's presently standing mature and old-growth would be protected in this alternative Wildlife populations dependent on mature or old-growth habitat would be maintained at almost four times their minimum levels Big-game hunting opportunities would decline by almost 60 percent from what they are today Stream temperatures would be cooler, and fish habitat would be enhanced, although access for fishing would be more limited

1. How Much Timber Should the Forest Produce?

Alternative M would result in the average annual production of 6 1 MMCF (34 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade Governed by a policy of nondeclining flow, average annual sale offerings would remain constant over the entire planning horizon Harvest would generally occur when the timber stands reach age 250

Timber production would be supported by a land base of 207,000 acres (selected suitable), which includes no acres of standing hardwood Final harvest would occur on an average of 754 acres per year during the first decade, increasing to 820 acres per year by the fifth decade Appendix I, Table I-70 (M) displays the Management Areas that provide timber management opportunities

2 How Much Old-Growth Forest Should be Preserved?

Alternative M is designed to reserve 289,633 acres displayed by Management Area in Appendix I, Table I-71 (M) having mature and old-growth forest characteristics Of the 443,000 acres of mature and old-growth that currently exist, 435,460 would remain at the end of the first decade of harvest activity With the long rotation, this alternative would reproduce stands with old-growth characteristics for a portion of their life span even in the areas with programmed timber harvest A total of 542,800 acres would exhibit old-growth characteristics by the end of the planning horizon due to maturation of such stands into an old-growth condition

3 How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures. Watershed conditions would be maintained in pristine areas and improved in those areas presently degraded Allocations of 670,117 acres (61 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect fish and watershed values in those areas In other areas, these values would be protected though the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 9 to 13 percent per decade specific to each planning basin.

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat No harvest activity would occur on riparian vegetation surrounding Class I, II, and III streams in any basin Land surrounding all 30 rivers and creeks with exceptional salmon and steelhead rearing capabilities would be allocated to the Supplemental Resource Management Area where no programmed timber management activities would occur Forest wide, approximately 175,493 acres (100 percent) of riparian vegetation would be protected in its existing state. Appendix I, Table I-72 (M) shows how riparian habitat would be affected by the various Management Area designations

A low level of capital investment is proposed in this alternative since most fish habitat needs would be satisfied through land allocations Approximately $387,100 per year would be spent on fish, soil and water resource projects

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes All viewsheds surrounding the rivers would have a natural or near-natural appearance as lands would be managed to meet or exceed their inventoried VQO's Land within 1/4 mile of either side of the Chetco, North Fork Smith, and Elk Rivers would be managed under two Management Areas, the interior 1/8 mile is allocated to a Supplemental Resource Management Area, while the remaining land would be allocated to the respective Scenic/Recreation River Management Area

Appendix I, Table I-73 (M) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes Those that contribute to maintenance of water quality and visual quality are indicated.

5 How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the

Forest (see LRMP, Chapter IV). RNA's and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants Four new RNA's are proposed in addition to the three existing areas (for a total of 4,756 acres) resulting in the protection of 25 ecotypes Twenty-five new Botanical areas would be recommended for addition to the three that presently exist for a total of 39,001 acres.

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-74 (M). Specific descriptions and attributes of each individual site are included in the FEIS, Appendix F.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing to meet the inventoried VQO's on the entire Forest. All 44 viewsheds considered would be governed by their respective inventoried VQO's.

Appendix I, Table I-75 (M) shows the number of acres in each VQO category by Management Area. Approximately 726,256 acres would have an unmodified appearance (Preservation). While management activities would be evident, but visually subordinate (Partial Retention) on 109,448 acres, another 23,329 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (233,269 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

Among the significant land allocations would be all the Special Wildlife Sites (7,029 acres) and the four Supplemental Resource Areas with high wildlife value (Fishhook Peak, Morris Rodgers Creek, Pebble Hill, and Windy Valley). Designated Wildlife Habitat Management Areas that exceed MR's by 57,000 acres are proposed along with an additional 18,086 acres of habitat that occur in small blocks and serve as "stepping stones" between individual Designated Wildlife Habitat areas In total, 289,633 acres of mature and old-growth forest wildlife habitat would be maintained.

Appendix I, Table I-76 (M) shows a variety of land allocations that would contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds. Approximately 58,260 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status. Early seral stage habitat and big-game forage would decline substantially. Approximately 19 percent of the Forest (207,000 acres) would provide a combination of cover and forage for deer to sustain an average herd size of 16,700 animals for the first five decades

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species Approximately $56,000 per year would be prescribed to complete an average of 191 structural improvements and treat about 449 acres.

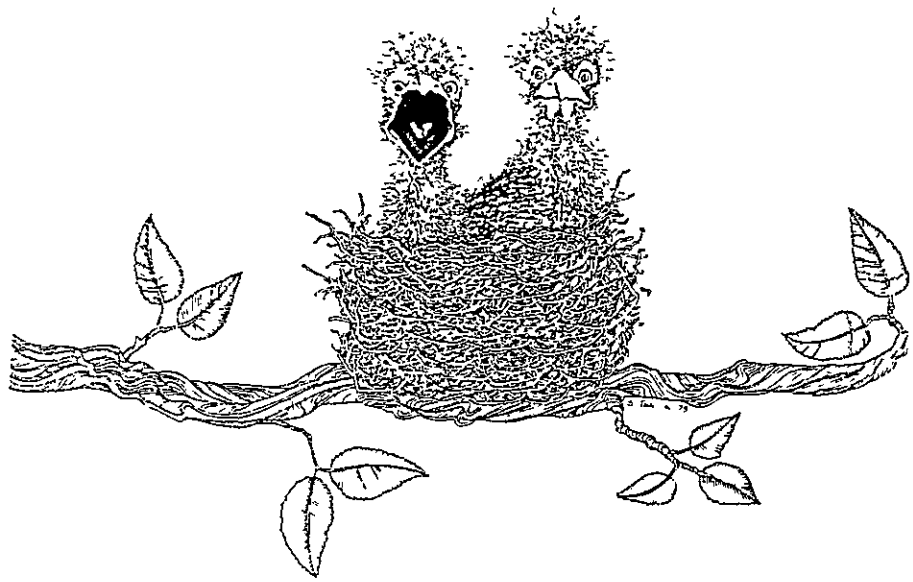
8 How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally through allocation to Backcountry Recreation Management Areas, and in existing Wildernesses. Primitive and Semi-primitive recreational capacity would be increased in the Backcountry Recreation and Wilderness areas by constructing 21 5 miles ($336,000) and reconstructing 7.0 miles ($59,500) of trail during the first decade. Overall, 347,400 acres of unroaded Primitive and Semi-primitive recreation opportunities would

be provided on the Forest. Appendix I, Table I-77 (M) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed In Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 75 percent of the Forest (824,271 acres) in an accessible category Approximately 91 percent of accessible acres (746,649 acres) have low to moderate restrictions which would not limit mining activities. Approximately 9 percent (77,622 acres) have access restrictions in the high category which could make many types of mining activity uneconomical. Appendix I, Table I-78 (M) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in the LRMP, Chapter IV, for each Management Area







ALTERNATIVE S

ALTERNATIVE S

GOALS

The purpose of Alternative S is to achieve a balanced program of resource management, address the desires of a wide range of user groups and interests, maintain a healthy ecosystem for the future, and continue to supply goods and services vital to the maintenance of local and National economies Achievement of the objective requires that the Forest capitalize on the multi-product nature of land allocations that minimize tradeoffs between goods and services.

DESIGN

This alternative is designed in response to public input Innumerable suggestions from agencies, groups, and individuals have helped guide the design and various aspects of Alternative S

Timber production would be at a moderately high level. A limited amount of hardwood conversion would be allowed. Fertilizer would be applied to increase yields from specific areas managed for timber production. The wildlife MR's are included A number of areas with special resource values such as sensitive plants, unique ecosystems, wildlife habitat, and backcountry recreation opportunities would be allocated to Management Areas which have no programmed timber harvest

The full range of inventoried VQO's would be allocated in the high priority viewsheds Some of the moderate priority viewsheds would have the inventoried Retention areas allocated to Partial Retention. The prescription for riparian areas in the timber base in seven planning basins would be Prescription C; the remaining basins would be allocated to Prescription B

OVERVIEW

Alternative design specifications would have the following results Timber outputs would be sustained at approximately 95 percent of the current level A little over one-half of the Forest land area would eventually be roaded and developed Motorized recreation opportunities would be enhanced, as roads are constructed for timber management Non-motorized recreation experiences would also be enhanced through trail construction in the Wilderness and Backcountry Recreation Management Areas. Viewsheds most important to recreational use would be maintained in a natural or near-natural condition A high level of recreation capital investments reflects increased partnerships with counties, other local agencies and groups

Approximately 45 percent of the Forest's presently standing mature and old-growth would be protected in this alternative Biological diversity would be promoted through. (1) allocations to maintain older seral stages and natural processes (primarily in Wilderness, RNA's, Backcountry Recreation, Botanical, Supplemental Resource and Designated Wildlife Habitat Management Areas), and (2) management direction (Standards and Guidelines). Wildlife populations dependent on mature or old-growth habitat would be maintained above viable levels. Big-game hunting opportunities would be similar to those currently available.

Fish habitat would be enhanced through the allocation of high value fisheries to Riparian Prescription C, limitations on the amount of timber harvest within each watershed basin by decade; through capital investments, and soil and water Standards and Guidelines.

1. How Much Timber Should the Forest Produce?

Alternative S would result in the average annual production of 29 MMCF (162 MMBF) of chargeable sawtimber volume plus one percent chargeable salvage during the first decade. Governed by a policy of

nondeclining flow, average annual sale offerings would gradually increase in subsequent decades to reach the LTSY of 48 MMCF. Harvest would generally occur when the timber stands reach CMAI (approximately 100 years)

Timber production would be supported by a land base of 505,000 acres (selected suitable), which includes 34,624 acres of standing hardwood. Hardwood conversion would be limited to no more than 7,500 acres per decade, subject to market conditions. Final harvest would occur on an average of 4,790 acres per year during the first decade, decreasing to 4,268 acres per year by the fifth decade Appendix I, Table I-79 (S) displays the Management Areas that provide timber management opportunities

2. How Much Old-Growth Forest Should be Preserved?

Alternative S is designed to reserve 198,097 acres having mature and old-growth forest characteristics With the exception of the reserved areas displayed by Management Area in Appendix I, Table I-80 (S), existing mature and old-growth would be metered out to accommodate the harvest sale schedule. Of the 443,000 acres of mature and old-growth that currently exist, 391,758 would remain at the end of the first decade of harvest activity. By the tenth decade, all unprotected mature and old-growth would be removed.

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures Watershed conditions would be maintained in pristine areas and improved in those areas presently degraded. Allocation of 464,730 acres (43 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest would protect the fish and watershed values in those areas In other areas, these values would be protected though the application of Standards and Guidelines and BMP's The impacts of timber harvest would be mitigated by distributing activities through time and space This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 7 to 17 percent per decade specific to each planning basin.

Land characterized by riparian vegetation would be managed to improve water quality and fishery habitat. Vegetative disturbance in the riparian area within lands in the timber base would be controlled by Riparian Prescriptions B or C. Prescription C would be applied on the Elk/Sixes, Lobster, Lower Rogue, Indigo, Silver, Pistol, and Lower Chetco basins, it is designed to produce a two-degree decrease in summer water temperature by the third decade Riparian prescription B, designed to maintain existing water temperatures, is applied in the remaining basins. Appendix I, Table I-81 (S) shows how riparian habitat would be affected by the various Management Area designations

A high level of capital investment is proposed in this alternative Approximately $581,000 per year would be spent on fish, soil and water resource projects

4 How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Land allocations to a variety of Management Areas would protect Wild and Scenic River attributes. All viewsheds surrounding the rivers would have a natural or near-natural appearance as lands would be managed to meet their inventoried VQO's

Both the North Fork Smith and Chetco Rivers have a 2-mile segment designated "Scenic" in the recently passed Act which are carried as "Wild" in this alternative. In each case the Forest reviewed classification and concluded areas meet "Wild" status (see FEIS, Chapter III, Wild and Scenic Rivers). This alternative protects the inventoried values in the interim until further analysis or river management plans indicate another course of action is appropriate

Appendix I, Table I-82 (S) shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River attributes. Those that contribute to maintenance of water quality and visual quality are indicated.

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest would be managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (see LRMP, Chapter IV). Research Natural Areas (RNA's) and Botanical Management Areas would provide special emphasis to the preservation of ecotypes and sensitive plants. Four new RNA's are proposed in addition to the three existing areas (for a total of 4,754 acres) resulting in the protection of 25 ecotypes. Nineteen new Botanical areas would be recommended for addition to the three that presently exist for a total of 19,262 acres.

The distribution (percentages) of sensitive plant habitat in the various Management Areas is indicated in Appendix I, Table I-83 (S). Specific descriptions and attributes of each individual site are included in the FEIS, Appendix F.

6. How, and to What Degree, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives would be achieved by designing to meet VQO's on 657,193 acres. Twelve viewsheds (of the 44 considered) would be governed by their respective inventoried VQO's, four of which encompass heavily used recreation travel corridors Management of Forest scenic values would be designed to complement high recreation use travel corridors and viewsheds The high priority viewsheds that would be managed to meet or exceed their respective inventoried visual objectives are: Upper Illinois, Rogue-Illinois, Oregon Caves, Highway 199, Game Lake, Bolan Lake, and Rough and Ready.

Appendix I, Table I-84 (S) shows the number of acres in each VQO category by Management Area. Approximately 487,540 acres would have an unmodified appearance (Preservation) While management activities would be evident, but visually subordinate (Partial Retention) on 148,397 acres, another 21,256 acres would be managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (435,109 acres) would be in Modification where management activities may dominate the characteristic landscape, but resemble naturally occurring patterns when viewed in the background

7. How Should Wildlife Habitats on the Forest be Managed?

The combination of land allocations and capital expenditures prescribed in this alternative would provide a wide range of effective habitat conditions Designated Wildlife Habitat Management Areas would be allocated to meet MR's for wildlife inhabiting mature and old-growth forest All Special Wildlife Sites (Management Area 9) would be allocated, including more than 15,000 acres of mature and old-growth forest habitat These old-growth sites within Management Area 9 are small areas not suitable for timber management, they serve as "stepping stones" between a number of Designated Wildlife Habitat areas In total, 198,097 acres of mature and old-growth forest wildlife habitat would be maintained through the tenth decade.

Appendix I, Table I-85 (S) shows a variety of land allocations that contribute to overall wildlife habitat diversity. Standing dead trees (snags) in areas managed for timber production would provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds. Approximately 53,995 acres of prime bald eagle and osprey habitat would be provided along rivers and streams that have a protected status Approximately 46 percent of the Forest (505,000 acres) would provide an adequate

combination of cover and forage for deer to sustain an average herd of 28,500 animals for the first five decades

Capital investments for wildlife habitat improvements would result in higher carrying capacity for many species A minimum of $123,000 per year would be prescribed to complete an average of 418 structural improvements and treat about 983 acres.

8 How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Primitive and Semi-primitive Non-motorized recreation opportunities would be provided principally through allocation to Backcountry Recreation Management Areas, and in existing Wildernesses. The Backcountry Recreation Management Areas include: (1) Primitive and Semi-primitive recreation opportunities in non-motorized areas and (2) Semi-primitive recreation opportunities in areas with some primitive roads and trails which allow motorized use.

Primitive and Semi-primitive recreational capacity would be increased in the Backcountry Recreation and Wilderness areas by constructing 69.5 miles ($483,800) and reconstructing 24 miles ($109,500) of trail during the first decade. Overall, 293,500 acres of unroaded Primitive and Semi-primitive recreation opportunities would be provided on the Forest. Appendix I, Table I-86 (S) shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development would be facilitated by retaining 75 percent of the Forest (822,972 acres) in an accessible category Approximately 92 percent of accessible acres (754,532 acres) have low to moderate restrictions which would not limit mining activities. Approximately 8 percent (68,440 acres) have access restrictions in the high category which could make many types of mining activity uneconomical Appendix I, Table I-87 (S) displays the level of restriction affecting acres within each Management Area Specific Standards and Guidelines affecting mineral exploration and development are defined in the LRMP, Chapter IV, for each Management Area.

MANAGEMENT AREA ASSIGNMENTS

Table II-2 displays the proposed allocation of land to Management Areas under each alternative The Management Areas are numbered in order of increasing activity from the least ground disturbance and vegetation manipulation to the most. Where alternative design results in overlaps, the acres are assigned to the more restrictive Management Area (lower number) This precludes double counting and assures that each acre will have only one set of management direction

The organization of the alternatives in Table II-2 is also by the level of ground disturbance or vegetation manipulation expected The alternatives are arranged in order of decreasing selected suitable timber land This organization is intended to array the alternatives from the most vegetation manipulation to the least (i.e., from the least preservation to the most)

Table II-3 is a complete listing of all the "Special Areas" used in the assignment of lands to Management Areas during the alternative development process The concept of Special Areas was developed to identify logical areas with attributes of significance to specific resources that could be assigned to various management options through the range of alternatives. The definition of Special Areas runs parallel with the definition of Management Areas. The Special Areas are the existing or candidate areas that are used as the building blocks to create the land allocations by Management Area Each Special Area is a discrete unit that can be identified on the ground. Collections of these then become the Management Area which may be scattered over the Forest, but would be managed under the same management direction. This table can be used to determine the assignments of special areas that went into the formulation of each alternative.

With all of the potential land allocations and myriad of existing and candidate areas, overlaps between Special Areas are numerous Because of the system for dealing with overlaps (as mentioned above in the description of Table II-2 above), the acres listed for the assigned Special Areas will seldom add up to the Management Area acres. The General Forest (Management Area 14) is not a composite of specific areas, but consists of all land on the Forest not allocated for other purposes, and therefore does not have Special Areas. A full range of alternatives was developed by assigning differing levels and combinations of the special areas to be subtracted from General Forest. The table lists the total acreage of each Special Area and the acres within the area which would otherwise be tentatively suitable for timber production.

Specific recreation sites and trails on the Forest, and their treatment in the alternatives, are listed in Table II-4.

The following explanation of the table headings may facilitate the use of the table:

- "MA No " is the assigned Management Area number associated with the Special Areas that follow.

- "Name of MANAGEMENT AREA/Special Area" is the management area name with the associated Special Area name following.

- "Area NF (Acres)" is the acreage in the Special Area.

- "Area T.Suit (Acres)" is the tentatively suitable for timber acreage.

- "Alternative Selection" indicates whether a Special Area is in a particular alternative. The Special Areas selected are marked by an X if they were selected for the alternative.

Table II-2. Acreage in Management Areas (Alternatives are ranked in order by decreasing amount of vegetative manipulation expected)

Management Area No.-Name	ALTERNATIVE											
	No Change	C	D	B	A-Departure	A No Action	D1	K	S	G	E	M
1-Wilderness	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495
2-Wild River	3,120	2,043	2,043	2,043	3,120	3,120	2,043	2,043	5,029	3,120	3,120	3,120
3-Research Natural Area	3,249	3,349	3,349	3,349	3,249	3,249	3,349	4,704	4,608	4,693	4,693	4,693
4-Botanical	1,067	5,648	5,648	5,648	1,067	1,067	5,648	7,296	16,275	35,658	24,267	35,658
5-Unique Interest	0	395	395	395	0	0	395	1,595	2,015	1,333	1,568	1,333
6-Backcountry Recreation	0	0	0	0	0	0	0	13,691	108,092	150,431	301,737	296,520
7-Supplemental Resource	29,589	1,285	13,739	13,739	29,589	29,589	13,739	39,498	21,412	50,453	27,680	36,144
8-Designated Wildlife Habitat	5,082	55,109	52,885	52,885	52,053	52,053	52,885	59,477	47,354	70,858	39,242	53,125
9-Special Wildlife Site	6,261	9,477	9,195	9,195	5,883	5,883	9,195	14,581	27,450	8,640	7,547	7,029
10-Scenic/Recreation River	15,248	9,526	9,526	9,526	13,642	13,642	9,526	3,557	10,317	5,963	6,192	5,850
11-Riparian	122,279	115,743	111,749	111,749	110,465	110,465	111,749	102,944	89,206	72,483	62,337	56,139
Prescription B	(84,517)	(83,528)	(48,770)	(48,747)	(81,318)	(81,318)	(44,664)	(69,895)	(39,836)	(0)	(0)	(0)
Prescription C	(0)	(0)	(33,059)	(33,044)	(0)	(0)	(30,276)	(6,161)	(27,130)	(45,212)	(0)	(0)
Prescription Minimum Level	(37,762)	(32,215)	(29,920)	(29,958)	(29,147)	(29,147)	(36,809)	(26,888)	(22,240)	(27,271)	(62,337)	(56,139)
12-Retention Visual	50,715	0	7,678	7,678	46,050	46,050	7,678	10,280	9,717	23,060	19,622	17,479
13-Partial Retention Visual	229,802	86,551	94,282	94,282	218,545	218,545	94,282	129,323	131,822	149,830	116,281	109,448
14-General Forest 1/	393,395	570,681	549,318	549,318	376,144	376,144	549,318	470,818	386,510	283,285	245,521	233,269
TOTAL NATIONAL FOREST LAND	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302

Table II-3 Special Area Assignments

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Surf (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
1	**WILDERNESS**												
	Grassy Knob (Existing)	17,200	0	X	X	X	X	X	X	X	X	X	X
	Kalmiopsis (Existing)	179,850	0	X	X	X	X	X	X	X	X	X	X
	Red Buttes (Existing)	3,414	0	X	X	X	X	X	X	X	X	X	X
	Siskiyou (Existing)	5,323	0	X	X	X	X	X	X	X	X	X	X
	Wild Rogue (Exist -Addl 9,392 BLM)	26,708	0	X	X	X	X	X	X	X	X	X	X
2	**WILD RIVER** 1/												
	Wild-Chetco River (Eligible)	8,161	128	X	X				X	X		X	
	Wild-Chetco River (Existing)	8,975	641										X
	Wild-Elk River (Existing)	607	532										X
	Wild-Illinois River (Existing)	9,275	0	X	X	X	X	X	X	X	X	X	X
	Wild-Rogue River (Existing)	5,226	0	X	X	X	X	X	X	X	X	X	X
	Wild-Smith River NF (Eligible)	2,149	102	X	X				X	X		X	
	Wild-Smith River NF (Existing)	3,045	586										X
3	**RESEARCH NATURAL AREA**												
	Cedar Log Flat	441	145						X	X	X	X	X
	Coquille River Falls (Existing)	501	0	X	X	X	X	X	X	X	X	X	X
	Craggy Peak	100	0			X	X	X	X	X	X	X	X
	Hoover Gulch	1,292	1,099	X	X	X	X	X	X	X	X	X	X
	Lemmingsworth Gulch	966	261						X	X	X	X	
	Lemmingsworth Gulch (Option 1)	818	225										X
	Port Orford Cedar (Existing)	1,120	0	X	X	X	X	X	X	X	X	X	X
	Wheeler Creek (Existing)	336	0	X	X	X	X	X	X	X	X	X	X
4	**BOTANICAL**												
	Babyfoot (Existing)	352	0	X	X	X	X	X	X	X	X	X	X
	Bear Camp (Option 1)	244	177						X	X	X	X	X
	Bear Camp (Option 2)	386	348						X	X	X	X	X
	Bear Camp (Option 3)	2,983	2,611						X	X		X	
	Bear Camp (Option 4)	2,314	1,539							X		X	
	Big Craggies (Existing)	3,803	0	X	X	X	X	X	X	X	X	X	X
	Big Tree	127	116										X
	Bigelow Lakes	411	136						X	X	X	X	X
	Bigelow Lakes (Addition)	560	160						X	X		X	
	Bolan Lake	451	124						X	X		X	
	Bolan Lake (Option 1)	297	37										X
	Chrome Ridge	1,014	430						X	X		X	
	Chrome Ridge (Option 1)	589	256										X
	Cleopatra	800	249								X	X	
	Days Gulch	987	0			X	X	X	X	X	X	X	
	Days Gulch (Option 1)	1,252	21										X
	Eight Dollar Mountain	2,150	0			X	X	X	X	X	X	X	
	Eight Dollar Mountain (Addition)	200	50							X		X	
	Eight Dollar Mountain (Option 1)	2,738	0										X
	Grayback Mountain	166	0			X	X	X	X	X		X	
	Grayback Mountain (Option 1)	197	0										X
	Green Knob	153	132						X	X		X	
	Iron Mountain	1,295	1,026						X	X	X	X	X
	Iron Mountain (Addition)	571	420						X	X	X	X	X
	Lobster Grove	85	64						X	X	X	X	X
	Lobster Grove (Addition)	360	161						X	X		X	
	Lobster Grove (Addition Option 1)	449	248										X
	Oregon Mountain	4,401	117						X	X		X	
	Oregon Mountain (Option 1)	2,623	102										X
	Page Mountain Grove	64	64			X	X	X	X	X	X	X	X
	Page Mountain Grove (Addition)	64	59							X		X	

Table II-3 Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
4	**BOTANICAL** (Continued)												
	Red Flat	5,384	3,907						X	X		X	
	Red Flat (Addition)	1,788	866							X		X	
	Red Flat (Option 1)	53	37										X
	Redwood Groves	185	181										X
	Redwood Groves (Option 1)	326	315										X
	Rough and Ready Flat	934	0			X	X	X		X		X	
	Rough and Ready Flat (Option 1)	1,499	0										X
	Snaketooth Redwood	21	20						X	X	X	X	X
	Snow Camp	748	561						X	X		X	
	Snow Camp (Addition)	727	702						X	X		X	
	Snow Camp (Option 1)	1,041	840										X
	Sourgame	1,094	533							X		X	
	Sourgame (Addition)	2,546	1,470							X		X	
	Sourgame (Option 1)	63	63										X
	Sourgame (Option 2)	508	291										X
	Squaw Mountain	638	252							X		X	
	Vulcan	133	0			X	X	X		X		X	X
	Waldo Ridge	195	95							X		X	
	Waldo Ridge (Addition)	512	421							X		X	
	Windy Collier	147	115			X	X	X		X		X	
	York Creek (Existing)	320	0	X	X	X	X	X	X	X	X	X	X
5	**UNIQUE INTEREST**												
	Collier Butte	171	96						X	X	X	X	X
	Devils Half Acre Ridge	203	129						X	X	X	X	X
	Elk Creek Falls	32	32										X
	Ferris Ford Cedar Log House	48	29			X	X	X	X	X	X	X	X
	Gray Butte	48	0			X	X	X	X	X	X	X	X
	Horse Sign Butte	101	21						X	X	X	X	X
	Lawson Butte	155	42						X	X	X	X	X
	Pyramid Rock	27	18						X	X	X	X	X
	Quosatana Butte	543	308						X	X	X	X	X
	Saddle Mountain	59	11			X	X	X	X	X	X	X	X
	Signal Butte	75	16			X	X	X	X	X	X	X	X
	Silver Creek Falls	388	96										X
	Stack Yards Rock	48	46			X	X	X	X	X	X	X	X
	Taylor Creek Falls	64	9			X	X	X	X	X	X	X	X
	Wheeler Creek Bomb Site	53	40			X	X	X	X	X	X	X	X
6	**BACKCOUNTRY RECREATION** by RARE II No -Name												
	0000-Grassy Knob	6,009	4,264						X			X	
	0000-Grassy Knob (Option 1)	1,055	805							X			
	0000-Grassy Knob (Option 2)	2,426	1,397										X
	6171-Copper Mountain	10,944	9,249						X			X	
	6171-Copper Mountain (Option 1)	8,688	7,243							X			
	6171-Copper Mountain (Option 2)	1,939	1,609										X
	6172-Mule Creek	517	405						X			X	
	6173-Rogue	4,469	4,134						X			X	
	6174-Potato Mountain	7,576	6,564						X			X	
	6175-Shasta Costa	15,595	12,624						X			X	
	6176-North Kalmiopsis	110,175	71,518						X			X	
	6176-North Kalmiopsis (Option 1)	80,159	50,245							X			
	6176-North Kalmiopsis (Option 2)	13,961	7,056								X		
	6176-North Kalmiopsis (Option 3)	103,432	69,325										
	6176-North Kalmiopsis (Option 4)	42,224	19,835										X
	6177-Quosatana	5,406	4,116						X			X	

Table II-3 Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
6	**BACKCOUNTRY RECREATION** (Continued)												
	6178-Briggs	5,748	4,274						X			X	
	6179-Squaw Mountain	7,704	3,533						X			X	
	6180-Windy Valley	10,214	7,907						X			X	
	6180-Windy Valley (Option 1)	1,909	1,639										X
	6183-Kalmiopsis (Addition)	1,166	1,023						X			X	
	6184-Mount Emily	5,945	5,625						X			X	
	6701-Siskiyou	3,284	997						X	X		X	
	6701-Siskiyou (Option 1)	628	37										X
	6703-Kangaroo	7,418	4,053						X	X		X	
	6703-Kangaroo (Option 1)	2,955	715										X
	6707-North Fork Smith	952	399						X	X		X	
	6708-Packsaddle	5,482	2,084						X	X		X	
	6708-Packsaddle (Option 1)	1,744	96										X
	6709-South Kalmiopsis	105,421	29,075						X			X	
	6709-South Kalmiopsis (Option 1)	51,569	10,078							X			
	6709-South Kalmiopsis (Option 2)	2,757	1,883								X		
	6709-South Kalmiopsis (Option 3)	13,323	6,181										
	6709-South Kalmiopsis (Option 4)	57,301	5,392										X
	Other Land Outside Roadless Areas	5,287	1,374										X
7	**SUPPLEMENTAL RESOURCE**												
	Alternative G Additions	14,069	8,656							X		X	
	Anvil Creek	549	426	X	X	X		X	X	X	X	X	
	Bald Knob	47	47						X	X		X	
	Bald Mountain Creek	802	742						X	X		X	
	Big Trees	127	116			X	X	X	X	X	X	X	
	Brandy Peak	514	320						X	X		X	
	Briggs Creek	366	155	X	X				X	X		X	
	Briggs Creek (Addition)	682	523						X	X		X	
	Chetco River	2,526	1,536	X		X		X	X	X	X	X	
	Chetco River (Option 1)	2,596	1,553	X									
	Chetco South Fork	999	417	X	X	X		X	X	X	X	X	X
	Collier Creek North Fork	320	156						X	X	X	X	X
	Craggy Mountain	2,980	994	X	X				X	X	X	X	
	Craggy Mountain (Addition 1)	4,496	1,951						X	X		X	
	Craggy Mountain (Addition 2)	3,240	2,331						X	X		X	
	Craggy Mountain (Addition 3)	321	155								X	X	
	Elk Creek Falls	32	32					X	X	X	X		
	Elk River	2,072	1,717			X		X	X	X		X	
	Emily Creek	742	731	X	X	X	X	X	X	X	X	X	X
	Father Mountain	373	351						X	X	X	X	X
	Fishhook Peak	457	147						X	X	X	X	
	Horse Sign Creek	389	378						X	X	X	X	X
	Illahe East	550	326										X
	Indigo Creek	1,104	693	X	X	X		X	X	X	X	X	X
	Indigo Creek East and West Fork	1,163	715						X	X		X	X
	Lawson Creek	566	224	X	X	X		X	X	X	X	X	X
	Lawson Creek (Addition 1)	416	293			X	X	X	X	X	X	X	X
	Lawson Creek (Addition 2)	1,202	690								X	X	X
	Little Silver Creek	651	368										X
	Lobster Creek	1,283	1,104						X	X	X	X	
	Lobster Creek (Option 1)	1,416	1,226										X
	Lower Illinois	5,471	3,782	X	X				X	X		X	
	Lower Illinois (Option 1)	5,441	3,900						X	X		X	
	Mislatnah	4,241	1,126						X	X	X	X	
	Morris Rodgers	282	170						X	X	X	X	
	Panther Ridge	255	248						X	X		X	
	Pebble Hill	777	525						X	X		X	
	Preston Peak	4,490	2,552	X	X				X	X		X	

Table II-3 Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
7	**SUPPLEMENTAL RESOURCE** (Continued)												
	Purple Mountain	708	692						X	X	X	X	X
	Quosatana Creek	317	275						X	X	X	X	X
	Rock Creek	214	118	X	X	X		X	X	X		X	
	Rogue River Visual	9,943	6,625						X	X	X	X	X
	Shasta Costa Creek	874	613	X	X	X		X	X	X	X	X	X
	Shasta Costa Creek (Addition)	554	239			X		X	X	X	X	X	X
	Silver Creek	1,125	581	X	X	X		X	X	X	X	X	X
	Silver Creek and North Fork (Addition)	2,101	1,017						X	X	X	X	X
	Silver Creek Falls	389	96	X	X				X	X	X	X	
	Siskiyou	3,215	992	X	X				X	X		X	
	Sixes South Fork	1,152	272						X	X	X	X	X
	Skookumhouse Butte	1,519	573						X	X		X	
	Smith North Fork	947	399						X	X		X	
	Smith River North Fork	825	420	X	X	X		X	X	X	X	X	
	Smith River North Fork (Option 1)	4,277	1,081										
	Squirrel Peak	373	221						X	X		X	
	Winchuck	1,046	920	X	X	X		X	X	X	X	X	X
	Windy Valley	2,413	2,082	X	X				X	X	X	X	
8	**DESIGNATED WILDLIFE HABITAT**												
	300 Acre-Spotted Owl	5,446	5,027	X									
	MR-Spotted Owl	96,602	18,219		X	X	X	X	X	X	X	X	
	MR-Spotted Owl (Option 1)	102,982	24,935										X
	MR-Pileated Woodpecker	38,493	5,573		X	X	X	X	X	X	X	X	
	MR-Pileated Woodpecker (Option 1)	38,868	6,349										X
	MR-Pine Marten	18,305	5,571		X	X	X	X	X	X	X	X	
	MR-Pine Marten (Option 1)	18,099	5,428										X
	Connecting Wildlife Habitat	18,086	4,163						X	X	X	X	
	Level 1-Pileated Woodpecker	1,423	1,360						X	X		X	
	Level 1-Pine Marten	3,830	3,363						X	X		X	
	Level 1-Spotted Owl	11,162	10,503						X	X		X	
	Level 2-Pileated Woodpecker	901	848							X		X	
	Level 2-Pine Marten	1,824	1,572							X		X	
	Level 2-Spotted Owl	4,335	3,771							X		X	
	Level 3-Pileated Woodpecker	5,092	4,837							X		X	
	Level 3-Pine Marten	4,704	4,484							X		X	
	Level 3-Spotted Owl	6,401	6,173							X		X	
9	**SPECIAL WILDLIFE SITE**												
	Botanical Sites	224	212	X	X				X	X	X	X	
	Botanical Sites (Option 1)	194	185										X
	Dispersed Old-Growth	14,705	2,355										X
	Elk Areas	309	292						X	X	X	X	X
	Hardwoods	2,040	1,242										X
	Lakes and Ponds	272	129			X	X	X	X	X	X	X	X
	Meadow Buffers	4,431	3,194			X	X	X	X	X	X	X	
	Meadow Buffers (Option 1)	4,346	3,130										X
	Meadows	6,677	1,805	X	X	X	X	X	X	X	X	X	
	Meadows (Option 1)	6,516	1,681										X
	Osprey Nest Sites	5	5	X	X	X	X	X	X	X	X	X	X
	Pigeon Areas	528	332						X	X	X	X	X
	Rock Bluffs	11,706	75						X	X	X	X	
	Rock Bluffs (Option 1)	11,109	288										X
	Swamps, Springs and Wet Areas	15	11	X	X	X	X	X	X	X	X	X	X
	Tanoak Areas	298	298						X	X	X	X	X

Table II-3 Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
9	**SPECIAL WILDLIFE SITE** (Continued)												
	Wildlife Areas	539	428	X	X				X	X	X	X	
	Wildlife Areas (Option 1)	4,809	3,314										X
10	**SCENIC/RECREATION RIVER** 1/												
	Recreation-Chetco River (Preliminary)	3,173	2,533	X	X				X	X		X	
	Recreation-Chetco River (1988 Act)	3,101	2,487										X
	Recreation-Elk River	4,798	2,879										X
	Recreation-Illinois River	542	340	X	X	X	X	X	X	X	X	X	X
	Recreation-Rogue River	3,959	2,031	X	X	X	X	X	X	X	X	X	X
	Scenic-Chetco River (Preliminary)	3,023	2,170	X	X				X	X		X	
	Scenic-Chetco River (1988 Act)	2,274	1,704										X
	Scenic-Illinois River	5,436	1,732	X	X	X	X	X	X	X	X	X	X
	Scenic-Rogue River	2,541	2,022	X	X	X	X	X	X	X	X	X	X
	Scenic-Smith River NF (Preliminary)	2,128	979	X	X				X	X		X	
	Scenic-Smith River NF (1988 Act)	1,280	512										X
11	**RIPARIAN** by Planning Basin (Displays Riparian Prescription (Rx) and Basin Constraints) 2/												
	01-Elk and Sixes Rivers	12,198	7,647	B	B	C	B	C	M	C	C	M	C
	02-South Fork Coquille River	9,930	9,070	B	B	B	B	B	M	C	B	M	B
	03-Lobster Creek	4,613	4,087	B	B	B	B	B	M	C	B	M	C
	04-Upper Rogue River	11,894	6,413	B	B	C	B	C	M	C	B	M	B
	05-Lower Rogue River	7,009	5,834	B	B	C	B	C	M	C	B	M	C
	06-Indigo Creek	7,851	6,095	B	B	B	B	B	M	C	B	M	C
	07-Silver Creek	6,927	4,704	B	B	C	B	C	M	C	B	M	C
	08-Galice and Slate Creeks	7,050	5,688	B	B	B	B	B	M	C	B	M	B
	09-Lower Illinois River	10,690	5,389	B	B	B	B	B	M	C	B	M	B
	10-Upper Illinois River	14,046	3,431	B	B	B	B	B	M	C	B	M	B
	11-Briggs Creek	6,229	5,161	B	B	B	B	B	M	C	B	M	B
	12-Pistol River	7,128	6,208	B	B	B	B	B	M	C	B	M	C
	13-Lower Chetco River	14,743	9,514	B	B	C	B	C	M	C	B	M	C
	14-Upper Chetco River	15,824	0	B	N	N	N	N	M	N	N	M	M
	15-Rough and Ready/Josephine Creeks	8,729	904	B	B	B	B	B	M	C	B	M	B
	16-Winchuck River	6,346	5,710	B	B	C	B	C	M	C	B	M	B
	17-North Fork Smith River	9,083	2,412	B	B	B	B	B	M	C	B	M	B
	19-East and West Fork Illinois River	5,954	3,900	B	B	B	B	B	M	C	B	M	B
	20-Sucker Creek	9,256	6,901	B	B	B	B	B	M	C	B	M	B
	01-Elk and Sixes Rivers	12,198	7,647	T	T	0	T	0	0	0	0	0	2
	02-South Fork Coquille River	9,930	9,070	T	T	T	T	T	1	1	1	1	2
	03-Lobster Creek	4,613	4,087	T	T	T	T	T	1	1	1	1	2
	04-Upper Rogue River	11,894	6,413	T	T	2	T	2	2	2	2	2	6
	05-Lower Rogue River	7,009	5,834	T	T	2	T	2	2	2	2	2	5
	06-Indigo Creek	7,851	6,095	T	T	T	T	T	1	1	1	1	1
	07-Silver Creek	6,927	4,704	T	T	9	T	9	9	9	9	9	7
	08-Galice and Slate Creeks	7,050	5,688	T	T	T	T	T	2	2	2	2	4
	09-Lower Illinois River	10,690	5,389	T	T	T	T	T	1	1	1	1	4
	10-Upper Illinois River	14,046	3,431	T	T	T	T	T	2	2	2	2	8
	11-Briggs Creek	6,229	5,161	T	T	T	T	T	2	2	2	2	6
	12-Pistol River	7,128	6,208	T	T	T	T	T	2	2	2	2	2
	13-Lower Chetco River	14,743	9,514	T	T	0	T	0	0	0	0	0	9
	14-Upper Chetco River	15,824	0	N	N	N	N	N	N	N	N	N	N
	15-Rough and Ready/Josephine Creeks	8,729	904	T	T	T	T	T	1	1	1	1	8
	16-Winchuck River	6,346	5,710	T	T	2	T	2	2	2	2	2	5
	17-North Fork Smith River	9,083	2,412	T	T	T	T	T	2	2	2	2	8
	19-East and West Fork Illinois River	5,954	3,900	T	T	T	T	T	2	2	2	2	2
	20-Sucker Creek	9,256	6,901	T	T	T	T	T	3	3	3	3	8

Table II-3 Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
12	**RETENTION VISUAL**												
	Babyfoot Lake	5,227	1,669	X	X				X	X		X	
	Bear Camp	9,179	6,638	X	X				X	X		X	
	Bob's Garden	303	151	X	X				X	X		X	
	Bolan Lake	1,626	722	X	X				X	X		X	
	Bolan Lake (Option 1)	938	491										X
	Briggs V/Shan Creek	1,205	630	X	X				X	X		X	
	Buckskin Peak	36	0	X	X				X	X		X	
	Chetco	6,273	5,015	X	X				X	X		X	
	Chetco (Option 1)	1,712	1,283										X
	Coquille River	3,547	3,045	X	X				X	X		X	
	Crazy Peak	15	0	X	X				X	X		X	
	Eden Valley	48	29	X	X				X	X		X	
	Elk River (Option 1)	1,958	1,805										X
	Frog Lake	550	429	X	X				X	X		X	
	Game Lake	3,403	2,736	X	X				X	X		X	
	Game Lake (Option 1)	2,923	2,510										X
	Highway 199	384	299	X	X	X		X	X	X	X	X	X
	Indigo Creek	1,146	717	X	X				X	X		X	
	Lawson Creek	107	64	X					X	X		X	
	Oregon Caves	3,66	2,882	X	X	X		X	X	X	X	X	X
	Quail Mountain	2,593	1,199	X	X				X	X		X	
	Quail Mountain (Option 1)	1,040	683										X
	Rogue-Illinois	19,563	12,334	X	X				X	X		X	
	Rogue-Illinois (Option 1)	19,362	12,246								X		
	Rogue-Illinois (Option 2)	18,370	11,374										X
	Silver Trails	7,754	2,711	X	X				X	X		X	
	Sugarloaf Mountain	395	364	X	X				X	X		X	
	Upper Illinois	12,186	3,190	X	X	X		X	X	X	X	X	
	Upper Illinois (Option 1)	8,234	2,210										X
	Wheeler Creek	139	145	X	X				X	X		X	X
	Wild Horse	367	133	X	X				X	X		X	
	Winchuck River	1,040	921	X	X				X	X		X	X
	Windy Valley	725	640	X	X				X	X		X	
13	**PARTIAL RETENTION VISUAL**												
	Babyfoot Lake	10,229	1,578	X	X				X	X		X	
	Babyfoot Lake (Option 1)	15,456	3,247								X		X
	Bear Camp	16,656	13,947	X	X				X	X		X	
	Bear Camp (Option 1)	25,835	20,585								X		X
	Biscuit Hill	3,526	117	X	X				X	X		X	
	Bob's Garden	6,251	5,960	X	X				X	X		X	
	Bob's Garden (Option 1)	303	151								X		
	Bob's Garden (Option 2)	6,554	6,111										
	Bob's Garden (Option 3)	3,327	2,967										X
	Bolan Lake	10,915	7,235	X	X				X	X		X	
	Bolan Lake (Option 1)	12,541	7,957								X		
	Bolan Lake (Option 2)	11,605	7,466										X
	Briggs V/Shan Creek	14,342	11,629	X	X				X	X		X	
	Briggs V/Shan Creek (Option 1)	5,530	4,275								X		
	Briggs V/Shan Creek (Option 2)	15,547	12,259										
	Briggs V/Shan Creek (Option 3)	8,193	6,509										X
	Buckskin Peak	19,222	2,522	X	X				X	X		X	
	Chetco	19,584	17,759	X	X				X	X		X	
	Chetco (Option 1)	25,857	22,774			X	X	X					
	Chetco (Option 2)	6,273	5,015								X		
	Chetco (Option 3)	9,409	8,356										X
	Coquille River	10,096	9,449			X		X					
	Coquille River (Option 1)	13,643	12,494								X		
	Coquille River (Option 2)	18,676	17,158										X

Table II-3. Special Area Assignments (Continued)

MA No	Name of MANAGEMENT AREA/ Special Area	Area NF (Acres)	Area T Suit. (Acres)	Alternative Selection NC	A	B	C	D	E	G	K	M	S
13	**PARTIAL RETENTION VISUAL** (Continued)												
	Crazy Peak	7,559	5,057	X	X				X	X	X	X	X
	Eden Valley	1,771	1,672	X	X				X	X		X	
	Eden Valley (Option 1)	133	122								X		X
	Elk River	2,971	2,203	X	X				X	X	X	X	
	Elk River (Option 1)	1,205	569										X
	Frog Lake	1,648	1,549	X	X				X	X		X	
	Game Lake	5,649	4,126	X	X				X	X		X	
	Game Lake (Option 1)	9,052	6,862								X		
	Game Lake (Option 2)	6,128	4,354										X
	Highway 199	4,358	2,857	X	X	X		X	X	X	X	X	X
	Hog Mountain	1,450	1,358	X	X				X	X		X	
	Horse Mountain	10	9	X	X				X	X		X	
	Indigo Creek	6,331	5,582	X	X				X	X		X	
	Indigo Creek (Option 1)	7,477	4,865										
	Lawson Creek	2,469	1,370	X	X				X	X		X	
	Lawson Creek (Option 1)	1,842	1,509										X
	Mt Butler	3,626	2,851	X	X				X	X		X	
	Mt. Butler (Option 1)	154	137								X		X
	Oregon Caves	4,719	4,292	X	X	X		X	X	X	X	X	
	Oregon Caves (Option 1)	8,388	7,174				X						
	Oregon Caves (Option 2)	4,721	4,292										X
	Pacific Crest	3,429	1,270	X	X				X	X		X	
	Quail Mountain	3,861	3,564	X	X				X	X		X	
	Quail Mountain (Option 1)	6,454	4,773								X		
	Quail Mountain (Option 2)	5,412	4,082										X
	Red Dog	9,670	4,951	X	X			X	X			X	
	Rogue-Illinois	40,374	37,033	X	X				X	X		X	
	Rogue-Illinois (Option 1)	59,937	49,367			X	X	X					
	Rogue-Illinois (Option 2)	40,609	37,156								X		
	Rogue-Illinois (Option 3)	42,867	39,087										X
	Rough and Ready	2,912	32	X	X				X	X		X	
	Silver Trails	9,653	7,462	X	X				X	X		X	
	Silver Trails (Option 1)	17,407	10,173										
	Silver Trails (Option 2)	788	667										X
	Slate Creek	4,113	1,729	X	X				X	X		X	
	Sourdough	5,029	539	X	X				X	X		X	
	Sourdough (Option 1)	1,947	197										X
	Sugarloaf Mountain	7,621	5,999	X	X				X	X		X	
	Upper Chetco	8,619	4,906	X	X				X	X		X	
	Upper Chetco (Option 1)	6,197	3,891										X
	Upper Illinois	21,962	9,322	X	X	X		X	X	X	X	X	
	Upper Illinois (Option 1)	34,148	12,510				X						
	Upper Illinois (Option 2)	24,468	9,093										X
	Wheeler Creek	5,285	3,062	X	X				X	X		X	
	Wild Horse	5,477	5,233	X	X				X	X		X	
	Winchuck River	3,659	3,529	X	X				X	X		X	
	Winchuck River (Option 1)	4,699	4,450			X		X					
	Winchuck River (Option 2)	1,040	921								X		
	Winchuck River (Option 3)	2,420	2,337										X
	Windy Valley	2,655	2,440	X	X				X	X		X	

1/ The Omnibus Oregon Wild and Scenic Rivers Act of 1988 designated the Chetco, North Fork Smith, and Elk Rivers Any alternative selected would be brought into conformance with the Act.

2/ The following LEGEND applies to the "Alternative Selection" of Riparian.

B = Riparian B Rx
C = Riparian C Rx
M = Minimum Level Rx
M = Minimum Level Rx
7 = 7% Basin Constraint
9 = 9% Basin Constraint
0 = 10% Basin Constraint
1 = 11% Basin Constraint
2 = 12% Basin Constraint
3 = 13% Basin Constraint
4 = 14% Basin Constraint
5 = 15% Basin Constraint
6 = 16% Basin Constraint
8 = 17% Basin Constraint
T = 20% Basin Constraint
N = N/A Basin Constraint

Table II-4 Recreation Site and Trail Assignments

Type of Site	Development Scale	Name of Area	Area NF (Acres)	Picnic Units	Camp Units	Boat Launch	Alternative Selection N C	A	B	C	D	E	G	K	M	S
DEVELOPED RECREATION SITES																
Res	-	Agness Rec. Residences	4	0	0	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Big Pine	35	12	14	0	X	X	X	X	X	X	X	X	X	X
Picnic	2	Big Tree	5	3	0	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Bolan Lake	12	0	12	1	X	X	X	X	X	X	X	X	X	X
Camp	3	Butler Bar	12	1	7	0	X	X	X	X	X	X	X	X	X	X
Camp	4	Cave Creek	30	0	18	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Daphne Grove	11	3	17	0	X	X	X	X	X	X	X	X	X	X
Boat	4	Foster Bar	12	0	0	1	X	X	X	X	X	X	X	X	X	X
Camp	4	Grayback	26	8	35	0	X	X	X	X	X	X	X	X	X	X
Camp	4	Illahe	20	0	22	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Little Redwood	10	4	11	0	X	X	X	X	X	X	X	X	X	X
Picnic	4	Lobster Creek	5	12	5	1	X	X	X	X	X	X	X	X	X	X
Camp	-	Ludlum Place (Group)	14	2	2	0	X	X	X	X	X	X	X	X	X	X
Lodge	-	Marial Lodge (Rooms)	32	0	12	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Myrtle Grove	4	0	6	0	X	X	X	X	X	X	X	X	X	X
Camp	4	Quosatana	37	0	43	1	X	X	X	X	X	X	X	X	X	X
Camp	3	Rock Creek	9	2	6	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Squaw Lake	11	1	6	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Store Gulch	4	0	3	0	X	X	X	X	X	X	X	X	X	X
Camp	3	Winchuck	21	3	8	0	X	X	X	X	X	X	X	X	X	X
Picnic	2	Bear Camp Overlook	1	1	0	0	X	X	X	X	X	X	X	X	X	X
MINIMUM DEVELOPED RECREATION SITES																
Camp	2	Bear Camp Pasture	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Briggs Valley	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Camp	1	Brushy Bar	3	0	8	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Buck Creek	1	0	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Eden Valley	1	0	1	0	X	X	X	X	X	X	X	X	X	X
Picnic	2	Elk Creek Falls	1	1	0	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Elkhorn	1	0	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Elko	10	0	3	0	X	X		X		X	X	X	X	X
Camp	2	Game Lake	3	0	6	0	X	X	X	X	X	X				
Camp	2	Laird Lake	5	5	4	0	X	X		X		X	X	X	X	X
Camp	2	Lockhart	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Long Ridge	1	0	2	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Myers Creek	1	10	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Panther Creek	1	0	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Peacock	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Pioneer Camp	1	1	2	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Red Mountain	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Sam Brown	20	3	3	0	X	X	X	X	X	X				
Camp	2	Secret Creek	1	1	1	0	X	X	X	X	X	X	X	X	X	X
Picnic	2	Shan Creek Viewpoint	1	1	0	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Spalding Mill	2	1	2	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Sunshine	1	2	2	0	X	X		X						
Camp	2	Tin Can	1	1	2	0	X	X	X	X	X	X	X	X	X	X
Camp	2	Wildhorse	11	0	3	0	X	X		X		X	X	X	X	X
Camp	2	Wooden Rock	1	0	1	0	X	X	X	X	X	X	X	X	X	X

Table II-4 Recreation Site and Trail Assignments

Type of Site	Develop-ment Scale	Name of Area	Area NF (Acres)	Picnic Units	Camp Units	Boat Launch	Alternative Selection N C	A	B	C	D	E	G	K	M	S
PROPOSED RECREATION PROJECTS																
Info	4	Agness Visitor Center	1	0	0	0	X	X					X	X	X	X
Picnic	3	Bear Camp Overlook	1	2	0	0										X
Picnic	2	Bigelow Lakes	2	5	0	0							X		X	
Boat	3	Bradford Creek	2	2	0	1			X		X	X	X		X	
Camp	3	Briggs Creek	5	0	8	0			X		X	X	X		X	X
Camp	3	Eight Dollar Mountain	15	10	20	0							X		X	
Camp	2	Game Lake (Group Site)	6	0	8	0							X	X	X	X
Camp	3	Josephine Bridge	5	5	20	1			X		X	X	X	X	X	X
Camp	3	Maple	5	5	15	0							X	X	X	X
Boat	3	Miami Bar	1	0	0	1			X		X	X	X	X	X	X
Boat	3	Nail Keg Creek	1	2	0	1			X		X	X	X		X	
Camp	3	Nancy Creek	14	5	30	0			X		X	X	X	X	X	X
Camp	3	Old English Place	20	5	20	0							X		X	
Camp	2	Packers Cabin	4	0	5	0							X		X	
Picnic	3	Page Mountain Grove	10	5	0	0							X	X	X	X
Camp	2	Red Mountain Prairie	8	0	10	0							X		X	
Camp	3	Sam Brown (Group Site)	80	0	36	0							X	X	X	X
Picnic	3	Shasta Costa Vista Point	1	1	0	0										X
Camp	3	Sixmile	2	8	8	0			X		X	X	X	X	X	X
Camp	3	Sunshine Bar	5	5	20	0			X		X	X	X	X	X	X
Vista	3	Deer Creek Overlook	1	0	0	0										X
Camp	3	Store Gulch	4	3	0	0										X
Camp	2	Knopke Gulch	4	0	3	0										X
Picnic	2	Illinois River Falls	3	5	0	0										X
Vista	2	Five Finger Gulch	1	0	0	0										X
"REOPEN" EXISTING CLOSED RECREATION SITES																
Camp	3	Boundary (Dev.)	7	0	5	0				X		X	X		X	
Camp	2	Mc Gribble (Min. Dev.)	5	0	6	0				X		X	X		X	
Camp	2	Pine Point (Min. Dev.)	1	2	0	0				X		X	X		X	
Camp	2	Sourdough (Min. Dev.)	3	0	3	0				X		X	X		X	

Table II-4 Recreation Site and Trail Assignments

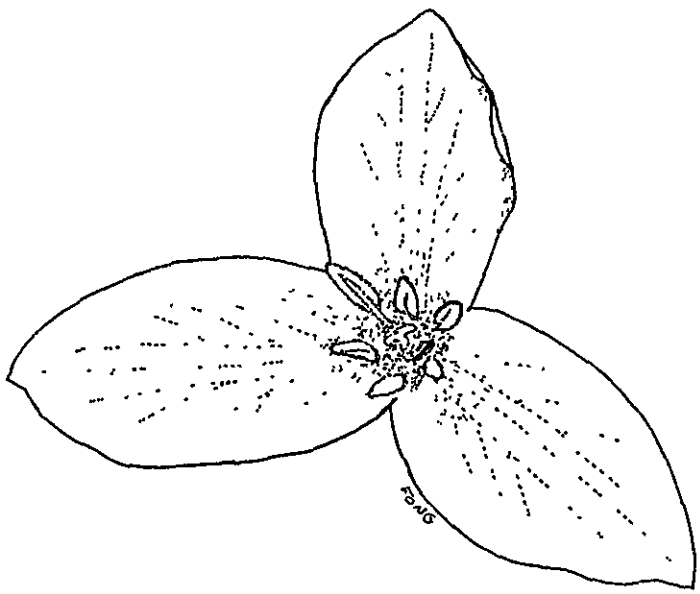
Trail Name	Trail Number	Miles: Wilderness Area Planned	Wilderness Area Existing	Non-Wilderness Planned	Non-Wilderness Existing	Alternative Selection: N	C	A	B	C	D	E	G	K	M	S
POTENTIAL TRAIL IMPROVEMENTS																
Anvil Mountain(Grassy Knob)	1241	8.0	-	-	3.0					X						X
Azalea Lake	1262	-	-	-	1.2		X	X				X	X	X	X	
Baily Cabin	1109 B	1.0	-	-	-				X	X	X				X	
Bald Mountain Relocation	1103 A	6.0	-	-	-				X	X	X			X		X
Black Butte Tie	1273	1.5	-	-	-		X	X					X	X	X	
Blossom Bar	1162	3.0	-	-	-				X	X	X		X	X	X	X
Boulder Creek	1110 B	5.0	-	-	-		X	X	X	X	X		X	X	X	X
Bower Mine Relocation	1102 A	1.5	-	.5	-				X	X	X		X	X	X	X
Carter Creek	1109 A	4.0	-	-	-				X	X	X					
Chetco Gorge	1112	-	-	13.0	1.0		X	X				X	X	X	X	X
Chetco Peak	1133 A	10.0	-	-	-				X	X	X					
Clay Hill Creek	*1161*	*2.0*	-	-	-				X	X	X		X	X	X	X
Coquille River	1202	-	-	6.0	-											X
Eagle Gap	1221 A	-	-	2.0	-								X		X	
Fall Creek	1221	-	-	-	6.0									X		X
Game Lake Trail Complex	1174 A	5.0	-	5.0	-				X	X	X		X	X	X	
Horse Sign Butte Tie	1169 A	1.0	-	1.0	-		X	X					X	X	X	
Johnson Butte	1110	-	3.0	-	-		X	X						X		X
Josephine Mountain	1124 B	-	-	.5	-								X	X	X	X
Klondike Creek	1124 A	8.0	-	-	-				X	X	X					
Lawson Creek	1169	-	-	-	8.0											X
Lobster Creek	1203	-	-	2.0	-											X
Madstone Creek	1134 A	4.0	-	-	-				X	X	X		X	X	X	X
Mule Creek	1163	5.0	-	1.0	-				X	X	X			X		X
Mule Creek East	1163 A	-	1.0	-	-				X	X	X			X		X
Mule Creek West	1163 B	-	1.0	-	-				X	X	X			X		X
Osgood Ditch Int.	1201	-	-	2.0	0											X
Page Mountain Grove	1276	-	-	.8	-		X	X				X	X	X	X	X
Pinnacle Point	1195	2.0	-	-	-				X	X	X					X
Pupps Camp	1174.1	1.5	4.0	-	-		X	X					X	X	X	X
Rough and Ready Creek	1210 A	-	-	4.0	-								X	X	X	X
Silver Creek Falls	1134 B	-	-	.3	-		X	X				X	X	X	X	
Silver Creek Trail	1165	-	-	20.0	-											X
Silver Peak-Hobson Horn	1166	-	-	-	18.1		X	X				X	X	X	X	X
Slate Creek	1241 A	3.0	-	-	-					X						
Snowcamp	1103	-	-	-	8.0		X	X				X	X	X	X	X
Solitude Bar	1188	2.5	-	.5	-				X	X	X					
South Bank Illinois	1162 D	-	-	18.0	-		X	X				X	X	X	X	X
Taggarts Bar	1121 B	2.0	-	-	-				X	X	X					
Tincup Creek	*1117*	*15.0*	*7.0*	-	*3.0*		X	X	X	X	X		X	X	X	X
Tincup Trail (NC)	1116	9.0	-	-	-											X
Vulcan Lake	1121 A	5.0	-	-	-				X	X	X					
Wild Rogue South	1187	-	7.0	-	3 0				X	X	X					

SUMMARY OF ALTERNATIVE OUTPUTS, EFFECTS, ACTIVITIES, AND COSTS

Table II-5 displays the significant land uses, environmental effects, and resource outputs of the alternatives It lists the outputs and/or effects quantitatively by decade. The organization of the alternatives in Table II-5 is also by the level of ground disturbance or vegetation manipulation expected. The alternatives are arranged in order of decreasing selected suitable timber land. This organization is intended to array the alternatives from the most vegetation manipulation to the least (i.e , from the least preservation to the most).

Table II-6 displays the significant land uses, environmental effects and resource outputs of the alternatives. It is a qualitative comparison of the alternatives It is a product of the professional judgement of the ID team. The organization of the alternatives in Table II-6 is also by the level of ground disturbance or vegetation manipulation expected The alternatives are arranged in order of decreasing selected suitable timber land. This organization is intended to array the alternatives from the most vegetation manipulation to the least (i e., from the least preservation to the most).

Table II-7 summarizes in a comparative format the response of each alternative to the individual Planning Problems This table tries to capture in a very brief format the key differences between the alternatives It is based on measurable outputs, but indicates the relative differences without relying solely on the numbers. The alternatives are arranged in order of decreasing selected suitable timber land. This organization is intended to array the alternatives from the most vegetation manipulation to the least (i.e , from the least preservation to the most)



MONSTER MATRIX

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE											
		No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
TIMBER PRODUCTION													
Selected Suitable	1000 Acres	576.0	566.0	560.0	558.0	557.0	557.0	550.0	529.0	505.0	406.0	287.0	207.0
General Forest	1000 Acres	307.0	411.0	394.0	392.0	298.0	298.0	391.0	349.0	310.0	227.0	176.0	105.0
Long-Term Sustained Yield	Million CF	54.2	57.0	54.8	54.8	52.7	52.7	49.0	48.8	48.0	38.7	32.2	22.2
Timber Offered (ASQ-Sawtimber)	Million CF												
Decade 1		31.0 1/	31.8	30.4	36.8	31.2	30.1	33.2	27.8	29.0	20.5	16.2	6.1
Decade 2		31.0 1/	31.8	30.4	36.8	31.2	30.1	33.2	27.8	29.0	20.5	16.2	6 1
Decade 5		31.0 1/	31.8	30.4	25.0	29.4	30.1	33.2	27.8	29.0	20.5	16.2	6.1
Timber Offered	Million BF												
Decade 1		167.5 2/	177.4	169.7	205.4	174.1	167.9	185.2	155.1	161.8	114.4	90.4	34 0
Final Harvest	Acres												
Decade 1		4,518	6,713	5,570	5,562	4,697	4,505	5,251	4,520	4,790	3,495	2,890	754
Decade 2		5,404	5,046	5,466	5,428	5,340	5,206	5,788	4,443	4,823	3,493	2,884	746
Decade 5		5,572	6,072	5,093	4,364	5,429	5,401	5,335	4,217	4,268	3,095	2,560	820
Commercial Thinning	Million CF												
Decade 1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8	0.0	0.0	0.0	0.0
Decade 2		0.1	0.1	0.4	3.7	0.1	0.1	3.0	2.2	0.1	0.1	0.1	0.0
Decade 5		6.5	6.0	6.8	7.9	7.2	6.9	6.1	7.0	6.8	6.4	6.1	2.0
Commercial Thinning	Acres												
Decade 1		0	0	0	0	0	0	0	415	0	0	0	0
Decade 2		65	55	215	1,684	84	65	1,373	1,012	61	56	60	0
Decade 5		4,268	4,060	4,496	5,140	4,731	4,587	4,115	4,583	5,094	4,230	4,043	1,327
Fuelwood	1000 Cords												
Decade 1		51.8	52.9	50.7	59.9	51.2	49.1	55.0	44.3	48.6	35.3	28.0	10 6
Decade 2		50.2	50.9	48.0	54.6	50.4	48.5	48.9	41.4	47.6	33.5	27.8	10.6
Decade 5		37.3	40.3	37.6	26.9	34.0	35.6	44.2	32.5	34.9	21.5	17.4	7.0
Reforestation	Acres												
Decade 1		6,067	10,919	9,218	7,929	6,494	6,254	7,208	6,247	6,310	4,369	3,612	942
Decade 2		7,608	9,210	8,795	7,492	7,906	7,686	8,129	6,660	6,631	4,367	3,605	932.5
Decade 5		9,065	8,751	7,071	7,542	8,885	8,850	8,418	6,712	6,871	4,369	3,200	1,025
Timber Stand Improvement	Acres												
Decade 1		7,067	7,468	7,819	7,594	7,092	7,129	6,891	6,904	5,298	5,927	5,740	2,987
Decade 2		7,140	12,229	10,830	9,026	7,493	7,297	8,397	7,271	7,569	5,577	4,851	2,086
Decade 5		10,684	11,276	9,896	11,394	11,163	10,571	11,455	8,320	10,285	6,441	4,193	1,802
Timber Growth in Year 2030	Million CF	36.7	46.5	43.4	38.7	37.3	36.6	33.6	35.0	35.3	29.0	26.1	17.3

1/ Potential Yield from the 1962 Timber Management Plan is displayed for the No Change Alternative.
2/ Does not include 5 MMBF nonchargeable salvage.

MONSTER MATRIX (Cont'd)

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE											
		No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
OLD-GROWTH FOREST													
Old Growth & Mature Reserved	1000 Acres	153.0	166.1	171.0	171.0	173.8	173.8	171.0	184.7	198.1	254.0	273.1	289.6
Available Old Growth at end of:	1000 Acres												
Decade 1 1/		345.2	352.8	348.4	328.8	341.9	343.0	334.2	343.0	341.9	358.3	364.8	385.6
Decade 2 1/		284.0	297.1	292.7	265.4	279.6	282.9	267.6	289.5	286.2	315.7	335.3	377.9
Decade 5 1/		184.6	184.6	191.2	175.8	193.3	193.3	172.6	199.9	208.6	249.0	296.0	356.1
SOIL, WATER, AND FISHERIES													
Harvest Dispersion Constraint	No. Basins	0	0	6	6	0	0	6	18	18	18	18	18
Sediment	1000 Tons												
Decade 1		696.9	748.7	733.4	723.9	703.1	697.3	715.4	705.4	708.0	686.0	679.5	634.8
Decade 2		725.4	718.7	727.0	718.0	729.1	725.6	731.9	704.8	712.0	689.0	677.9	637.5
Decade 5		716.0	715.9	702.4	699.6	713.5	713.3	673.5	695.8	691.0	680.0	664.3	641.5
Improved Watershed Condition	Acres												
Decade 1		452	811	697	579	470	451	540	452	479	350	289	75
Decade 2		540	645	648	544	552	528	595	452	483	349	288	75
Decade 5		632	607	509	548	618	615	618	452	502	350	256	82
Fish Use	1000 WFUD's												
Decade 1		67.0	68.2	68.9	72.5	67.0	67.0	69.0	71.3	72.3	69.8	69.6	69.8
Decade 2		74.4	76.5	78.9	85.3	74.4	74.4	78.9	77.4	86.8	79.5	79.1	79.5
Decade 5		74.4	66.8	81.3	88.1	74.4	74.4	81.3	77.7	88.7	82.0	81.5	82.0
Anadromous Fish													
Commercial Harvest	1000 Pounds												
Decade 1		978	992	1,005	1,048	978	978	1,005	1,028	1,044	1,014	1,011	1,014
Decade 2		1,075	1,104	1,145	1,229	1,075	1,075	1,145	1,189	1,222	1,154	1,147	1,154
Decade 5		1,075	1,104	1,181	1,274	1,075	1,075	1,181	1,203	1,249	1,194	1,185	1,194
Management Indicator Species													
Steelhead	1000 Smolts												
Decades 1, 2		791.0	853.4	862.0	906.8	791.0	791.0	862.1	840.3	875.4	873.3	870.3	869.5
Decade 5		972.9	980.9	1,044.6	1,120.0	972.9	972.9	1,044.6	958.5	998.5	1,065.6	1,056.3	1,060.9
Chinook Salmon	1000 Smolts												
Decades 1, 2		2,269.0	2,265.8	2,288.7	2,407.4	2,269.0	2,269.0	2,228.7	2,230.9	2,265.6	2,318.6	2,310.7	2,308.5
Decade 5		2,517.3	2,604.3	2,773.4	2,973.4	2,517.3	2,517.3	2,773.4	2,544.6	2,641.8	2,829.0	2,804.4	2,816.6
Searun Cutthroat Trout	1000 Smolts												
Decades 1, 2		135.6	133.9	135.2	142.2	135.6	135.6	135.2	131.8	137.3	137.0	136.5	136.4
Decade 5		152.0	153.9	163.9	175.7	152.0	152.0	163.9	150.3	156.6	167.2	165.7	166.4
Capital Investment (Fish plus Soil and Water)	Thousand $												
Decade 1		451.4	664.6	595.6	650.0	464.7	455.1	563.1	589.8	581.0	429.2	388.3	387.1
Riparian Prescriptions C and M	1000 Acres	37.8	32.2	63.0	63.0	29.1	29.1	67.1	33.0	49.4	72.5	62.3	56.1
Management Areas 1 through 9	1000 Acres	280.9	309.8	319.7	319.7	327.5	327.5	319.7	375.4	464.7	557.7	642.3	670 1

1/ Mature is not included; old growth acres are derived by estimating the proportion of mature and old growth that is old growth.

MONSTER MATRIX (Cont'd)

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
WILD AND SCENIC RIVERS													
Wild and Scenic River Use	1000 RVD's												
Decade 1		144.8	122.8	122.8	122.8	144.8	144.8	122.8	122.8	151.3	144.8	144.8	144.8
Decade 2		152.2	129.7	129.7	129.7	152.2	152.2	129.7	129.7	159.0	152.2	152.2	152.2
Decade 5		175.1	152.6	152.6	152.6	175.1	175.1	152.6	152.6	182.9	175.1	175.1	175.1
Adjacent Area Meeting VQO	1000 Acres	165.6	145.7	147.8	147.8	168.1	168.1	147.8	143.7	156.8	174.5	183.2	183.7
SENSITIVE PLANTS													
Research Natural Area	1000 Acres	3.2	3.3	3.3	3.3	3.2	3.2	3.3	4.8	4 6	4.8	4.8	4.8
Botanical Area	1000 Acres	4.5	9.1	9.1	9.1	4.5	4.5	9.1	10.7	19.6	39.0	27.6	39.0
VISUAL RESOURCES													
Visual Quality Objectives													
Preservation	1000 Acres												
Decade 1		318.6	342.0	349.7	349.7	356.6	356.6	356.6	402.3	487.5	584.9	704.7	726.3
Retention	1000 Acres												
Decade 1		72.3	9.5	18.2	18.2	65.5	65.5	18.1	15.1	21.3	31.3	25.8	23.3
Partial Retention	1000 Acres												
Decade 1		258.6	97.6	106.1	106.1	246.3	246.3	105.1	145.4	148.4	164.7	116.3	109.4
Modification/Max-Mod.	1000 Acres												
Decade 1		442.8	643.2	618.3	618.3	423.9	423.9	612.5	529.5	435.1	311.4	245.5	233.3
Meets or Exceeds Part. Retention	1000 Acres	649.5	449.1	474.0	474.0	668.4	668.4	479.8	562.8	657 2	780.9	846.8	859.0
Viewsheds Meeting Inventoried VQO	Number	44	5	8	8	44	44	8	9	12	44	44	44
WILDLIFE HABITAT													
Spotted Owl Habitat Capability	Pair												
Decade 1		153	153	153	153	153	153	153	153	153	153	153	153
Decade 2		113	136	137	135	137	137	135	138	139	142	147	150
Decade 5		32	86	89	81	90	90	80	93	97	107	129	140
Woodpecker Habitat Capability in Managed Forest	Percent	60	20	20	20	60	60	20	60	60	60	60	60
Deer	1000 Deer												
Decade 1		28.3	35.2	33.2	30.8	28.6	28.1	29.7	27.7	27.9	24.4	22.0	16.5
Decade 2		29.9	33.3	32.8	30.5	30.2	29.5	31.2	27.8	28.2	24.2	21.7	16.0
Decade 5		32.7	32.1	30.0	31.0	32.2	32.7	32.3	28.2	28.8	24.8	21.4	16.6
Osprey	Pair												
Decades 1, 2, 5		18	18	18	18	18	18	18	18	18	18	18	18
Wildlife	1000 WFUD's												
Decade 1		77.3	93.3	87.1	94.3	84.2	83.6	87.1	83.1	97.1	78.6	75.5	60.0
Decade 2		81.7	92.9	88.9	96.2	88.7	87.9	88.9	85.5	99.6	80.6	77.3	69.7
Decade 5		92.6	99.1	92.6	104.7	99.2	99.1	92.6	93.8	107 4	89.1	84.6	78.1

MONSTER MATRIX (Cont'd)

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
WILDLIFE HABITAT (Continued)													
Old-Growth Habitat at end of:	Percent Forest												
Decade 1		31.6	32.3	31.9	30.1	31.3	31.4	30.6	31.4	31.3	32 8	33.4	35.3
Decade 2		26.0	27.2	26.8	24.3	25.6	25.9	24.5	26.5	26.2	28.9	30.7	34.6
Decade 5		16.9	16.9	17.5	16.0	17.7	17.7	15.8	18.3	19.1	22.8	18.3	32.6
Habitat Improvement	1000 Acres												
Decades 1,2,5		0.0	4.5	2.3	45.5	4.5	4.5	4.5	4.5	9.8	4.5	4.5	4.5
Habitat Improvement	*1000 Structures*												
Decades 1, 2, 5		0.0	1.9	1.0	1.9	1.9	1.9	1.9	1.9	4.2	1.9	1.9	1.9
Special Wildlife Sites	1000 Acres	7.5	11.4	11.4	11.4	7.5	7.5	11.4	25.0	45.1	25.0	25.0	25.0
Capital Investments	Thousand $												
Decades 1,2,5		0.0	560.0	560.0	1,100.0	560.0	560.0	280.0	560.0	1,230.0	560.0	560.0	560.0
WILDERNESS AND UNROADED													
Inventoried Unroaded Areas Assigned to Unroaded Management Prescriptions (Management Areas 1-9)	1000 Acres	27.8	30.7	36.5	36.5	47.2	47.2	36.5	70.0	146.5	178.1	284.2	284.2
Unroaded Primitive and Semi-Primitive Recreation Opportunities	1000 Acres	261.5	261.5	261.5	261.5	261.5	261.5	261.5	269.5	293.5	342.5	343.5	347.5
MINERALS													
Non Energy Minerals Accessible with Limited (Low to Moderate) Restriction	Oper Plans	335	335	335	335	335	335	335	335	335	250	200	200
	1000 Acres	786.0	809.6	798.2	798.2	786.7	786.7	798.2	768.1	754.5	732.2	765.1	746.6
RECREATION													
Developed Recreation Use	1000 RVD's												
Decade 1 1/		121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6
Decade 2		127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.8	127.8
Decade 5		148.4	148.4	148.4	148.8	148.4	148.4	148.4	148.4	148.4	148.8	148.8	148.4
Non Wilderness Dispersed Recreation Use													
Roaded	1000 RVD's												
Natural													
Decade 1		366.1	388.1	388.1	388.1	366.1	366.1	388.1	388.1	366.2	366.1	366.1	366.1
Decade 2		386.1	408.0	408.0	408.0	386.1	386.1	408.0	408.0	386.1	386.1	386.1	386.1
Decade 5		452.0	473.9	473.9	473.9	452.0	452.0	473.9	473.9	452.0	452.0	452.0	452.0
Semi-Primitive Motorized													
Decade 1		72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.3	72.2	72.3
Decade 2		76.0	76.0	76.0	75.9	76.0	76.0	76.0	75.9	75.9	75.9	75.9	75.9
Decade 5		88.2	88.2	88.2	88.1	88.2	88.2	88.2	88.1	88.1	88.1	88.1	88.1

1/ These decades represent an average annual output or effect for their 10-year periods.

MONSTER MATRIX (Cont'd)

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
RECREATION (Continued)													
Non Wilderness Dispersed													
Recreation Use (Continued)													
Unroaded	1000 RVD's												
Semi-Primitive Non-Motorized													
Decade 1		12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Decade 2		6.2	6.2	6.2	6.2	6.2	6.2	6.2	7.1	12.7	12.7	12.7	12.7
Decade 5		6.2	6.2	6.2	6.2	6.2	6.2	6.2	7.1	14.8	14.8	14.8	14.8
Primitive													
Decade 1		0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Decade 2		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.7	0.7	0.7	0.7
Decade 5		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.8	0.8	0.8	0.8
Wilderness Use	1000 RVD's												
Decade 1		22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Decade 2		23.6	23.6	23.5	23.6	23.6	23.6	23.5	23.6	23.6	23.6	23.6	23.6
Decade 5		27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4
Trail Construction/ Reconstruction 1/	Miles	102.4	124.0	110.0	110.0	102.4	102.4	110.0	147.9	192.9	126.9	60.4	127.9
Developed Site Construction/ Reconstruction	PAOT	1,850	2,255	1,850	1,755	1,850	1,850	1,850	2,465	2,573	3,145	2,285	3,145
OTHER													
Arterial and Collector Road													
Construction	Miles/Decade												
Decade 1		10.0	20.0	15.0	20.0	10.0	10.0	15.0	26.0	26.0	0.0	0.0	0.0
Decade 2		10.0	10.0	12.0	15.0	10.0	10.0	12.0	10.0	22.0	0.0	0.0	0.0
Decade 5		4.0	0.0	0.0	0.0	4.0	4.0	0.0	0.0	0.0	0.0	0.0	0.0
Reconstruction	Miles/Decade												
Decade 1		80.6	94.8	86.3	92.4	81.3	80.6	94.8	72.5	74.8	56.0	45.1	12.8
Decade 2		81.6	89.9	86.5	92.0	82.3	81.6	95.1	73.8	75.3	56.0	45.1	11.2
Decade 5		90.2	98.2	87.3	92.2	90.6	90.2	96.3	75.7	76.3	58.8	48.2	12.7
Purchaser Road													
Construction	Miles/Year												
Decade 1		21.8	28.8	24.6	25.2	21.9	21.8	24.5	19.0	21.2	13.6	10.7	0.0
Decade 2		23.2	25.1	25.4	25.5	23.7	23.2	26.2	19.5	20.6	13.6	10.6	0.0
Decade 5		25.2	29.2	25.1	21.6	25.3	25.2	18.9	19.8	19.8	13.5	8.9	0.0
Reconstruction	Miles/Year												
Decade 1		145.8	171.5	156.0	167.1	147.0	145.8	171.5	131.1	135.3	101.2	81.5	23.1
Decade 2		147.5	162.6	156.4	166.4	148.9	147.5	172.0	133.5	136.2	101.3	81.6	20.2
Decade 5		163.1	177.5	157.8	166.7	163.8	163.1	174.2	136.9	138.0	106.3	87.1	23.0

1/ Total miles completed by the end of the Fifth Decade or sooner.

Table II-5. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs (by decreasing amount of vegetative manipulation expected)

Outputs/Effects	Units of Measure	ALTERNATIVE No Change	C	D	B RPA	A Departure	A No Action	D1	K	S	G	E	M
OTHER (Continued)													
Roads Suitable for Public Use													
Passenger Car	Miles												
Decade 1		1,245	1,235	1,511	1,613	1,246	1,245	1,511	1,396	1,401	916	1,403	1,057
Decade 2		1,325	1,284	1,608	1,703	1,327	1,325	1,611	1,459	1,468	919	1,435	1,057
Decade 5		1,546	1,431	1,870	1,939	1,547	1,546	1,873	1,616	1,631	927.0	1,522	1,057
High Clearance Vehicle Only	Miles												
Decade 1		1,283	1,341	1,043	941	1,282	1,283	1,042	806	810	1,388	619	1,059
Decade 2		1,351	1,450	1,104	1,010	1,351	1,351	1,105	828	832	1,440	625	1,059
Decade 5		1,589	1,816	1,295	1,238	1,590	1,589	1,293	908	917	1,594	639	1,059
Roads Closed	Miles												
Decade 1		347	377	362	368	348	347	362	649	662	483	733	529
Fire Management													
Effectiveness Index	$/1000 Protected Acres												
Decades 1, 2, 5		2,140	1,776	1,776	1,776	2,140	2,140	1,776	1,776	1,776	1,776	1,776	1,776
Fuel Treatment (Natural Fuels)	Acres												
Decade 1		60.0	400.0	400.0	250.0	60.0	60.0	400.0	400.0	400.0	400.0	400.0	400.0
Decades 2, 5		60.0	400.0	400.0	250.0	60.0	60.0	400.0	400.0	400.0	400 0	400.0	400.0
Total Capital Investment Costs	Million $												
Decade 1		6.9	8.2	7.5	8.2	7.0	7.0	7.9	6.7	7.2	4.7	3.9	1.1
Returns to Government	Million $												
Decade 1		56.9	58 4	55.8	67.9	57.4	55.3	61.3	50.6	53.6	37.9	29.9	10.8
Decade 2		62.8	64.3	61.1	71.1	62.9	60.8	64.4	54.2	58.9	41.6	32.9	12.0
Decade 5		68.2	73.2	68.2	51.0	62.7	64.9	56.8	60.3	59.2	41.2	31.0	12 1
Changes in Jobs	Number												
Compared to Average Harvest 1975-84 1/		660	830	640	1,230	680	580	880	380	560	-300	-700	-1650
Compared to Alternative A		*80*	*250*	*60*	*650*	100	0	300	-200	-20	-880	-1280	-2303
Annual Changes in Income	Million $												
Compared to Average Harvest 1975-84 1/		15.7	18.2	15.0	28.3	16.1	13.8	20.7	9.0	13.0	-6.4	-15.3	-38.8
Compared to Alternative A		1.9	4.4	1.2	14.5	2.3	0.0	6.9	-4.8	-1.1	-20.2	-29.1	-52.6
Annual Payments to Counties	Million $												
Decade 1		13.8	14.2	13.5	16.4	13.9	13.4	14.8	12.4	12.9	8.8	6.8	2.7
Range-Permitted Grazing	1000 AUM's												
Decades 1, 2, 5		3	3	3	3	3	3	3	3	3	3	3	3

1/ 23.7 MMCF

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	No Change (NC)	C	D	B	A-Departure	A
Air Quality.	Moderate temporary adverse impact.	High adverse impact exceeds baseline.	High adverse impact.	Moderately high adverse impact.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Visual Character of the Forest.	Range from natural appearing to modified.	Primarily modified visual character.	Same as Alternative C.	Same as Alternative C.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Changes in Recreational Use Patterns.	No changes anticipated. Some increase in Wild & Scenic.	Possible increase in use of developed sites and Wilderness.	Some increase in Wilderness use may occur.	Same as Alternative D.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Accessibility for Exploration of Mineralized Areas.	Moderately accessible.	Most accessible.	Second most accessible.	Same as Alternative D.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Energy: Fuelwood for Domestic Use.	Moderate availability.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Greatest availability.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Small Hydroelectric Sites.	Slightly less restrictive than normal development.	Roading would allow normal development.	Slightly less restrictive than Alternative C.	Same as Alternative D.	Same as Alternative C.	Same as Alternative C.
Requirements.	Moderate demand for fossil fuels.	Slightly greater demand than NO CHANGE Alternative.	Slightly less demand than NO CHANGE Alternative.	Greatest demand for fossil fuels.	Slightly greater demand than NO CHANGE Alternative.	Slightly less demand than Alternative D.
Effects on Ongoing Economic Trends: Changes in Employment Opportunities.	Significant increase in jobs in lumber, wood products, & service sectors.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Significant but temporary increase in jobs in lumber, wood products, & service sectors.	Same as Alternative B.	Same as NO CHANGE Alternative.

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected) (Cont'd)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	No Change (NC)	C	D	B	A-Departure	A
Effects of Ongoing Economic Trends: Changes in Lifestyles.	More opportunities for jobs, hunting, firewood gathering & motorized recreation. Less opportunity for roadless rec. & undisturbed scenery.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative but more opportunity for fish.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Community Cohesion.	Conflicts within communities are accelerated due to reduction of MR's for old-growth indicator species.	Community conflicts increased.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Conflicts within communities are not accelerated.
Historic and Cultural Resources.	Much inventory & evaluation of sites. Greater chance of site damage due to ground-disturbing activities.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Research Values.	Opportunities for research dealing with natural ecosystems reduced.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Threatened and Endangered Species.	Old-growth habitat for indicator species is not protected.	All present habitat maintained; exceeds eagle recovery needs.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected) (Cont'd)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	No Change (NC)	C	D	B	A-Departure	A
Game Populations and Distributions.	Populations slightly higher than present situation.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Nongame Species: Populations, Distributions.	Long-term habitat reduced below MR levels for old-growth dependent species.	Habitat maintained at MR levels or above.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.
Plant Diversity.	Diversity maintainable.	Potential for maintaining diversity lowered.	Same as Alternative C.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Wild and Scenic River Eligibility.	The Omnibus Oregon Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers as National Wild and Scenic Rivers. As a result, the inventoried Wild and Scenic Rivers would be treated the same for all alternatives.					

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected) (Cont'd)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	D1	K	S	G	E	M
Air Quality.	Same as Alternative B.	Produces moderate adverse impact.	Same as Alternative K.	Low adverse impact.	Same as Alternative G.	Negligible adverse impact.
Visual Character of the Forest.	Same as NO CHANGE Alternative.	Modified natural appearance in recreation corridor.	Natural, or near natural appearance in sensitive viewsheds.	Maintenance of existing visual character.	Same as Alternative G.	Improves visual quality over time.
Changes in Recreational Use Patterns.	Same as Alternative D.	None expected.	Some increase in Wild & Scenic, otherwise no change.	Same as Alternative S.	Same as Alternative S.	None Expected.
Accessibility for Exploration of Mineralized Areas.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Least accessible.	Same as NO CHANGE Alternative.	Same as Alternative G.
Energy: Fuelwood for Domestic Use.	High availability.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Least availability.	Same as Alternative G.	Same as Alternative G.
Small Hydroelectric Sites.	Same as Alternative D.	Same as Alternative C.	Same as Alternative C.	Much more restrictive than Alternative C.	Same as Alternative G.	Greatly more restrictive than Alternative C.
Requirements.	Somewhat less demand than Alternative B.	Somewhat less demand than Alternative A.	Slightly greater demand than Alternative K.	Somewhat greater demand than Alternative E.	Somewhat greater demand than Alternative M.	Least demand for fossil fuels.
Effects of Ongoing Economic Trends: Changes in Employment Opportunities.	Same as Alternative D.	A few more jobs in lumber, wood products, trade, & service sectors.	Same as Alternative K.	Decrease in jobs in lumber, wood products, trade & service sectors.	Significant decrease in jobs in products, trade, & service sectors.	Same as Alternative E.

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected) (Cont'd)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	D1	K	S	G	E	M
Effects on Ongoing Economic Trends: Changes in Lifestyle.	Same as NO CHANGE Alternative.	Intermediate opportunities for jobs, hunting, firewood gathering, and motorized recreation. Less opportunity for roadless recreation. More opportunity for fishing.	More opportunity for jobs, hunting, firewood gathering, motorized, and roadless recreation. More opportunity for fishing. Less opportunity for undisturbed scenery.	More opportunities for viewing undisturbed scenery, fishing, & roadless recreation. Less opportunity for hunting, firewood gathering, & motorized recreation.	Same as Alternative G.	Same as Alternative G.
Community Cohesion.	Same as Alternative C.	Same as Alternative A.	Same as Alternative A.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.
Historic and Cultural Resources.	Same as NO CHANGE Alternative.	Moderate levels of disturbance and evaluation of sites.	Same as Alternative K.	Little disturbance or evaluation of sites.	Same as Alternative G.	Same as Alternative G.
Research Values.	Same as NO CHANGE Alternative.	Opportunities for research dealing with natural ecosystems maintained.	Same as Alternative K.	Same as Alternative K.	Same as Alternative K.	Opportunities for research dealing with natural ecosystems enhanced.
Threatened and Endangered Species.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.

Table II-6. Qualitative Resource Outputs and Environmental Effects (by decreasing amount of vegetative manipulation expected) (Cont'd)

Resource Outputs and Environmental Effects	ALTERNATIVE					
	D1	K	S	G	E	M
Game Populations and Distributions.	Same as NO CHANGE Alternative.	Slightly lower than present situation.	Same as NO CHANGE Alternative.	Populations lower than present situation.	Same as Alternative G.	Populations significantly lower than present situation.
Nongame Species: Populations, Distributions.	Same as Alternative C.	Same as Alternative C.	Same as Alternative C.	Habitat maintained above MR levels.	Same as Alternative G.	Population in old-growth and mature conifer habitat highly benefited; other habitat substantially lower
Plant Diversity.	Same as Alternative C.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.	Same as NO CHANGE Alternative.
Wild and Scenic River Eligibility.	The Omnibus Oregon Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers as National Wild and Scenic Rivers. As a result, the inventoried Wild and Scenic Rivers would be treated the same for all alternatives.					

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE NO CHANGE	C	D	B (RPA)
1. How much timber should the Forest produce?	A. Selected Suitable Forest Land Base (Commercial Forest Land)	Ranked highest selected acreage: 576,000 acres.	Ranked 2nd in selected acreage: 566,000 acres. 10,000 acres less than NO CHANGE.	Ranked 3rd in selected acreage: 560,000 acres. 16,000 acres less than NO CHANGE.	Ranked tied-4th in selected acreage: 558,000 acres. 18,000 acres less than NO CHANGE.
	B. Comparison with RPA target ASQ.	5.8 MMCF less than RPA.	5.0 MMCF less than RPA. Highest non-departure output. Meets current level.	6.4 MMCF less than RPA.	Cuts 36.8 MMCF, with strong departure, to meet RPA and State goals. Note drop in ASQ in the 5th decade.
	C. ASQ - 1st Decade	Ranked 5th	Ranked 3rd	Ranked 6th	Ranked 1st
	D. ASQ - 5th Decade	Ranked 3rd	Ranked 2nd	Ranked 4th	Ranked 9th
	E. LTSY.	Ranked 4th	Ranked 1st	Rank tied	Rank tied
2. How much old-growth forest should be preserved?	A. Total Area of old growth, plant & wildlife habitat.	The 41% of Forest now in old growth declines to 17% at 5th decade, eventually down to 14%.	5th decade same as NO CHANGE, but in long-term reduces down to 15%.	5th decade old growth declines to 18%, but in long-term reduces down to 16%.	5th decade old growth declines to 16% and remains at 16% in the long-term.
	B. Pairs of Spotted Owls.	Largest reduction, 32 pairs accommodated out of 153 pairs. (This is less than MR.)	Large reduction down to 86 pairs by 5th decade.	Large reduction down to 89 pairs by 5th decade.	Large reduction down to 81 pairs by the 5th decade.
3. How can the Forest's fish habitat, water quality, and soil productivity be maintained or improved?	A. Percent change in fish habitat capability for 3 anadromous salmonid indicator species.	Current situation; 5th decade 14% increase over 1st decade.	2% increase 1st decade over NO CHANGE; 3% increase 5th decade over NO CHANGE.	3% increase 1st decade over NO CHANGE; 9% increase 5th decade over NO CHANGE.	8% increase 1st decade over NO CHANGE; 17% increase 5th decade over NO CHANGE.
	B. Mean percent change in accelerated sediment first five decades.	2% more than A.	Highest yield; 14% more than A.	3% more than A.	2nd highest production; 5% more than A.
4. How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild & Scenic River attributes?	A. Inventoried Wild & Scenic River allocation.	The Omnibus Oregon Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers as National Wild and Scenic Rivers. As a result, the inventoried Wild and Scenic Rivers would be treated the same for all alternatives.			
	B. Viewshed allocation within and adjacent to Wild & Scenic boundaries.	Maintains inventoried visual objectives in all river (designated and inventoried) viewsheds.	Reduced level of VQO in all river viewsheds. North Fork Smith reduced to modified forest setting.	Maintains inventoried VQO's on Rogue and Illinois. Does not maintain VQO's on N.F. Smith and Chetco, except PR objectives on Chetco.	Same as D.
5. How should the sensitive plant resource be managed?	A. Botanical areas.	Maintains 3 existing areas.	10 areas protected; several lower priority areas with minimal resource conflicts; acreage in Botanical Areas doubles.	Same as C.	Same as C.
	B. Cells filled by RNA's.	11 cells filled.	14 cells filled.	Same as C.	Same as C.

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected) (Cont'd)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE NO CHANGE	C	D	B (RPA)
6. How should Forest scenic values be protected and to what degree?	A. Visual Quality Objectives (VQO): Preservation (P) Retention (R) Partial Retention (PR) General Forest (M)	Maintains current visual inventory in all viewsheds.	Shift towards modified end of values: increases M (45%); increases P (7%), decreases R (87%) and PR (62%) from NO CHANGE.	Similar to C. But not as much: increases M (40%); increases P (10%), decreases R (75%) and PR (59%) from NO CHANGE.	Same as D.
	B. Level of Visual Quality allocation in high use, recreation viewsheds.	Maintains inventoried level.	No high use, recreation viewsheds would be governed by their inventoried VQO's.	Offers inventoried VQO in 3 viewsheds. Reduced protection in other high use, recreation viewsheds.	Same as D.
7. How should wildlife habitats on the Forest be managed?	A. Percent of snag level for maximum woodpecker population.	Harvested stands snag habitat at 60% level. Populations Forest-wide reduce to 75% over time.	Harvested stands snag habitat at 20% level. Populations Forest-wide reduce to 45% over time.	Same as C.	Same as C.
	B. Black-tailed deer habitat capability.	Average capability during first 5 decades is about 9% more than existing.	Average capability during first 5 decades is 17% more than existing.	Average capability during first 5 decades is about 11% more than existing.	Same as D.
	C. Area allocated to special wildlife sites.	Lowest acreage; includes wildlife areas and meadows, but no buffers.	Slightly more acreage than NO CHANGE. Includes meadow buffers, special wildlife areas not included.	Same as C.	Same as C.
	D. Acres of hardwoods converted first decade.	Up to 750 acres annually.	Up to 1,400 acres annually.	Same as C.	Same as C.
8. How will management direction affect recreation opportunities in the wilderness and unroaded areas?	A. Area allocated to: Primitive Non-Motor. Semi-primitive N-M. Primitive WRS Semi-primitive WRS	No primitive non-motorized acreage; 29,000 ac. semi-primitive non-motorized. Wilderness primitive and semi-primitive acreage at 113,000 ac. and 119,000 ac. respectively.	Same as NO CHANGE.	Similar to NO CHANGE; 2,000 ac. reduction in wilderness primitive acreage.	Same as D.
	B. Opportunity for unroaded recreation.	Unroaded recreation opportunities lost over-time, down to 6.2 MRVD in 5th decade (6.5 MRVD loss).	Same as NO CHANGE. Loss offset by aggressive trail construction program in wilderness.	Same as C. Except loss offset by slightly less aggressive trail construction program in wilderness.	Same as C.
9. How should mineral resources of the Forest be developed in coordination with management of other resources?	A. Known and potential mineral area withdrawn or restricted from mineral entry.	Ranked 7th for minerals access. High access restrictions on 40,000 ac. Represents existing condition.	Ranked 1st for minerals access. High access restrictions on 17,000 ac.	Ranked tied-2nd for minerals access. High access restrictions on 28,000 ac.	Same as Alternative D.
		All alternatives have 268,000 acres of withdrawn land, including 34,000 acres with high mineral potential.			

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected) (Cont'd)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE A-Departure	A (No Action)	D1	K
1. How much timber should the Forest produce?	A. Selected Suitable Forest Land Base (Commercial Forest Land)	Ranked tied-4th in selected acreage: 558,000 acres. 18,000 acres less than NO CHANGE.	Ranked 6th in selected acreage: 557,000 acres. 19,000 acres less than NO CHANGE.	Ranked 7th in selected acreage: 550,000 acres. 26,000 acres less than NO CHANGE.	Ranked 8th in selected acreage: 529,000 acres. 47,000 acres less than NO CHANGE.
	B. Comparison with RPA target ASQ.	5.6 MMCF less than RPA. Designed to meet current level of output.	6.7 MMCF less than RPA. Reflects current land management direction.	3.6 MMCF less than RPA. Unique - 2nd decade shorter rotation. Exceeds NFMA requirements for CMAI.	9.0 MMCF less than RPA.
	C. ASQ - 1st Decade.	Ranked 4th - 1st decade.	Ranked 7th - 1st decade.	Ranked 2nd - 1st decade.	Ranked 9th - 1st decade.
	D. ASQ - 5th Decade.	Ranked 6th - 5th decade.	Ranked 5th - 5th decade.	Ranked 1st - 5th decade.	Ranked 8th - 5th decade.
	E. LTSY.	Rank tied-5th for LTSY.	Rank tied-5th for LTSY.	Ranked 7th for LTSY.	Ranked 8th for LTSY.
2. How much old-growth forest should be preserved?	A. Total Area of old-growth, plant & wildlife habitat.	Similar to D.	Same as A-Departure.	Similar to B.	18% remains at 5th decade; 17% remains long-term.
	B. Pairs of Spotted Owls.	Reduction down to 90 pairs by 5th decade.	Same as A-Departure.	Similar to B, reduction to 80 pairs by 5th decade.	Reduction down to 93 pairs by 5th decade.
3. How can the Forest's fish habitat, water quality, and soil productivity be maintained or improved?	A. Percent change in fish habitat capability for 3 anadromous salmonid indicator species.	Same as NO CHANGE.	Same as NO CHANGE.	1% increase 1st decade over NO CHANGE; 9% increase 5th decade over NO CHANGE.	Same as NO CHANGE.
	B. Mean percent change in accelerated sediment first five decades.	2% more than A.	Current situation.	Same as A.	15% less than A.
4. How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild & Scenic River attributes?	A. Inventoried Wild & Scenic River allocation.	The Omnibus Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers as National Wild and Scenic Rivers. As a result, the inventoried Wild and Scenic Rivers would be treated the same for all alternatives.			
	B. Viewshed allocation within and adjacent to Wild & Scenic boundaries.	Same as NO CHANGE.	Same as NO CHANGE.	Same as D.	Visual objectives reduced on inventoried rivers.
5. How should the sensitive plant resource be managed?	A. Botanical areas.	Same as NO CHANGE.	Same as NO CHANGE.	Same as C.	11 priority areas protected (11,000 acres).
	B. Cells filled by RNA's.	Same as NO CHANGE.	Same as NO CHANGE.	Same as C.	25 cells filled.

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected) (Cont'd)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE			
		A-Departure	A (No Action)	D1	K
6. How should Forest scenic values be protected and to what degree?	A. Visual Quality Objectives (VQO): Preservation (P) Retention (R) Partial Retention (PR) General Forest (M)	Slight change from NO CHANGE: increases P (12%), decreases R (9%), PR (5%), and M (4%) from NO CHANGE.	Same as A-Departure.	Same as D.	Some increases on P and M end of values: increases P (26%), increases M (20%); consequently decreases R (79%) and PR (44%) from NO CHANGE.
	B. Level of Visual Quality allocation in high use, recreation viewsheds.	Same as NO CHANGE.	Same as NO CHANGE.	Same as D.	Offers inventoried VQO's in 4 high use, recreation viewsheds. Reduced protection in the other viewsheds.
7. How should wildlife habitats on the Forest be managed?	A. Percent of snag level for maximum woodpecker population.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide reduce to 76% over time.	Same as A-Departure.	Similar to C.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide same as A-Departure.
	B. Black-tailed deer habitat capability.	Same as NO CHANGE.	Average habitat capability during first 5 decades is 8% more than existing.	Average habitat capability during first 5 decades is 12% more than existing.	Average habitat capability during first 5 decades is about 1% below existing.
	C. Area allocated to special wildlife sites.	Same as NO CHANGE.	Same as NO CHANGE.	Same as C.	All habitat sites included.
	D. Acres of hardwoods converted first decade.	Same as NO CHANGE.	Same as NO CHANGE.	Same as C.	Same as NO CHANGE.
8. How will management direction affect recreation opportunities in the wilderness and unroaded areas?	A. Area allocated to: Primitive Non-Motor. Semi-primitive N-M. Primitive WRS Semi-primitive WRS	Same as NO CHANGE.	Same as NO CHANGE.	Same as D.	4,000 ac. increase in primitive and semi-primitive non-motorized areas over NO CHANGE. Wilderness primitive and semi-primitive same as NO CHANGE.
	B. Opportunity for unroaded recreation.	Same as NO CHANGE.	Same as NO CHANGE.	Same as C.	Similar to C: 1.3 MRVD increase in 5th decade from NO CHANGE, loss offset by moderate trail construction in wilderness.
9. How should mineral resources of the Forest be developed in coordination with management of other resources?	A. Known and potential mineral area withdrawn or restricted from mineral entry.	Ranked tied-5th for minerals access. High access restrictions on 39,000 ac.	Same as A-Departure.	Same as Alternative D.	Ranked 8th for minerals access. High access restrictions on 58,000 ac.
		All alternatives have 268,000 acres of withdrawn land, including 34,000 acres with high mineral potential.			

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected) (Cont'd)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE S	G	E	M
1. How much timber should the Forest produce?	A. Selected Suitable Forest Land Base (Commercial Forest Land)	Ranked 9th in selected acreage: 505,000 acres. 71,000 acres less than NO CHANGE.	Ranked 10th in selected acreage: 406,000 acres. 170,000 acres less than NO CHANGE.	Ranked 11th in selected acreage: 287,000 acres. 289,000 acres less than NO CHANGE.	Ranked lowest in selected acreage: 207,000 acres. 369,000 acres less than NO CHANGE.
	B. Comparison with RPA target ASQ.	7.8 MMCF less than RPA. Outputs designed to be between Alts. K and G.	16.3 MMCF less than RPA.	20.6 MMCF less than RPA.	30.7 MMCF less than RPA. Unique - Rotations extended to 250 years.
	C. ASQ - 1st Decade.	Ranked 8th - 1st decade.	Ranked 10th - 1st decade.	Ranked 11th - 1st decade.	Ranked 12th - 1st decade.
	D. ASQ - 5th Decade.	Ranked 7th - 5th decade.	Ranked 10th - 5th decade.	Ranked 11th - 5th decade.	Ranked 12th - 5th decade.
	E. LTSY.	Ranked 9th for LTSY.	Ranked 10th for LTSY.	Ranked 11th for LTSY.	Ranked 12th for LTSY.
2. How much old-growth forest should be preserved?	A. Total Area of old-growth, plant & wildlife habitat.	19% at 5th decade; 18% in the long-term.	3rd highest residual; 23% at 5th decade. 23% in the long-term.	18% at the 5th decade; 25% in the long-term.	Greatest old growth acreage; 33% at 5th decade; 27% in long-term .
	B. Pairs of Spotted Owls.	4th highest amount of spotted owl pairs at 5th decade, with 97 pairs.	3rd highest amount of spotted owl pairs at 5th decade, with 107 pairs.	2nd highest most spotted owl pairs accommodated. 129 owl pairs at end of 5th decade.	Most spotted owl pairs accommodated. 140 pairs at end of 5th decade. 13 pairs below current (approx 153).
3. How can the Forest's fish habitat, water quality, and soil productivity be maintained or improved?	A. Percent change in fish habitat capability for 3 anadromous salmonid indicator species.	3% increase 1st decade over NO CHANGE; 4% increase 5th decade over NO CHANGE.	4% increase 1st decade over NO CHANGE; 12% increase 5th decade over NO CHANGE.	4% increase 1st decade over NO CHANGE; 11% increase 5th decade over NO CHANGE.	Same as G.
	B. Mean percent change in accelerated sediment first five decades.	12% more than A.	3rd lowest; 35% less than A.	2nd lowest yield; 46% less than A.	Lowest yield; 81% less than A.
4. How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild & Scenic River attributes?	A. Inventoried Wild & Scenic River allocation.	The Omnibus Oregon Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers as National Wild and Scenic Rivers. As a result, the inventoried Wild and Scenic Rivers would be treated the same for all alternatives.			
	B. Viewshed allocation within and adjacent to Wild & Scenic boundaries.	Maintains inventoried VQO's on all five designated Wild and Scenic Rivers.	Backcountry Recreation allocation would upgrade inventoried visual objectives.	Visuals upgraded through management of Backcountry Recreation areas under Preservation objectives.	Extended rotations and "no harvest" on old-growth maintains Retention and Preservation over Plan life
5. How should the sensitive plant resource be managed?	A. Botanical areas.	Protection of 22 important sites; 19,300 acres in total.	Highest acreage protected. All 25 areas protected; 39,000 acres in total.	Second highest protection. 18 areas protected; 27,700 acres in total; moderate and high priorities.	Same as G.
	B. Cells filled by RNA's.	Same as K.	Same as K.	Same as K.	Same as K.

Table II-7. Comparison of Planning Problem Response by Alternative (by decreasing amount of vegetative manipulation expected) (Cont'd)

Planning Problem	Outputs or Effects to be Measured	ALTERNATIVE S	G	E	M
6. How should Forest scenic values be protected and to what degree?	A. Visual Quality Objectives (VQO): Preservation (P) Retention (R) Partial Retention (PR) General Forest (M)	Increases in P end of values: increases P (53%); decreases R (71%); PR (43%) and M (2%) from NO CHANGE.	Shift towards Preservation end of values: increases P (84%); decreases R (57%), PR (36%), and M (30%) from NO CHANGE.	Similar to G, almost double Preservation end of values: increases P (121%), correspondingly decreases R (64%), PR (55%) and M (45%) from NO CHANGE.	More than doubles Preservation end of values: increases P (128%); correspondingly decreases R (68%), PR (58%), and M (47%) from NO CHANGE.
	B. Level of Visual Quality allocation in high use, recreation viewsheds.	VQO's would be met on 4 high use, recreation viewsheds. Reduced protection in other high use, recreation viewsheds.	All viewsheds will be governed by their inventoried VQO's.	Same as G.	Meets and exceeds inventoried level.
7. How should wildlife habitats on the Forest be managed?	A. Percent of snag level for maximum woodpecker population.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide reduce to 79%.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide reduce to 83% over time.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide reduce to 86% over time.	Harvested stands snag habitat same as NO CHANGE. Populations Forest-wide same as E over time.
	B. Black-tailed deer habitat capability.	Average habitat capability during first 5 decades is about 1% above existing.	High capability reduction: 13% average decrease first 5 decades.	High capability reduction: 24% average decrease first 5 decades.	Highest reduction in habitat capability, average 41% first 5 decades.
	C. Area allocated to special wildlife sites.	Same as K, plus dispersed old growth.	Same as K.	Same as K.	Same as K.
	D. Acres of hardwoods converted first decade.	Same as NO CHANGE.	Up to 400 acres annually.	No conversion of hardwoods.	Same as E.
8. How will management direction affect recreation opportunities in the wilderness and unroaded areas?	A. Area allocated to: Primitive Non-Motor. Semi-primitive N-M. Primitive WRS Semi-primitive WRS	9,000 ac. increase in primitive and 23,000 ac. increase in semi-primitive non-motorized areas over NO CHANGE. Wilderness primitive and semi-primitive same as NO CHANGE.	Primitive non-motorized increases 12,000 ac. and semi-primitive non-motorized increases 69,000 ac. over NO CHANGE. Wilderness primitive and semi-primitive same as NO CHANGE.	Primitive non-motorized increases 14,000 ac. and semi-primitive non-motorized increases 68,000 ac. over NO CHANGE. Wilderness primitive and semi-primitive same as NO CHANGE.	Primitive non-motorized increases 14,000 ac. and semi-primitive non-motorized increases 72,000 ac. over NO CHANGE. Wilderness primitive and semi-primitive same as NO CHANGE.
	B. Opportunity for unroaded recreation.	9.4 MRVD increase in 5th decade from NO CHANGE; loss offset by aggressive trail construction program in wilderness.	5th decade 9.4 MRVD more than NO CHANGE. Moderate trail construction program in Wilderness provides additional capacity.	5th decade 9.4 MRVD more than NO CHANGE.	5th decade 9.4 MRVD more than NO CHANGE. Moderate trail construction program in wilderness provides additional capacity.
9. How should mineral resources of the Forest be developed in coordination with management of other resources?	A. Known and potential mineral area withdrawn or restricted from mineral entry.	Ranked 10th for minerals access. High access restrictions on 68,000 ac.	Ranked 12th for minerals access. High access restrictions on 92,000 ac.	Ranked 9th for minerals access. High access restrictions on 59,000 ac.	Ranked 11th for minerals access. High access restrictions on 78,000 ac.
		All alternatives have 268,000 acres of withdrawn land, including 34,000 acres with high mineral potential.			

COMPARISONS OF THE ALTERNATIVES CONSIDERED IN DETAIL

This section presents comparisons of the alternatives by environmental component The land allocations and descriptions by Planning Problem were presented in the previous section. Much of the data in the preceding tables is also pertinent to the following comparisons. The discussion here includes resource outputs, environmental effects, and costs and benefits presented in a comparative format with explanation of some of the more significant differences between alternatives. This section also presents the analysis of the tradeoffs among the alternatives

CULTURAL RESOURCES

As production-oriented resource outputs (such as timber harvest levels) change by alternative, the cultural resource requirements of inventory, evaluation, protection, mitigation, and monitoring vary quantitatively.

Alternatives E, G, and M favor the least production and development oriented approach to land management and therefore trigger few ground-disturbing activities within the Siskiyou National Forest. The primary project type requiring cultural resource involvement under these alternatives is road building. For every planned length of new road construction, adequate cultural resource survey work must be undertaken. In relative terms, these alternatives result in low costs for cultural resource compliance work, as listed above, due to low levels of production. These alternatives favor preservation of archaeological and historic sites, but provide little opportunity for locating new sites or conducting data recovery projects, such as excavation.

Alternatives K and S call for moderate levels of production. With the introduction of land-disturbing activities, cultural resource inventories and subsequent evaluation of any sites discovered are required. Protection, mitigation, and monitoring of any site determined eligible to the National Register of Historic Places is provided through consultation with the State Historic Preservation Office. Funding, commensurate with the degree of cultural resource compliance work required, is at a level between those alternatives listed above and below.

Alternatives NC, A, A-Departure, B, C, D, and D1 would permit the highest levels of production among the range of alternatives. Consequently, the costs of cultural resource compliance measures identified above are higher for these alternatives than the others. The potential to identify new sites is the greatest under these alternatives, as is the likelihood of damaging cultural evidence.

Figure II-17 displays the acres by alternative in Management Areas which permit ground disturbing activities, and the acres that have high or moderate probability for containing cultural resources, as determined by the Forest's Sample Survey Design. The Management Areas considered are: Riparian, Retention Visual, Partial Retention Visual, and General Forest. Figure II-18 displays the high probability acres for cultural resource sites within these Management Areas, by alternative.

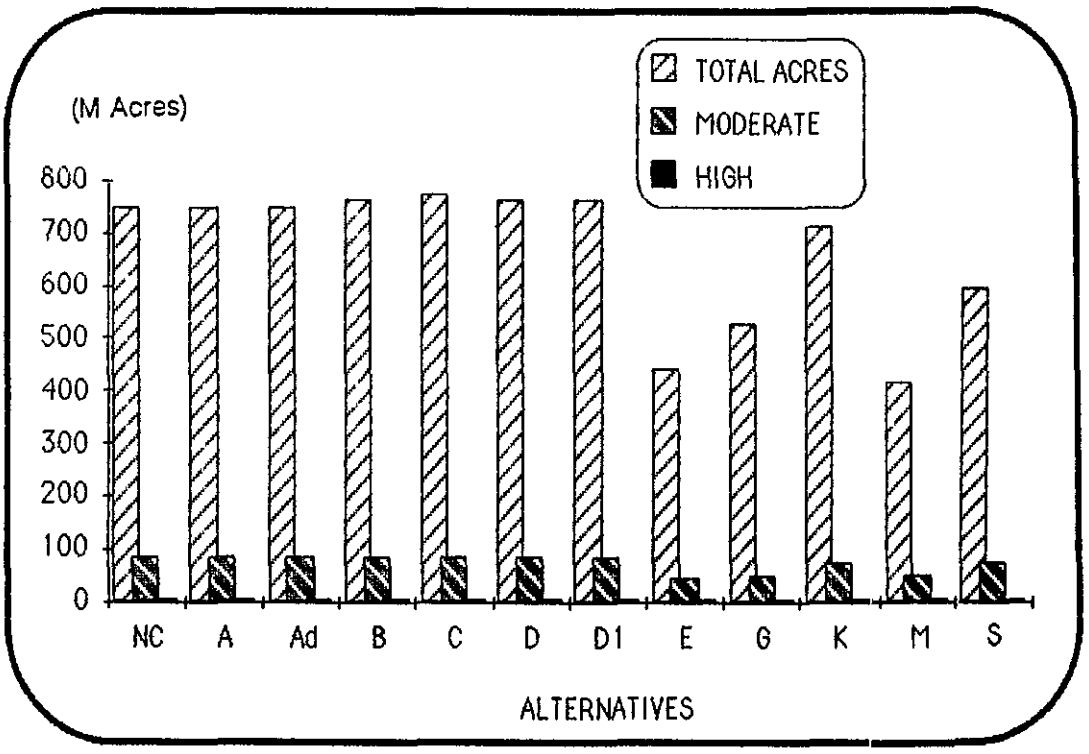


Figure II-17 The Area Under Management Allowing Ground Disturbance by Cultural Site Potential (M Acres), by Alternative

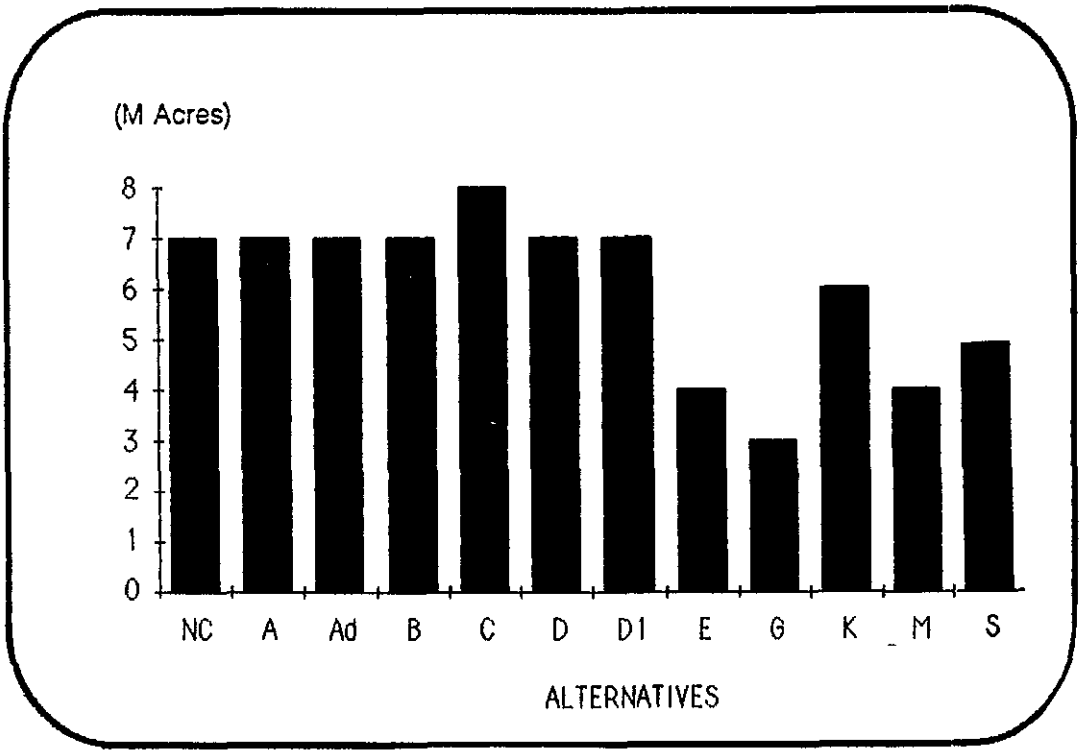


Figure II-18. High Probability Area for Cultural Resource Sites in Management Areas Allowing Ground Disturbance (M Acres), by Alternative

ENERGY

FUELWOOD

Current Direction could continue to produce about 49,000 cords of fuelwood per year during the first decade Alternative B would produce the highest volume of fuelwood of any of the alternatives considered, about 22 percent more than currently. Alternative S, the Preferred Alternative, would produce about eight percent less than Current Direction. At 78 percent less than Current Direction, Alternative M would produce the fewest cords of fuelwood. Projected cords of fuelwood available in decades one, two, and five by alternative, are displayed in Table II-5.

HYDROPOWER

The comparison of alternatives relative to potential hydropower development focuses on access The access and restrictions on access associated with the alternatives are discussed under the heading **"MINERAL DEPOSITS"** in this section The reader is referred there as the implications for hydropower development would be similar

ENERGY REQUIREMENTS

The energy required to continue with current direction is about 4,293,102 BTU's per decade. The alternatives range from the high of Alternative B (20 percent more than Current Direction) to the low of Alternative M (76 percent less) with the Preferred Alternative about 5 percent less.

The energy required to implement the alternatives (Table II-8) has been broken down by activities as a percent of the total for each alternative, and the total relative energy requirement of each alternative is displayed as a percent of the requirement for Current Direction.

Table II-8 Percentage of Each Alternative's Energy Requirement by Activity, and Comparison of Alternative Totals as Percent of Current Direction

	Alternative (Percent)											
Activities	NC	A	A-Dep	B	C	D	D1	E	G	K	M	S
Timber Harvest	87	87	87	88	86	86	86	83	85	86	74	88
Biomass Extraction	0	0	0	0	0	1	0	0	0	0	0	0
Range	0	0	0	0	0	0	0	0	0	0	0	0
Recreation	4	4	4	4	4	4	4	8	6	5	18	5
Water Management	0	0	0	0	0	0	0	0	0	0	0	0
Minerals Extraction (Non-fuel)	1	1	1	0	0	1	1	0	0	0	0	0
Road Construction	7	7	7	7	8	7	7	7	7	7	4	7
Fire Management	1	1	1	1	2	2	1	2	2	2	4	2
Percent of Alternative A - Current Direction	102	100	103	120	107	101	110	70	70	92	24	95

MINERAL DEPOSITS

The geologic potential for locatable (hardrock) minerals and leasable (oil, gas and geothermal) energy resources has been evaluated Accessibility restraints for National Forest lands have also been reviewed. When considered together, potential and accessibility restrictions tend to indicate the potential for development of the mineral and energy resources

The land area accessible to mineral exploration, development, and extraction with limited (low or moderate) restrictions is shown for each alternative in Figure II-19 (The definitions of the restriction categories and discussion of mineral potential are found in Chapters III and IV, MINERAL DEPOSITS.) As less acres are withdrawn from mineral entry, or as fewer areas receive high accessibility restrictions, the area remaining for mineral activities would be greater. Approximately three-fourths of the National Forest is now available for mineral and energy development with varying degrees of restriction In addition, nearly three-fourths of the area available for mineral entry has low access restrictions

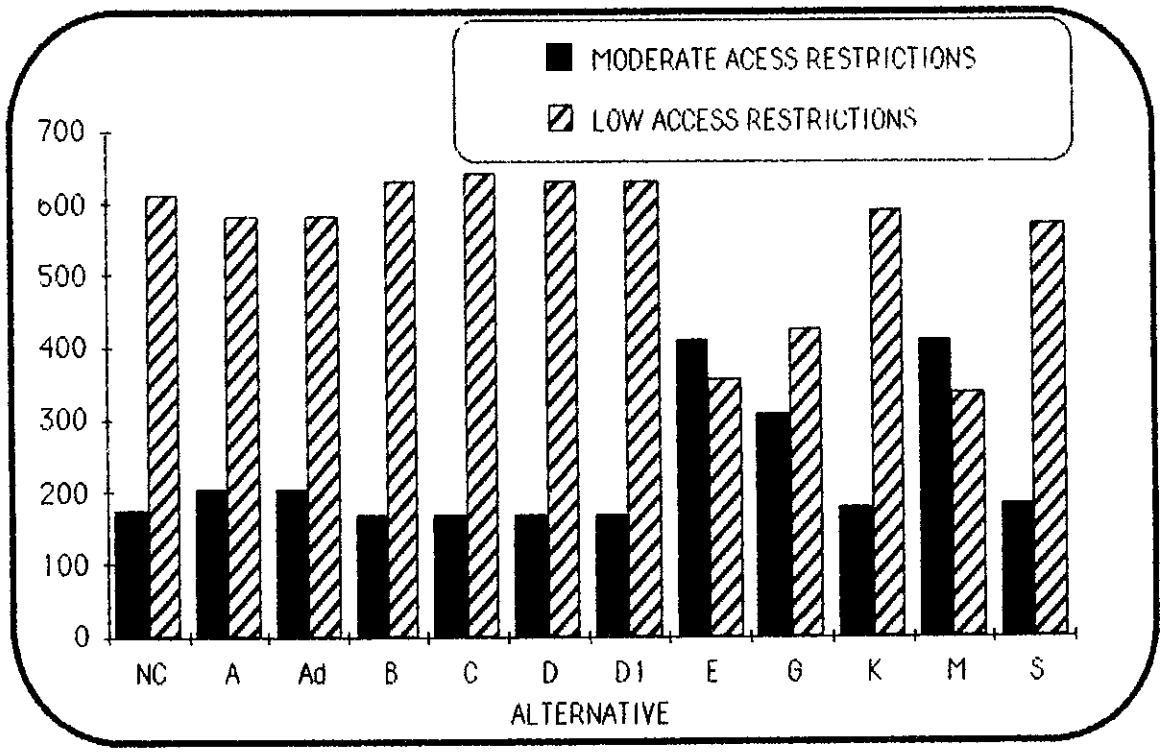


Figure II-19 Land Area Accessible to Mineral Exploration, Development and Extraction with Limited (Low or Moderate) Restrictions (M Acres)

IMPROVEMENTS

ROADS

Miles of new road construction are projected with the FORPLAN model based on the acres scheduled for harvest The model does not have the spatial resolution to exactly portray the roading program needed to support the timber harvest scheduled in any particular decade. This is due to the variability in the mix of harvest areas scheduled requiring new roads versus those that are accessed by existing roads, and to the situations where initial entry into an area may require more road per acre harvested than subsequent entries when units may be harvested along previously constructed roads The estimates of road construction miles balance out over the first few decades and the total road system projected is accurate, however the miles projected in any one decade may not be adequate to support the timber program. The pattern projected by the model generally underestimates the miles of road needed in the first two or three decades and overestimates the miles needed in subsequent decades The projected miles are presented here for comparison purposes; actual miles needed for implementation of any alternative may be more than those shown.

Alternatives NC, A, A-Departure, B, C, D, and D1 would provide the greatest amount of new roads with the addition of approximately 1,550 miles. The most mileage constructed during the first decade would be under Alternative C. Alternative M plans no new road construction. Table II-9 compares construction under each alternative. In the long-term, Alternative C would provide a total road system of 4,222 miles, while Alternative M would leave the road system at the existing 2,645 miles. Alternatives A, A-Departure, B, C, D, and D1 would include the highest non-timber-sale road mileages (for recreation, mining, etc.).

Table II-9. Miles of Road Construction 1/ 2/

	Miles				
Alternative	Decade 1 Built 3/	Built to Complete System	Non-Timber Sale	System Ultimate Road System	Decade 95 Percent Complete
NC, A, and A-Departure	230	1,545	(47)	4,190	7
B	277	1,553	(47)	4,198	6
C	308	1,577	(44)	4,222	5
D and D1	271	1,555	(48)	4,200	5
E	110	665	(7)	3,310	5
G	142	963	(11)	3,608	7
K	206	1,433	(32)	4,078	8
M	0	0	(0)	2,645	0
S	228	1,343	(32)	3,988	7

1/ Does not include temporary roads which will be reclaimed after use and which serves a single use
2/ Fiscal Years 80 through 84 averaged 49 6 miles per year of new road construction
3/ Roading estimates are based on FORPLAN modeling and may underestimate the road construction needed to support the timber outputs scheduled for early decades (see discussion in Appendix B)

Road reconstruction would be highest in Alternatives C and D1; while Alternative M would have the need for the least. Table II-10 includes comparisons of Decades 1, 5, 10, and 15 road reconstruction needs by alternative This comparison indicates that all alternatives have a general upward trend in the amount of miles reconstructed per year

Table II-10 Miles of Road Reconstruction 1/

Alternative	Decade (Miles/Year)			
	1	5	10	15
NC and A	146	163	132	166
A-Departure	147	164	132	178
B	167	167	169	169
C	172	178	166	179
D	156	158	167	168
D1	172	174	192	194
E	82	87	95	97
G	101	106	119	115
K	131	137	146	140
M	23	23	20	36
S	135	138	146	144

1/ Fiscal Year 1980 through 1984 averaged 112 miles per year of reconstruction

Tables II-11 and II-12 display the availability of the road system for public use at the end of the first decade and the long-term availability when the road system is complete. Alternative C would provide the most road network for public and commercial users. In the first decade, Alternative C would provide 2,576 miles of road for general public use; of this amount 1,235 miles would be suitable for passenger car use, and 1,341 miles would be suitable for high ground-clearance vehicles only. Also in the first decade, road closures would be highest in Alternative E with 733 miles and lowest in Alternatives NC and A with 347 miles. In the long-term road system the highest amount of closure occurs in Alternative K with 1,385 miles; the lowest amount closed is in Alternative M with 529 miles. Alternative B would provide the highest mileage available for passenger car users in both the first decade and the long-term road system with 1,613 and 2,012 miles respectively. Alternative G would provide the least mileage available for passenger car users in both the first decade and the long-term road system with 916 and 932 miles respectively. In the first decade, the highest amount of road suitable for high clearance vehicles occurs in Alternative G with 1,388 miles; the lowest amount suitable would be in Alternative E with 619 miles. In the long-term road system, the highest and lowest alternatives suitable for high clearance vehicles are Alternatives C and E, respectively.

Table II-11. First Decade Availability of Roads for Public Use (Miles)

Alternative	Miles				
	End of First Decade	Closed 1/	Available For Public Use 2/	Suitable For Passenger Cars	Suitable for High Clearance Vehicles Only
NC, A and A-Departure	2,875	347	2,528	1,245	1,283
B	2,922	368	2,554	1,613	941
C	2,953	377	2,576	1,235	1,341
D and D1	2,916	362	2,554	1,511	1,043
E	2,755	733	2,022	1,403	619
G	2,787	483	2,304	916	1,388
K	2,851	649	2,202	1,396	806
M	2,645	529	2,116	1,057	1,059
S	2,873	662	2,211	1,401	810

1/ May not be the same road from decade to decade, or year to year
2/ Only a portion suitable for passenger cars, all suitable for high ground-clearance vehicles (those which can travel over objects four inches high)

Table II-12 Long-term Availability of Roads for Public Use (Miles)

	Miles				
Alternative	Long-term	Closed 1/	Available for Public Use 2/	Suitable for Passenger Cars	Suitable for High Clearance Vehicles Only
NC, A, and A-Departure	4,190	871	3,319	1,632	1,687
B	4,198	878	3,320	2,012	1,308
C	4,222	885	3,337	1,456	1,881
D and D1	4,200	875	3,325	1,962	1,363
E	3,310	1,092	2,218	1,572	646
G	3,608	977	2,631	932	1,699
K	4,078	1,385	2,693	1,727	966
M	2,645	529	2,116	1,057	1,059
S	3,988	1,330	2,658	1,701	957

1/ May not be the same road from decade to decade, or year to year
2/ Only a portion suitable for passenger cars, all suitable for high ground-clearance vehicles (those which can travel over objects four inches high)

Alternative M would require the fewest dollars from timber purchaser credit allowances to be used for reconstruction activities during the first decade $599,000 per year. The greatest amount of timber purchaser credit during the first decade would be required in Alternative C with $6,869,000 per year for road construction and reconstruction. Road-related capital investments would be the highest in Alternative B during the first decade with $1,360,000 per year needed; the lowest would be in Alternative M with $165,000 per year (used for reconstruction and structure replacements). Alternative B, during the first decade, would require the most road maintenance work with $4,351,000 needed per year; the lowest amount ($1,421,000 per year) would be required in Alternative M. Table II-13 displays the projected expenditures for construction, reconstruction, and maintenance and indicates the amounts that would be funded from timber sale sources and from appropriated allocations

Table II-13. First Decade Annual Road Costs (M $) 1/

	Miles				
	Timber Purchaser Credit			Maintenance	
Alternative	Construction	Reconstruction	Road Capital Investment 2/	Timber Sale	Allocated
NC, A, and A-Departure	1,809	4,316	853	2,401	1,043
B	1,967	4,658	1,360	3,131	1,220
C	2,098	4,771	1,044	2,683	1,070
D	1,860	4,351	1,092	2,598	1,151
D1	1,969	4,782	1,167	2,775	1,091
E	762	2,527	657	1,320	1,159
G	989	3,053	634	1,695	880
K	1,460	4,081	956	2,307	1,108
M	0	599	165	440	981
S	1,566	4,189	654	2,417	1,060

1/ Roading estimates are based on FORPLAN modeling and may underestimate the road construction needed to support the timber outputs scheduled for early decades (see discussion in Appendix B)
2/ This includes road construction and reconstruction work, road-related recreation and water quality improvement work, and supplementation of timber sale road work

TRAILS

Potential trail improvements are identified in Table II-4; this table identifies those existing and planned trails selected for reconstruction or construction under each management alternative. The existing 450-mile trail system would be expanded the most under Alternative S, which would add 130 miles over the next three decades for a total of 580 miles. The added mileage is nearly equally split between Wilderness and non-Wilderness areas. Alternative C would add the most mileage to the Wilderness trail system with 92 miles. Alternative E would add the least mileage to the system with 32 miles; all of these miles are outside Wildernesses and the construction could span five decades. Alternative S would provide the greatest amount of additional non-Wilderness trails with 68 miles of construction All alternatives provide for some reconstruction work to bring trails up to standard, Alternative E would provide none in Wilderness. In total, Alternative S would reconstruct the most (63 miles) with about two-thirds in non-Wilderness

In the first decade, Alternative S would add the highest mileage to the trail system with 86 miles. Alternative C would have the most reconstruction (47 miles) in the first decade for Wilderness, and the 35 miles reconstruction in Alternative S is the most in the first decade for non-Wilderness. Long-term and first decade construction and reconstruction comparisons are shown in Table II-14

Table II-14. Miles of Trail Construction and Reconstruction 1/

	Wilderness (Miles)		Non-Wilderness (Miles)		
Alternative	Construction	Reconstruction	Construction	Reconstruction	Decade Work Complete
NC, A, and A-Departure	24 0 (0 3)	14 0 (0 0)	33 1 (0 0)	31 3 (11 0)	3
B	81 0 (21 0)	16 0 (7 0)	7 0 (5 0)	6 0 (3 0)	4
C	92 0 (47 0)	16 0 (7.0)	7 0 (5 0)	9 0 (3.0)	2
D and D1	81 0 (21 0)	16 0 (7 0)	7 0 (5 0)	6 0 (3 0)	4
E	0 0 (0 0)	0 0 (0 0)	32 1 (14 1)	28 3 (28 3)	5
G	39 5 (21 5)	11 0 (7 0)	45 1 (6 3)	31 3 (8 0)	4
K	50 5 (15 0)	16 0 (7 0)	44.1 (5 0)	37 3 (0 0)	3
M	40 5 (21 5)	11 0 (7.0)	45 1 (6 3)	31 3 (8 0)	4
S	62 0 (42 0)	16.0 (8 0)	67 8 (44 5)	47 1 (35 0)	3

1/ First decade construction and reconstruction miles shown in parentheses

First decade investments in trails would be the highest with Alternative S at $1,269,300, as would be expected from its highest construction mileage (86 miles). The next highest would be in Alternative C with $1,017,700. During the first decade, Alternatives NC, A, and A-Departure would require the least with $84,000 needed for construction and reconstruction work. Trail maintenance cost during the first decade ranges from $1,461,500 in Alternative S down to $1,226,600 in Alternatives NC, A, and A-Departure Table II-15 displays first decade trail costs

Table II-15. First Decade Trail Costs (M $)

	Trail Costs (M $) 1/		
Alternative	Construction	Reconstruction	Maintenance
NC, A, and A-Departure	9 7	74 3	1,226 6
B, D, and D1	357 5	192 4	1,309 0
C	863 3	154 4	1,400 0
E	165 2	82 4	1,253 7
G and M	420 5	125 0	1,313 4
K	298 0	59 5	1,288 0
S	888 3	381 0	1,461 5

1/ Used for construction or reconstruction of trails, trail bridges, or trailheads

Tables II-16 and II-17 display the availability of trails for public use during the first decade and the long-term respectively. These tables assume no additional restrictions on pack and saddle or motorized users. In the first decade, Alternative S will provide the most trail access with 537 miles in the total system Alternatives NC, A, and A-Departure would provide the least amount of trail access with 450 miles (present mileage). In Wilderness during the first decade, Alternative C would provide the most mileage with 264 miles, the present access would be retained in Alternatives NC, A, A-Departure, and E during this period in Wilderness. Except for Alternative S (with about 40 miles more), during the first decade there is little difference between alternatives for non-Wilderness trails. In the long term, Alternative S would provide the most trail access (580 miles), exceeding the next highest by some 31 miles (Alternative C) While Alternative E would provide the least trail access with 482 miles

Table II-16. First Decade Availability of Trails for Public Use (Miles) 1/

		Wilderness (Miles)		Non-Wilderness (Miles)		
Alternative	End of First Decade Trail System	Hiker	Pack and Saddle	Hiker	Pack and Saddle	Motorized
NC, A, and A-Departure	450	217	204	233	200	171
B, D, and D1	476	238	225	238	205	176
C	502	264	251	238	205	176
E	452	217	204	247	214	185
G and M	478	239	226	239	206	177
K	470	232	219	238	205	176
S	537	259	246	278	245	216

1/ Assumes no additional restrictions on pack and saddle or motorized users

Table II-17. Long-term Availability of Trails for Public Use (Miles) 1/

		Wilderness (Miles)		Non-Wilderness (Miles)		
Alternative	Ultimate Trail System (Miles)	Hiker	Pack and Saddle	Hiker	Pack and Saddle	Motorized
NC, A, and A-Departure	507	241	228	266	233	204
B, D, and D1	538	298	285	240	207	178
C	549	309	296	240	207	178
E	482	217	204	265	232	203
G and M	535	257	244	278	245	216
K	544	267	254	277	244	215
S	580	279	266	301	268	239

1/ Assumes no additional restrictions on pack and saddle or motorized users

DEVELOPED RECREATION SITES

Table II-4 displays the availability of developed recreation sites and the recreation projects selected for each management alternative. Table II-18 summarizes the management status for existing and potential recreation sites by alternative. The development scale of existing sites would be retained the most under Alternatives NC, A, A-Departure, and C with 46 sites, and retained the least under Alternatives B, D, and D1 with 42 sites A total of seven sites, including the four presently closed sites, would not be identified as usable with Alternatives B, D, and D1. Alternatives NC, A, A-Departure, K, and S would also not reopen the existing four closed sites; while Alternatives C, E, G, and M would reopen those four sites Alternative C would provide for no new construction Alternatives G and M would construct the most new recreation sites for public use (15). The most sites opened would be 65 under Alternatives G and M. The least amount of sites opened (47) would be under Alternatives A and A-Departure

Table II-18 Number of Recreation Sites by Status and Alternative1/

	Number of Sites					
Alternative	Development Scale Retained	Closed	Upgraded 2/	Closed Site Reopened	New Construction	Total Open
NC, A, and A-Departure	46	(4)	0	0	1	47
B, D and D1	42	(7)	1	0	7	50
C	46	(0)	0	4	0	50
E	45	(0)	1	4	7	57
G	43	(0)	3	4	15	65
K	43	(4)	3	0	7	53
M	43	(0)	3	4	15	65
S	43	(4)	4	0	9	56

1/ Includes developed sites and minimum developed sites (formalized dispersed sites)
2/ Minimum developed site(s) identified for reconstruction to a developed site(s)

Recreation site capital investments and maintenance needs for the first decade are displayed in Table II-19. Investment costs would be the highest under Alternative S with $2,236,000 average per year, partially due to increased size or higher level of development for some sites (e.g , flush toilets, showers) Alternative C would be the lowest with no capital investments When maintenance is included, these alternatives retain their respective high and low positions Recreation site maintenance costs for Alternatives NC, A, A-Departure, and C would be the lowest during the first decade; Alternatives B, D, and D1 would be the next lowest for this period Maintenance cost in Alternative S would be the highest with $862,800, which is slightly higher than the group containing Alternatives E, G, K, and M During the first decade, only Alternative S has rehabilitation work planned

Table II-19 First Decade Recreation Site Costs (M $)

	Costs (M $)		
Alternative	New Construction	Rehabilitation	Maintenance
NC, A, and A-Departure	590 0	0	783 8
B, D, and D1	233 0	0	695 2
C	0 0	0	783 8
E	233 0	0	842 8
G and M	802 4	0	842 8
K	212 4	0	842 8
S	2,326 0	910 0	862 8

WILDLIFE AND FISH HABITAT IMPROVEMENT

Structural improvements for wildlife are incorporated with fish improvements in Table II-20, and the capital investments for structural improvements for wildlife and fish are found in Table II-21 All alternatives would provide 1,910 wildlife structures (primarily nest structures) within the first decade, except Alternatives D and S which would provide 960 and 4,180 structures respectively. Consequently, the first decade capital investments are the same under all alternatives, except Alternative D which is half of the others and Alternative S which is over twice as much as the others

The most structural improvements for fish (log weirs, ladders, etc.) as well as nonstructural improvements (erosion control, vegetative planting, etc) during the first decade, would occur in Alternatives B, K, and S with 5,300 structures. The least amount would occur in Alternatives NC, A, and A-Departure, providing 350 structures less than the next higher group The other alternatives (C, D, D1, E, G, and M) range from 3,790 to 3,940 structures. The first decade capital investments in fish structural improvements fall into the same groupings, with the high of $3,500,000, the low of $1,750,000, and the mid-range of $2,270,000 to $2,600,000 Investments are projected to continue at the same rate in future decades resulting in a constant level of wildlife structures and approximately double the number of fish structures existing through future decades

Table II-20 Number of Wildlife and Fish Habitat Structural Improvements 1/

	Number of Structures			
	Decade 1 Construction		Long-term Inventory	
Alternative	Wildlife 2/	Fish	Wildlife 2/	Fish
NC, A, and A-Departure	1,910	3,440	1,910	6,880
B and K	1,910	5,300	1,910	10,600
C, G, and M	1,910	3,940	1,910	7,880
D	960	3,790	960	7,580
D1 and E	1,910	3,790	1,910	7,580
S	4,180	5,300	4,180	10,600

1/ These have varying lengths of useful life (maximum of 20 years)
2/ Most of the improvements are nest structures (95 percent) which are replaced in conjunction with meadow improvements, the remainder are water-related, 4,490 acres per decade of nonstructural improvements (meadow rehabilitation) in all alternatives except D and S, which would be 2,245 and 9,830 acres per decade respectively

Table II-21 Wildlife and Fish Habitat Structural Improvements Capital Investments

	Decade 1 (M $)		Long-term (M $/Decade)	
Alternative	Wildlife 1/	Fish 2/	Wildlife 1/	Fish 2/
NC, A, and A-Departure	107	2,270	107	2,270
B and K	107	3,500	107	3,500
C, G, and M	107	2,600	107	2,600
D	54	2,500	54	2,500
D1 and E	107	2,500	107	2,500
S	234	3,500	234	3,500

1/ An additional $453,000 per decade for nonstructural improvements applies to all alternatives, except, B is $993,000, D is $226,500, and S is $996,000 per decade
2/ Approximately 10 percent of fish improvements actually consist of nonstructural work

WILDERNESS AND ROADLESS AREAS

The effects of management on the Wilderness vary through the range of alternatives Effects are projected from management directly affecting designated Wildernesses (primarily trail construction) and from management activities on lands that are adjacent to Wildernesses (primarily timber harvest and road construction). The effects on the Wildernesses are demonstrated in the fluctuations in the Wilderness Recreation Spectrum (WRS) classes and in the variations in allocation to Backcountry Recreation Management Areas These figures are displayed in Tables II-22 and II-23.

When ranked according to the beneficial value to the existing and potential Wilderness resource (which includes undeveloped areas retaining wilderness characteristics), the alternatives are listed from most to least value in the order shown below.

1 M
2 E
3. G
4. S
5. K
6 NC, A, and A-Departure
7. B, D, and D1
8. C

Table II-22 Wilderness Recreation Spectrum Acreages (M Acres), by Alternative

	Alternative (M Acres)							
WRS Class	NC, A, and A-Dep	C	B, D, and D1	E	G	K	M	S
Primitive	21	21	24	21	25	29	20	29
Pristine	93	93	90	93	88	85	93	85
Semi-Primitive	119	119	119	119	119	119	119	119

Table II-23. Backcountry Recreation Management Area Allocations (M Acres), by Alternative

	Alternative (M Acres)							
Management Area	NC, A, and A-Dep	C	B, D, and D1	E	G	K	M	S
Backcountry Recreation	0	0	0	301	150	14	297	108

The approximate acres remaining roadless at the end of decades one, two, and five are summarized in Table II-24. The acres are the decade total of the 18 roadless areas by alternative The estimates are made with the assumptions displayed prefacing Table C-3 in Appendix C.

Table II-24. Roadless Area Remaining at the End of Decades 1, 2, and 5 (Thousands of Acres), by Alternative

	Area Remaining End of Decade (M Acres)1/		
Alternative	1	2	5
A, A-Dep, and NC	102	90	85
B, C, D, and D1	86	74	69
E and M	284	284	284
G	186	173	173
K	109	97	92
S	135	126	126

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Alternatives M and E are almost identical with regard to their benefit to the Wilderness resource. Trail construction would be limited so that effects on the Primitive character of the Kalmiopsis Wilderness are minimized. Management intent would be to maintain the existing trail systems within the designated Wildernesses and concentrate efforts toward construction of new trail systems in the areas allocated to Backcountry Recreation In both of these alternatives, all of the unroaded areas would be allocated to Backcountry Recreation so that the effects of management on lands adjacent to the designated Wildernesses are minimized and Wilderness potential of these areas are retained for at least another decade The total area, including Wilderness, that remains in an undeveloped, natural setting exceeds a half million acres in these alternatives

Alternative G would implement plans for new trail construction in the designated Wildernesses which would have some effect on the Pristine character of the Kalmiopsis Wilderness. Trail construction would also be programmed in the Wild Rogue Wilderness in Alternative G. Much of the former North Kalmiopsis Roadless Area is allocated to Backcountry Recreation Alternative G, while allocating 150,000 acres to Backcountry Recreation, retains through the first decade approximately 186,000 acres in a roadless condition In addition to existing Wilderness, this would result in over 400,000 acres remaining in roadless condition at the end of the first decade While allocated Backcountry Recreation area is considerably less than in Alternative E and M, most are located adjacent to existing Wildernesses and provide similar benefits through minimizing adjacent land management effects.

Alternative S would implement plans for new trail construction in the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses (approximately 62 miles) which would have some effect on the Pristine (trailless) character of the Kalmiopsis Wilderness. Of 42,000 acres allocated to Backcountry Recreation in the North Kalmiopsis roadless area, a large portion lies contiguous to the north boundary of the Kalmiopsis Wilderness in the lower reaches of Silver and Lawson Creeks and the Wild section of the Illinois River Alternative S would allocate approximately 108,000 acres (portions of eight roadless areas) to Backcountry Recreation Combined with existing Wilderness, over 360,000 acres would remain in a roadless condition after the first decade. As with the above alternatives, the Backcountry Recreation areas in Alternative S are predominately located adjacent to existing Wildernesses, benefits would be similar but at a lesser scale

Alternative K would implement a moderate program of trail construction (approximately 50 miles) in the Kalmiopsis and Wild Rogue Wildernesses The Pristine character of the Kalmiopsis would be affected. This alternative would allocate approximately 14,000 acres to Backcountry Recreation This area consists of portions of two unroaded areas which are beneficial to the Wilderness resource primarily due to their location adjacent to the Kalmiopsis Wilderness Some Primitive opportunities are maintained in the area

located in lower Silver Creek north of the Wilderness. The effects of management on adjacent lands on the quality of wilderness recreation experiences would be more pronounced under these alternatives. Approximately 340,000 acres would remain in an unroaded condition after the first decade.

Alternatives NC, A, and A-Departure would maintain the Forest's current management direction for Wilderness management. Trail construction is proposed in the Kalmiopsis Wilderness (approximately 24 miles), which would affect the Pristine (trailless) character of the Wilderness There is no trail construction proposed in the Wild Rogue or Grassy Knob Wildernesses. There would be no allocations to Backcountry Recreation in these alternatives, so that the wilderness potential of any of the unroaded areas would not be maintained. Management activities on lands adjacent to designated Wilderness would affect both the Primitive character (in the Kalmiopsis) and the quality of recreation experiences in areas of the Wilderness where these activities are evident Approximately 330,000 acres, including existing Wilderness, would remain unroaded after the first decade. Development of the North Kalmiopsis roadless area would affect approximately 4,000 acres of currently inventoried Primitive area in the Kalmiopsis Wilderness. Wilderness character would be maintained within the boundary; however, the type of experiences provided would be Semi-primitive rather than Primitive.

Alternatives B, C, D, and D1 would have the same effect on the Wilderness resource and the Forest's Wilderness potential Under these alternatives, an aggressive program of trail construction would be implemented Management intent would be to provide additional recreation opportunities in Wilderness in order to offset the loss of similar opportunities in General Forest The Pristine (trailless) character of the Kalmiopsis Wilderness would be affected (reduced by approximately 11,351 acres) These alternatives would not allocate any of the unroaded areas to Backcountry Recreation so the wilderness character of the areas would be lost The majority of these areas would be allocated to General Forest management and the influence of management activities on adjacent Wildernesses is expected to be greater under these alternatives Approximately 320,000 acres would remain in an unroaded condition after the first decade.

WILD AND SCENIC RIVER

The Forest now has five Wild and Scenic Rivers. the Rogue, Illinois, Chetco, North Fork Smith, and Elk Rivers The question of designation is no longer relative. The inventoried and eligible Chetco, North Fork Smith, and Elk Rivers were designated through the Omnibus Oregon Wild and Scenic Rivers Act of 1988 The effects of management on the Wild and Scenic River resource would vary according to alternative emphasis. When alternatives are ranked according to their complement to the Wild and Scenic River resources and "outstandingly remarkable" attributes, they list from most to least as follows:

1 E and M
2 G
3. S
4 NC, A, and A-Departure
5. K
6. B, D, and D1
7. C

Alternatives E and M are similar in that the effects of the land allocations would be very nearly the same Alternative M would be more beneficial to the Wild and Scenic River resource due to extended harvest rotations (250 years) and limiting harvest activities to previously roaded areas. A more natural-appearing Forest landscape would be expected over time as a result. The significant difference between E and M, in this respect, is that areas allocated to management under Partial Retention and General Forest would have shorter rotations (130 and 100 years, respectively), so that reductions to the character of the landscape would be expected. Both alternatives would allocate all of the Forest's unroaded areas to

Backcountry Recreation. Several of the unroaded areas are in river corridors and would maintain the natural character of the landscape.

Alternative G would retain the natural or near-natural character of the river corridors through the allocation of adjacent viewsheds to a full range of visual management. Adjacent viewsheds would be allocated to visual management resulting in the maintenance of the natural or near-natural character of the landscape Allocations to Backcountry Recreation of two unroaded areas within the upper and lower reaches of the Illinois River would directly benefit the recreation settings The inventoried foreground Retention area along the Recreation and Scenic portions of the Rogue River would not have programmed timber harvest; the vegetative character of the river would be protected. Other allocations within the river corridors that would benefit the resource include Designated Wildlife Habitat and Supplemental Resource Management Areas

Alternative S would retain the natural or near-natural character of the river corridors through the allocation of adjacent viewsheds to a full range of visual management Adjacent viewsheds within these river corridors would be allocated to visual management resulting in the maintenance of the natural or near-natural character of the landscape. Allocations to Backcountry Recreation would directly benefit the recreation setting within the upper and lower portions of the Illinois as well as portions of the Chetco, North Fork Smith, and Elk Rivers The inventoried foreground Retention area along the Recreation and Scenic portions of the Rogue River would not have programmed timber harvest; the vegetative character of the river would be protected. Other allocations within the river corridors that would benefit the resource include Designated Wildlife Habitat and Supplemental Resource Management Areas

Alternatives NC, A, and A-Departure would maintain the natural or near-natural character of the river corridors primarily through the allocation of all inventoried visual objectives in the adjacent viewsheds. This would be expected to maintain the natural or near-natural appearance of the landscape character The viewshed adjacent to the last six miles of the Wild section of the Illinois River would be allocated to the Supplemental Resource Management Area which has no programmed timber harvest

The benefits of Alternative K would be similar in effect to those described in Alternatives NC, A, and A-Departure, although allocations to Backcountry Recreation are added. The most significant allocation to Backcountry Recreation is the viewshed adjacent to the last six miles of the Wild section of the Illinois River which would be maintained in an unroaded condition. The natural or near-natural character of the river corridors would be maintained through the allocation of adjacent viewsheds to visual management. The viewsheds adjacent to the Chetco River would be managed for a reduced level of Visual Quality Objectives resulting in a near-natural or modified landscape Viewsheds adjacent to the North Fork Smith and Elk Rivers would be expected to remain in a natural or near-natural condition.

Alternatives B, D, and D1 would have the same effect on the Wild and Scenic River resource. The quality of recreation settings currently available would be reduced due to the absence of visual management in the adjacent viewsheds Partial Retention schemes would be applied to the Rogue-Illinois viewshed which would allow management within the viewshed adjacent to the last six miles of the Wild section of the Illinois River.

Alternative C would have the most dramatic effect on the character of the river corridors Recreation settings would be affected by the change in allocations to lower visual management objectives in the Rogue and Illinois River corridors. The viewsheds adjacent to the North Fork Smith and Elk River corridors would be allocated to General Forest Development activities in the viewshed adjacent to the last six miles of the Wild section of the Illinois would be obvious.

SOIL AND WATER

SEDIMENT

Increased turbidity or sediment in streams and rivers supporting beneficial uses of water provides an indicator of potential adverse effects resulting from either natural conditions or management activities. For each alternative, the amount of accelerated sediment would vary directly with the amount of road construction and timber harvest, as modified by the accompanying mitigation measures provided through Standards and Guidelines and Best Management Practices (Forest Plan, Appendix F).

Figure II-20 compares the mean decade percent change (first five decades) in potential accelerated sediment to the projected continuing implementation of current management direction (Alternative A). In comparison to Alternative A, Alternatives NC, A-Departure, B, C, and D would result in greater amounts of sediment, with Alternative C being the most significant increase. Alternative D1 is equivalent to Alternative A outputs. Alternatives K and S are considerably less Sediment produced by Alternatives E, G, and M are significantly less than current rates All alternatives, however, would have some degree of programmed activity, and thereby would have from slight to moderately large increases in potential sediment over background levels

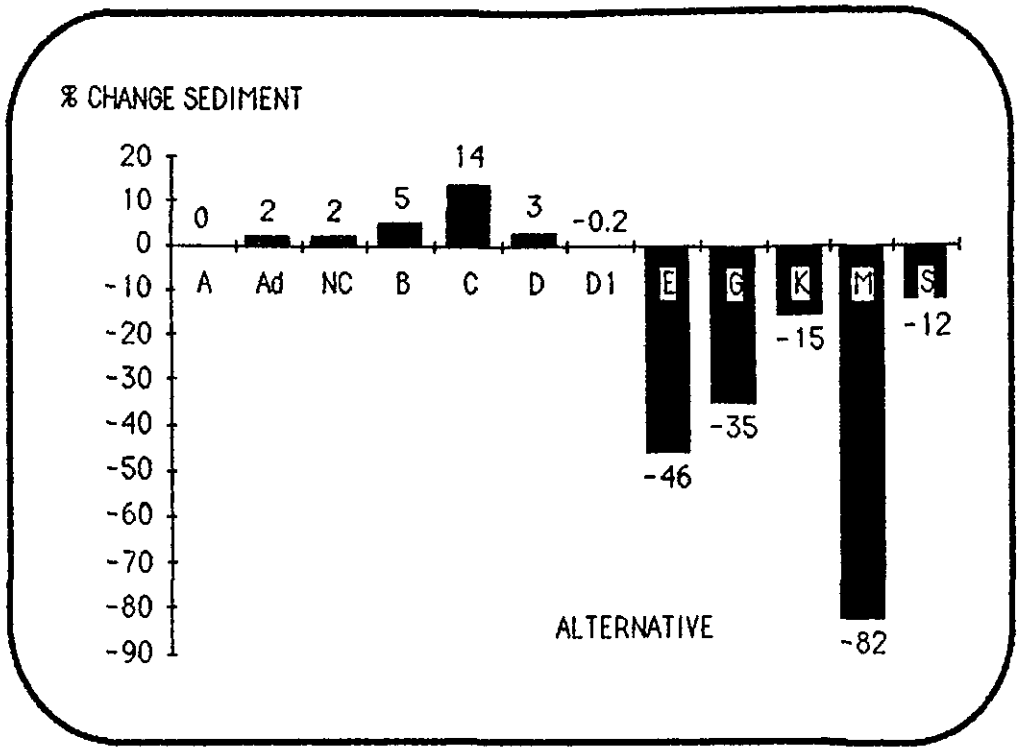


Figure II-20. Mean Percent Change in Estimated Accelerated Sediment Compared to Current Program (Alternative A), by Alternative

Figure II-21 compares the mean decade (first through fifth decades) estimated potential accelerated sediment, by alternative. The bar graph displays the quantity of sediment that would be produced by the management activity, taking into account the accompanying mitigation measures proposed for each alternative.

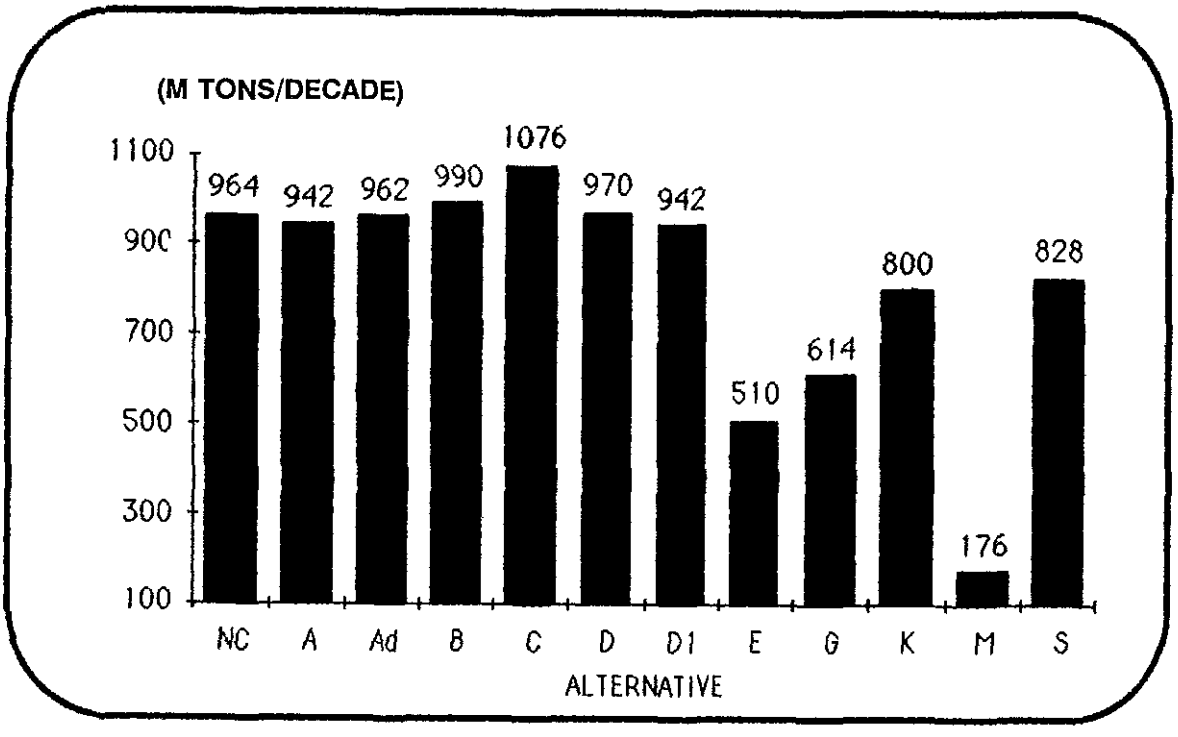


Figure II-21. Estimated Accelerated Sediment by Alternative - Mean Decades 1-5

CUMULATIVE EFFECTS

Cumulative watershed effects for both sedimentation and stream temperature increases may occur if management activities are not adequately dispersed in watersheds through time and space Rice (1980) discusses the issue of cumulative effects and supports the simple distribution of harvest as a mitigation of cumulative effects. "The problem of synchronization of effects should be addressed by dispersing watershed disturbances as greatly as feasible in time and space A more elegant approach to the problem cannot be supported by current knowledge concerning the propagation of flow or sediment in steep, rough, natural channels."

Figure II-22 compares the mean planning basin variation (coefficient of variation) for accelerated sediment for the first through fifth decades. Smaller values indicate a more even flow of sediment over the first five planning decades, while larger values indicate a greater variability in accelerated sediment delivery Smaller values in the variation of sediment over the first five decades indicate a greater dispersal of sediment over time and space with lower peaks and less potential for cumulative effects.

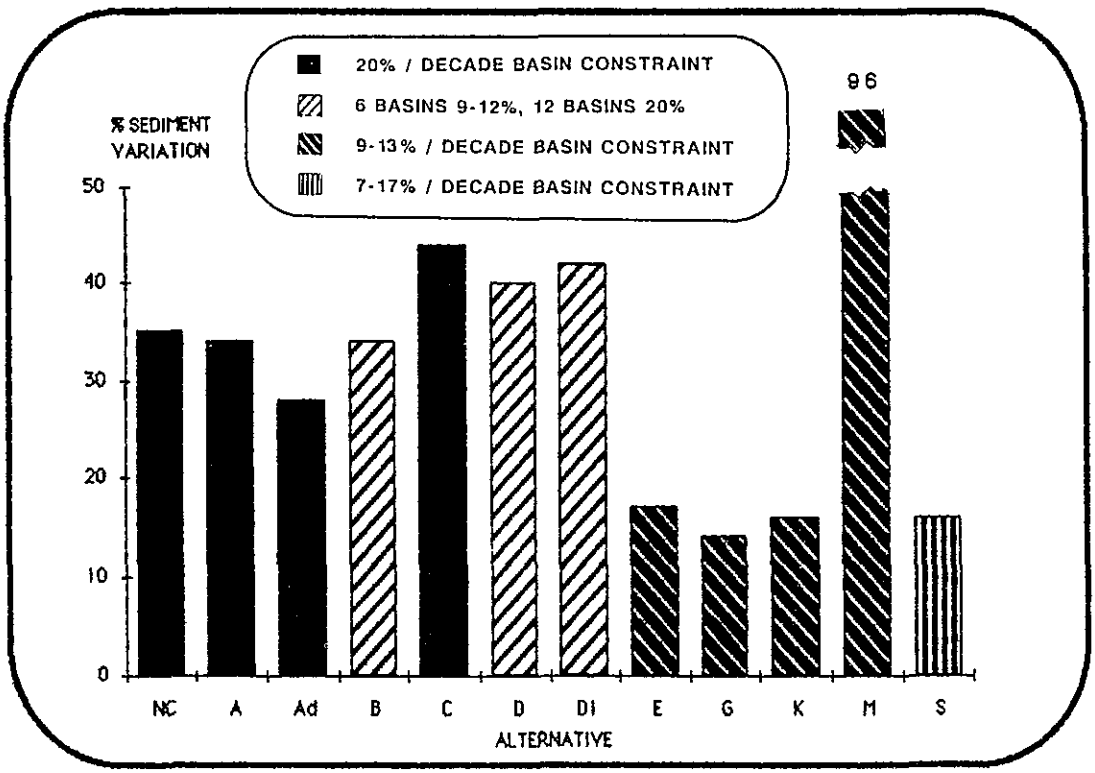


Figure II-22 Comparison of Mean Basin Variation in Accelerated Sediment by Alternative

The variation in projected accelerated sediment over the first five decades is limited for Alternatives E, G, K, and S, ranging from 14 to 17. Each of these alternatives is modeled with basin-specific timber harvest dispersion constraints of 9-13 percent (7-17 percent for Alternative S). These constraints limit the acres scheduled for harvest in any one decade to a percentage of the suitable acres in the planning basin with the objective of distributing activities, and thus effects, between the basins and through time for each basin

Although Alternative M also provides for the same decade limit, the average variation in accelerated sediment over the first five decades is nearly double However, the average variation for this alternative is not a good measure of increased potential for cumulative effects since the total amount of sediment produced is very small, even with the extreme variation, the peaks would be insignificant.

The variation in projected accelerated sediment over the first five decades ranges from 28 to 44 percent for Alternatives NC, A, A-Departure, and C. These alternatives are modeled with harvest dispersion constraints of 20 percent per decade for each basin Utilization of this basin constraint results in a less uniform scheduling of timber harvest and associated roading by basin and, thereby, greater variability in accelerated sediment is projected with higher peaks and greater potential for cumulative effects

The variation in projected accelerated sediment over the first five decades ranges from 35 to 42 percent for Alternatives B, D, and D1. For six basins, these alternatives are modeled with 9-12 percent per decade basin limit on activity acres. A 20 percent limit for the remaining twelve basins is used. The increased variation in accelerated sediment is due, in part, to more sediment being produced in the basins containing the 20 percent limit versus that being produced in the basins containing the 9-12 percent basin constraint

The potential for cumulative effects by Planning Basin is discussed under the **FISH** section in Chapter IV.

SEDIMENT AND BENEFICIAL USES

The amount of accelerated sediment and its potential risk to the beneficial uses of water, including public and domestic water supply, irrigation, wildlife, fisheries, boating, water contact recreation, visual quality, and navigation, vary by alternative The potential effects of sediment and stream temperature changes on the beneficial uses for each planning basin are discussed under the FISH section of Chapter IV (as are the definitions for "risk") For Alternative C, the estimated risk to beneficial uses ranges from moderate adverse to negligible and is about equally distributed between minor adverse and negligible. For Alternatives B, D, and D1, the estimated risk of sediment on the beneficial uses of water ranges from moderate adverse to negligible, the majority of estimated risks are negligible.

For Alternatives NC, A, and A-Departure, the estimated risk of sediment on the beneficial uses of water ranges from minor adverse to negligible; the majority of estimated risks are negligible. For Alternatives K and S, the estimated risk of sediment on the beneficial uses of water also ranges from minor adverse to negligible, however, nearly 90 percent of the estimated risks are negligible.

Alternative E, G, and M also have a negligible risk of sediment on the beneficial uses of water. The lower levels of timber harvest and roading activity in these alternatives allow for the current background level of sediment to be lowered over time Alternative M proposes the least timber harvest and roading activity.

WATER TEMPERATURE

Increased water temperatures during the summer may result from removing the vegetation shading streams and rivers Table II-3 shows the allocation of various planning basins by each alternative to Riparian Prescriptions B and C. The goal is to maintain water temperature for all planning basins allocated to Riparian Prescription B, and reduce it by up to two degrees Fahrenheit by the end of the third planning decade for all planning basins allocated to Riparian Prescription C. Alternatives that allocate planning basins to Riparian Prescription C provide a means of reducing stream water temperature within planning basins containing critical fisheries where there has been a net loss of stream shading due to past management The effect of increased stream temperature on the resident and anadromous fishery is discussed in the **FISH** section of this chapter

WATERSHED IMPROVEMENT

The amount of proposed soil and water resource improvement varies by alternative as shown below in Figure II-23 Alternatives that propose a greater rate of timber harvest would also result in greater financing for watershed improvement, since the funding for approximately 60 percent of the work is tied to timber harvest activity and volume of harvest

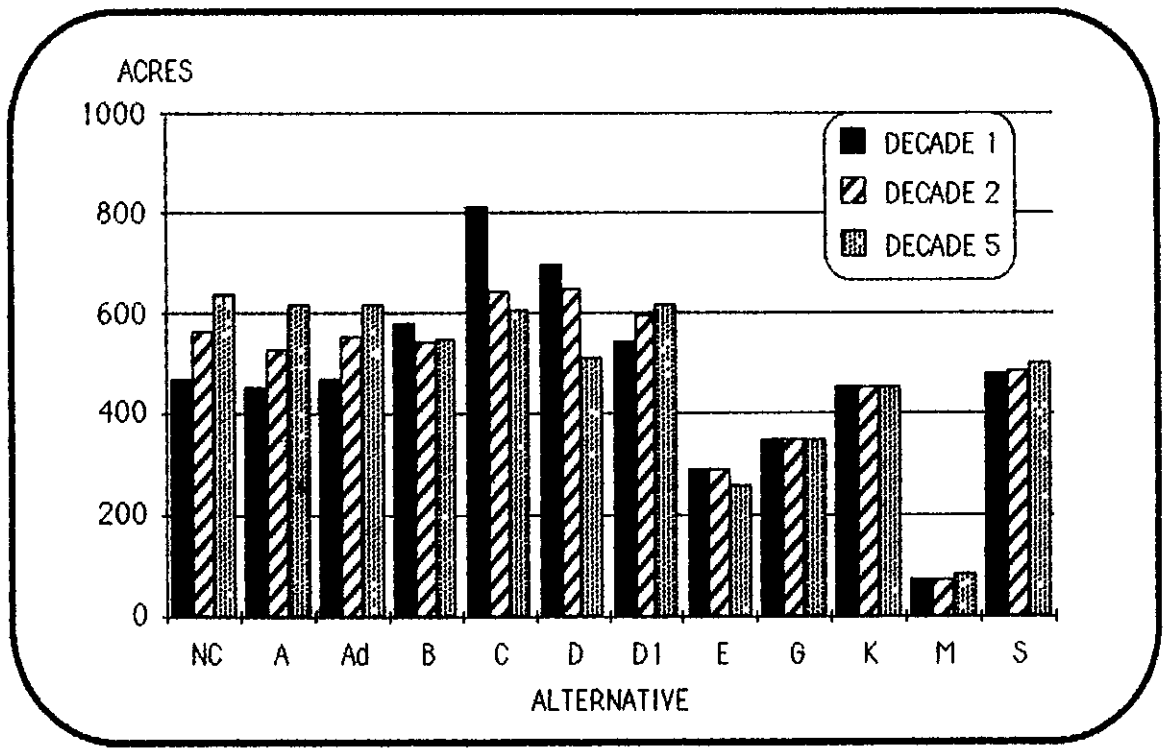


Figure II-23. Annual Acres of Improved Watershed Condition for Decades One, Two, and Five by Alternative

WATER YIELD

When compared to the total water yield for each planning basin, the increased water yield resulting from the removal of only a small percentage of mature forest is not significant. The water yield increase is gradually diminished each year as other vegetation grows on the site and the area is reforested, until returning to preharvest levels after 20 years See Chapter IV, ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVES, for more detail

SITE PRODUCTIVITY

Considerable research suggests that nutrient reserves, organic residues, and soil physical properties are critical elements of the ecosystem that must be managed to ensure long-term productivity All alternatives contain Standards and Guidelines that provide for maintaining soil physical properties; all alternatives but NC, A, and A-Departure contain Standards and Guidelines to retain on-site large woody material for maintenance of a healthy forest ecosystem Alternatives NC, A, and A-Departure contain Standards and Guidelines of current direction established and documented under plans listed in Appendix D which provide for maintaining soil physical properties, but do not contain specific direction for large woody material management. See Chapter IV, SOIL AND WATER and RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY sections for additional discussion.

FIRE

The interactions of fire, both managed (prescribed fire, i.e., slash burning and wildlife habitat improvement burning) and unmanaged (wildfire), with Forest resources and land allocations will depend upon its frequency, intensity, and duration on the site The ability of the fire management organization to physically deal with fire, in particular wildfire, is influenced by land allocations and associated Standards and Guidelines A well dispersed array of land allocations would be more difficult to manage than a limited number of land allocations consolidated in general areas Management complexity is generated by the individual fire management prescriptions developed to support the specific resource management objectives, and the activities permitted within each land allocation The array of management activities and uses of Forest resources portrayed in the range of alternatives will compound the management complexities associated with various key elements of the fire protection program, such as prevention, suppression, and fuels management.

PREVENTION

Increased recreation opportunities and timber harvest activities will add to the risk of human-caused fires. No specific numbers are available to determine the actual amount of increase, however, as activities increase, the risk of an ignition (start of a fire) also increases.

The range of alternatives provide a broad spectrum of recreational opportunities. In alternatives such as B, C, and D, areas not presently accessible would become available for recreation use as the road network expands during the course of timber harvest activities Forest recreationists, in many cases, would follow the expanding road system into areas not previously available for motorized recreation The increased recreation use and shifting recreation load would raise the risk of a human-caused wildfire in these areas

Dispersed recreation opportunities, such as those emphasized or enhanced in Alternatives E, G, K, M, and S would present a larger problem than developed recreation With dispersed recreation, the Forest visitor uses unimproved areas, which presents a greater risk of wildfire than use in developed areas

Motorized recreation, which is affected by the miles of roads open to such use, will also compound the fire prevention problem Prevention efforts will be further complicated by motorcycle and all-terrain-vehicle (ATV) users who will continue to use the many miles of unmaintained roads for recreational purposes

The prevention of industrial operations fires is a major portion of the wildfire prevention program throughout the range of alternatives The higher levels of timber activity in Alternatives NC, A, B, and C, for example, would increase the chances of an operations fire to a much greater degree than Alternatives E, G, and M The problem would increase by the fifth decade as the acreage involved in timber harvest increases in conjunction with the addition of commercial thinning activities (Table II-25)

Table II-25. Expected Annual Harvest Acres, by Alternative

	Decade (Acres Harvested)	
Alternative	1	5
NC	4,518	9,840
A	4,505	9,988
A-Departure	4,697	10,160
B	5,562	9,504
C	6,713	10,132
D	5,570	9,589
D1	5,251	9,450
E	2,890	6,603
G	3,495	7,325
K	4,934	8,800
M	754	2,147
S	4,790	9,363

SUPPRESSION

Two levels of fire protection are incorporated into the range of alternatives Alternatives NC, A, and A-Departure represent no change from the base fire planning organization The protection level for the remainder of the alternatives reflects a high degree of fire management efficiency A detailed discussion of the levels of protection analyzed for the Forest Planning process is presented in Appendix B.

The primary effect of the protection level on Forest resources such as fish, wildlife, water, recreation, timber, and facilities (improvements) is to establish a balance between suppression costs incurred while protecting resources and the damages to resources associated with wildfire occurrence.

All Forest resources will be affected by a catastrophic wildfire. These have occurred in the past and will occur on infrequent occasions in the future, regardless of the alternative The expected frequency of occurrence of a wildfire of 300 acres or larger is once every seven years.

Fire suppression effectiveness will be affected by the acres harvested in the various alternatives, the acres of hardwood stands converted to conifer production, and the resultant fuels treatment activities, which provide a diversity or mosaic of fuels The increasing diversity, coupled with fuels management practices will produce a fuels mosaic composed of recently treated harvest units, plantations, pole stands, mature timber, and old-growth timber While having average rates of spread similar to the current situation, the future fuels mosaic will have lower fuel loadings, resulting in fires of generally lower intensity and more efficient fireline construction rates This will equate to less acres burned, lower suppression costs, and lower resource damage per fire.

All alternatives, except Alternatives E, G, and M, would result in at least half of the Forest being affected by the development of a broad fuels mosaic by the end of the tenth decade. Alternative C would develop the most extensive mosaic and would complete it by the end of the eighth decade Alternative M, on the other hand, would only affect 38 percent of the Forest and the mosaic would be completed by the end of the seventh decade High percentages, 75 to 90 percent, of the mosaics in Alternatives NC, A, A-Departure, E, G, K, and S would be completed by the end of the seventh decade (Table II-26).

Table II-26 Fuels Mosaic Development through Timber Harvest Activities

Alternative	Time Mosaic Completed (Decade)	Affected Forest (Percent)
NC, A, A-Departure, D and D1	10	70
B	9	70
C	8	71
E	10	40
G	10	48
K	10	65
M	7	38
S	10	55

The miles of road available for immediate fire suppression access, as well as the miles of closed road that could be opened quickly in a fire emergency, will have a major influence on the type and amount of fire suppression forces maintained on the Forest. In alternatives such as NC, A, A-Departure, and D, which are well-roaded, a fire organization emphasizing ground forces supported by limited aerial forces would be most appropriate On the other hand, in alternatives such as E and M, a more equal balance between ground forces and aerial forces would be appropriate (Table II-27).

Table II-27 Road Available for Fire Access in Decade 1 (Miles)

	Miles	
Alternative	Open	Closed
NC, A, and A-Departure	2,528	347
B	2,254	368
C	2,576	377
D and D1	2,554	362
E	2,022	733
G	2,304	483
K	2,202	649
M	2,116	529
S	2,211	662

FUELS TREATMENT

Fuels treatment would vary throughout the range of alternatives from two important aspects (1) the activity fuels program, i e , slash or brush disposal (BD); and (2) the treatment of natural fuels

The amount of activity fuels treatment is dependent upon the acres of timber harvested. During the first decade, Alternatives B, C, and D would generate the greatest BD workload. However, by the fifth decade, the heaviest workload would fall in Alternatives NC, A, A-Departure, and C Alternative M would produce the lightest BD workload over the range of alternatives (Table II-28)

Table II-28. Expected Annual Harvest Acres Requiring Fuels Treatment, by Alternative

	Decade (Acres Requiring Treatment) 1/	
	1	5
NC	3,386	5,886
A	3,379	5,886
A-Departure	3,523	5,964
B	4,172	5,329
C	5,035	6,178
D	4,178	5,618
D1	3,938	5,647
E	2,168	3,537
G	2,621	4,154
K	3,556	4,996
M	566	1,146
S	3,593	5,239

1/ The acres treated assumes that 75 percent of the final harvest removal acres and 40 percent of the commercial thinned acres would require some form of hazard reduction work to meet resource management objectives

Three levels of natural fuels treatment are fixed into the range of alternatives. Alternatives NC, A, and A-Departure are fixed at 60 acres per year and represent no major effort at natural fuels treatment Alternative B (250 acres per year) reflects the 1980 RPA outputs (USDA 1984a). The remainder of the alternatives reflect a fixed value of 400 acres per year.

Most land allocations support use of prescribed fire as a tool to manage the accumulation of natural fuels Wilderness areas allow for the use of both planned and unplanned ignitions (See Table II-29).

The effects of the prescribed fire program will depend on factors such as size of area treated, fuel loading, and current weather conditions Accumulated fuels will be consumed by prescribed fire, reducing the severity and impacts of future fires. In addition to reducing fire hazards, low-intensity prescribed fires would increase forage for big game by removing tall, dense vegetation and encouraging earlier stages of forb and low shrubs. Palatability of forage would also be increased Prescribed fire increases both vegetative and animal diversity along with increases in populations of animal species that prefer early seral stages. The variety of fuels profiles on the Forest would be further enhanced by treating fuels complexes which have experienced 70 years of fire exclusion

Other important effects will be on air, soil, and water quality Alternatives such as B, C, and D, which utilize prescribed fire to the greatest extent, would have the greatest impact, while Alternative M, which makes the least use of prescribed fire, would have only minor impacts.

Table II-29 Prescribed Fire Ignition Strategies for Siskiyou National Forest Wildernesses

	Wilderness (Fire Ignition Strategy 1/)				
Alternative	Kalmiopsis	Wild Rogue	Grassy Knob	Siskiyou	Reb Buttes
NC, A, and A-Departure, E and M	4	4	4	5	1
B, C, D, and D1	2	1	4	5	1
G, K, and S	3	2	4	5	1

1/ Strategy 1 Planned ignitions only
Strategy 2 Planned ignitions supplemented by unplanned ignitions at Fire Intensity Level (FIL) 1
Strategy 3 Planned ignitions supplemented by unplanned ignitions at any FIL in the Pristine and Primitive (WRS) sections
Strategy 4 No planned or unplanned ignitions, fire exclusion
Strategy 5 Planned and unplanned ignitions

VEGETATION

Plant diversity has been defined variously. Many accepted quantitative definitions include the number of different species within an area and their relative abundance For example, an area with 10 different species with 10 individuals per species is considered to be more diverse than an area with 10 different species with one individual per species It is difficult to quantify the diversity of a given area and yet more difficult to predict what changes will occur, and how these changes would or should be influenced by management

Plant diversity is not static; change is inevitable For instance, control of wildfire is a major cause of change in plant community composition Ponderosa pine is not as common now on the Siskiyou as it once was. The lack of wildfire in the last few decades has left it at a competitive disadvantage. White fir, however, thrives in the absence of fire. Similarly, the application or lack of application, of management tools can be used to manipulate species composition to favor particular species or increase diversity.

Tree diversity will be maintained under all alternatives, although some fluctuations will occur in relative abundance. Although tree seedlings of various commercial species are presently not planted in the same proportions as they exist in natural stands prior to harvest, current practices are tending in that direction. Some species are given special attention Douglas-fir and sugar pine are tied to a tree improvement program Special efforts are made to plant both redwood and Brewer spruce on the sites they were removed from and onto sites identified as having the potential to grow them In fact, Brewer spruce, an indigenous tree species present on both commercial and reserved Forest lands, is being monitored to insure that it remains a viable species on commercial sites; seed is also being collected for use in reforestation Another concern is Port-Orford-cedar Because it can be killed by an introduced root disease, it will be monitored both locally and species wide Management direction designed to control the spread of the disease is included in the Standards and Guidelines governing all alternatives (LRMP, Chapter IV).

For species other than trees, the maintenance of diversity may require active management For sensitive species, alternatives with high rates of harvest and disturbance may require timely acquisition of management information, such as existing population density and sensitivity to change Alternatives E and M would leave more area undisturbed and more options open. However, species that require disturbance, such as fire, for their survival may be at risk. Alternatives E through S would tend to "preserve" diversity As mentioned, some species may require disturbance, and although these alternatives give us time, information will still be needed to assure the viability of all species, particularly sensitive species

HARDWOOD CONVERSION

Hardwood stands provide habitat diversity They are thought to be important for small mammals and birds; acorns from tanoak, one of the major hardwood species, are a staple for deer and elk They also play an important ecological role The high demand for nutrients by hardwood stands tends to slow nutrient loss after a disturbance, and their leaves quickly decompose in the winter, recycling what they have taken up The net result often enhances productivity

Alternatives B, C, D, and D1 would allow significant acres of hardwoods (14,000) to be converted to conifer plantations in the first decade Actual acres converted would depend on market conditions. Alternative A, A-Departure, K, and S would allow a moderate level of conversion the first decade (7,500 acres). Alternative G would allow a low level (4,000 acres), Alternatives NC, E, and M would not allow any

OLD GROWTH

Old-growth stands would provide the bulk of the timber harvest in the early decades in all alternatives. The rate at which old-growth stands would be harvested would serve as an indicator of the rate at which standing inventory deductions occur Departure alternatives would accelerate this rate of reduction, in comparison to their nondeclining yield counterparts. In general, old growth would be harvested more quickly under Alternatives NC, A, A-Departure, B, C, D, D1, K, and S. Under Alternative M, lands suitable for the production of timber would be managed on an old-growth rotation (250 years)

In all alternatives, some mature and old-growth forests would be maintained in the sense that they are located on lands unsuitable or unavailable for timber harvest, reserved as designated wildlife habitat, or where long rotations are established in visually sensitive areas. Mature and old growth in these categories is as low as 153,000 acres in Alternative NC, which does not meet MR's for wildlife. In alternatives with wildlife MR's, minimum levels of mature and old-growth forest would be maintained at 166,000 acres in Alternative C and would range up to 290,000 acres in Alternative M. Acres of mature and old-growth forest projected to be harvested from suitable timber lands during the first five decades are shown in Table II-30 Acres of old growth remaining are displayed by decade by alternative in Table II-31.

By the tenth decade, old-growth habitat would decline between 61 and 73 percent under Alternatives NC, A, A-Departure, B, C, D, D1, K, and S. Although still significant, reductions in old growth under Alternatives E and G would be less, 29 and 46 percent, respectively. Reduction in old growth would only be 13 percent under Alternative M (Table II-32).

By the tenth decade, old-growth habitat will be at its lowest ebb under all alternatives, old growth would occupy between 10 and 31 percent of the Forest land base, depending on the alternative. Under all alternatives, some presently young or mature timber stands would be located in areas where timber harvest is not permitted Because these stands will reach the old-growth successional stage by the fifteenth decade, the percent of old growth will actually show an increase by that time A comparison of the old-growth component as a percent of the total Forest is displayed by decade, by alternative, in Table II-32

Table II-30. Mature and Old-Growth Forest Planned for Harvest per Decade, by Alternative (Acres)

	Decade (Acres)				
Alternative	1	2	3	4	5
NC	48,490	60,860	66,430	61,150	62,870
A	50,030	60,800	62,880	62,050	61,160
A-Departure	51,950	61,460	61,390	61,080	61,440
B	64,830	63,500	70,220	68,600	50,410
C	73,350	59,680	61,300	69,140	67,910
D	60,420	63,730	60,110	63,580	58,050
D1	59,350	67,100	72,450	69,150	38,190
E	28,900	28,840	27,570	26,310	23,870
G	35,490	41,690	42,200	39,890	38,510
K	50,770	53,300	53,340	51,370	49,350
M	7,540	7,460	12,020	10,630	8,200
S	51,240	56,240	54,610	54,390	45,270

Table II-31 Remaining Old Growth at End of Decades (M Acres) 1/

	Decade (M Acres)				
Alternative	1	2	3	4	5
NC	345	284	227	185	147
A	343	283	229	193	156
A-Departure	342	280	227	193	156
B	329	265	202	175	141
C	353	297	236	185	137
D	348	293	233	191	152
D1	334	268	212	173	145
E	365	335	311	296	286
G	358	316	279	249	230
K	343	289	238	200	171
M	386	378	366	356	347
S	342	286	236	209	185

1/ Existing Old Growth is 393,000 acres

Table II-32. Proportion of the Forest Classified as Old Growth at the Start of Decades, by Alternative (Percent)

	Old Growth at Start of Decade (Percent)						
Alternative	1	2	3	4	5	10	15
NC	36 0	31 6	26 0	20 8	16 9	9 9	17 3
A	36 0	31 4	25 9	21 0	17 7	11 6	18 7
A-Departure	36 0	31 3	25 6	20 8	17 7	11 4	18 0
B	36 0	30 1	24 3	18 5	16 0	11 1	18 0
C	36 0	32 3	27 2	21 6	16 9	10 9	16 6
D	36 0	31 9	26 8	21 3	17 5	11 1	17 2
D1	36 0	30 6	24 5	19 4	15 8	11 1	18 2
E	36 0	33 4	30 7	28 5	27 1	25 4	39 5
G	36 0	32 8	28 9	25 5	22 8	19 6	30 1
K	36 0	31 4	26 5	21 8	18 3	12 8	21 5
M	36 0	35 3	34 6	33 5	32 6	31 2	50 3
S	36 0	31 3	26 2	21 6	19 1	14 2	22 4

SUCCESSIONAL STAGES

Under all alternatives except M, the greatest change would occur in the old-growth stage which presently occupies 36 percent of the Forest land base, but which would decline significantly The proportions of mature and young forest would fluctuate significantly throughout the planning period under all alternatives except M, due mostly to the Forest's uneven distribution of stand age classes. Tables II-33 and II-34 demonstrate the progression of environmental consequences in the fifth and tenth decades, respectively, which would occur as old-growth stands are converted to managed stands (100-year rotations)

Seral stage proportions on the Siskiyou vary widely by planning basin Predictably, planning basins which are predominantly Wilderness or unroaded contain rather high proportions of old growth and low proportions of early seral stages If future timber harvests are distributed evenly, according to the amount of land allocated to timber production in each planning basin, each seral stage could be maintained at a minimum proportion of four or five percent within the non-Wilderness planning basins (Grass/Forb and Low Shrub grouped together)

Table II-33. Proportion of the Forest in Various Successional Stages at the Start of the Fifth Decade, by Alternative (Percent)

	Successional Stages (Percent)							
Alternative	Misc 1/	Grass/ Forb 0-3	Low Shrub 4-10	Tall Shrub 11-20	Poles 21-40	Young 41-100	Mature 101-200	Old Growth 201+
NC	23 4	2 5	4 5	6 1	10 0	20 1	16 4	16 9
A	23 4	2 5	4 5	6 0	10 2	20 1	15 6	17 7
A-Departure	23 4	2 5	4 4	6 3	10 5	20 1	15 1	17 7
B	23 4	2 6	4 7	6 4	12 0	20 1	14 8	16 0
C	23 4	2 5	4 4	6 5	14 7	20 1	11 4	16 9
D	23 4	2 4	4 1	5 7	13 6	20 1	13 3	17 5
D1	23 4	2 1	4 8	6 7	11 9	19 9	14 9	15 8
E	23 4	1 5	1 7	2 5	5 3	20 1	18.6	27 1
G	23 4	1 8	2 8	3 9	7 1	20 1	18 1	22 8
K	23 4	2 1	3 5	5 0	9 6	20 2	18 0	18 3
M	23 4	9	7	1 1	1 4	20 1	19 9	32 6
S	23 4	2 2	3 7	5 3	9 8	19.9	16 2	19 1
Present situation for comparison	23 4	1 8	3 3	4 7	9 2	17.0	4 6	36 0

1/ The miscellaneous category contains serpentine/peridotite areas, rock outcrops, and hardwood stands

Table II-34. Proportion of the Forest in Various Successional Stages at the Start of the Tenth Decade, by Alternative (Percent)

	Successional Stages (Percent)							
Alternative	Misc 1/	Grass/ Forb 0-3	Low Shrub 4-10	Tall Shrub 11-20	Poles 21-40	Young 41-100	Mature 101-200	Old Growth 201+
NC	23 4	1 8	2 7	3 1	7 2	31.4	20 5	9 9
A	23 4	1 6	2 4	3 0	6 6	31 6	17 0	11 6
A-Departure	23 4	1 7	2.5	2 9	6 4	32.2	19.6	11.4
B	23 4	1 4	1.9	2 2	7 1	34 8	18 1	11 1
C	23 4	2 2	3 6	3 0	6 2	35 5	15 3	10 9
D	23 4	2 0	3 3	3 2	8 0	32 7	16 2	11 1
D1	23 4	1 8	2 3	3 4	10 5	30 6	17 1	11 1
E	23 4	1 6	1 8	1 5	4 2	16 3	26 1	25 4
G	23 4	1 5	2 2	2 1	6 3	22 4	22 6	19 6
K	23 4	1 9	2 9	3 5	9 3	27 0	19 2	12 8
M	23 4	1	0	0	7	8 7	35 5	31 2
S	23 4	1 4	1 8	3 0	8 6	28 3	19.2	14.2
Present Situation for comparison	23 4	1 8	3 3	4 7	9 2	17 0	4 6	36 0

1/ Contains serpentine/peridotite areas, rock outcrops, and hardwood stands.

TIMBER

The implications of the alternatives on timber resource management can best be understood by examining a few parameters of acre allocations and scheduled outputs. Measures of the availability of the land base to produce timber are provided by examining the acres allocated to prescriptions that include timber management. The management areas with programmed timber are: General Forest, Partial Retention Visual, Retention Visual, Riparian, and Scenic/Recreation River. The General Forest prescription provides for the highest level of timber outputs, subject to broad multiple-use constraints. The other prescriptions emphasize management for nontimber resource values (such as visual quality or riparian and watershed values) and have reduced levels of timber output. The acres allocated to these prescriptions are displayed for each alternative in Table II-3, and are illustrated by Figure II-24.

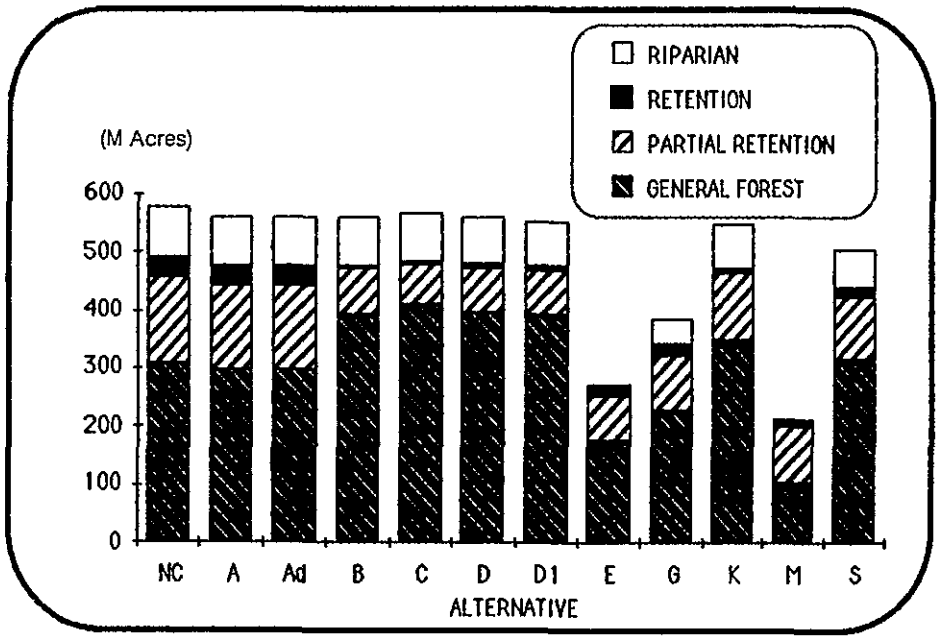


Figure II-24. Acres with Programmed Timber Harvest (M Acres)

The important timber outputs that can be used to gauge the alternatives are: first decade Allowable Sale Quantity (ASQ) and Long-Term Sustained Yield (LTSY). Both are expressed in terms of annual timber volume output. These outputs are also displayed for each alternative in Table II-5, and are illustrated by Figure II-25. Table II-35 includes timber resource management information about present and future timber production.

The analysis and projections for future timber outputs use cubic volume measure. Historic volumes and volumes projected for harvest by alternative in the next decade are also displayed in board foot measure It is expected that there will be a transition from using board foot measure to cubic measure, both within the Agency and within the timber industry, in the next decade Volumes are displayed in board foot measure for the first decade only. In the future, the board feet expected to be harvested will vary as the size of the specific stands harvested varies Board foot measure of volume harvested is expected to decline over the next few decades as the average diameter of the stands harvested decreases, even though the volume in cubic measure may be the same. For example, Alternative A projects harvest at 30.1 MMCF per year on a non-declining flow schedule, but this same volume measured in board feet could range from approximately 170 MMBF in the first decade to less than 150 MMBF by the fifth decade as the relationship of board feet to cubic feet declines with the harvest of smaller material This trend would occur under any alternative except Alternative M.

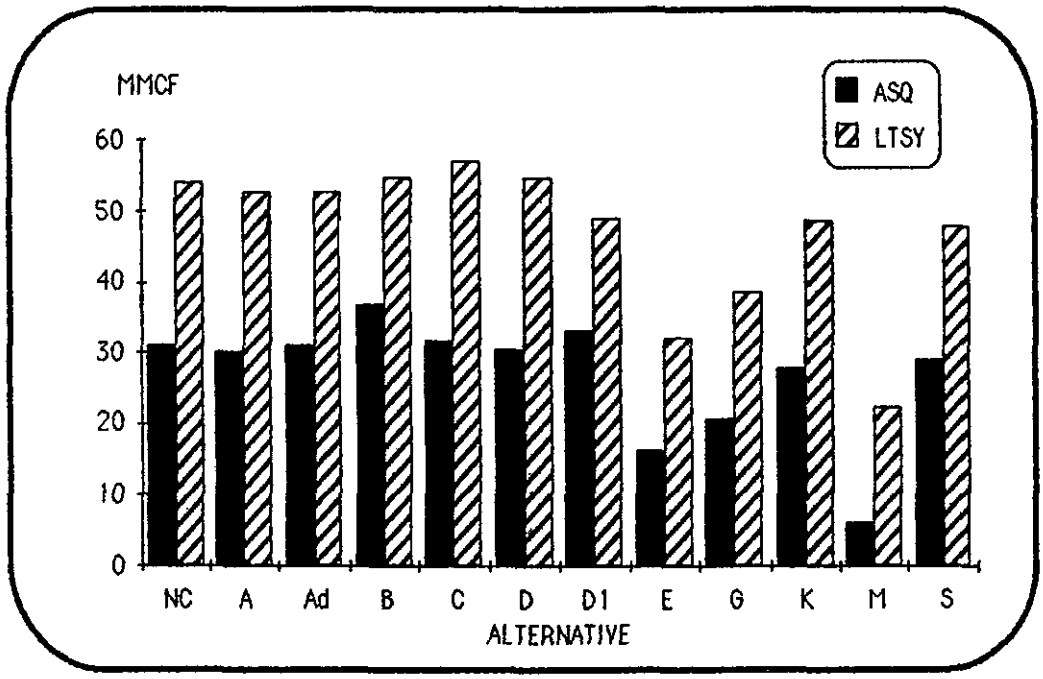


Figure II-25. Annual Timber Volume Output for ASQ (First Decade) and LTSY by Alternative (MMCF)

Suitable area declines from Alternative NC to A to D1 to K to S due to allocation of lands where programmed timber harvest is excluded (Management Areas 1-9). The amount of suitable area continues to decline from Alternative S to G to E to M

First decade ASQ and LTSY are also generally proportionate to suitable acres. Exceptions occur for the first decade ASQ where a departure harvest schedule exists (A-Departure and B) or where the rotation length is shortened (Alternative D1). Alternative NC is also different since timber production is set at the level of the 1962 Timber Management Plan LTSY would generally be reached in the ninth or tenth decade except in Alternative M where the LTSY would not be reached until after the fifteenth decade.

The net growth in year 2030 is also proportionate to the amount of suitable acres. The net growth per acre varies due to the differences in age class distribution on different site classes Those alternatives that harvest large areas early (such as C, D, and B) have large per acre growth rates due to conversions of hardwoods and slow-growing old-growth stands to thrifty growing young stands The alternatives that do not develop unroaded areas (Alternatives G, E, and M) also have high proportionate growth rates. This is due to leaving the mature stands in the unroaded areas out of the base The areas already accessed have a much higher balance of acres in younger age classes with high per-acre growth

The display of regeneration harvest acres generally varies with the harvest level. Those alternatives that have a higher harvest level have more acres harvested The amount of hardwood conversion also influences the amount of harvest acres Alternative C has the highest amount of hardwood conversions while Alternatives G, E, and M have no hardwood conversions planned.

The percentage of the potential timber yield available from the selected suitable land is a function of land allocation Those acres allocated to General Forest are managed for full yield. The Partial Retention Visual Management Area would produce less than full yield, but greater than 50 percent yield. The Riparian and Retention Management Areas would produce less than 50 percent yield

Table II-35. Timber Resource Management Information by Benchmark and Alternative

Benchmark or Alternative 1/	Selected Suitable Lands M Acres	Inventory Begin MMCF	Inventory Begin/Acre CF	Inventory End MMCF	First Decade Average Annual ASQ MMCF	First Decade Average Annual ASQ % of Col (2)	First Decade Average Annual ASQ MMBF	LTSY MMCF	LTSY % of Decade Col (4)	LTSY Met	Average Annual Net Growth CF/Acre Present	Average Annual Net Growth CF/Acre 2030	Average Annual Net Growth MMCF 2030
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Benchmark													
Maximum Timber	571	1,491	2,611	2,079	33.4	2.2	186.4	59.0	2.8	10	16.4	81.1	463
Maximum PNV	549	1,558	2,838	1,871	32.4	2.1	180.8	52.0	2.8	10	19.5	67.8	372
Alternative													
NC	576	1,632	2,833	2,105	31.0	1.9	167.5	54.2	2.6	12	18.7	63.8	367
C	566	1,548	2,734	1,998	31.8	2.1	177.4	57.0	2.9	9	17.8	82.1	464
D	560	1,502	2,682	1,909	30.4	2.0	169.7	54.8	2.9	9	17.7	77.5	434
B	558	1,414	2,534	2,046	36.8	2.6	205.4	54.8	2.7	10	15.2	69.4	387
A-Departure	558	1,545	2,769	2,133	31.2	2.0	174.1	52.7	2.5	11	18.9	66.7	372
A	557	1,540	2,764	2,050	30.1	1.9	167.9	52.7	2.6	11	19.0	65.7	366
D1	550	1,432	2,647	1,517	33.2	2.3	185.2	49.0	3.2	10	16.2	62.2	336
K	529	1,366	2,582	1,698	27.8	2.0	155.1	48.8	2.9	11	21.8	66.1	350
S	505	1,363	2,699	1,811	29.0	2.1	161.8	48.0	2.7	10	19.6	69.8	353
G	406	1,071	2,638	1,403	20.5	1.9	114.4	38.7	2.8	15	20.8	71.4	290
E	287	803	2,798	1,159	16.2	2.0	90.4	32.2	2.8	9	25.1	90.9	261
M	207	455	2,198	1,992	6.1	1.3	34.0	22.2	1.1	2/	33.6	83.5	173

Table II-35. Timber Resource Management Information by Benchmark and Alternative (Continued)

Benchmark or Alternative	Area and % of Suitable Land by Yield Level						First Decade			
	Full Yield		50-90% Yield		Under 50% Yield		Clearcut	Shelterwood/ Seed Tree	Selection	Harvest Total
	M Acres	% Col (1)	M Acres	% Col (1)	M Acres	% Col (1)	M Acres	M Acres	M Acres	% Col (1)
	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)
Benchmark										
Maximum Timber	486	85.1	0	0	85	14.9	83.4	3/	5.3	15.5
Maximum PNV	466	84.9	0	0	83	15.1	44.4	3/	4.6	8.9
Alternative										
NC	307	53 3	148	25.7	121	21.0	48.5	3/	3.3	9.0
C	421	74.3	61	10.9	84	14.8	67.1	3/	6.2	12.9
D	406	72.5	66	11.8	88	15.7	55.7	3/	4.7	10.8
A-Departure	289	51.8	155	27.8	114	20.4	47.0	3/	5.0	9.3
B	405	72.6	65	11.6	88	15.8	55.6	3/	9.2	11.6
A	291	52.2	153	27.4	113	20.3	45.0	3/	5.0	9.0
D1	397	73.4	64	11.8	80	14.8	52.5	3/	6.8	10.8
K	354	66.9	92	17.4	83	15.7	45.2	3/	5.6	9.6
S	316	62.6	108	21.4	81	16.0	47.9	3/	3.3	10.0
G	232	57.1	112	27.6	62	15.3	34.9	3/	0.5	8.7
E	188	65.5	85	29.6	14	4.9	28.9	3/	0.0	10.1
M	135	65.2	62	30.0	10	4.8	7.5	3/	0.0	3.6

1/ Tentatively suitable for timber lands for all alternatives: 624,240 acres
2/ Harvest in Decade 15 is 28 percent of long-term sustained yield (LTSY).
3/ Some acres shown as clearcut acres may be seedtree, shelterwood, or selection treatments depending upon site specific prescription. Refer to Appendix G for more details.

Harvests scheduled in riparian areas are shown as selection harvest (column 22) All other harvests are shown as acres clearcut, however, actual selection of a harvest method will be on a site-specific basis (refer to Appendix G) and some of these acres may be shelterwood, seed tree, or selection harvests

Most of the alternatives are designed to produce timber on a nondeclining harvest schedule The projected LTSY with applied timber management is higher than the harvest level that can be maintained by the existing stands, as they are metered out to last until the regenerated stands become available for harvest. The harvest schedules would generally remain constant over the first several decades, and then increase about the eighth or ninth decade as managed timber stands become available for harvest.

Exceptions to this pattern are Alternatives A-Departure and B which depart from the nondeclining even-flow policy. These alternatives are designed to meet specific outputs in the short term Alternative B starts with the same initial acreage allocation as Alternative D, but, with the departure schedule, would meet the RPA timber goals for two decades and then drop to a low of 25 MMCF in the fifth, sixth, and seventh decades before climbing up toward LTSY. Alternative A-Departure would continue timber outputs at approximately the current level for the next two decades, and then drop to a low of 29 4 MMCF in the middle decades.

Alternative D1 is unique (in General Forest areas) in that it would provide rotations (i.e., time span from plantation establishment to harvest and establishment of a new plantation) two decades shorter than those allowed by other alternatives. With the exception of the rotation lengths, this alternative is the same as Alternative D. Alternative D1's rotation for high and medium site General Forest areas would be approximately 80 years This may not meet the NFMA requirement that, prior to harvest, stand growth shall generally have reached the culmination of mean annual increment (CMAI); minimum rotations would be one or two decades shorter than the time required for culmination of 95 percent of mean annual increment.

Alternative M is also unique, requiring minimum rotation lengths of 250 years on all lands where timber harvest is allowed These acres are listed as General Forest, but the yield tables and timber outputs would be reduced accordingly. In addition, no new roads would be constructed, and only those areas accessible by existing roads would be planned for timber management

The effects of the alternatives on management of the timber resource would primarily be the result of the allocations of land to uses that either reduce or do not provide for timber harvest. This would be mitigated to some extent by providing intensive timber management regimes on those acres remaining available for timber production To optimize the timber production aspects of each alternatives objectives, practices such as precommercial and commercial thinning, tree planting, improvement of genetic stock, and animal damage control are planned in various combinations. Treatment schedules are also designed to provide the highest outputs achievable for the existing inventory structure. The analysis and development of these regimes are described in *Managed Yield Tables For the Siskiyou National Forest* (Craig 1984).

Another way of intensifying production on available acres would be to shorten the minimum rotation length as described for Alternative D1 above. This would provide a higher level of timber output (Alternative D1, at 33 2 MMCF, versus Alternative D at 30 4 MMCF), but as mentioned, may not meet the requirement of NFMA. The option of using short rotations to increase timber outputs is discussed in more detail in the section, **ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY** in this chapter.

Developing prescriptions that allow timber harvesting in areas that are allocated to the protection or management of other resources is also a form of minimizing the effects of such allocations on the management of the timber resource As examples· allocations emphasizing visual quality have prescriptions that allow timber harvesting at the highest rates that can be maintained while still meeting the objectives for visual management; riparian areas would also produce varying levels of timber, according to the alternative's Riparian Prescription and land allocations Alternatives E and M would not allow harvest from streamside areas; the remaining alternatives, however, would all provide for limited harvest of timber within the riparian area -- subordinate to the management objectives for the riparian,

fisheries, and watershed resources Alternative G would allow a low level of harvest Alternatives NC, A, A-Departure, C, and K would allow timber harvesting at or near the highest level that could be maintained while protecting fish and watershed values. Alternatives B, D, D1, and S would provide intermediate levels of timber harvest in riparian areas, with prescriptions assigned to individual basins so as to correspond to the themes of the alternatives

Historical Perspective

The Forest has historically supplied significant volumes of timber for harvest. The current Timber Management Plan was completed in 1962 and established an annual potential yield of 190 9 MMBF Amendments have adjusted the potential yield to account for changes in the land base, primarily wilderness additions Table II-36 displays the potential yield as amended, and the net chargeable volume sold and harvested by year from 1963 to 1987.

Table II-36. Siskiyou National Forest Timber Harvest Record 1963 to 1987 (MMBF)

	MMBF		
Fiscal Year	Potential Yield	Volume Sold	Volume Harvested
1963	190 9	287 4	168 4
1964	190 9	183.3	258 2
1965	190 9	262 3	198.6
1966	190 9	230 9	253 4
1967	190 9	157.1	222 7
1968	190 9	216 0	241 6
1969	190.9	186 6	183.5
1970	190.9	191.8	138 0
1971	190.9	201.6	154 4
1972	190.9	196 2	222 5
1973	190.9	190 4	258 5
1974	190 9	192.8	162 2
1975	188 3	188 0	142.4
1976 1/	235 3	230 7	194 7
1977	188 3	151 1	146 9
1978	188 3	185 1	197 0
1979	180 6	185 0	202 4
1980	173 0	200 0	116 4
1981	171 5	200 2	84 1
1982	171 5	158 8	32 1
1983	171 5	174 8	88 6
1984	171 5	114 3	110 0
1985 2/	167 5	-230 0	112 6
1986	167 5	197 2	150 7
1987	167 5	203 3	194 4
TOTALS	4,633 1	4,454 9	4,234 3

1/ Includes transition quarter
2/ Volume sold reflects a buy-out adjustment of -412 5 MMBF

Examining the events over a recent decade (1975-1984) may add some perspective and contribute to understanding the effects of changes in the timber outputs. Events and actions within the Forest Service, and within the industry, are of interest

During this period, purchasers annually bought an average of 174 4 MMBF and cut an average of 128.3 MMBF (net merchantable) The reason the amount of timber harvested was less than the amount of timber sold involves the recession A severe depression of the housing market and a general slowdown in the economy sent demand and prices for lumber and plywood crashing in 1980. Many purchasers had a considerable volume of high priced timber under contract on the Forest at the time This impact was felt on the Siskiyou in two ways. First, timber harvest declined, in 1982 only 39 4 MMBF (all products) were cut on the Forest. Second, purchasers tried to stay competitive by harvesting their less expensive timber For example, in 1982, the average bid price for timber on the Forest was 129 dollars per MBF (all products), while the average price paid for timber cut on the Forest was 82 dollars per MBF (all products).

The average potential yield, for the Forest from 1975 through 1984 was 179 5 MMBF (chargeable sawtimber volume), as prescribed in the 1962 Timber Management Plan. Actual annual sell level for the same period, was only 170.1 MMBF (chargeable sawtimber volume) The difference between potential and actual sell was due primarily to injunctions involving the RARE II Roadless Areas which prevented the Forest from offering a number of fully prepared sales during the period In addition, several deficit sales late in the period failed to sell. In 1985, potential yield was reduced to 167.5 MMBF following passage of the Oregon and California Wilderness Acts of 1984. If current direction were to continue, the 1962 Timber Management Plan would have to be adjusted downward again to reflect the Wild and Scenic River corridors designated under the Omnibus Oregon Wild and Scenic River Act of 1988

A comparison of the past timber program and the projections for each of the alternatives is presented in Table II-37. The effect of implementing the Forest Plan depends on whether the events of the past decade continue or change. The ASQ of the Preferred Alternative (S) represents the amount of timber that could be sold in the decade (in any given year sales can exceed or fall short of the ASQ, but the cumulative total for the decade may not be exceeded). This maximum was represented by the potential yield in the current Timber Management Plan, approved in 1962. During the 1975-84 period, the Forest sold about 95 percent of the potential yield under the current Timber Management Plan. Barring unforeseen circumstances such as inadequate funding by Congress or litigation, the Forest Service expects to achieve 100 percent of the ASQ in the new Forest Plan

On the Siskiyou National Forest in 1985, Purchasers returned 412.5 MMBF under the Federal Timber Contract Payment Modification Act. This net merchantable sawtimber volume, with an average bid value of 632 dollars per MBF, was bought out at a rate of 16 dollars per MBF under the terms of the Act Also, the Forest Service implemented regulations in 1982 that require shorter term sales and more up-front money to curb the incentive to hold timber for speculation (which was a major contributing factor to the large backlog of high-priced stumpage resulting in the buy-out legislation). While harvest was very low in the early 1980's, the average annual harvest has experienced an upswing since 1986 (Table II-36) Purchasers are expected to harvest approximately what is sold under the Preferred Alternative of the Forest Plan.

Compared to the potential yield in the current Timber Management Plan, the Current Direction Alternative (A) represents only a three percent decrease in chargeable sawtimber outputs. The Preferred Alternative (S) amounts to a seven percent decrease. Compared to the actual harvest in the 1975-84 period, the Preferred Alternative represents an increase of 18 percent. Since receipts are based on cut, this equates to a 2.1 million dollars projected annual increase in county receipts, and a potential increase of 270 jobs

Table II-37. Comparison of First Decade Timber Outputs by Alternative

Timber Output Component	1975-1984 Annual Average Sold	Cut	Existing '62 TM Plan No Change	ALTERNATIVE No Action	A-Departure	B	C	D	D1	E	G	K	M	S
CHARGEABLE (MMBF)														
Sawtimber (Green)	170.1	128.2	167.5	167.9	174.1	205.4	177.4	169.7	185.2	90.4	114.4	155.1	34.0	161.8
Salvage (Dead)	--	--	--	1.7	1.7	2.1	1.8	1.7	1.9	0.9	1.1	1.6	0.3	1.6
SUBTOTAL (ASQ) 1/	--	--	167.5	169.6	175.8	207.5	179.2	171.4	187.1	91.3	115.5	156.7	34.3	163.4
NONCHARGEABLE (MMBF)														
Salvage (Dead)	4.4	3.3	5.0	--	--	--	--	--	--	--	--	--	--	--
SUB-MERCHANTABLE (Cull and Small Logs Which Do Not Meet Merchantability Standards) (MMBF)														
	18.7	13.4	16.8	16.8	17.4	20.5	17.7	17.0	18.5	9.0	11.4	15.5	3.4	16.2
CONVERTIBLE PRODUCTS (M Cords)														
Firewood, Posts, etc	49.6	31.0	49.6	49.1	51.2	59.9	52.9	50.7	55.0	28.0	35.3	44.3	10.6	48.6
TIMBER SALE PROGRAM QUANTITY (TSPQ) (MMBF) 2/														
	193.2	144.9	189.3	186.4	193.2	228.0	196.9	188.4	205.6	100.3	126.9	172.2	37.7	179.6

1/ No Change figure is Potential Yield, others are ASQ
2/ TSPQ does not include convertible products.

Mills in Coos, Curry, Jackson, and Josephine Counties are expected to face a fluctuating timber supply over the next 30 years. Projections indicate that the supply of non-National Forest stumpage will drop for the next 10 years. The projected supply for the following 10 years is not of sufficient magnitude to satisfy potential consumption needs (as postulated in Chapter III). Therefore, alternatives containing National Forest harvest flows that counterbalance changes in non-National Forest supply could have the beneficial effect of mitigating the total timber supply over time Different alternatives then have different levels of projected supply within the four-county area (Table II-38)

Table II-38. Total Projected Four-County Timber Supply by Alternative and Estimated Demand (MMCF/Decade)

	Historical	Projected Supply by Decade (MMCF/Decade)		
Alternative	1980-1984	1989-1998	1999-2008	2009-2018
Volume Other than Siskiyou National Forest	1,447	1,966	1,352	1,939
Total Volume by Alternative, including Siskiyou National Forest (Arranged by Increasing Volume for the First Decade)				
M	1,606	2,027	1,413	2,000
E	1,606	2,128	1,514	2,101
G	1,606	2,171	1,557	2,144
K	1,606	2,244	1,630	2,217
S	1,606	2,250	1,636	2,223
A	1,606	2,267	1,653	2,240
D	1,606	2,270	1,656	2,243
NC	1,606	2,276	1,662	2,249
A-Departure	1,606	2,278	1,664	2,242
C	1,606	2,284	1,670	2,257
D1	1,606	2,292	1,684	2,271
B	1,606	2,334	1,720	2,269
Estimated Demand, All Ownerships				
Low Projection		2,056	2,282	2,282
High Projection		2,282	2,506	2,506

Two projections of estimated demand of wood by local mills are made. The lower projection is 2,058 MMCF in 1990 increasing to 2,282 MMCF in the year 2000. The high end projection estimates 2,282 MMCF of wood will be processed in 1990 with 2,506 MMCF being processed in the year 2000

In the first decade, Alternatives B, C, and D1 would meet or exceed anticipated log consumption needs using the high end of the range for consumption as developed in Chapter III. Alternatives NC, A, D, S, and K would almost meet the projected consumption while Alternatives E, G, and M would fall short of the projected log needs. In the second and third decade, no alternative would meet the anticipated log consumption needs for the local area of influence at the lowest level of projected demand. Alternative B would come the closest to meeting the projected needs with a total supply of 1,720 MMCF per decade

Using the low end of the range of projected consumption, all alternatives except Alternative M would exceed the projected log needs for the four-county area of Coos, Curry, Josephine, and Jackson Counties for the first decade In the second and third decades, no alternative would exceed the lower limit of demand for log consumption.

As discussed earlier, the departure alternatives (Alternative B and A-Departure) would have decreases in timber production in future decades while the other alternatives would maintain or increase their timber outputs. The departure alternatives respond to the projected downfall in timber supply in the first, second, and third decades from other ownerships The potential of the Forest to supply timber limits the extent to which the Siskiyou National Forest can respond to the projected shortage of logs

It is important to recognize other options for harvest scheduling, such as a departure beginning in the second decade. However, the time span for implementation of this plan is 10 years Management has the option to depart from evenflow harvest to respond to supply conditions in future plans as well as in the present planning effort

Comparison to Oregon Department of Forestry Goals

The Forestry Program For Oregon - An Action Program for the Eighties (Oregon State Board of Forestry 1982) updates the 1977 Forestry Program for Oregon (FPFO) which includes goals for timber production from the National Forests that correspond to State of Oregon objectives. The goals have been revised by the Oregon Department of Forestry (ODF) to correspond with the current land classifications on the Forest (letter of April 2, 1985, in the Planning Records) The revised projections indicate goals for timber outputs of 40.7 MMCF for the first decade; 39.1 MMCF for the second decade; and a decline in the third and fourth decades to 36.5 MMCF and 37.2 MMCF, respectively; it then increases to 40 MMCF or more for the remaining decades

These projections are not directly comparable to the results of the current analysis, due to differences in yield tables, inventory data, and reduced yields on acres where nontimber values are emphasized. For example, the State projections do not include harvest dispersion requirements or reduced yields in riparian areas. Installing these requirements in our analysis results in a 15 percent change in the timber harvest level. Alternative B appears to come the closest to meeting the State goals, producing 36.8 MMCF ASQ (40.5 MMCF when nonchargeable volume is included) for the first and second decades. However, this is a departure alternative and would not meet the goals in future decades.

The ODF also has identified objectives for land allocation, intensive management, and community stability. Table II-39 (developed by the ODF) displays the FPFO objectives and the standards of the ODF by which to measure how well Forest Plan FEIS alternatives meet their objectives. The alternatives are displayed according to whether they meet both the objective and the State standard (level 1); fit with the objective, but do not meet the State standard (level 2), or meet neither the objective nor the State standard (level 3). The listing of alternatives in this display was revised based on ODF review of the DEIS. Alternative C is the only alternative which meets the compatibility standards for all three objectives.

Table II-39. Relationship of the Proposed Action and Alternatives to the Basic Objectives of the Forestry Program for Oregon

Basic Objective	Proposed Action and Alternatives			Discussion
	Level 1 1/	Level 2 2/	Level 3 3/	
1. To maintain the maximum potential commercial forest land base consistent with other resource uses while assuring environmental quality.				Oregon Dept. of Forestry has stated the Forestry Program for Oregon acknowledges the need for minimum levels of environmental protection. While the ODF believes that some
ODF Standard: Alternatives are compatible with objective if the acres suitable for timber management meet or exceed the suitable land base used in the maximum PNV benchmark run, constrained by MR's.		NC, A, A-Dep, B, C, D, D1	E, G, K, M, S	MR's may unnecessarily restrict timber management, they suggest use of the maximum PNV with MR's benchmark as the best available land base standard for comparison.
2. To identify and implement economically feasible levels of intensive forest management required to achieve cost-effective growth and harvest.				The Oregon Dept. of Forestry defines the full timber yield constrained by a 95 percent culmination of mean annual increment. Again, using the MR constrained acres as a standard does not
ODF Standard: An alternative is compatible with the objective if the number of acres allocated to full timber yield in the alternative equals 90 percent or more of the number of acres allocated to the full timber yield in the PNV Benchmark.		C	NC, A, A-Dep, B, D, D1, E, G, K, M, S	mean the ODF approves of all MR strategies. The maximum PNV benchmark identifies the economically feasible levels of intensive forest management for this analysis.
3. To maintain community stability by remaining flexible for increases in future harvest levels that would offset projected shortages.				The Forestry Program addresses timber harvest scheduling and the resulting effects on local communities and the economy of the State. For most Oregon National Forests, the ODF has stated
ODF Standard: An alternative is compatible with this objective if the number of jobs and income levels and payments to counties meets or exceeds the current direction levels of these during the first decade.		NC, A, A-Dep, B, C, D, D1	E, G, K, M, S	that departure from non-declining evenflow will be necessary to maintain overall economic stability as private industrial harvests inevitably decline. The three parameters listed will be measured to determine how each alternative maintains, improves, or decreases economic stability. The ODF believes that although the Current Direction alternative on some Forests may not actually represent the existing situation, it provides the best available basis for comparison.

1/ Meets share of FPFO target level and is compatible with basic objective.
2/ Is compatible with the basic objective but does not meet target level.
3/ Does not meet target level and is not compatible with the basic objective.

SENSITIVE PLANTS AND RESEARCH NATURAL AREAS

The following discussion explains how sensitive plants and Research Natural Areas are treated in the various alternatives In response to Planning Problem #5, "How should sensitive plant resources be managed?," land allocations for Botanical and Research Natural Areas range from none to inclusion of all candidate areas Two other Planning Problems peripherally addressed are #2, "How much old-growth forest should be preserved?," and #9, "How should mineral resources of the Forest be developed in coordination with management of other resources?"

SENSITIVE PLANTS

Well over 1,000 plant species are known to exist on the Siskiyou National Forest. Most species are relatively common and widespread. However, over 60 plants are classified as sensitive by the Forest Service, and require protection or management to maintain species viability.

The two methods of managing sensitive plant resources are protection and Standards and Guidelines. Protection involves designation of specific sites as Botanical areas Important concentration areas of sensitive or rare plants are logical candidates for designation. Certain areas on the Forest, such as Eight Dollar Mountain, are more unique than others The Forest's 24 candidate Botanical areas for sensitive plants and old growth are described in detail in Appendix F.

Twenty-two candidate areas would be designated as Botanical Areas in Alternatives G and M. All or portions of 19 Botanical Areas would be designated in Alternative S; these areas present a cross section of the best sensitive plant habitat and old-growth groves the Forest has to offer, from Mountains Eight Dollar and Grayback, to Lakes Bolan and Vulcan, Groves Page and Lobster. Fifteen areas would be included with Alternative E. Alternative K would install eight of the best candidate areas. These eight sites represent a good cross section of habitat types, ranging from Iron Mountain in the northern part of the Forest to Eight Dollar Mountain in the east central, to Bigelow Lakes in the southeast. Alternatives B, C, D and D1 include seven candidate areas, most of these areas were not selected on a priority basis, but more so based on their occurrence on serpentine sites which have little tradeoff relative to the inventoried timber resource. However, Eight Dollar Mountain, the most important botanical site on the Forest, would be designated in these alternatives No candidate areas would be designated with Alternatives NC, A, and A-Departure Botanical Areas are illustrated in Figure II-6 and general alternative groupings are listed in Table II-40. A detailed display of allocations by alternative is contained in Appendix F.

Table II-40. Proposed Botanical and Research Natural Areas, by Alternative (three existing Botanical Areas encompass 4,474 acres [75 percent within the Kalmiopsis Wilderness], three existing RNA's encompass 1,957 acres)

Proposed Botanical and Research Natural Areas		Alternative					
		NC, A, and A-Dep	B,C,D,D1	E	G and M	K	S
Sensitive Plant	Number of Areas	--	6	12	19	5	14
	Acres	--	4,517	22,636	33,932	6,044	13,901
Old Growth	Number of Areas	--	1	3	3	3	5
	Acres	--	64	530	594	170	1,257
Research Natural Area	Number of Areas	1	2	4	4	4	4
	Acres	1,290	1,391	2,797	2,797	2,797	2,649

Forest-wide Standards and Guidelines will govern timber harvesting, road building, mining activities, and livestock grazing in candidate areas not selected in a given alternative. This is also true for non-candidate areas where sensitive or rare plants are more widely dispersed.

Potential conflicts between mining activities and sensitive plants exist under any alternative. These conflicts will be handled on a case-by-case basis and mitigated in the operating plans required for any major mineral activity. Sensitive plant species may also be impacted during road construction or maintenance. Alternative M, with no new roads, would have little or no risk, while Alternatives NC, A, A-Departure, B, C, D, and D1 would have a high probability of affecting some sensitive plants.

An Eight Dollar Mountain Consensus Group, composed of private citizens, The Nature Conservancy, and public agencies with land management responsibilities on the mountain, was formed in 1984 In April 1986, this group published a final report, *Eight Dollar Mountain Coordinated Management Framework*. The group considered five alternative approaches for management of the Mountain. These approaches have all been considered during the Forest Planning process and are represented in our range of alternatives for the Forest Plan The participants (Forest Service, Bureau of Land Management, Josephine County, Oregon Division of State Lands, The Nature Conservancy, and Eight Dollar Mountain Landowners Association) have developed a MOU agreement (Memorandum of Understanding) to manage the mountain in compliance with the Framework (see Appendix F and Planning Records for more information)

RESEARCH NATURAL AREAS (RNA'S)

A system of Research Natural Areas (RNA's) has been set up throughout the Pacific states to preserve representatives of plant communities RNA's are examples of typical natural ecosystems, reserved for scientific and educational use Many plant communities are not yet represented by RNA's The Siskiyou presently has three RNA's Four additional areas on the Siskiyou have been proposed by Forest Service researchers and others for inclusion into the RNA system (Dyrness and others 1975) Research Natural Areas are illustrated in Figure II-5 See Appendix F for descriptions of individual areas

Only Hoover Gulch RNA would be recommended in Alternatives NC, A, and A-Departure; this area was proposed as an RNA in the Chetco-Grayback Land Management Plan (Unit Plan). Alternatives B, C, D, and D1 would recommend Craggy Peak and Hoover Gulch. All four RNA's would be recommended with Alternatives E, G, K, M, and S, these are the only alternatives that would fulfill the cell needs for Research Natural Areas (Dyrness and others 1975). The Cedar Log Flat and Lemmingsworth Gulch areas also contain a number of sensitive plant species General alternative groupings are listed in Table II-40 A detailed display of allocations by alternative is contained in Appendix F.

AIR QUALITY

Air quality on the Forest and surrounding urban areas will be affected by the array of forest resource management activities proposed through the range of alternatives, particularly prescribed fire operations Prescribed burning is an essential tool of forest management; carried out properly, its benefits far exceed any adverse side effects, including smoke contamination

The only Air Quality Related Value (AQRV) that will be significantly impacted is visibility--and this impact will be temporary Those alternatives which use prescribed fire extensively (e g , Alternatives B, C, and D) would have a greater probability of impacting visibility than alternatives such as E, G, or M, which would have a lower level of prescribed fire use

Estimates of total suspended particulate (TSP) production exceed the 1979 baseline value of 7,300 tons in six of the alternatives Alternative C could exceed the baseline during the first decade. By the fifth decade, Alternatives NC, A, A-Departure, B, and D1 could exceed the baseline. All of the TSP estimates displayed in Table II-41 include the application of current smoke reduction techniques

The largest contribution to TSP production will come from the broadcast burning of final harvest units and the burning associated with the hazard reduction efforts in commercial thinning operations The hardwood conversion program, which is not included in all alternatives, would be the second largest contributor to TSP, followed by the burning of landing piles and road right-of-way piles The TSP production associated with the treatment of natural fuels will not be a major factor in annual TSP production

Table II-41. Expected Annual Production of Total Suspended Particulates (TSP), by Alternative.

	Decade 1		Decade 5	
Alternative	Tons of TSP	Percent Change from 1979 Baseline	Tons of TSP	Percent Change from 1979 Baseline
NC	4,307	-41	7,545	+03
A	4,280	-42	7,545	+03
A-Departure	4,445	-39	7,631	+04
B	5,804	-21	7,649	+05
C	9,159	+25	6,703	-08
D	7,265	-01	5,892	-19
D1	5,386	-26	7,554	+03
E	2,771	-63	3,330	-55
G	3,344	-55	3,913	-47
K	4,430	-39	5,663	-23
M	748	-90	1,093	-85
S	4,579	-37	5,218	-29

TSP emissions in local urban areas will be influenced by the burning of firewood obtained from the National Forest Firewood is largely produced as a by-product of the timber harvest operations. Alternatives B, C, and D1 would have the greatest opportunity to affect local air quality, while Alternatives E and M would have the least projected impact The use of the logging residues as firewood will reduce potential emissions on the Forest by 20 to 30 percent. A relevant and important consideration, this use transfers a portion of the emissions problem to urban areas already impacted by air quality problems during the winter months The burning of the residues in wood stoves and fireplaces, however, produces 55 to 60 percent less emissions than burning the same material in the Forest (Table II-42)

Table II-42 Annual Particulate Production from Firewood Versus Forest Residues for Decade 1

Alternative	Firewood Production (M Cords)	Equivalent Residues (Tons)1/	Wood stove TSP Production (Tons) 2/	Field TSP Production (Tons) 3/
NC	52	62,400	878	1,560
A	49	58,800	826	1,470
A-Departure	51	61,200	860	1,530
B	60	72,000	1,012	1,800
C	53	63,600	894	1,590
D	51	61,200	860	1,530
D1	55	66,000	927	1,650
E	28	33,600	472	840
G	35	42,000	590	1,050
K	44	52,800	742	1,320
M	11	13,200	185	330
S	45	54,000	759	1,350

1/ One cord equals 2,400 pounds
2/ Emission rate of 28 1 lbs/ton for wood stoves (Duncan and others 1979)
3/ Emission rate of 50 lbs/ton for field conditions (Ward and others 1976)

Wildfire smoke will also affect air quality and air quality-related values throughout the array of alternatives. Since the occurrence of wildfires is a random event in both time and space, the severity of the air quality impact will vary depending upon fire intensity, fuel type and conditions, size of the fire, and meteorological conditions. Wildfires, and lightning fires in Wilderness that are managed as prescribed fires, are not considered in TSP production estimates.

Forest protection efforts would occasionally be hampered by smoky conditions. The visibility from fixed detection points (lookout towers) would be reduced and aerial detection capabilities restricted, increasing the probability of a wildfire being undetected for a period of time. This could lead to more costly wildfires relative to fire suppression costs and resource damage. Wildfire smoke would add to already existing smoky conditions, compounding the visibility impact

Management efforts to meet air quality standards and direction, and not exceed the TSP baseline value of 7,300 tons annually, will compound resource management complexities and raise the overall management costs in the affected alternatives. Day-to-day burning restrictions could limit the actual accomplishments, extending the amount of time and increasing the effort necessary to accomplish the necessary prescribed burning Reforestation efforts, for example, in harvested units could be slowed or delayed because of inadequately treated or unburned logging slash due to the limited availability of suitable burning days from a smoke management standpoint Planting costs could be higher due to additional requirements and slower production rates associated with untreated or marginally treated units. Accumulations of marginally-treated slash could jeopardize the Forest's ability to attain visual management objectives along travel routes while increasing the risk of wildfire.

FISH

None of the alternatives would degrade salmonid (salmon, trout, and steelhead) habitat capability below current condition described in Chapter III, **FISH**. However, some alternatives would place individual planning basins at risk of minor adverse impact (moderate for one basin in one alternative); water quality standards could be exceeded on a short-duration, localized basis. A summary of potential risk for environmental effects on fish habitat is shown by alternative in Table II-43. Discussion of the projected risk and environmental effects by planning basin for each alternative, along with the definitions of the terms can be found in Chapter IV, **FISH**. Major factors affecting Forest fish habitat, under the current condition, have been identified as water temperature, stream flow, pool depth, instream cover (large woody material), and overhead vegetative shade cover. These interrelated environmental factors combine to have prime influence over salmonid rearing capability.

Table II-43. Comparison of Alternatives and Potential Risk for Effects on Fish (Smolt) Habitat Capability 1/

Alternative	Range by Basin	Forest-wide Effect
NC, A, and A-Departure	Minor adverse to negligible	Negligible
B, D, and D1	Moderate adverse to minor improvement	Minor adverse to negligible
C	Moderate adverse to negligible	Minor adverse to negligible
E and G	Negligible to moderate improvement	Minor improvement
K and S	Minor adverse to minor improvement	Negligible to minor improve
M	Minor to moderate improvement	Minor to moderate improve

1/ This assessment is based on the land allocation, excluding the benefits of capital investment

Forest salmonid output is influence by land treatments and their effect on aquatic habitat, both on and off the Forest. Forest habitat capability is an indicator for adult production since the Forest habitat primarily involves capability to rear juvenile fish to the smolt stage Off-Forest influence, such as sedimentation, water availability, water temperature, ocean survival, and fish-passage obstructions also influence Forest salmonid output.

Supplemental Resource Management Area allocations contribute to maintenance and improvement of production capability. Juvenile salmonids produced off-site find a refuge from warm summer water and nongame fish competition by moving into superior habitat provided by many of these inner-gorge Management Areas. Although credit is given to the basins from which juvenile salmonids originated, their survival must be attributed to the condition of the entire watershed of which the Supplemental Resource management Areas are a key component. Tables II-2 and II-3 display the number and location of acres allocated to the Supplemental Resource Management Area.

The management direction for riparian areas is of particular importance to salmonid habitat. Table II-44 summarizes the Riparian Prescriptions included in each alternative, and the anticipated gains for the fishery. Application of Riparian Prescription B, C, or Minimum Level (M) involves the total riparian system within each planning basin rather than individual streams By application of the Prescription C or M, maximum benefit for the added protection is the improvement in salmonid capability anticipated by the end of the third decade.

Table II-44. Potential Annual First Decade Gain on Fisheries from Riparian Prescription, by Alternative (First Decade), Relative to the Current Condition

Alternative	Riparian Prescription	Expected Annual Gain 1/ Relative to Current Condition Commercial Lbs	WFUD's
NC, A, and A-Departure	18 Basins-B 1 Basin-M	0 0	0 0
B, D, and D1	12 Basins-B 6 Basins-C 1 Basin-M	0 18,000 0	0 1,100 0
C	18 Basins-B 1 Basin-M	0 0	0 0
E	19 Basins-M	19,000	1,500
G	18 Basins-C 1 Basin-M	19,000 0	1,500 0
K	17 Basins-B 1 Basin-C 1 Basin-M	0 1,000 0	0 100 0
M	19 Basins-M	19,000	1,500
S	11 Basins-B 7 Basins-C 1 Basin-M	0 14,000 0	0 1,000 0

1/ Yields in subsequent decades (through the third decade) are higher.

Fish production may also be influenced by instream enhancement projects. Anticipated first decade fisheries outputs attributable to capital investments included in the alternatives is displayed in Table II-45

Table II-45. Potential Annual First Decade Gain in Fisheries from Capital Investment, by Alternative 1/

		Potential Fisheries Gain	
Alternative	Annual Investment ($)	Commercial Lbs	WFUD's
NC, A, and A-Departure	227,000	98,000	8,100
B	350,000	150,000	12,500
C	260,000	112,000	9,300
D and D1	250,000	107,000	8,900
E	250,000	112,000	9,200
G and M	260,000	115,000	9,500
K	350,000	147,000	12,300
S	350,000	150,000	12,500

1/ Gains from project work are adjusted for the influence of land and vegetation treatment

WILDLIFE

Management of wildlife resources is directly related to Planning Problem #7 and touches on two others (#1 and #2) Planning Problem #7, "How should wildlife habitats on the Forest be managed?" is addressed in terms of programs and environmental effects through the following discussion Planning Problems #1 "How much timber should the Forest produce?," and #2 "How much old-growth forest should be preserved?" are not answered directly here, but can be inferred from the land allocations within the various alternatives.

WILDLIFE-RELATED RECREATION

The portion of Wildlife and Fish User Days (WFUD's) attributable to wildlife are derived from two sources, game (hunting) and nongame (viewing) The Forest assumes game WFUD's are tied to deer habitat capability; when habitat capability goes up or down in response to timber harvest levels (acres harvested), so do the "attached" game WFUD's. This assumption is based on the contention that people will continue to hunt only if their opportunity for success does not diminish. This modeling assumption would not be quite correct if hunters are willing to accept lower success rates, but it provides a fair method for comparing the alternatives at a constant quality level (success rate). It is also assumed that nongame WFUD's are not tied to timber harvest and will increase by one-half percent per year similar to the predicted increase in demand for other recreation opportunities for southwestern Oregon (Gibbs and others 1979)

In relation to present day use (80,900 WFUD's), use increases more than 10 percent during the first five decades in all alternatives except E, G, and M (Table II-46). Significant decreases in WFUD's would result from implementation of Alternative M.

Improvement projects can be used to increase the quality of habitat for a variety of species, both game and nongame. Increased availability of wildlife results in increased WFUD's. Capital investments are included in all alternatives except NC Capital investments would be scheduled at 56 thousand dollars per year in all alternatives except D, B, and S Alternative D would schedule 28 thousand dollars per year Capital investments in B would be 110 thousand dollars to meet RPA habitat goals In Alternative S, capital investments would be programmed at 123 thousand dollars per year The WFUD's displayed in Table II-46 include those attributable to capital investments

Table II-46. Average Annual (by Decade) Wildlife User Days, in M Visitor Days 1/, by Alternative (Includes Capital Investment 2/)

	Decade (Average Annual Percent)							
Alternative	1	2	3	4	5	Average 1-5	10	15
NC	77 3	81.7	85 1	89 3	92 6	85 2	82.0	87 9
A	83 6	87 9	91.9	95 8	99 1	91.7	88 2	94.5
A-Departure	84 2	88 7	92.9	95.7	99 2	92 1	88 3	94.7
B	94 3	96.2	100 3	96 9	104 7	99 9	100 0	100 7
C	93 3	92 9	94.1	95 9	99 1	95 1	93.6	94 8
D	87 1	88 9	88 4	90 7	92.6	89.5	91 8	90 2
D1	85 8	90.1	94 0	97 3	99.3	93.3	96 3	96 9
E	75 5	77 3	79 5	82.0	84 6	79 8	84 5	84.6
G	78 6	80.6	83 3	86 2	89 1	83.6	87 2	88 1
K	83 1	85 5	88 2	90.9	93.8	88 3	91 5	92 6
M	60 0	69.7	73.5	76 0	78 1	71 5	75 6	77 8
S	97.1	99 6	102.6	104 9	107 4	102 3	106 3	106 7

1/ The "Present Situation" is 80.9 M WFUD's per year and contains no WFUD's attributable to capital investments.
2/ Capital investments are programmed for all alternatives except NC This table includes M WFUD's attributable to capital investments added per decade for each alternative D (3.7), B (14 5); S (21 4), all other alternatives, (7 4)

The capital investment program is based on the Forest's Comprehensive Fish and Wildlife Plan (Sikes Act, Public Law 93-452). Historically, planned habitat improvement projects have not received full funding. This same situation could prevail in the future regardless of which alternative is used as the basis for management of the Forest. It may be possible to utilize K-V funding (Knutson-Vandenberg) to accomplish a portion of the capital investment program; but K-V funds are limited to use for projects within timber sale areas

BALD EAGLE AND OSPREY

Prime habitat for bald eagle and osprey identified on the Siskiyou totals 58,260 acres. At least 48,620 acres are protected in all alternatives:

Alternatives	Protected Acres
E, G, and M	58,260
NC	54,815
A and A-Departure	54,719
S	53,995
K	52,062
B, C, D, and D1	48,620

This habitat is located along the Rogue, Illinois, and Chetco Rivers. Additional secondary habitat is available, although much of it could be altered by timber management in the long term, except in Alternative M. In all alternatives, the osprey population is maintained at average level (18) recorded during the 1980's. Standards and Guidelines (Chapter IV of the Forest Plan) will govern management of bald eagle and osprey habitat, whether primary, secondary, or otherwise. Bald eagle habitat and populations will be managed in accordance with the Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986). Informal consultation with the U.S. Fish and Wildlife Service is taking place concurrently with development of this FEIS and the Forest Plan; formal consultation will occur any time an activity may adversely affect a bald eagle or its habitat (this is also true for the endangered peregrine falcon).

SPOTTED OWL, PILEATED WOODPECKER, PINE MARTEN

The spotted owl is dependent on old-growth forest, the viability of this species is tied to the amount and dispersion of this habitat type on the Siskiyou and adjacent National Forests, and Bureau of Land Management areas The habitat needed to support a viable population would be spread among a variety of National Forests and BLM Districts. To meet minimum dispersion needs, the Siskiyou must provide designated SOHA's for 28 owl pairs in areas tentatively suitable for timber production Habitat for another 33 pairs is available in Wildernesses and land unsuitable for timber management The Siskiyou presently supports an estimated 153 pairs of spotted owls. Pileated woodpeckers and pine marten require mature forest habitat Together with the spotted owl, all three animals are used as indicators to represent the myriad of wildlife species using mature or old-growth forest

A Forest-wide habitat network was established to meet Management Requirements (MR's) for all three species. Because a given alternative influences each species similarly, and because very little mature forest exists on the Siskiyou, old-growth habitat was designated to fulfill the MR needs for pileated woodpeckers and pine marten The habitat networks for all three species were designed to minimize the opportunity costs to timber production by locating habitat areas to the extent possible on lands unavailable or unsuitable for timber management, or on lands with less than full timber yield (such as Retention Visual areas), refer to Table II-47 for the effects.

Table II-47 Spotted Owl Habitat, by Land Allocation Category, by Alternative (Acres)

	Acres by Category 1/			
			Designated SOHA's	
Alternative	Reserved	No Yield	Reduced Yield	Full Yield
NC	98,900	50,500	2,500	1,100
A and A-Departure	98,900	61,100	11,100	2,700
B, D, and D1	98,900	58,400	9,500	4,200
C	98,900	53,400	6,900	6,900
E	98,900	165,700	7,000	1,500
G	98,900	144,900	7,700	2,500
K	98,900	74,000	7,500	4,300
M	98,900	182,300	7,000	1,400
S	98,900	82,900	8,400	7,900

1/ Acreage figures are estimates made by comparing maps of land unsuitable for timber management, Designated Habitat, and Alternatives (see Appendix I, Planning Problem 2, for list of mature and old-growth acreage by Management Area, by Alternative) RESERVED = existing land allocations by Chief of Forest Service or higher, includes Management Areas 1 through 4 NO YIELD = includes Management Areas 2 through 4, if allocated in this Forest Plan, plus land in Management Areas 5 through 7, plus 9, plus land unsuitable for timber harvest in Management Areas 10 through 14 REDUCED YIELD = land in Management Area 8 which is also allocated to Management Areas 10 through 13 FULL YIELD = land in Management Area 8 which would otherwise be allocated to Management Area 14 (General Forest)

Mature and old-growth components of the commercial forest land base will diminish as more timber stands are harvested and brought under intensive timber management Alternatives E, G, and M would provide additional habitat enclaves for spotted owls, pileated woodpeckers, and pine marten (see Table II-3). Under Alternative M, numbers of all three indicator species would be maintained at near current levels. Although mature and old-growth habitat would diminish under Alternatives E and G, relatively high populations of the three indicator species would be maintained indefinitely Except for Alternative NC, wildlife species dependent on mature or old-growth forest would eventually decline significantly from present levels, but would never be less than MR's Under Alternative NC, by the tenth decade populations of the three species would drop below the levels needed to meet MR's Figure II-10 shows the location of habitat areas in the MR networks for all three species

Table II-48 displays estimated capability of the Forest to support spotted owls, by alternative and by decade, in terms of acres and numbers of owl pairs These data correspond to generalized capability estimates provided in the Spotted Owl Guidelines (USDA 1988b). Table II-49 displays the number of habitat areas available to pileated woodpeckers and pine marten by decade and by alternative In this table, the number of pileated and marten home ranges is strictly a function of available habitat Fragmentation of habitat will become increasingly important as more timber areas are harvested for the first time; this concept was a factor in the calculations Numbers of habitat areas were calculated by dividing the amount of available habitat by 600 and 160 for pileated woodpecker and pine marten respectively, total habitat areas actually occupied by pairs (reproductive units) are probably fewer than indicated.

Table II-48. Spotted Owl Habitat and Capability to Support Pairs, by Alternative, by Decade (M Acres/Owl Pairs)

	Average Annual Per Decade--M Acres/Owl Pairs						
Alternative	Present Sit 1	2	3	4	5	10	15
NC	393/153	344/113	284/73	227/32	185/32	108/32	133/32
A	393/153	343/137	283/122	229/106	193/90	127/71	149/71
A-Departure	393/153	342/137	280/122	227/106	193/90	125/71	141/71
B	393/153	329/135	265/117	203/99	175/81	121/71	141/71
C	393/153	353/136	297/120	236/103	185/86	119/71	126/71
D	393/153	348/137	292/121	232/105	192/89	122/71	133/71
D1	393/153	334/135	267/117	212/98	173/80	122/71	144/71
E	393/153	365/147	336/141	311/135	296/129	278/120	376/120
G	393/153	358/142	316/130	278/119	249/107	214/90	274/90
K	393/153	343/138	290/123	239/108	200/93	140/71	180/71
M	393/153	386/150	378/146	366/143	356/140	340/135	495/135
S	393/153	342/139	287/125	236/111	210/97	155/75	190/75

Table II-49 Average Number of Habitat Areas for Pileated Woodpeckers and Pine Marten, by Alternative, by Decade

	Number of Home Ranges per Decade--Pileated Woodpecker/Pine Marten						
Alternative	Present Sit 1	2	3	4	5	10	15
NC	682/2673	602/2370	500/1990	405/1634	335/1370	208/893	249/1049
A	690/2700	607/2387	507/2012	417/1675	357/1450	247/1037	283/1174
A-Dep	690/2700	605/2381	502/1994	413/1662	357/1450	243/1025	270/1125
B	690/2700	583/2300	477/1900	373/1512	327/1337	237/1000	270/1125
C	690/2700	623/2450	528/2100	428/1719	343/1400	233/987	245/1031
D	690/2700	615/2200	524/2069	422/1694	355/1444	283/1006	257/1075
D1	690/2700	592/2331	480/1912	388/1569	323/1325	278/1006	275/1144
E	690/2700	643/2525	595/2344	553/2187	528/2094	498/1981	662/2594
G	690/2700	632/2481	562/2219	498/1981	450/2362	392/1581	492/1956
K	690/2700	607/2387	518/2056	433/1737	368/1494	268/1119	335/1369
M	690/2700	678/2656	665/2606	645/2531	628/2469	602/2369	860/3337
S	690/2700	604/2380	512/2033	427/2033	384/1552	292/1210	350/1425

WOODPECKERS

In unmanaged timber stands, the total woodpecker population is limited by territorial needs, not by the availability of wildlife trees (dead or defective trees, i.e., snags). For managed timber stands, two sets of timber yield tables were used as part of the FORPLAN data base; snags were prescribed at levels capable of providing either 20 or 60 percent of the potential capability in the various alternatives. Under Alternatives NC, A, A-Departure, E, G, K, M, and S, snag habitat would be provided in managed harvested stands to sustain woodpecker populations at 60 percent of the potential capability. Under Alternatives B, C, D, and D1, less snag habitat would be maintained; only enough to provide for 20 percent of the potential woodpecker capability The 20 percent level is a Management Requirement; a woodpecker population at this level would be considered minimally viable, and not capable of playing an active role in its ecosystem. Woodpecker populations at 60 percent or higher are considered highly viable.

Currently, woodpecker population levels range from 100 percent in areas not under a managed rotation, to 20 percent or less in areas harvested before the late 1970's. In 1976, Wildlife Tree Guidelines were implemented on the Siskiyou, since then, enough snags have been left in managed stands to support woodpecker population levels in the 50-60 percent range. Because only 13 percent of the Siskiyou is presently under a managed rotation, existing snag habitat (on a Forest-wide "average") supports woodpecker populations at approximately 92 percent of potential.

At the fifth decade, under Alternatives NC, A, A-Departure, E, G, K, M, and S, the Forest-wide average would still be above 80 percent. However, significant reductions in habitat capability would take place in those alternatives (B, C, D, and D1) which only provide for 20 percent population levels in managed stands. Even though the Forest-wide average for these alternatives would be approximately 70 percent, woodpecker populations would be below effective levels in areas managed for timber. Table II-50 depicts the trends in Forest-wide habitat capability for woodpeckers by alternative, by decade

Dead and down woody material is important to many wildlife species. Under current direction (Alternative A), at least two cull logs (40 cubic feet minimum volume) per acre are left after timber harvesting.

Table II-50 Average Forest-wide Habitat Capability for Woodpeckers, by Alternative, by Decade (Percent at Beginning of Decade)

		Forest-wide Percent by Decade						
Alternative	Managed Stand Snag %	1	2	3	4	5	10	15
NC	60	92	89	87	84	81	75	75
A	60	92	90	87	85	82	76	76
A-Departure	60	92	90	87	85	82	76	76
B	20	92	86	81	75	69	46	46
C	20	92	86	80	74	68	46	46
D	20	92	87	81	76	70	45	45
D1	20	92	87	81	76	70	46	46
E	60	92	91	90	88	87	86	86
G	60	92	90	89	87	85	83	83
K	60	92	90	88	85	83	76	76
M	60	92	92	92	91	91	86	86
S	60	92	90	88	85	83	79	79

BLACK-TAIL DEER AND ROOSEVELT ELK

Present habitat capability for black-tail deer and elk would be maintained over the long term under all alternatives except Alternatives E, G, and M As shown in Table II-51, average habitat capability of Alternatives NC, A, A-Departure, B, C, D, and D1 would increase during the first five decades Alternatives K and S would average close to the present situation. Reductions would occur in Alternatives E, G, and M, ranging from an average drop of 24 percent in Alternative E to 41 percent in Alternative M.

Tables II-52 (deer) and II-53 (elk) depict the same relative differences among alternatives, but in terms of predicted herd size rather than habitat capability. By the tenth decade, habitat capability would decrease in most of the alternatives, primarily because commercial thinnings will make up an increasingly larger proportion of the timber harvest (thinnings produce less forage than final harvests). Calculations in Tables II-51, II-52, and II-53 do not include increases in habitat capability due to habitat improvement projects.

Table II-51. Average Habitat Capability for Black-tail Deer and Roosevelt Elk, by Alternative, by Decade (Percent Change from Present Situation) 1/

	Average Percent Difference by Decade 1/							
Alternative	1	2	3	4	5	Average 1-5	10	15
NC	0	+6	+10	+13	+16	+9	-12	+3
A	-1	+4	+8	+12	+16	+8	-15	+1
A-Departure	+1	+7	+11	+12	+14	+9	-14	+2
B	+9	+8	+12	+15	+10	+11	-2	-1
C	+25	+18	+14	+12	+13	+17	-1	+2
D	+17	+16	+8	+7	+6	+11	0	-1
D1	+5	+10	+14	+16	+14	+12	+6	+8
E	-22	-23	-23	-24	-24	-24	-25	-24
G	-14	-14	-14	-13	-12	-13	-17	-15
K	-2	-2	-1	-1	0	-1	-6	-3
M	-42	-43	-40	-40	-41	-41	-48	-42
S	+2	0	+1	+2	+2	+1	-8	-7

1/"Present Situation" Habitat Capability is set at 28,300 deer.

Table II-52. Black-tail Deer Population, by Alternative, by Decade (M Animals)

	Average Annual Deer Population, by Decade 1/							
Alternative	1	2	3	4	5	Average 1-5	10	15
NC	28 3	29 9	31 0	32 0	32 7	30 8	24 8	29 1
A	28 1	29 5	30 7	31 7	32 7	30 5	24 0	28 7
A-Departure	28 6	30 2	31 5	31 7	32 2	30 8	24 2	29 0
B	30 8	30 5	31 7	32 6	31 0	31 3	27 6	28 1
C	35 3	33 3	32 3	31 8	32 1	33 0	28 1	29 0
D	33 2	32 8	30 5	30 4	30 0	31 4	28 2	28 1
D1	29 7	31 2	32 3	32 8	32 3	31 7	30 1	30 5
E	22 0	21 7	21 6	21 4	21 4	21 6	21 3	21 4
G	24 4	24 2	24 3	24 6	24 8	24 5	23 4	24 0
K	27 7	27 8	28 0	28 1	28 2	28 0	26 5	27 4
M	16 5	16 0	17 1	17 1	16 6	16 7	14 7	16 4
S	27 9	28 2	28 7	28 8	28 8	28 5	26 0	26 4

1/ "Present Situation" Habitat Capability is set at 28,300 deer

Table II-53. Average Annual Roosevelt Elk Population, by Alternative, by Decade (M Animals)

	Population Size by Decade (M Animals) 1/							
Alternative	1	2	3	4	5	Avg 1-5	10	15
NC, A, and A-Departure	13	14	14	15	15	14	11	13
B	14	14	15	15	14	14	13	13
C	16	15	15	15	15	15	13	13
D	15	15	14	14	14	14	13	13
D1	14	14	15	15	15	15	14	14
E	10	10	10	10	10	10	10	10
G	11	11	11	11	11	11	11	11
K and S	13	13	13	13	13	13	12	13
M	8	7	8	8	8	8	7	8

1/ "Present Situation" Habitat Capability is set at 1,300 elk

SPECIAL WILDLIFE HABITATS

Hardwoods

Hardwood stands occupy approximately 95,000 acres of the Siskiyou National Forest Approximately 48,000 acres occur on land tentatively suitable for the production of timber. No management indicator species were chosen to represent this habitat type because not enough is known about use by wildlife. Hardwood stands are thought to be important for game mammals and birds that live in the forest canopy. Hardwoods do provide habitat diversity Alternatives B, C, D, and D1 would allow significant acres of hardwoods to be converted to conifer plantations in the first decade. However, actual acres converted would depend on market conditions. First decade harvests in other alternatives range from moderate to no conversion at all Few options for the management of this habitat would be precluded by activities during the next decade.

Riparian Habitat

From a wildlife perspective, there are two basic options for management of riparian areas: Minimum Level (M) with no programmed timber harvest, or Riparian Prescription B or C which program partial timber harvest with stands managed to attain uneven-aged or multi-aged structure. Riparian areas not managed for timber harvest retain the most value as wildlife habitat (e.g., travel corridors, security cover). In alternatives where timber would be harvested from riparian areas, the total acres converted to uneven-aged management would be related to the size of the land base devoted to timber management. Lands assigned to Prescription C would retain more value to wildlife than under Prescription B due to fewer trees being harvested. Although lands assigned to Riparian Prescription B would sustain the highest level of timber harvest, "B" areas are still very productive habitat, especially when compared to other suggested options (see Table II-54).

Alternatives with higher amounts of land managed for timber (Alternatives NC through D1 and K) would result in approximately 76,000 to 86,000 acres converted to uneven-aged management over an entire rotation. A large proportion of managed riparian habitat would be allocated to Prescription C in Alternatives B, D, D1, G, and S. A significant amount of land would be managed for timber in Alternative S, but only 66,000 acres of riparian zone would be entered (40 percent being Prescription C) Relatively few acres (46,000) would be impacted in Alternative G No timber harvest would take place in riparian habitat in Alternatives E and M. Table II-54 displays the various management levels for the Riparian Management Area, by alternative

Table II-54 Management Prescriptions for Riparian Habitat (Acres) 1/

	Prescription				
	Managed for Partial Timber Harvest		Not Managed for Timber Harvest		
Alternative	B 1/	C 2/	Minimum Level 3/	Other 4/	Total 5/
NC	81,313	-	29,147	65,035	175,500
A and A-Departure	84,598	-	29,407	61,492	175,500
B	49,872	34,419	29,953	61,256	175,500
C	86,028	-	32,215	57,257	175,500
D	49,895	34,434	29,920	61,251	175,500
D1	45,769	31,651	36,809	61,271	175,500
E	-	-	62,337	113,163	175,500
G	-	46,382	27,271	101,847	175,500
K	69,895	6,161	26,888	72,556	175,500
M	-	-	42,920	132,580	175,500
S	39,497	26,899	22,810	86,294	175,500

1/ Prescription B = retention of at least 85% canopy closure on Class I and II streams (average 150' either side of stream); 70% along Class III (100' either side of stream)
2/ Prescription C = retention of at least 90% canopy closure on Class I and II streams, 80% along Class III
3/ Minimum Level = adjacent land managed for timber, but no harvest from riparian habitat
4/ Other = Riparian areas within land allocations with no programmed timber harvest (e g , Wilderness, RNA)
5/ Total = Total riparian area on Forest

Meadows

Meadows are the most important Special Wildlife Sites Meadow habitat was mapped from aerial photographs in 1979; 4,711 acres were catalogued. Since that time, an additional 1,805 acres were located in areas otherwise classified as tentatively suitable forest land, for a total of 6,677 acres Fifty years ago meadow habitat on the Siskiyou totaled at least 9,050 acres; control of forest fires has allowed adjacent forest stands to encroach on many of the meadows Meadows are very productive wildlife habitat; they contribute to maintenance of overall habitat diversity. In all alternatives, 6,677 acres of meadow habitat would be allocated to wildlife. Except for Alternatives NC, A, and A-Departure, all alternatives include protection of meadow buffers (edge). Some timber may be harvested (unprogrammed) from buffer areas, but only as a management tool in reaching wildlife objectives.

Special Wildlife Sites

Special Wildlife Sites were identified during the planning process. These special habitats are important wildlife resources and furnish considerable habitat diversity. Thirteen types of Special Wildlife Sites would be allocated with Alternative S (Table II-55, see footnote for explanation). Eleven types of sites would be allocated with Alternatives E, G, K, and M. In all other alternatives, only five types of sites would be allocated. In addition, four Supplemental Resource Management Areas have high values for wildlife; these are allocated by alternative as follows: Morris Rodgers (Alternatives E through S); Fishhook Peak (E through S); Pebble Hill (E, G, M, and S); and Windy Valley (NC, A, A-Departure, and E through S).

Table II-55. Special Wildlife Areas, by Alternative (Acres)

Type of Habitat Site	Total Acres by Alternative			
	NC, A, and A-Dep	B, C, D, and D1	E, G, K, and M	S 1/
Meadows	6,677	6,677	6,677	6,516
Meadow buffers	-	4,431	4,431	4,346
Swamps/Springs	15	15	15	15
Lakes/Ponds/Bogs	-	272	272	270
Tanoak areas	-	-	298	300
Elk areas	-	-	309	307
Pigeon areas	-	-	528	526
Osprey nest sites	5	5	5	5
Wildlife areas	539	-	539	4,809
Rock bluffs	-	-	11,706	11,109
Botanical sites	224	-	224	194
Dispersed Old Growth	-	-	-	14,705
Hardwoods	-	-	-	2,040
Total	7,460	11,400	25,004	45,142
Connecting Habitat-MA 8	-	-	18,086	-
Supplemental Resource-MA 7	-	-	1,516 2/	-

1/ The array of wildlife sites in Alternative S varies from all other alternatives Alternative S includes two types of sites (Dispersed Old Growth and Hardwoods) which in other alternatives are listed as "Connecting Habitat" under Management Area 8 (see Special Area Assignments, Table II-3); Alternative S also includes Wildlife Areas (such as Horse Creek) which were allocated to Connecting Habitat in other alternatives, and three Wildlife Areas which were listed as Supplemental Resource Management Areas in other alternatives (Pebble Hill, Morris Rodgers, and Fish Hook Peak). Shifting habitat types between Management Areas in Alternative S causes acre totals to vary (due to overlaps and rounding) for some types of sites, such as meadows, even though the allocations are the same
2/ For Alternative K, acres are 739 (less Pebble Hill)

VISUAL RESOURCES

Land allocations to visual resource management vary by alternative. The alternatives are ranked in the following list according to their beneficial value to the visual resource:

1. M
2. E
3 G
4. S
5. NC, A, and A-Departure
6. K
7. D, D1, and B
8. C

Table II-56 displays the acres expected to meet Preservation, Retention, and Partial Retention VQO's for each alternative. Note that in some alternatives a decrease in Retention or Partial Retention acres may not mean a reduction in visual quality, these areas are being overlapped by more restrictive allocations and are shown under Preservation.

Table II-56. Visual Quality Objectives by Alternative (M Acres)1/

	Alternative (M Acres)										
Visual Quality Objective	NC	A and A-Dep	B	C	D	D1	E	G	K	M	S
Preservation	356	356	349	342	349	349	704	585	402	726	487
Retention	65	65	18	9	18	18	26	31	15	23	21
Partial Retention	246	246	106	97	106	106	116	164	145	109	148
Modification 2/	423	423	618	643	618	618	245	311	529	233	435

1/ Acres shown are approximate.
2/ "Modification" includes both VQO's of Modification and Maximum Modification

Alternative M would be most beneficial to the visual resource because of the extended harvest rotation (250 years), the restriction of harvest to areas that have been previously entered, and the allocation of all the unroaded areas to Backcountry Recreation Management Area. The net effect would be the return of visual conditions to a more natural appearance throughout the entire Forest.

Alternative E is similar to Alternative M in land allocations; however, harvest rotations are shorter in areas allocated to Partial Retention (130 years) and General Forest (100 years) so that some reductions in the character of the Forest landscape would be expected. The most substantial benefits to the visual resource under this alternative would be the allocation of all of the unroaded areas to the Backcountry Recreation. These areas would be managed to achieve a Preservation visual objective and remain essentially unaffected by management activities. Inventoried Retention and Partial Retention areas outside of unroaded areas would be allocated to meet full inventoried objectives in all viewsheds A modified appearance would be expected in all areas of the Forest allocated to General Forest.

Alternative G is similar to E, though the allocations to Backcountry Recreation are fewer. Inventoried visual objectives would be achieved in all viewsheds. Backcountry Recreation allocations would have the most benefit to the upper and lower sections of the Illinois Wild and Scenic River.

Alternative S would allocate inventoried Retention and Partial Retention in six of the Forest's most sensitive viewsheds. The maintenance of a natural or near-natural character in the landscape could be expected. Fourteen more of the Forest's more sensitive viewsheds would be allocated to reduced schemes of visual management designed to achieve Partial Retention objectives. The reduction in character of the landscape would result in maintenance of near natural and modified appearances. Allocations to Backcountry Recreation would be expected to retain the undisturbed character of the landscape on 108,000 acres consisting of portions of eight roadless areas.

Alternatives NC, A and A-Departure would allocate the existing visual inventory Forest-wide, resulting in the maintenance of natural and near-natural appearances in the landscape character in heavily used recreation areas and major travel routes. There would be no allocations to Backcountry Recreation; modifications to the landscape character in most of the unroaded areas would be expected. The viewshed adjacent to the last six miles of the Wild section of the Illinois River would be protected through allocation to Supplemental Resource; while this would allow road construction subject to the Retention visual objective, the potential to compromise the natural character of the existing landscape is low.

Alternative K would allocate inventoried Retention and Partial Retention in four of the Forest's most sensitive viewsheds. The maintenance of a natural and near-natural character in the landscape can be expected. Ten more of the Forest's more sensitive viewsheds would be allocated to reduced schemes of visual

management designed to achieve Partial Retention objectives Reduction in the character of the landscape resulting in the maintenance of near natural and modified appearances would be expected in these viewsheds Allocations to Backcountry Recreation under these alternative would maintain the viewshed adjacent to the last six miles of the Wild section of the Illinois River in an undisturbed (unroaded) condition.

Alternatives B, D, and D1, would have a similar effect on the visual resource All of these alternatives would allocate inventoried visual objectives in only three of the Forest's sensitive viewsheds Four more of the Forest's sensitive viewsheds (including the Rogue-Illinois) would be allocated to reduced levels of visual management designed to achieve the Partial Retention visual objective Reductions in the character of the landscape resulting in near natural and modified appearances would be expected in these viewsheds All of the remaining viewsheds would be allocated to General Forest management so that modifications to the character of the landscape would be expected

Alternative C would have the most detrimental effect on the visual resource Under this alternative, four of the Forest's most sensitive viewsheds would be allocated to reduced levels designed to achieve the Partial Retention objective. Near natural and modified appearances would be expected in these viewsheds There would be no allocations to the Retention visual objective other than those required by law under this alternative All of the remaining viewsheds would be allocated to General Forest management

RECREATION SETTINGS

The effects of management activities on the recreation resource will vary through the range of alternatives Alternatives are ranked according to the range of opportunities provided in all elements of the recreational spectrum. Alternatives have the following order when ranked from most to least beneficial.

1. S
2 K
3 NC, A and A-Departure
4. G
5 B, C, D, and D1
6. E and M

The effects of the alternatives on the recreation resource are best illustrated through the fluctuations in the Recreation Opportunity Spectrum (ROS) inventory (See Table II-57).

Table II-57. ROS Acreages by Alternative (M Acres) 1/

	Alternative (M Acres)										
ROS Class	A	A-Dep	B	C	D	D1	E	G	K	M	S
Primitive	0	0	0	0	0	0	14	12	4	14	9
Semi-Primitive Non-Motorized	29	29	29	29	29	29	97	98	33	101	52
Semi-Primitive Motorized	111	111	109	109	109	109	99	101	108	97	95
Roaded Natural	720	720	722	722	722	722	650	649	715	648	704
WRS Class 2/											
Pristine	93	93	90	93	90	90	93	88	85	93	85
Primitive	21	21	24	21	24	24	21	25	29	20	29
Semi-Primitive	119	119	119	119	119	119	119	119	119	119	119

1/ Acres shown are approximate, but show valid trends for comparisons
2/ Wilderness Recreation Spectrum (WRS)

The existing developed sites have a capacity for approximately 1,900 RVD's each day. Any of the alternatives could sustain the demand for developed recreation until approximately the seventh decade of the planning horizon. The Forest has 18 potential developed sites that could be constructed as demand approaches or reaches capacity, therefore, the Forest could sustain projected levels of demand for developed recreation regardless of the alternative.

Alternative S would enhance or improve both motorized and non-motorized recreation opportunities outside of Wilderness through allocations to Backcountry Recreation. Opportunities for Primitive and Semi-primitive Wilderness recreation would increase The recreation settings in 26 of the Forest's viewsheds would be maintained in a natural or near natural condition through allocations to varying levels of visual management. Viewsheds adjacent to all of the Wild and Scenic Rivers corridors would be allocated to their inventoried level of visual management. Recreation settings would be further enhanced by land allocations to the Supplemental Resource Management Areas The inventoried foreground Retention areas within the Recreation and Scenic sections of the Rogue River (9,943 acres) would not have programmed timber harvest in order to protect the vegetative character. The viewshed adjacent to the last six miles of the Wild section is included in the 42,000 acres of Backcountry Recreation allocated within the inventoried North Kalmiopsis roadless area and would remain in an undisturbed condition. Trail construction would be programmed in the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses

Alternative K would enhance or improve motorized opportunities, reduce non-motorized opportunities in the areas with programmed development (Management Areas 10-14), and increase slightly the opportunity for Primitive and Semi-primitive Wilderness recreation opportunities The recreation settings would be maintained in a natural or near natural condition through the allocation of 16 of the Forest's sensitive viewsheds to varying levels of visual management Both the Rogue and the Illinois River corridors would be allocated to their inventoried level of visual management Recreation settings would be further enhanced by land allocations to the Supplemental Resource Management Area designation in two areas The inventoried foreground Retention areas within the Recreation and Scenic sections of the Rogue River (9,943 acres) would not have programmed timber harvest in order to protect the vegetative character. The viewshed adjacent to the last six miles of the Wild section of the Illinois River (5,400 acres) would be maintained in an unroaded condition (Backcountry Recreation) that would protect the natural appearance of the area, and provide some additional capacity for Primitive recreation opportunities outside of Wilderness. Viewsheds adjacent to the Chetco, North Fork Smith, and Elk Rivers would be allocated to reduced levels of Visual Management Trail construction would be programmed in the Kalmiopsis and Wild Rogue Wildernesses. No trails are proposed for the Grassy Knob Wilderness so that the Wilderness is capable of providing trailless recreation opportunities.

Alternatives A and A-Departure would maintain the current management direction for recreation. Motorized opportunities would be increased, while Primitive and Semi-primitive Non-motorized opportunities in the areas with programmed development (Management Areas 10-14) would be lost or reduced. Wilderness recreation opportunities would be increased slightly. Recreation settings would be affected by management activities and would, in turn, affect the quality of the recreation experiences. The full inventory of visual objectives would be allocated as guidelines in all viewsheds Natural and near natural Forest settings would be expected in the designated and potential Wild and Scenic River corridors and a range of near natural to modified settings in the remainder of the Forest. There would be no allocations to Backcountry Recreation so that all unroaded areas would be managed for timber harvest. Capacities for Primitive recreation opportunities would be lost in the areas programmed for development, and capacities for Semi-primitive Non-motorized opportunities reduced to a point that would not sustain projected levels of use. Trail construction would be programmed in the Kalmiopsis Wilderness while all other trails would be maintained in their current condition

Alternative G would increase opportunities for motorized recreation and maintain the opportunities for Primitive and Semi-primitive Non-motorized recreation opportunities outside of Wilderness Approximately 150,000 acres from eight roadless areas would be allocated to Backcountry Recreation in Alternative G and maintained in a roadless condition that would provide Primitive and Semi-primitive Non-motorized recreation opportunities The portion of the North Kalmiopsis Roadless Area allocated to Backcountry Recreation would include the viewshed adjacent to the last six miles of the Wild section of the Illinois River. Other roadless allocations occur in the Upper Illinois viewshed would be beneficial to the maintenance of the recreation settings in the river corridor. The opportunity for Wilderness recreation opportunities would be increased through trail construction in the Kalmiopsis and Wild Rogue Wilderness. The Grassy Knob Wilderness would be maintained in a trailless condition Recreation settings throughout the Forest would be maintained in a natural or near natural condition due to the allocation of the full inventory of visual objectives in all viewsheds.

Alternatives B, C, D, and D1 would have a significant effect on the quality of the recreation setting throughout the Forest Motorized recreation opportunities would be increased while Primitive and Semi-primitive Non-motorized opportunities would be lost or reduced to a point below the demand for this type of recreation Due to reduced visual allocations, a reduction in the character of the landscape would be expected and would affect the quality of the recreation setting All roadless areas would be allocated to areas with some level of programmed harvest and other activity. Aggressive programs of trail construction would be implemented in the Kalmiopsis and Wild Rogue Wildernesses that would affect the trailless character that currently exists.

Alternatives E and M would maintain the Forest in its existing condition and maintain recreation opportunities With Alternative M, access would be limited to existing road systems and significant portions of the Forest would be accessible only by foot. Alternative E would construct new roads only in those areas outside of the former inventoried roadless areas The full inventory of visual objectives would be allocated in all viewsheds Significant reductions in the character of the landscape would not be expected in either alternative; recreation settings would be expected to remain in a natural or near natural condition

ECONOMIC EFFICIENCY ANALYSIS OF ALTERNATIVES

The purpose of this section is to display and compare the differences in economic costs and benefits of the alternatives, and to discuss the general reasons for these differences More complete discussions of the relationship between economic values and net public benefits appear in the following section, **MAJOR TRADEOFFS AMONG ALTERNATIVES**, and the **SUMMARY OF EFFECTS** section in Appendix B.

COMPARISON OF COSTS AND BENEFITS

Table II-58 displays Present Net Value (PNV) and total discounted costs and benefits for the alternatives and the Maximum PNV Benchmark PNV is the primary measure of economic efficiency used by the Forest Service. It is the sum of priced benefits minus the sum of costs for the 150-year planning horizon, discounted to the present at the rate of four percent per year. An additional sensitivity analysis has been completed using a discount rate of 7 1/8 percent per year. Results of the analysis are documented in Appendix B.

Table II-58. PNV, Discounted Costs, and Discounted Benefits, with Incremental Changes for Alternatives ranked in order of decreasing PNV (MM $ discounted at four percent for 15 periods)

	MM $					
Alternative	PNV	Change	Costs	Change	Benefits	Change
Maximum PNV Benchmark	1,278		785		2,062	
		-37		+15		-21
B	1,241		800		2,041	
		-27		-8		-35
D1	1,214		792		2,006	
		0		-61		-61
NC	1,214		732		1,946	
		-17		+85		+68
C	1,197		817		2,013	
		-37		-37		-73
D	1,160		780		1,940	
		0		-37		-37
A-Departure	1,160		743		1,903	
		-10		-7		-18
A	1,150		736		1,885	
		-19		-24		-42
S	1,131		712		1,843	
		-48		-3		-51
K	1,083		709		1,792	
		-239		-132		-371
G	844		577		1,421	
		-165		-60		-225
E	679		517		1,196	
		-407		-187		-594
M	272		330		602	

Generally, both discounted costs and discounted benefits decrease as PNV decreases. All three variables are directly related to the level of timber harvest. As the amount of timber harvested increases, PNV, discounted benefits, and discounted costs all increase (and conversely decrease as timber harvest declines). *Benefits generally decline faster than costs. PNV and level of timber harvest range from the* highest in Alternative B to the lowest in Alternative M.

Exceptions to the relationship described above occur in Alternatives NC, B, C, and D1 Alternatives B and C were modeled to maximize timber production They would achieve higher timber outputs by including lands and management regimes that are less economically desirable than those selected for alternatives designed to maximize PNV. Alternative NC would operate on the largest suitable land base, but would not maximize timber production as would Alternatives B and C Alternative D1 has a shorter rotation length

which increases harvest levels of existing old-growth, but would provide less benefits in the future due to the smaller diameter of timber harvested.

Benefits associated with nonmarket goods, such as recreation, do not vary as much between the alternatives as do timber benefits. Recreational benefits are very similar between alternatives due to existing excess capacity compared to present and near-future use. Fisheries benefits increase with increased capital improvements and increased protection due to riparian prescriptions. With increased vegetative diversity, wildlife benefits also increase. Benefits associated with minerals production are presently not quantified except for recreational mining and mineral use fees. The mineral benefits could become greater in the future if the demand for minerals increases.

Table II-59 displays PNV and discounted benefits for the major resources, and Table II-60 displays discounted costs. Timber is the main component of PNV, discounted costs and discounted benefits. Wilderness accounts for less than four percent of each variable in all alternatives.

Direct comparisons of benefits and costs displayed for individual resource outputs provide general indications of relationships However, many activities of multiple-use forestry have common costs and benefits, and cannot be exclusively separated and attributed to individual resources For example, harvest clearcuts produce additional forage while decreasing cover which changes the population of big-game animals with subsequent effects on wildlife benefits.

Table II-59 PNV and Discounted Benefits by Major Resource, by Alternative (MM $ discounted at four percent for 15 periods)

	MM $	Discounted Benefits (MM $)					
Alternative	PNV	Timber	Recreation	Fish	Wildlife	Wilderness	Misc
Maximum PNV Benchmark	1,278	1,712	175	106	55	10	3
B	1,241	1,691	175	104	58	10	3
D1	1,214	1,666	175	96	55	10	3
NC	1,214	1,614	175	90	53	10	3
C	1,197	1,674	175	92	59	10	3
D	1,160	1,601	175	96	54	10	3
A-Departure	1,160	1,572	175	90	53	10	3
A	1,150	1,554	175	90	52	10	3
S	1,131	1,486	175	103	67	10	3
K	1,083	1,454	175	101	50	10	3
G	844	1,092	175	98	43	10	3
E	679	871	175	97	39	10	3
M	272	286	175	98	29	10	3

Table II-60. Major Resource Discounted Costs by Alternative, (MM $ discounted at four percent for 15 Periods) 1/

	Discounted Costs (MM $)						
Alternative	Timber	Roads 2/	Recreation	Fish	Wildlife	Wilderness	Fixed and Misc Costs
Maximum PNVBenchmark	378	195	12	13	2	2	181
B	415	181	12	10	3	2	177
D1	404	181	12	7	2	2	183
NC	358	162	11	7	2	1	190
C	428	187	11	8	2	3	177
D	405	172	12	7	2	2	179
A-Departure	373	162	11	7	2	1	187
A	366	162	11	7	2	1	185
S	336	142	15	12	7	2	196
K	345	153	12	9	2	2	187
G	251	107	13	8	2	1	195
E	211	88	12	7	2	1	195
M	90	16	13	8	2	1	199

1/ Direct comparisons of benefits and costs displayed for individual resource outputs provide general indications of relationships However, many activities of multiple use forestry have common costs and benefits, and cannot be exclusively separated and attributed to individual resources

2/ Costs for roads includes Forest Service and purchaser costs for road construction and reconstruction but not maintenance

COSTS

Two types of costs are included in Forest management. (1) operation and maintenance, and (2) capital investment.

Operation and maintenance costs are the costs of activities required to plan and manage outputs, and maintain existing capital assets at standard levels. These include fixed costs such as general administration, and variable costs which vary with different levels of outputs. Fixed costs are constant across all alternatives, whereas variable costs differ among alternatives. The major determinant affecting variable costs is the quantity of timber produced, timber production generates the analyses and project support needed to assure quality management of the fisheries, wildlife, and watershed resources

Capital investment costs are the costs of creating or enhancing capital assets, such as roads, trails, or fish habitat improvement structures Road construction costs are the main component of capital investments; they are also a direct function of timber harvest activity. Other capital investment costs such as fish and wildlife vary independently of the timber program. Total costs for alternatives vary both above and below the current direction (Alternative A) budget level of 21 million dollars per year.

NET CASH FLOWS, ECONOMIC BENEFITS, AND COSTS

Table II-61 displays average annual net cash flows, total receipts, total costs, and noncash economic benefits, by alternative, for the first and fifth decades. The fifth decade is shown because it represents the RPA planning horizon and captures most of the changes within the alternatives that occur in later decades.

In Table II-61, annual net cash receipts are total Forest receipts minus total Forest costs. This economic indicator, like others discussed earlier, varies directly with the level of timber outputs. Net cash flow would be positive for all of the alternatives with the exception of Alternative M. In Alternative M, costs of operating and maintaining the Forest would be greater than the receipts from selling timber and other outputs.

Table II-61 Average Annual Net Cash Receipts, Total Costs, Total Cash Receipts, and Noncash Benefits for Decades 1 and 5 (MM $)

	MM $/Decade							
	Net Cash Receipts		Total Cost		Total Receipts		Noncash Benefits	
Alternative	1	5	1	5	1	5	1	5
B	43 0	25 0	24 9	26 0	67 9	51 0	8 8	10 8
D1	38 2	29 8	23 1	27 0	61 3	56 8	8 6	10 4
NC	36 0	41 1	21 0	27 1	57 0	68 2	8 6	10 2
A-Departure	35 8	35 4	21 6	27 3	57 4	62 7	8.6	10 2
A	34 1	37 8	21 1	27 1	55 3	64 9	8 6	10 2
C	32 1	45 3	26 3	27 9	58 4	73 2	8 6	9 9
S	31 9	34 3	21 7	25 0	53 6	59 2	9 1	11 0
D	31.6	42 0	24 2	26 2	55 8	68 2	8 5	10 3
K	29 0	35 8	21 6	24 5	50 6	60 3	8 7	10 5
G	20 1	20 5	17 8	20 7	37 9	41 2	8 6	10 5
E	13 2	12 6	16 7	18 4	29 9	31 0	8 7	10 4
M	-1 4	-0 9	12 2	13 0	10 8	12 1	8 7	10 5

The alternatives are listed in order of decreasing first decade net cash flows. The ranking of the alternatives is somewhat different than under the decreasing PNV ranking. The primary difference is that the departure Alternatives A-Departure and B would have higher first decade net cash flows because they would harvest more timber in the first decade. Alternatives C and D (which have higher PNV for 15 decades than Alternative A-Departure) are modeled somewhat differently than the other alternatives. They would have higher costs because they include less economically desirable lands and practices in order to increase overall timber outputs Alternative S is different due to the more intensive timber management of lands currently roaded; fertilization of plantations and the exclusion of expensive road construction in areas allocated to Backcountry Recreation allow cash flows to be higher. Net cash flows for the other alternatives follow the same pattern as that for PNV.

Economic benefits are reported in two columns: as total receipts, and as noncash benefits Total receipts are money that the Forest receives from the sale of products and uses They include timber, fuelwood, developed recreation, river permit fees, range fees, special use permits, and power and minerals use fees. Commercial timber sales represent approximately 99 percent of total receipts across the alternatives, with the exception of Alternative M where they comprise approximately 50 percent because of reduced harvests due to longer rotations and no additional roading. Changes in the amount of timber sold also account for virtually all of the differences in total receipts among the alternatives The other components of total receipts remain relatively constant through all alternatives

Noncash benefits are economic values that have been assigned to uses of Forest resources that have value, but have not been generally traded in a marketplace where money is exchanged They are based on research of individuals' willingness to pay for certain types of experiences. The noncash benefits included in the Siskiyou's planning model are Recreation Visitor Day (RVD) use values for various types of wildlife, fishing, and general recreation experiences General recreation use does not vary much between the alternatives due to excess capacity over existing use The increase shown in future decades is the result of projections of increased demand for outdoor recreation on the Forest. The RVD values for fishing experiences depend on the fisheries outputs As more fish are produced as a result of capital investments or more restrictive riparian prescriptions, more use is predicted Wildlife use is modeled by projecting increasing use with increased habitat capability for big game and game birds, and with increased recreational use over time for nongame wildlife use

PAYMENTS TO COUNTIES

National Forest Funds (NFF), which comprise 25 percent of all Forest receipts to the U.S. Treasury, are distributed to counties based on the amount of Forest land in each county. O&C funds, which are 50 percent of funds generated from O&C lands, are distributed on the basis of a percentage established by Federal law The returns projected for each alternative (Figure II-26) vary due to the level of Allowable Sale Quantity and land allocations

RELATED EMPLOYMENT AND INCOME CHANGES

Projected changes in timber harvest, recreational use, and fish harvest would result in changes in employment and income for the four-county area of influence. The total employment and income for the four-county area in 1983 were 76,000 jobs and 1.163 billion dollars. The estimated changes in employment are calculated using Alternative A (Current Direction) as the basis, with two base conditions for timber outputs: the 10-year average annual historic harvest of 128 1 MMBF, and the Allowable Sale Quantity for Alternative A of 167.9 MMBF. The variation among alternatives in projected employment and income changes (Figures II-27 and II-28) is primarily due to timber harvest related activities The figures represent direct, indirect, and induced effects of producing outputs

Alternative B has the highest projected gain in jobs and income, while Alternatives NC, A, A-Departure, C, D, D1, and S project sizable increases (greater than 500 jobs and greater than 13 million dollars income). Moderate increases in jobs and income are projected for Alternative K Alternative G projects moderate decreases in jobs and incomes (less than 350 jobs and greater than 7 million dollars) Alternatives E and M have sizable decreases in projected jobs and incomes

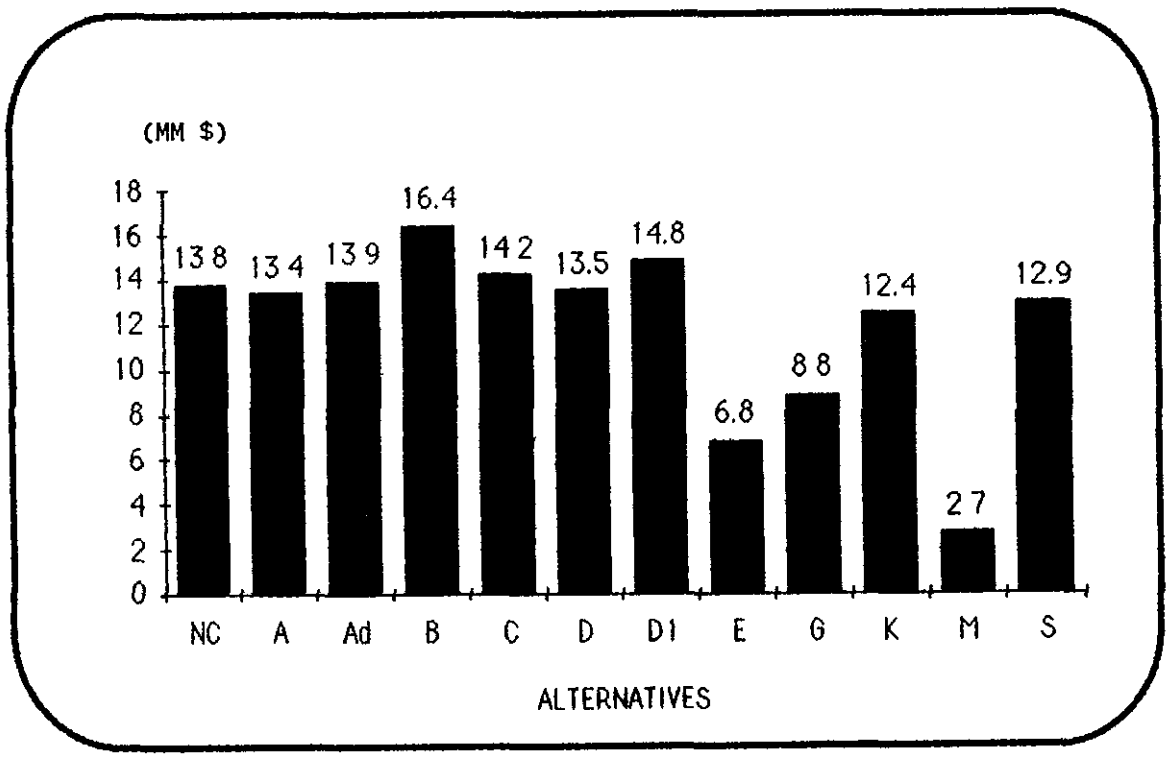


Figure II-26 Predicted Payments to Counties

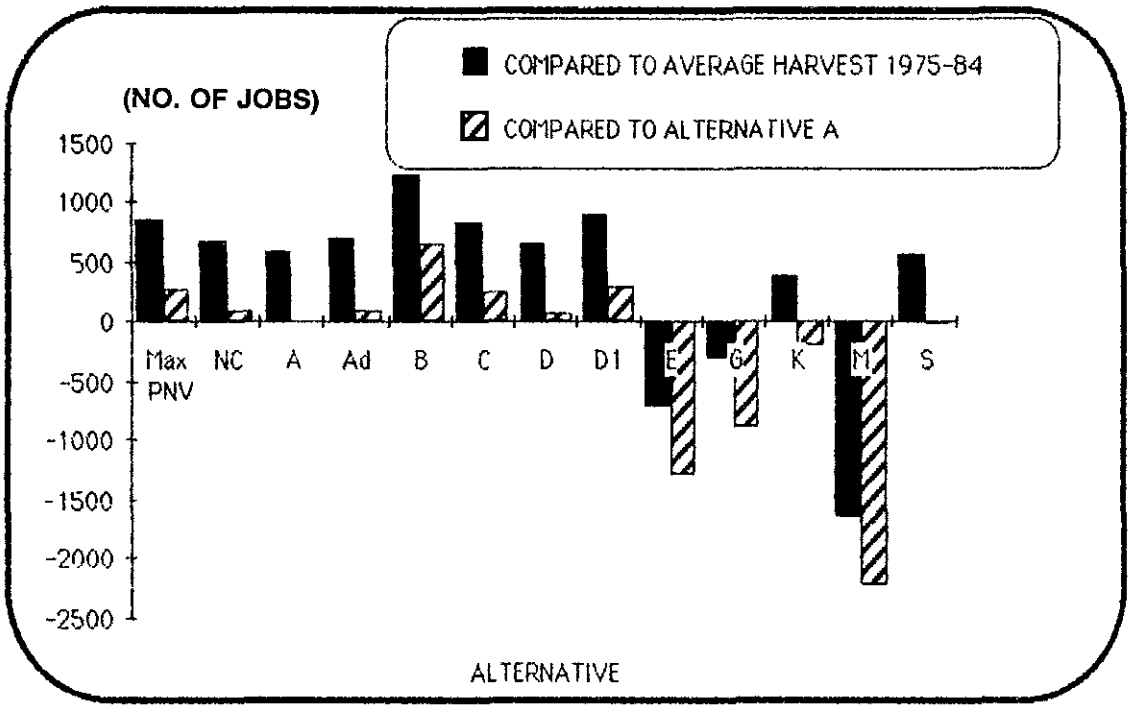


Figure II-27. Predicted Effects on Jobs

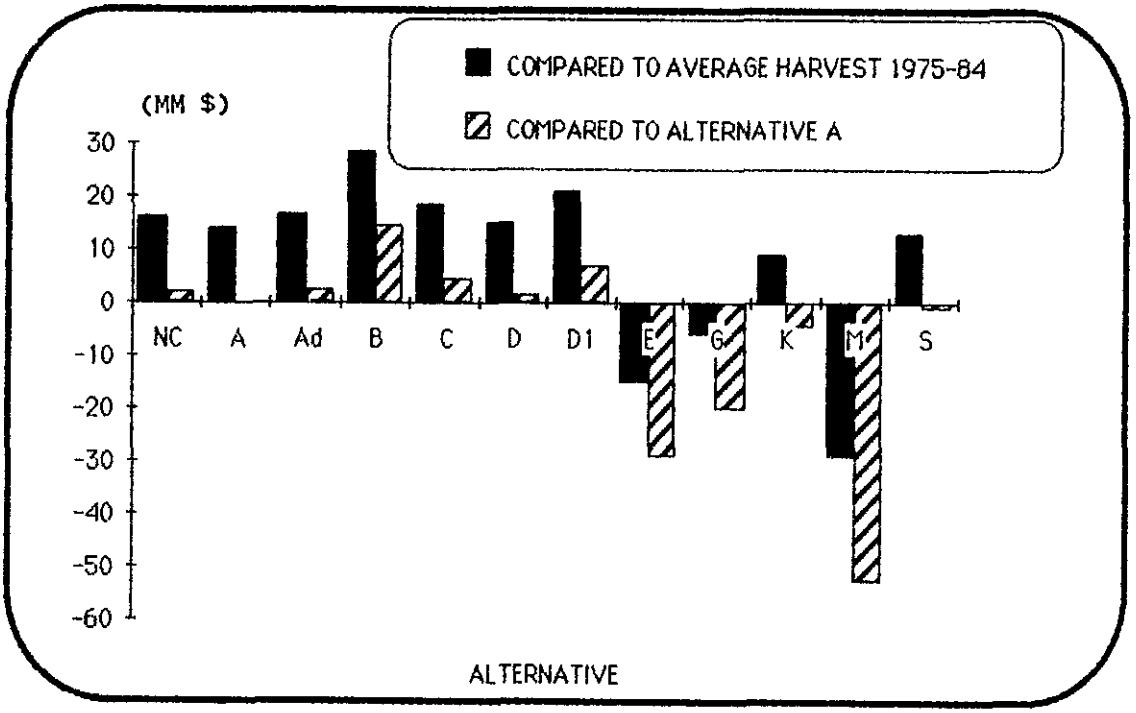
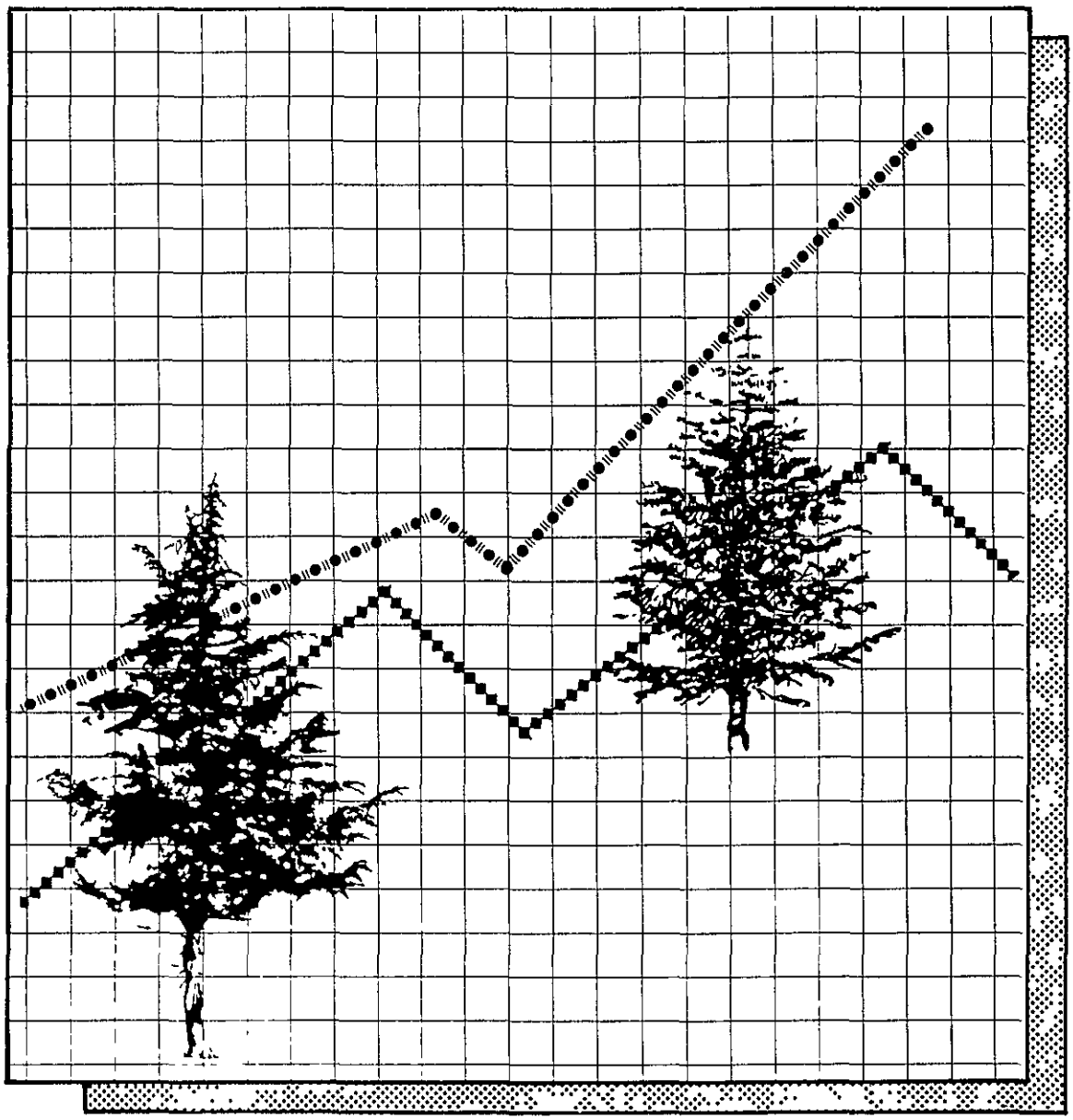


Figure II-28. Predicted Effects on Income



COMMUNITY EFFECTS

The previous discussion has considered only the economic programs of the Forest The social effects of the alternatives including the effects on community stability, lifestyles, and community cohesion are also important considerations

"Community stability" is defined as a community's capacity to handle change without major hardships or disruptions to component groups or institutions. Slow, steady growth is the desired condition for economic and social stability It allows for limited economic displacement of jobs due to sudden change with steadily increasing opportunities Sudden economic booms are also avoided An acceptable range for change will be defined as a predicted increase of less than two percent in jobs or income in the area of influence due to changes in Forest outputs Any decrease in present jobs or future outputs is deemed less desirable. Within this range, the communities would be able to readily adjust to the changes brought on by an increase in jobs and income If economic stagnation is prevalent, a loss of jobs, now as in the future may require significant community adjustment

Of course, these communities do not operate in a vacuum and forces other than Forest outputs influence the economic climate. However, for this analysis, these other forces are assumed to be constant. In general, Alternatives NC, A, C, D, D1, K, and S are classified as being more desirable for community stability. Alternatives A-Departure, B, E, G, and M are labeled as being less desirable for community stability due to decreases in either present jobs or future outputs and associated jobs.

Lifestyles are a result of the economic climate and local environment. The freedom, individualism, and security associated with the existing local lifestyles are affected little by any alternative, except perhaps Alternative M which greatly reduces Forest-related employment. Increases in Forest outputs could increase personal incomes which might provide added security to an individuals chosen lifestyle, provided the economic climate is not favoring development to the point of encroaching on individual freedom.

Alternatives NC, C, D, and D1 have the potential to increase incomes significantly (greater than one percent of total income in the area). Alternatives A-Departure and B would also boost income significantly in the first decade, but would have decreased outputs in the future. Alternatives A, K, and S would not tend to affect incomes very significantly (less than one percent total change in income). Alternatives E, G, and M have potential to decrease incomes significantly (greater than three percent decline in total income in the area of influence).

"Community cohesion" is defined as the degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them. As with lifestyles, community cohesion is not significantly affected by different alternatives due to the degree of existing conflict. The many differing opinions about Forest management can only be resolved by participation and communication of the parties with conflicting opinions Alternatives that emphasize timber production at the expense of preservation of old growth and unroaded areas, or favor the preservation of old growth and unroaded areas at the expense of timber production, may tend to accentuate the conflict over Forest management. Alternatives NC, A-Departure, B, C, D, D1, G, E, and M may then aggravate conflict in those communities where conflict already exists Alternatives A, K, and S, because they tend to continue present direction or seek a better balance, will not solve conflict, but should not encourage conflict beyond its present evolution.

OPPORTUNITY COSTS

Opportunity cost is the value of the opportunity lost or foregone when implementing an alternative instead of the Maximum PNV Benchmark It is calculated as the difference in total PNV between the PNV benchmark and the alternative Most of the opportunity costs (Figure II-29) for each alternative are related to foregoing timber harvest due to unroaded designation, riparian prescriptions, suitable wildlife habitat, quality visuals management, or old growth preservation

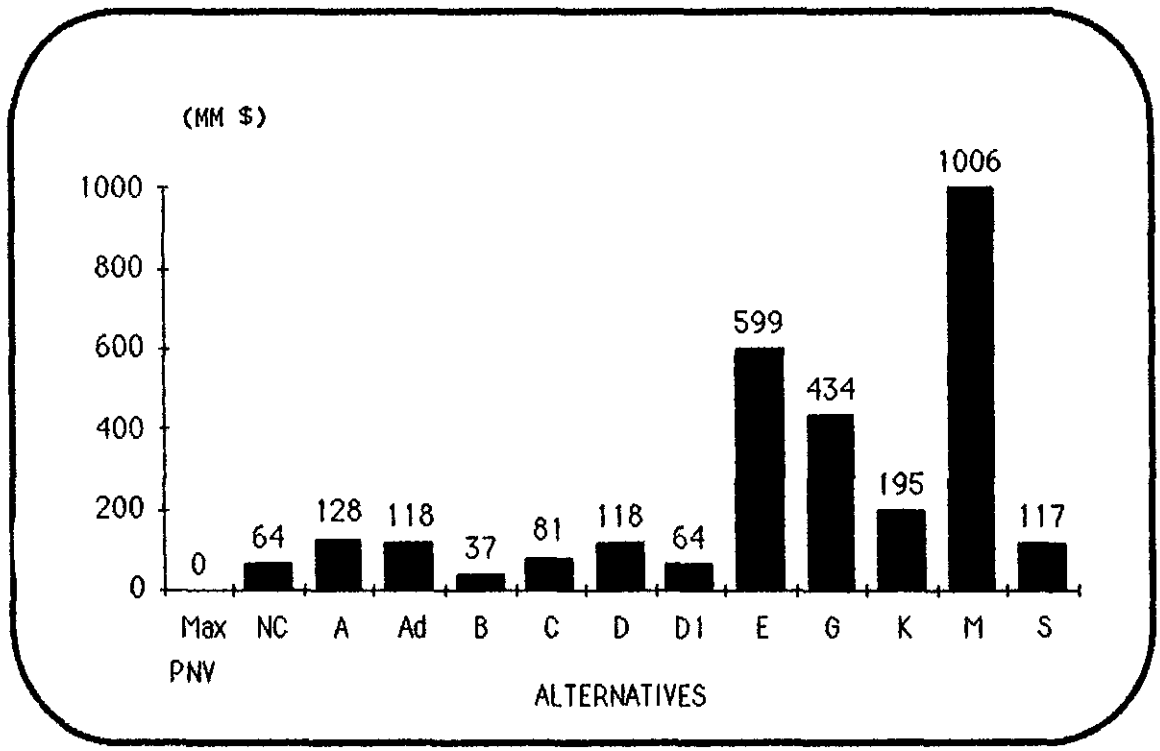


Figure II-29 Change in Opportunity Costs Compared to Maximum PNV Benchmark (MM $)

MAJOR TRADEOFFS AMONG ALTERNATIVES

This section summarizes the relationships among the economic values and community effects discussed in the previous section, **ECONOMIC EFFICIENCY ANALYSIS OF ALTERNATIVES**, and the differing responses among alternatives to the selected Planning Problems discussed in Appendix A. The purpose is to highlight major economic and non-economic tradeoffs or combinations of differences that can be quantified as indicators of response to the Planning Problems However, a complete understanding of the differences among alternatives requires reading all of Chapters II and IV, and Appendix B

To provide a partial framework for assessing these tradeoffs, the long-term resource demands or needs of the Nation, region, and local communities are briefly summarized; then selected economic values and quantified indicators of responsiveness to the Planning Problems are tabulated Finally, differences and similarities among individual alternatives are summarized in terms of major tradeoffs among competing objectives or responses to expressed public issues, management concerns, or resource use and development opportunities.

NATIONAL, REGIONAL, AND LOCAL OVERVIEW

National (RPA) planning estimates that total National demands will rise for outputs from all National Forests. At the same time, there is a strong demand to protect and enhance the quality of the environment. Demands and prices for production are generally determined in National markets and the Nation benefits most when supplies are provided using the most efficient sources of production

The demands for outdoor recreation uses and wildlife uses are mainly local and regional, although the Rogue River does attract National attention. Recreationists that visit the Siskiyou National Forest generally come from southwestern Oregon and northern California Total recreation growth is predicted to increase by one-half percent per year

The 1980 population in the four-county area was 271,500 This was an increase of approximately 35 percent from 1970, at least moderate growth is predicted for the next 10 years In 1980, total employment was about 76,000 for the area of influence with approximately 3,500 of those jobs coming from direct, indirect, and induced effects of Forest outputs Approximately 70 percent of the Forest-dependent jobs are due to consumption of timber outputs. Recreation, wildlife, and fisheries activities generate the rest of the Forest-derived employment. (For more information, refer to Appendix B and Chapter III.)

ECONOMIC VALUES AND RESPONSES TO MAJOR ISSUES, CONCERNS, AND OPPORTUNITIES

Alternatives differ so that each responds to the Planning Problems identified for this Forest in a different way. This section summarizes many of these differences in response by defining quantitative indicators for gauging the resolution of the Planning Problems It also discusses indicators of central concern to the Nation as a whole Appendix A and Chapter I discuss the development of the Planning Problems from the issues, concerns, and opportunities identified during scoping, and provides the linkages between the Planning Problems and key indicators The indicators for the Planning Problems which incorporate the major issues, concerns, and opportunities, and the local and National indicators used in this comparison are:

1. Indicators for TIMBER PRODUCTION
   - Selected suitable area (M Acres)
   - First decade Allowable Sale Quantity (ASQ) (MMCF)
   - Long-term sustained yield (LTSY) (MMCF)

2. Indicators for OLD-GROWTH FOREST preservation
   - Reserved area (M Acres)
   - Old-growth habitat available at end of fifth decade (M Acres)

3. Indicators for maintaining or improving the Forest's SOIL PRODUCTIVITY, WATER QUALITY, and FISH HABITAT
   - Anadromous sport Fish User Days (M WFUD's)
   - Average annual sediment (M Tons per decade)

4. Indicator for management of lands in and adjacent to river corridors to protect, preserve, and enhance WILD AND SCENIC RIVER attributes
   - Adjacent area meeting Visual Quality Objectives (M Acres)

5. Indicators for SENSITIVE PLANT resource management
   - Area allocated to Botanical Areas (M Acres)
   - Area allocated to Research Natural Areas (M Acres)

6. Indicators for management of the VISUAL RESOURCES
   - Area allocated to meet Preservation, Retention, and Partial Retention Visual Quality Objectives (VQO's) (M Acres)
   - Area that meets or exceeds Partial Retention (M Acres)

7. Indicators of WILDLIFE HABITAT management
   - Wildlife User Days (M WFUD's)
   - Old-growth habitat in fifth decade (Percent of Forest acreage)

8 Indicator of recreation opportunities in the WILDERNESS and UNROADED areas
   - Areas allocated to remain unroaded (M Acres)

9 Indicator of MINERAL resources development
   - Area accessible with limited restrictions (M Acres)

Indicators of LOCAL ECONOMIC and SOCIAL STABILITY.
   - First decade payments to counties (MM $)
   - First decade changes in employment (Jobs)
   - First decade changes in income (MM $)

Indicators of NATIONAL INTEREST.
   - PNV (MM $, discounted at four percent over 150-year period)
   - Net cash flow (MM $)
   - Noncash economic benefits (MM $)

In Table II-62, the indicators identified above are used to suggest the degree of response of each alternative to these Planning Problems. Other displays in Chapter II and discussions in Chapter IV and Appendix B provide more detailed information about specific effects and tradeoffs. The alternatives are arranged in order of decreasing PNV.

Table II 62 Indicators of Responsiveness to Planning Problems Alternatives are Ranked in Order of Decreasing PNV

| ALTERNATIVE | National Indicators | | | | | | | | | | Local Indicators | | | | | | | | | | | Planning Problems | | | | | | | | | | |

Maximum PNV Benchmark

PNV $1,278 MM
Opportunity Cost. None

The Maximum PNV Benchmark identifies the mix of goods and services with market and assigned values that results in the largest excess of discounted benefits over discounted costs It meets MR's for resource protection and produces a high level of timber harvest on a nondeclining yield schedule It is summarized here for comparison purposes

The Maximum PNV Benchmark provides 32.4 MMCF of timber the first decade with an LTSY of 51.9 MMCF Protection of old-growth vegetation amounts to 164,000 acres, while 74,000 WFUD's for fisheries, 69,000 WFUD's for wildlife uses, and 735,000 RVD's per year are projected for the first decade.

All unroaded areas outside designated Wildernesses would be developed. Allocations to Botanical and Research Natural Areas are 1,000 acres and 2,000 acres, respectively. A total of 820,000 acres would be available for mineral development

Average net receipts are $37.8 MM with noncash benefits of $8 8 MM for the first decade In the fifth decade, the net receipts increase to $48.1 MM with noncash benefits of $10 7 MM.

Alternative B

PNV: $1,241 MM
Opportunity Cost· $37 MM

INCREMENTAL CHANGE COMPARED TO MAXIMUM PNV BENCHMARK

Alternative B has the highest PNV of any alternative, primarily because first decade timber outputs are high The departure from nondeclining flow allowing more timber harvest in the first decade increases the PNV by $75 MM. A reduced land base results in approximately a $13 MM reduction in PNV. The production of the maximum amount of timber given the land base reduces the PNV by approximately $35 MM. Other opportunity costs are reflected in reduced harvest levels in riparian areas and General Forest areas in six basins (which reduces PNV by $21 MM) The additional allocation of visual management areas reduces the PNV by $26 MM. The remainder of the changes compared to the PNV Benchmark are due to wildlife, recreation, fisheries, and other miscellaneous programs (net $17 MM reduction)

Returns to the U.S. Treasury are increased by $5 2 MM in the first decade. The returns decline in the third decade due to reduced timber harvests. By the fifth decade, the federal receipts drop by $23 1 MM. Noncash economic benefits, for which no fees would be collected, would stay relatively constant, averaging about $8.8 MM per year in the first decade and increasing to $10.8 MM in the fifth decade

High timber harvests and a large road construction program would result in the largest contributions to community employment (more than 1,220 jobs), income (more than $28 7 MM), and the largest payments to counties ($16 4 MM annually) for the first decade. These would lead to increased economic growth assuming demand for wood products is high enough to result in consumption of all timber offered.

Acreages of old-growth trees, Botanical areas, and Research Natural Areas would be increased. The amount of scenic vistas would increase while the area allocated to Backcountry Recreation would remain constant The projected demand for Primitive and Semi-primitive recreation opportunities exceeds capacity in later decades and Primitive recreation opportunities would be limited to designated Wilderness and Wild River areas by the second decade

Fisheries values are increased due to an intensive capital investment program Though timber harvest from Riparian Management Areas would be implemented in all planning basins, six basins have more restricted timber harvest constraints in riparian areas and more restrictive scheduling constraints in General Forest areas This alternative would place the least restrictions on mineral accessibility

INCREASED INDICATORS COMPARED TO MAXIMUM PNV BENCHMARK

1. First decade ASQ (+3 6 MMCF)
2 LTSY (+2.9 MMCF)
3. Botanical areas (+5 M Acres)
4. Research Natural Areas (+1 M Acres)
5 Wildlife (+14 6 M WFUD's)
6 Visual areas (+132 M Acres)
7 Amount of reserved old growth (+6 M Acres)
8 First decade annual net receipts (+$5.2 MM)

DECREASED INDICATORS COMPARED TO MAXIMUM PNV BENCHMARK

1. Selected suitable area for timber production (-9 M Acres)
2. Fisheries (-2 M WFUD's)
3. Fifth decade annual net receipts (-$23 1 MM)
4 PNV (-$37 MM)

Alternative D1

PNV. $1,214 MM
Opportunity Cost: $27 MM Compared to Alternative B

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE B

This alternative is second to Alternative B in PNV, net receipts, payments to counties, jobs, and income for the first decade

The major difference between Alternative D1 and Alternative B is the shorter timber rotation and the nondeclining yield timber harvest constraint The nondeclining yield constraint results in lower first decade timber outputs. This accounts for most of the opportunity costs ($75 MM reduction in PNV). The shorter rotation increases PNV by $54 MM. The fisheries capital investment program is also reduced with a reduced PNV ($5 MM) for the fisheries program Other benefits and costs do not substantially change.

The old-growth trees, unroaded areas, Botanical areas, and area managed for visual resources for this alternative are very similar to Alternative B. Six basins would still be managed with the more restrictive timber harvest within Riparian Management Areas and in General Forest, but fisheries would be managed with a lower capital investment program compared to Alternative B, resulting in slightly lower fisheries benefits. Predicted sedimentation, on the average, would be lower than for Alternative B. However, projected sediment would increase in the third, fourth, and fifth decades due to a larger number of acres harvested per year No substantial change would occur in mineral access

INCREASED INDICATORS COMPARED TO ALTERNATIVE B

1 Increased harvest in the third through fifth decades.
2. Amount of reserved old growth (+1 M Acres)
3 Fifth decade annual receipts (+$4 8 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE B

1. First decade ASQ (-3 6 MMCF)
2. Selected suitable area for timber production (-8 M Acres)
3. LTSY (-5.8 MMCF)
4. Wildlife (-2.8 M WFUD's)
5. Old-growth habitat fifth decade (-0 2 percent of Forest)
6 Sedimentation (-46 M tons per decade)
7. Fisheries (-3 M WFUD's)
8. First decade payments to counties (-$1.6 MM)
9. First decade jobs (-350) and income (-$8.0 MM)
10. First decade annual net receipts (-$4.8 MM)
11. PNV (-$27 MM)

Alternative NC

PNV: $1,214 MM
Opportunity Cost. None Compared to Alternative D1

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE D1

Although the No Change Alternative (Alternative NC) has the same PNV as Alternative D1, there are significant differences in the timber, recreation, fisheries, and wildlife programs.

Alternative NC has a larger land base for timber production, which increases the PNV by approximately $33.8 MM It also has a longer rotation which decreases PNV by $54 MM. Because this alternative does not maximize timber production where costs exceed benefits, its PNV is increased by $35.7 MM compared to Alternative D1. The increased land base allocated to visual management reduces the PNV by $29.3 MM Streamside management with Prescription B in all basins increases PNV by approximately $20.8 MM. The total change in the timber program is a $7 MM increase in net benefits.

Other programs are significantly different. A decreased budget for capital investments for recreation improvements results in a $1 MM increase in net benefits due to surplus recreational capacity. Lower amounts of fisheries capital investments produce lower net benefits for the fisheries program. Last of all, the lower amount of seral vegetation in the Alternative NC leads to decreased wildlife benefits compared to Alternative D1.

Annual net receipts, payments to counties, and jobs are lower than Alternative D1 in the first decade However, due to the large land base, the fifth decade annual net receipts are larger.

Areas reserved for botanical objectives are reduced by approximately 4,000 acres and old-growth habitat reserves are reduced by 39,000 acres. Old-growth habitat existing in the fifth decade would be about 16.9 percent of the Forest, which is an increase compared to Alternative D1. This increase is due to longer rotation on the land base for timber management.

Other changes for key indicators are noted. This alternative has the largest land allocation for retention and partial retention visual management. Sediment yields are projected to increase compared to Alternative D1, partially due to less restrictive basin constraints on six sensitive basins.

INCREASED INDICATORS COMPARED TO ALTERNATIVE D1

1 Selected suitable area for timber production (+26 M Acres)
2. LTSY (+5 2 MMCF)
3. Old growth habitat - fifth decade (+1.1 percent of Forest)
4 Visual Management (+207 M Acres Retention and Partial Retention)
5 Annual Net Receipts - fifth decade (+$11 3 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE D1

1. Payments to counties (-$1 MM)
2 Jobs (-220) and Income (-$5 MM)
3. First Decade ASQ (-2 2 MMCF)
4. Old-growth Reserves (-39 M Acres)
5. Botanical Areas (-4,600 acres)
6 First Decade Annual Net Receipts (-$2.2 MM)

Alternative C

PNV. $1,197 MM
Opportunity Cost: $17 MM Compared to Alternative NC

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE NC

Alternative C has a lower PNV than Alternative NC due to a reduction in the timber base and due to production of the maximum amount of timber on the land base The maximum timber objective function has timber produced where the additional costs exceed the marginal benefits. The change in the land base and the timber objective function decrease PNV by $58 5 MM Decreased allocations to visual management offset the decreased land base by $35.5 MM

First decade net annual receipts are decreased due to the additional cost of timber management. Payments to counties and local jobs are increased due to additional first decade ASQ Fifth decade annual net receipts are increased due to the payoff from additional investment in the timber program with increased harvest levels

The amount of reserved old-growth habitat, the area allocated to Botanical Areas, and the amount of WFUD's would be increased compared to Alternative NC. The change in the old-growth habitat would be mainly due to increased land allocation for Management Requirements (MR's) for old-growth dependent species

Projected sediment yields are significantly increased compared to Alternative NC due to increased hardwood conversion activity. Area managed for visuals would also be decreased significantly

INCREASED INDICATORS COMPARED TO ALTERNATIVE NC

1 Increased payments to counties (+$0 4 MM)
2 Jobs (+170) and income (+$2 5 MM)
3 First decade ASQ (+0 8 MMCF)
4 LTSY (+2 8 MMCF)
5. Reserved old-growth habitat (+36 M Acres)
6 Botanical areas (+5 M Acres)
7 Annual net receipts - Fifth Decade (+$2 2 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE NC

1. Selected suitable area for timber production (-10 M Acres)
2. Sedimentation (+110 M tons per decade)
3. Visual management (-223 M Acres of Retention and Partial Retention)
4. Average annual net receipts - First Decade (-$3 9 MM)
5. PNV (-$17 MM)

Alternative D

PNV: $1,160 MM
Opportunity Cost. $37 MM Compared to Alternative C

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE C

This alternative has the next lowest PNV (-$37 MM) primarily due to a mixed emphasis on all commodity production. Unlike Alternative C, less intensive timber harvest in Riparian Management Areas and more restrictive watershed harvest constraints are planned for six basins, thus reducing timber outputs while increasing fisheries outputs. The cumulative effect on reduced timber outputs then reduces the net receipts, payments to counties, and other indicators for the first decade. LTSY is less by 2.2 MMCF due to operating on a smaller land base

The major reason for reduction of PNV compared to Alternative C is due to reduction in selected suitable acres (-$12 MM), an increase in visual management areas (-$5 MM), and more restricted harvest in Riparian Management Areas with stricter harvest constraints in six basins (-$20 MM). Less intensive timber management of the riparian areas and more restrictive harvest constraints are planned in six basins, so fisheries benefits are relatively high (+$5 MM) compared to Alternative C.

The amount of old growth that is in a preserved status is 171,000 acres. Backcountry Recreation, Research Natural Areas, Botanical, Wild River, and Scenic and Recreation River Management Areas are identical to previous alternatives. There is an increase of 24,000 acres for visual management. Sediment production would be lower than Alternative C due to less road construction in the first decade, though still at a relatively high level. Access to lands for mineral production changes little Wildlife use is expected to decrease due to reduced seral vegetation in the first decade

INCREASED INDICATORS COMPARED TO ALTERNATIVE C

1. Amount of reserved old growth (+2 M Acres)
2. Sedimentation (-108 M tons per decade)
3. Fisheries (+1 M WFUD's)
4. Visual areas (+24 M Acres)
5. Old-growth habitat fifth decade (+0.6 percent of Forest)
6. Area available for mineral development (+1 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE C

1. First decade ASQ (-1.4 MMCF)
2. LTSY (-2 2 MMCF)
3. First decade payments to counties (-$0 7 MM)
4. First decade jobs (-190) and income (-$3.2 MM)
5. Wildlife (-9 0 M WFUD's)
6. PNV (-$37 MM)
7. First decade annual net receipts (-$0.5 MM)

Alternative A-Departure

PNV· $1,160 MM
Opportunity Cost: None compared to Alternative D

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE D

Though the opportunity costs of Alternatives A-Departure and D are equal, each program is different. The increase in Supplemental Resource area reduces the acres for timber production This reduces the PNV by $8 MM. The removal of the timber objective function increases PNV (+$35 MM). The increase in areas managed for visuals lowers the lands available for intensive timber management and PNV (-$48 MM). Managing all basins with the least restrictive riparian harvest prescriptions increases PNV by $19 MM. Using Prescription B and lowering capital investments for fisheries result in decreased fisheries benefits Lower investment in recreation does not significantly affect benefits, due to surplus capacity.

The first decade outputs for net receipts, payments to counties, jobs, and income are greater due to the departure of timber outputs However, by the third decade, the timber outputs are reduced.

The amount of old-growth habitat, reserved old growth, and Backcountry Recreation areas are slightly increased The land dedicated to Botanical areas and RNA's would be the least of any alternative. The land allocated to visual management would be the highest of any alternative. The fisheries outputs are expected to decrease due to the implementation of Prescription B in the Riparian areas while projected sedimentation is somewhat lower than Alternative D

INCREASED INDICATORS COMPARED TO ALTERNATIVE D

1 First decade ASQ (+0 8 MMCF)
2 Amount of reserved old growth (+2 M Acres)
3 Visual areas (+193 M Acres)
4. Unroaded areas (+5 M Acres)
5. Area available for mineral development (+4 M Acres)
6. County payments (+$0 4 MM), jobs (+40), and income (+$1 1 MM)
7. Sedimentation (-6 M tons per decade)
8. First decade annual net receipts (+$4.2 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE D

1. LTSY (-2.1 MMCF)
2. Fisheries (-2 M WFUD's)
3 Botanical (-5 M Acres) and Research Natural Areas (-1 M Acres)
4. Wildlife (-0.8 M WFUD's)
5. Reduced ASQ, annual net receipts, and payments to counties in future due to departure scheduling

Alternative A

PNV $1,150 MM
Opportunity Cost· $10 MM Compared to Alternative A-Departure

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE A-DEPARTURE

The only significant difference between Alternatives A and A-Departure, which explain the $10 MM opportunity cost, is the decrease in first decade timber outputs in Alternative A Since A has the nondeclining yield timber harvest constraint, the first and second decade outputs are significantly less than the departure alternative. Wildlife values are reduced by $1 MM due to the decreased production of seral stages Other factors are equal including land allocation, program costs, and other benefits.

The change compared to Alternative A-Departure in payments to counties, net receipts, and social indicators of jobs and income changes follows the same trend as the amount of timber harvest for the first decade. Third decade outputs are higher due to the use of the nondeclining yield constraint.

Most other indicators including mineral accessibility, do not change significantly. However, the first decade sediment outputs are less by 6,000 tons due to less harvest and road construction in the first decade

INCREASED INDICATORS COMPARED TO ALTERNATIVE A-DEPARTURE

1. Amount of reserved old growth (+2 M Acres)
2. Sedimentation (-20 M tons per decade)
3 Higher ASQ, annual net receipts, and payments to counties in third, fourth, and fifth decades

DECREASED INDICATORS COMPARED TO ALTERNATIVE A-DEPARTURE

1. First decade ASQ (-1 1 MMCF)
2. Wildlife (-1 1 M WFUD's)
3 First decade payments to counties (-$0.5 MM)
4. First decade jobs (-100) and income (-$2.3 MM)
5 First decade annual net receipts (-$1 7 MM)
6. PNV (-$10 MM)

Alternative S

PNV: $1,131 MM
Opportunity Cost $19 MM Compared to Alternative A

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE A

All program costs are different for Alternatives A and S. An increase in the land allocated to Research Natural Areas, Botanical, Backcountry Recreation, Supplemental Resource, and Special Wildlife Sites Management Areas reduces the land available for timber harvest However, the land available for timber production is managed more intensively with fertilizer applications. The land available for timber production drops by 52,000 acres with a corresponding drop in PNV (-$18 MM). Use of the timber objective function in Alternative S reduces the PNV by approximately $31 MM compared to Alternative A. A reduction in the area allocated to visual management increases the land available for intensive timber management Relative to Alternative A, the percent increase in General Forest acres corresponds with a $40 MM increase in PNV. The change of seven basins to Riparian Prescription C reduces PNV by $2 MM

The capital investment programs for recreation are increased over those of Alternative A. However, all benefits remain the same due to excess capacity for recreation and wilderness experiences in the first decade. The capital investment program for fisheries is increased and results in increased net benefits of $6 MM.

Because of timber outputs, changes in wildlife habitat, and increased fish production, a slight increase of jobs, payments to counties, net receipts, and incomes are predicted

The fish outputs are increased due to implementation of a more restrictive riparian harvest in several basins and due to an increased capital investment program. Sediment projected in the first decade is lower (-114 tons) due to less acres harvested Mineral access would be highly restricted on an additional 32,000 acres Wildlife use would increase due to an increased wildlife capital investment schedule. The amount of reserved old growth is also increased

INCREASED INDICATORS COMPARED TO ALTERNATIVE A

1. Wildlife (+21 M WFUD's)
2. Amount of reserved old growth (+23 M Acres)
3. Sedimentation (-114 M tons per decade)
4. Fisheries (+11 M WFUD's)
5. Old-growth habitat (+1.4 percent of Forest in fifth decade)
6 Unroaded areas (+78 M Acres)
7. Botanical areas (+15 M Acres)
8. Research Natural Areas (+1 M Acres)
9 Average annual Noncash Benefits (+ $0 5 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE A

1. First decade ASQ (-1 1 MMCF)
2. LTSY (-4.7 MMCF)
9. Acres available for mineral development (-32 M Acres)
4. Visual areas (12 M Acres)
6 First decade payments to counties (-0 5 MM $/Yr)
7 First decade jobs (-20) and income (-$0 9 MM)
5 PNV (-$19 MM)
11 First decade annual net receipts (- $2 2 MM)

Alternative K

PNV: $1,083 MM
Opportunity Cost· $48 MM Compared to Alternative S

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE S

Alternative K has some differences in land allocations and constraints compared to Alternative S. A decrease in land allocations for Backcountry Recreation, Special Wildlife Sites, and Scenic/Recreation Rivers provides a larger land base (+13,000 acres) for timber management which results in a plus $28 MM for PNV A small reduction in visual management results in a slight increase in PNV (+$0 7 MM).

Taking away fertilization as a treatment option and the tighter constraint for watershed management result in a significant decrease in PNV (-$63 MM) The capital investment program for fisheries is the highest for all alternatives, resulting in high fisheries benefits The recreation and wildlife programs are lower than

Alternative S The recreation program has an increased PNV of $2.8 MM due to existing surplus capacity. The wildlife program has a decreased PNV compared to Alternative S of $13 MM due to a reduced capital investment program

Decreases in the annual net receipts, payments to counties, change in jobs, and change in income would occur in the first decade.

Alternative K would have slightly less old-growth habitat suitable for wildlife use in the fifth decade. Sediment production projected for the first decade is slightly less than Alternative S due to the lower level of harvest and roading Fish production decreases some due to more intensive timber management in six basins. The accessibility of minerals is slightly increased to that in Alternative S.

INCREASED INDICATORS COMPARED TO ALTERNATIVE S

1. Average Annual Net Receipts - 5th Decade (+$1.5 MM)
2 Suitable Land for Timber Production (+24 M Acres)
3 Sedimentation (-28 M Tons/Decade)
4 Minerals (+15 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE S

1 First decade ASQ (-1.2 MMCF)
2. Payments to counties first decade (-$0.5 MM)
3. Number of jobs (-180) and income (-$3.9 MM) first decade
4. Wildlife (-22 M WFUD's)
5. Old Growth Preserved (-9 M Acres)
6. Botanical and RNA Areas (-9 M Acres)
7. Fisheries (-7 M WFUD's)
8. PNV (-$48 MM)
9. Annual net receipts first decade (-$2.9 MM)
10. Average annual noncash benefits (-$0 4 MM)

All other indicators remain relatively constant

Alternative G

PNV: $844 MM
Opportunity Cost. $107 MM Compared to Alternative K

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE K

This alternative has significantly lower PNV compared to the previous Alternative (K) with spin-off decreases in payments to counties, net revenues, jobs, and incomes.

Alternative G's increasing opportunity costs are mainly due to the reduction of investment in the timber program. The opportunity costs for timber riparian management are $11 MM. Additional areas in Backcountry Recreation, Supplemental Resource, Botanical, and Designated Wildlife Habitat Management Areas reduce the investment opportunities for timber production and PNV by $84 MM. An increase in the visual management areas reduces the land available for intensive timber production The resulting decrease in General Forest acres equals $10 MM reduction in PNV. Due to high capital investments and the lack of harvest in riparian areas, the fisheries benefits are high with an increased PNV (+$3 MM)

The amount of reserved old growth (+27,000 acres) increases in connection with the unroaded areas Projected sediment decreases significantly in the first decade due to a decrease in road construction and harvest.

INCREASED INDICATORS COMPARED TO ALTERNATIVE K

1 Amount of reserved old growth (+74 M Acres)
2 Sedimentation (-182 M tons per decade)
3 Fisheries (+1 M WFUD's)
4. Botanical areas (+28 M Acres outside of Wilderness)
5 Visual areas (+219 M Acres)
6. Old-growth habitat fifth decade (+4 5 percent of Forest)
7. Unroaded area (+70 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE K

1 First decade ASQ (-7.3 MMCF)
2 LTSY (-10.1 MMCF)
3 Selected suitable area for timber management (-123 M Acres)
4 Wildlife (-8.9 M WFUD's)
5. Acres available for mineral development (-37 M Acres)
6. Payments to counties (-$3.6 MM)
7. Number of jobs (-680) and income (-$15 4 MM)
8. PNV (-$239 MM)
9. Annual net receipts (-$8.9 MM)

All other indicators are relatively constant

Alternative E

PNV· $679 MM
Opportunity Cost. $165 MM Compared to Alternative G

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE G

The PNV for Alternative E is $165 MM less than Alternative G The decreases in net receipts, county receipts, jobs, and incomes occur mainly due to a decrease of 4 3 MMCF in timber outputs The decrease is due to fewer acres managed for timber with a corresponding decrease in the LTSY (-6.5 MMCF)

Alternative E's emphasis on preserving unroaded areas foregoes timber management opportunities on 302,000 acres The increase in unroaded areas and subsequent decrease in land managed for timber production reduce PNV by $149 MM. Alternative E also foregoes timber management opportunities in all riparian areas This management reduces PNV by $22 MM Other economic programs are not significantly different. The capital investment program for fisheries is reduced. The lack of timber harvest in unroaded areas, Riparian areas, and Supplemental Resource areas provide fisheries benefits (though slightly reduced from Alternative G).

The unroaded area allocation and area of preserved old growth are increased The old-growth habitat suitable for wildlife would be increased as would visual management areas The area allocated to Botanical and RNA's would be decreased by 11,000 acres Projected sediment is less due to lower harvest levels and less road construction The areas open to mineral development would be decreased by 148,000 acres

INCREASED INDICATORS COMPARED TO ALTERNATIVE G

1 Amount of reserved old growth (+63 M Acres)
2. Sedimentation (-108 M tons per decade)
3 Visual areas (+66 M Acres)
4 Old-growth habitat fifth decade (+4.3 percent of Forest)
5 Unroaded areas (+10 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE G

1. First decade ASQ (-4 3 MMCF)
2. LTSY (-6.5 MMCF)
3. Selected suitable area for timber management (-119 M Acres)
4 Wildlife (-6.1 M WFUD's)
5 Acres available for mineral development (-148 M Acres)
6 Botanical areas (-11 M Acres outside of Wilderness)
7 Payments to counties (-$2 0 MM)
8. Number of jobs (-400) and income (-$8.9 MM)
9 PNV (-$165 MM)
10 Annual net receipts (-$6 9 MM)

All other indicators remain relatively constant.

Alternative M

PNV. $272 MM
Opportunity Cost: $407 MM Compared to Alternative E

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE E

Alternative M has the highest opportunity costs due to the long rotation length for timber management on a much reduced land base. Compared to Alternative E, the longer rotation of Alternative M reduces PNV by $239 MM. The maximum area is allocated to an unroaded status, Supplemental Resource, Botanical, RNA's, and Designated Wildlife Habitat areas. The opportunity costs of the reduced area allocated to timber production equals $161 MM compared to Alternative E. These costs are offset somewhat because some of these acres allocated to management not allowing programmed harvest were visual management acres. This reduces the opportunity costs by approximately $10 MM No harvest is programmed from riparian areas and the maximum amount of land is allocated to scenic vistas including preservation status. The increased fisheries budget combined with the lack of timber harvest in riparian areas results in high fisheries benefits, though slightly less than Alternative G. Other economic programs such as recreation and wilderness benefits do not increase due to projected surplus supply of unroaded areas compared to projected use in the near future.

The incremental decrease in county receipts, net cash flow, jobs, and income is the greatest of any alternative. As with the other alternatives, the amount of planned timber harvest accounts for most of this change. The amount of area managed for timber is the lowest for all alternatives and the planned rotation for the Forest is the longest, resulting in a lower LTSY.

The most old growth of any alternative would be preserved with corresponding habitat for old-growth-dependent species The maximum amount of land of all alternatives would be allocated to Preservation, Retention, and Partial Retention visual management. Fish production would also be high, with sediment production the lowest of all alternatives. Due to lack of activities that would create forage areas and habitat diversity, big game, small game, and nonconsumptive wildlife use would decline

INCREASED INDICATORS COMPARED TO ALTERNATIVE E

1. Amount of reserved old growth (+63 M Acres)
2. Sedimentation (-334 M tons per decade)
3. Botanical areas (+11 M Acres outside of Wilderness)
4. Visual areas (+11 M Acres)
5. Old-growth habitat (+5.5 percent of Forest in fifth decade)
6. Unroaded areas (+94 M Acres)

Decreased Indicators Compared to Alternative E

1. First decade ASQ (-10.1 MMCF)
2. LTSY (-10.0 MMCF)
3. Wildlife (-14.9 M WFUD's)
4. Payments to counties (-$4.1 MM)
5. Number of jobs (-950) and income (-$23.5 MM)
6. Fisheries (-1 M WFUD's)
7. PNV (-$407 MM)
8. First decade annual net receipts (-$14.6 MM)



IMPLICATIONS OF THE 1987 FIRES

The Siskiyou National Forest was impacted by several large fires in 1987. The effects of those fires and subsequent timber salvage projects, and the changes in the environmental components relevant to this Forest Plan analysis are described in the section **1987 FIRES** in Chapter III. Numerous changes have occurred which have little implication for the Forest Plan analysis. While they affect the Forest potential to produce a particular output or condition, the changes are small fractions of the Forest totals and will be the same regardless of the alternative selected in this analysis None of the alternatives or environmental components are significantly affected when viewed on a Forest-wide scale. Only those elements which have implications for changed outputs or conditions that may be of some interest in the design or evaluation of the alternatives will be discussed here. Based on the discussion in Chapter III, the more important resource changes to consider are changes in: (1) the timber inventory, (2) fish habitat and water quality, (3) wildlife habitat for mature and old growth dependent species, and (4) the recreational setting

TIMBER

The loss of timber volume from the inventory has some implications for the alternatives, particularly those that project high levels of timber harvest. The volumes salvaged in place of sales that would normally have been scheduled offset part of the potential loss Since most of the available volume in the Galice and Longwood Fire areas will be salvaged, the only losses of any importance occur in the Silver Fire area. Alternatives that would allocate part or all of the burned areas to uses with programmed timber outputs would be affected; others would not. The Silver Fire Recovery Project analysis also identified some additional lands that are unsuitable due to reforestation difficulty or potential for irreversible soil damage. The Record of Decision for the project indicated that the final Forest Plan would account for these inventory changes along with the changes from the fires themselves

Table II-63 displays the ASQ projected for each alternative and the ASQ that would be projected with the changes from the 1987 fires and revised suitability in the Silver Fire area Any alternative selected would be modified to be consistent with these resource potentials prior to development of the Forest Plan for implementation Departure Alternatives (A-Departure and B) could remain the same for the first decade, but would have slightly more reduction in future decades than projected.

Table II-63 ASQ Adjustments for 1987 Fires and Silver Fire Suitability (Chargeable Sawtimber)

	Alternative											
	NC	A	A-Dep	B	C	D	D1	E	G	K	M	S
Original ASQ												
MMCF	31 0	30 1	31 2	36 8	31 8	30 4	31 2	16 2	20 5	27 8	6 1	29 0
MMBF	167 5	168 0	174 1	205 3	177 4	169 6	174 1	90 4	114 4	155,1	34 0	161 8
Adjusted ASQ												
MMCF	31 0	29 4	31 2	36 8	31 1	29 7	30 5	16 2	20 5	27 1	6 1	28 4
MMBF	167 5	164 1	174 1	205 3	173 5	165 7	170 2	90 4	114 4	151 2	34 0	158 5

FISH HABITAT AND WATER QUALITY

The discussion in Chapter III explains the scope of the impacts to the fisheries resource (the primary beneficial use of water for the areas impacted). The total impact to fish production is projected to be less than one percent when viewed in the Forest-wide context. This impact has already been incurred and will not be affected by the alternatives considered in this analysis. The only consideration here is the need to

allow the burned areas to recover before additional timber harvest is scheduled within the perimeter of the Silver Fire area. Harvest scheduling for any alternative selected for implementation could be modified to provide additional mitigation in these areas until recovery has progressed to a stage allowing further harvest activities without significant adverse cumulative impacts.

MATURE AND OLD-GROWTH WILDLIFE HABITAT

Impacts to the habitat networks for species dependent on mature and old-growth habitat are described in Chapter III Although the acres of mature and old-growth forest are now approximately 25,000 acres less than displayed from the planning inventory (443,000 acres), Forest-wide there is no serious impact as a result of the fires on the habitat network proposed to maintain minimum viable populations of wildlife species dependent on mature and old-growth forest

RECREATIONAL SETTING

The character of the recreational setting is changed in the burned areas as a result of changes in the vegetation caused by the fires. The more important change relative to this analysis is the modification of the unroaded character and the ROS inventory resulting from the roading associated with the Silver Fire Recovery Project These changes are described in Appendix C. Alternatives which would allocate areas with new roads to the Backcountry Recreation Management Area would need restoration for these areas to return them to a more natural, undeveloped condition over time. Alternatives that would be affected are E, G, and M

CHAPTER III

AFFECTED ENVIRONMENT

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Chapter III
AFFECTED ENVIRONMENT
INTRODUCTION

The purpose of Chapter III is to describe the physical, biological, social, and economic components of the environment that would be affected by the array of alternatives. This chapter sets the stage for the discussion of significant interactions and environmental effects in Chapter IV.

For ease of discussion, the affected environment was divided into 21 separate environmental components as listed at the bottom of this page Most components are discussed from three standpoints. The first deals with the **EXISTING CONDITION** and provides an inventory of the raw material, explains why the component is important, and relates the local existing condition to the situation in southwestern Oregon and northwestern California The second describes the **CURRENT DEMANDS, WANTS, AND DESIRES** placed on the environmental component as expressed by the general public. The third focuses on the Forest's **ABILITY TO SATISFY DEMAND** (i.e., the wants, needs, and desires expressed about the component).

Discussion of Location, Climate, and Geology and Topography is provided as a basis for understanding the remaining components As such, the discussion of these components is limited primarily to the existing condition.

The interdependence of the various environmental components makes it difficult to present them in a logical sequence. In general, the more basic or fundamental components are listed before the more consumptive or output-related components.

The *Environmental Components* are.

1. Location
2. Climate
3. Geology and Topography
4 Land Allocations
5. Cultural Resources
6. Energy
7. Mineral Deposits
8. Improvements
9. Wilderness and Roadless Areas
10 Wild and Scenic Rivers
11. Soil and Water
12 Fire
13. Vegetation
14 Sensitive Plants
15. Air Quality
16 Fish
17. Wildlife
18. Biological Diversity
19 Visual Resource
20. Recréation Settings
21. Economic and Social

CHANGES BETWEEN DRAFT AND FINAL

As a result of public comments, on-going Forest management activity, the 1987 fires, and Congressional designation of three Wild and Scenic Rivers in late 1988, Chapter III of the DEIS has been updated to accurately reflect the significant environmental changes.

The **1987 FIRES** received Nationwide notoriety. The changes in the physical and biological environment brought about by three major fires are summarized at the end of this chapter.

In late 1988, the Chetco, Elk, and North Fork Smith Rivers were designated as Wild and Scenic Rivers under the Omnibus Oregon Wild and Scenic Rivers Act Both the Chetco and North Fork Smith Rivers had been carried as inventoried rivers for possible recommendation to the National System Following an administrative study this year, the Elk was also determined eligible for possible inclusion See **WILD AND SCENIC RIVERS** for further discussion.

Both the public and members of the Forest Management Team felt that **BIOLOGICAL DIVERSITY** should receive added emphasis. The discussion provided under the same heading will add value to the analysis and the reader's understanding of this important concept. This highlighted component, while still addressed under several environmental components, has been given a separate section to collectively describe the existing condition

The inventoried roadless areas have not remained fixed since the 1984 update. Along with some timber sale activity and pre-existing conditions, the salvage activity following the 1987 Silver Fire has reduced the inventoried amount from 314,000 to 284,000 acres The decision for the projects covered under the Silver Fire Recovery Project FEIS (USDA 1988d) accounts for approximately 19,000 acres of the reduction For a summary of the changes, refer to the section titled **WILDERNESS AND ROADLESS AREAS.** For a detailed summary of changes by inventoried roadless area, see Appendix C

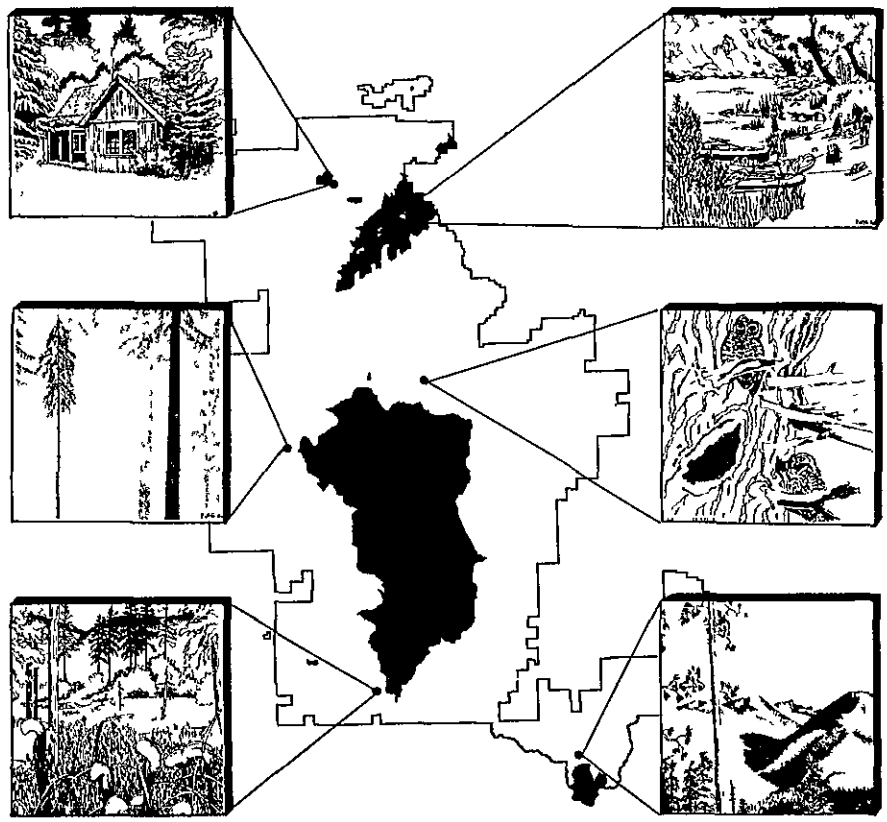
Public and other agency comments also resulted in other changes in the text throughout the chapter. More substantive rewrites are in the sections **SOIL AND WATER** and **FISH.**



LOCATION

The Siskiyou National Forest is located in the Klamath Mountains and Coast Range of southwestern Oregon (See Figure I-2). Oregon counties include Josephine, Curry, and Coos. A small segment of the Forest extends into northern California (Del Norte County). The Forest is positioned between the Cascades and the Pacific Ocean. The ocean can be viewed from the western edge of the Forest. The southern part borders the Six Rivers, Klamath, and Rogue River National Forests.

The Siskiyou contains 1,162,030 acres within its boundaries, 69,728 acres of which are privately owned or managed by other government agencies (refer to **LAND ALLOCATIONS**). The FEIS and Forest Plan apply only to the 1,092,302 acres of National Forest System lands



CLIMATE

The overall climate on the Forest can be characterized as a maritime climate with fairly hot, dry summers and warm, wet winters. Most of the annual precipitation falls between October and April. Precipitation amounts across the Forest range from 40 to 150 inches (see Figure III-1) Average monthly summertime maximum temperatures range from 72 to 89 degrees Fahrenheit Maximum high temperatures have exceeded 105 degrees at several locations

Several distinct climatic zones have been identified on the Forest, based primarily on available summer moisture (Atzet and Wheeler 1982) Two coastal zones are identified to the west of the coastal crest These zones are influenced strongly by the Pacific Ocean and are characterized by summer precipitation and fog. The northern zone, in the vicinity of the drainages of the Elk and Sixes Rivers, receives considerably more fog and is cooler than the coastal zone to the south The average annual precipitation in these zones ranges from 80 to 90 inches along the coast to 150 inches along the coastal crest. Most of the precipitation falls between November and March Mean winter temperatures in the coastal zones are in the mid-40's Mean summer temperatures reach the mid-60's

Fog is most prevalent in these zones during the summer months and extends inland via the river drainages to an elevation of 1,500 to 2,500 feet. This inland penetration is dependent on the height of marine inversion layers Hence, while the lower elevations along the coast may be cool and humid, higher elevations in the Coast Range above the inversion layer will be warm and dry

A drier zone, often characterized as a rainshadow, lies to the east of the coastal crest and extends to the vicinity of Grants Pass and Illinois Valley It has a mean winter temperature of 40 degrees Fahrenheit and a mean summer temperature in the 80's. During the summer and early fall, maximum daily temperatures often exceed 100 degrees. Precipitation averages 30 to 45 inches per year in the valley areas and 45 to 60 inches in the mountains.

A fourth climatic zone is located in the Siskiyou Mountains southeast of the Cave Junction area. The temperature regime there is similar to that of the rainshadow zone but receives up to 90 inches of annual precipitation

Because of the topographic irregularity and its influence on precipitation, the actual amounts of precipitation are quite variable within the narrow east-west range of the Forest. Many local areas receive precipitation amounts significantly above or below the yearly averages indicated for the broad climatic zones Rainfall intensities during winter storms tend to be highest on the west side of the Coast Range due to the orographic effect Potential evapotranspiration exceeds precipitation during the summer months. This is particularly so east of the coastal crest and on southerly aspects

East wind episodes are a common occurrence across the Forest and are a real concern to fire managers during the months of May through October These episodes are characterized by strong easterly winds, low humidities, and relatively high day and night temperatures. Maximum high temperatures of 80 to 85 degrees Fahrenheit have been recorded along the Pacific Coast at Brookings, Oregon during such periods. Temperatures in excess of 100 degrees have been recorded at mountain sites west of the coastal crest during east wind episodes. The most severe periods occur primarily in the late summer and fall months and are responsible for the local "Indian Summer" Many of the major wildfires on the Siskiyou National Forest have occurred under east wind conditions

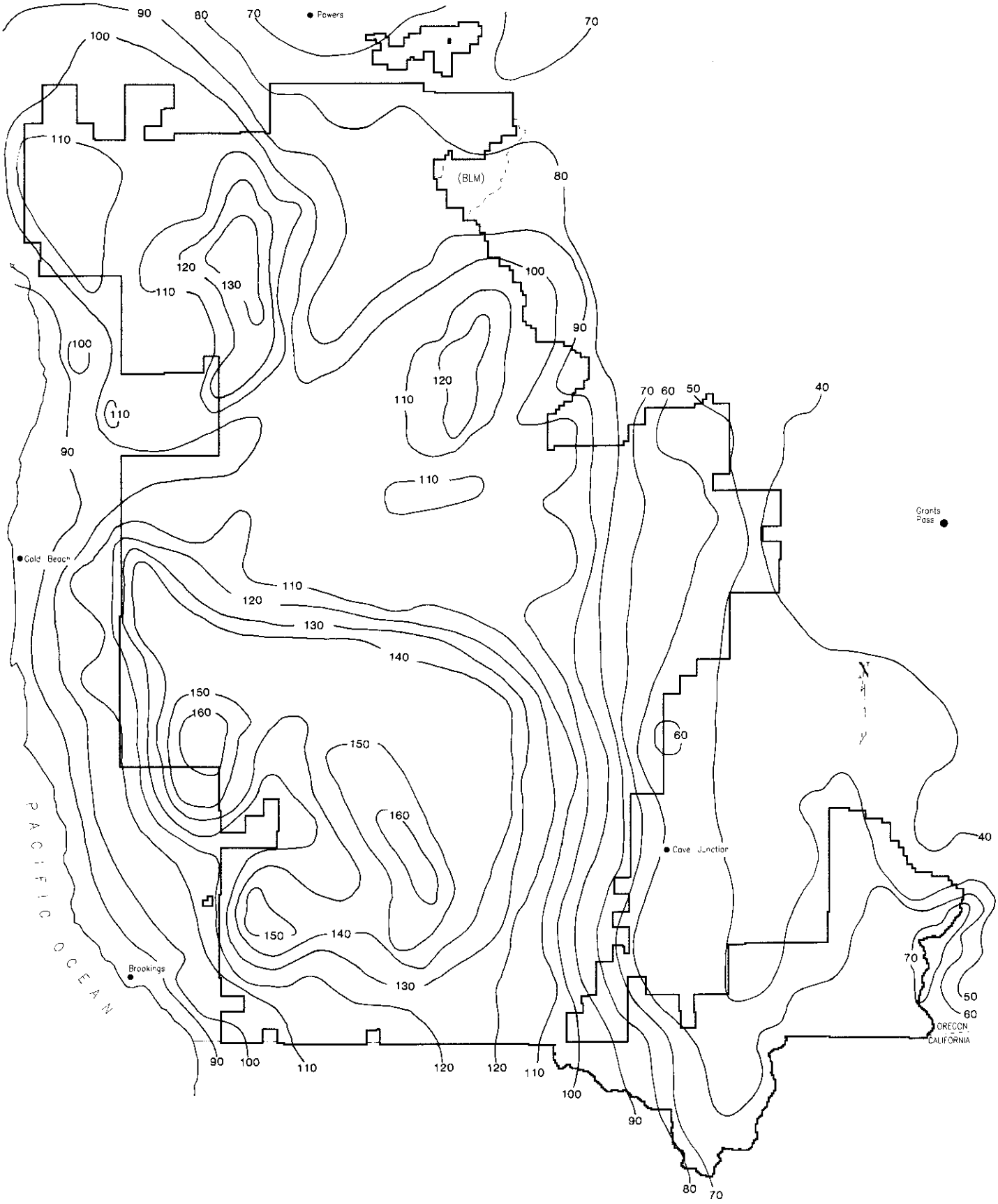


Figure III-1. Precipitation Map (Inches per Year)

GEOLOGY AND TOPOGRAPHY

The Siskiyou National Forest is included within portions of the Klamath Mountains and Oregon Coast Range Provinces Much of the Forest lies within the Siskiyou Mountains, which are loosely defined as the part of the Klamath along the Oregon-California border Northern portions of the Forest lie within the Oregon Coast Range Province, and differ in geology and topography (Baldwin 1986; Bailey 1966).

The Forest is characterized by deeply incised streams in narrow canyons, rocky ridges, steep slopes, rock cliffs, and numerous landslides Elevations range from 7,055 feet above sea level at Grayback Mountain to less than 100 feet along several of the coastal streams Many major ridges are at or near 4,000 feet The steep slopes, rocky canyons, and high-gradient streams are the products of bedrock geology and climate interacting over millions of years. The products of those ancient times, such as numerous soil types and oversteepened slopes, are parts of the environment currently managed by the Forest. Understanding the processes that formed the mountains and the limits of the natural systems provides a basis for resource management without degradation of environmental quality or long-term productivity.

Klamath Mountains Province

Most of the Forest is underlain by metamorphosed marine sedimentary and volcanic rocks. Near-surface rock is typically weathered or decomposed The common varieties are shaley slate, sandstone, schist, and greenstone (mostly andesitic lavas). Minor varieties include tuffs, chert, and conglomerate Intruded into the metamorphics are granitic rocks (mostly diorites and gabbros) and ultramafics (peridotite and serpentine) A geologic map is included in the Forest Soils Resource Inventory (USDA 1979c).

The rocks were formed during the Triassic and Jurassic Periods (200 million to 140 million years ago). The Triassic rocks are known as the Applegate Group. The Jurassic rocks are known as the Galice, Rogue, Dothan, and Otter Point Formations. Since Jurassic time, the area encompassed by the Forest has alternately been above and below sea level. Marine sediments were deposited over much of the area during the latter part of the Jurassic and during the Cretaceous Period (100 million years ago). Subsequent uplift and erosion have removed most of this cover. These strata make up the Humbug Mountain, Rocky Point, and Days Creek Formations

Coast Range Province

In the north central part of the Forest, the Klamath rocks are locally overlain by even younger sedimentary rocks (about 50 million years old) which are part of the Oregon Coast Range geologic province These are the Lookingglass, Flournoy, and Tyee Formations. In this area the ridges are broader and more rounded, although the inner gorges through which many streams flow are very steep and unstable. There are also plateaus, such as Eden Valley, which contrast with the steep terrain of the rest of the Forest.

Origin Of Canyon Landscape

The present canyons were eroded into the older, flatter landscape during the last two million years (known as the Pleistocene Epoch, or Ice Ages) As water was alternately stored in or released from glaciers, the land surface was intermittently high relative to sea level Precipitation was sometimes much greater than that of present times. Rock masses more resistant to weathering and erosion, such as greenstone, hard sandstone, and peridotite, became rocky ridges and buttes Easily eroded rocks, such as slates, some sedimentary rocks, schists, and some granitic rocks, became canyons and valleys A few glacially carved cirque basins and moraine deposits occur at elevations above 4,000 feet

The canyon landscape was sculpted by giant landslides that were many times larger than those of recent times The eroded landforms of these ancient slides occur throughout the Forest Intermittent strong earthquakes may have activated landslides during times of high groundwater. Many temporary lakes formed behind landslide debris dams; only a few small ones now exist.

LAND ALLOCATIONS

EXISTING CONDITION

Land allocations establish the permissible activities and restrictions on use. Use restrictions and management direction regarding activities are reflected in the Standards and Guidelines for each Management Area Table III-1 describes the primary objective for each Management Area

The relationship between land allocations and associated activities is an important concept introduced in this chapter. Many of the following resource component sections in Chapter III discuss various aspects of the existing land allocations However, in Chapter IV, a far more extensive discussion and analysis of the effects of alternative land allocations is presented Interactions exist among almost all of the land allocations, activities and uses, and the environmental components Given physical suitability, the number of acres allocated to each Management Area determines the types of activities and public uses that the Forest will provide Agency activities and public consumption of the opportunities afforded are the basis (causative agent) for most of the significant environmental effects evaluated in Chapter IV.

Existing allocations (classifications) of Management Areas are provided through the Land Management Plans and Multiple Use Plans prepared in the 1960's and 1970's. Many of the Management Area descriptions used in this document are similar in many respects to the older descriptions. The reader is referred to the following documents to gain a better understanding of the current land allocations and prescriptions:

Land Management Plans	**FEIS Filed**
Land Use Plan for Rogue Planning Unit (essentially the Wild Rogue Wilderness)	2/12/75
Land Use Plan for Mt Butler-Dry Creek Planning Unit (essentially the Grassy Knob Wilderness)	5/20/76
Rogue-Illinois Land Management Plan	10/12/79
Chetco-Grayback Land Management Plan	12/05/79
Multiple Use Plans	**Date Approved**
Powers Ranger District Multiple Use Plan	5/27/69
Illinois Valley Ranger District Multiple Use Plan (Revised)	6/08/70 6/08/82

Figure III-2 displays the location of lands whose status is unaffected by alternatives considered in the FEIS While physical changes in these lands are quite limited, the Forest does take credit for the special values that may occur, such as wildlife habitat, plant diversity, mineral potential, and wilderness character

The Siskiyou National Forest encompasses 1,162,030 acres, of which 69,728 are in Other Ownerships (Figure III-3). Approximately 55,000 acres are considered Non-forested Another 250,000 acres have been designated by the Chief of the Forest Service or higher authority to special uses (a combination of Wilderness and Other). For planning purposes, the remaining 787,000 acres of land are initially characterized as Forested Land (Figure III-3)

Table III-1 Management Areas of the Siskiyou National Forest

Management Area	
No - Name	Objective
1 - Wilderness	Maintain wilderness character in its natural condition and provide opportunities for solitude and recreation.
2 - Wild River	Maintain the natural, free-flowing, and primitive character of Wild segments of the river corridor
3 - Research Natural Area	Provide opportunities for research, observation and study of ecosystems influenced only by natural processes
4 - Botanical	Provide exhibits of plants, plant groups and communities with exceptional botanical and ecological value.
5 - Unique Interest	Provide opportunities for understanding the earth's unique geologic, historical, and archaeological features.
6 - Backcountry Recreation	Provide both motorized and non-motorized recreation opportunities in a largely undeveloped setting with the minimum management necessary for resource protection
7 - Supplemental Resource	Provide quality fisheries, water, wildlife habitat and recreation opportunities in a largely undeveloped setting.
8 - Designated Wildlife Habitat	Provide mature and old-growth habitat for dependent wildlife species
9 - Special Wildlife Site	Provide an array of unique plant and animal conditions that contribute to overall wildlife habitat diversity
10 - Scenic/Recreation River	Provide river-oriented recreation in an area of high quality scenery and largely undeveloped shoreline of of Scenic and Recreation segments of the river corridor.
11 - Riparian	Protect intrinsic values of ecosystems bordering bodies of water and wetlands while providing limited multiple-use development opportunities
12 - Retention Visual	Protect scenic values while providing multiple-use development opportunities that are not visually evident to the casual Forest visitor.
13 - Partial Retention Visual	Protect scenic values while providing multiple-use development opportunities that are visually subordinate to the characteristic landscape
14 - General Forest	Provide multiple-use development opportunities and a high yield of timber, subject to multiple use constraints.

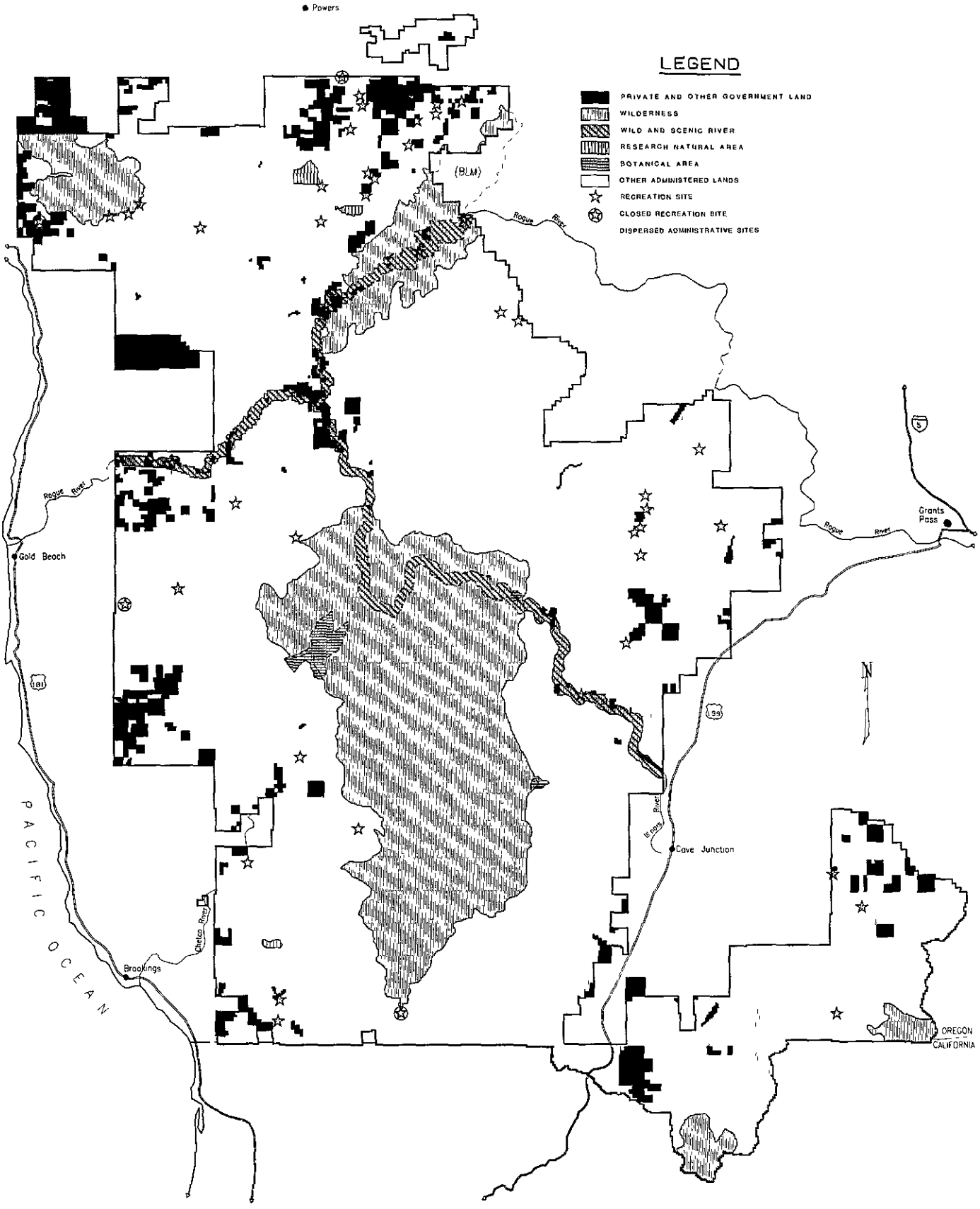


Figure III-2 Land Status Map

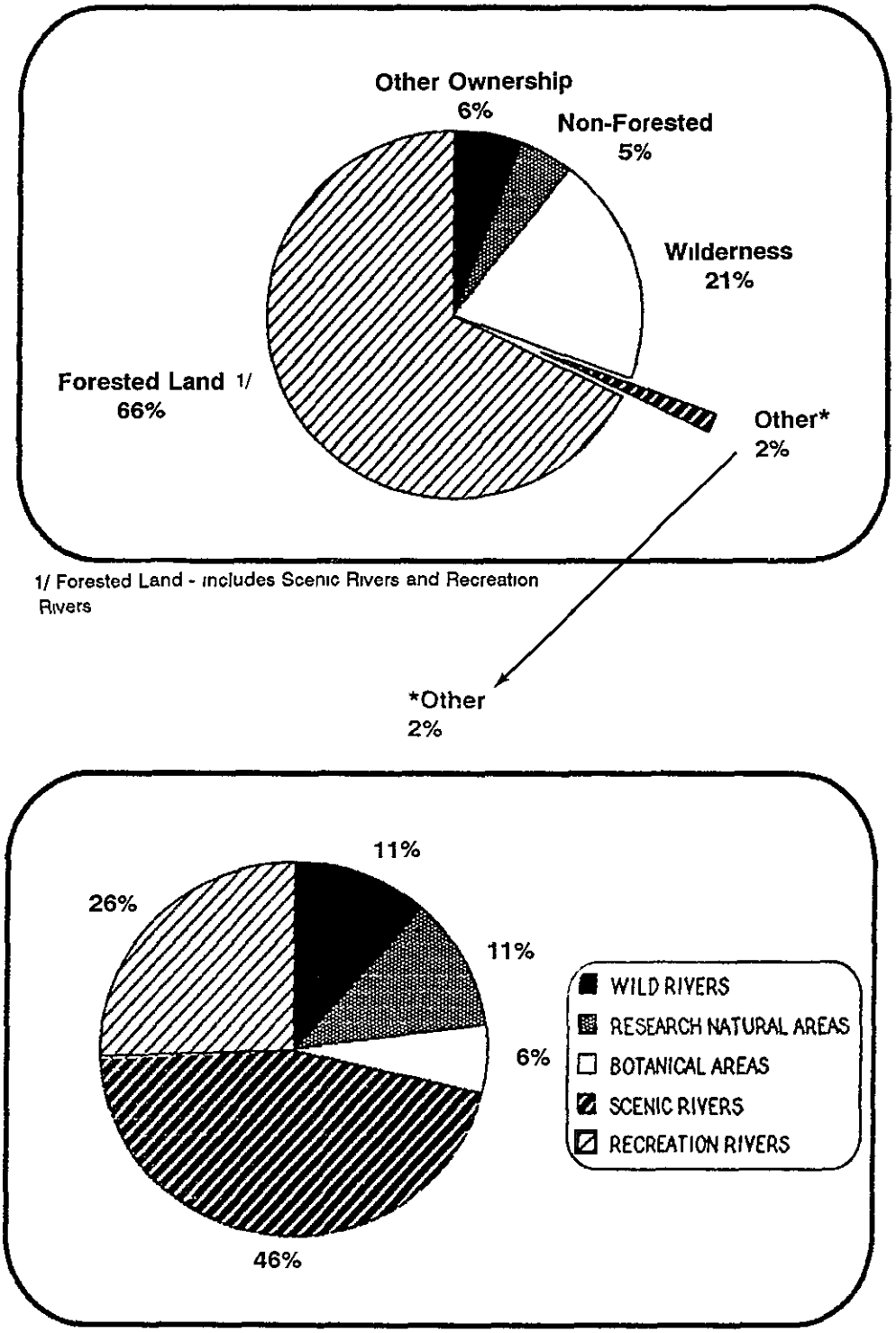


Figure III-3. Land Status Acreage

Some limitations on activities and uses of land within the Forest boundary are permanently established Unsuitable physical conditions are responsible for a few limitations, however, most are due to decisions made by the Chief of the Forest Service or higher authority The Regional Forester (the responsible official for the Forest Plan decision) does not have the authority to affect the land status in these cases without the Chief's approval Figure III-3 displays the inventory of acres on the Forest including those that presently have restrictions on use (again, Wilderness and Other) Table III-2 displays additional encumbrances existing on portions of the Forest

Table III-2. Special Use Permits and Withdrawal Orders

Permit/Order Category	Number of Cases	Acres Affected
Special Use Permits		
Recreation Use	15	27
Industrial Use	10	6
Research, Study, Training	8	362
Transportation	36	112
Utilities/Communications	44	242
Water Use	38	11
Other (Community, Public Information)	4	2
Withdrawal Orders		
Power	7	43,037
Mineral	28	50,101
TOTALS	190	93,900

CURRENT DEMANDS, WANTS, AND DESIRES

Maximizing the number of acres with a certain status, as reflected in the land allocations (Management Area assignments), best illustrates the level of demand associated with the resolution of the Planning Problems. This section describes the types of land allocations and changes in land status that would be necessary to move toward resolving a single Planning Problem. The physical capability of the Forest to satisfy the desired future condition through just land allocations is presented in the following:

1. "How Much Timber Should the Forest Produce?"

Timber production, measured by long-term sustained yield, is directly related to the number of acres selected as suitable for timber operations. Timber harvest can be programmed on lands selected as suitable in five Management Areas: Scenic/Recreation River, Riparian, Retention Visual, Partial Retention Visual, and General Forest Of the five Management Areas with timber potential, General Forest is the primary timber-producing allocation (having relatively few use or activity restrictions, other than those necessary to comply with laws and regulations). The greater the number of acres selected for timber production in General Forest, the greater the long-term sustained yield level. Lands selected as suitable for timber production in the other four Management Areas yield less volume per acre because of other multiple-use resource objectives, principally the visual resource Under current direction (Alternative A), 746,846 acres are allocated to the five Management Areas with programmed timber harvest. The General Forest acreage amounts to nearly half (376,144) of the total.

2. "How Much Old-Growth Forest Should Be Preserved?"

Old-growth forest characteristics are preserved when lands meeting the definition of old growth (see GLOSSARY) are allocated to Management Areas that do not allow physical manipulation of vegetation. Except for lands where timber harvest has occurred over the last 30 to 40 years, a considerable area of

the Forest meets the definition Land allocations to all Management Areas except Scenic/Recreation River, Riparian, Retention and Partial Retention Visuals, and General Forest should maintain existing old-growth characteristics In some situations, Scenic/Recreation River and Riparian are managed to maintain existing vegetation. A large part of the Riparian Management Area adjacent to larger streams and rivers could be considered "managed" old growth Under current direction (Alternative A), 173,754 acres of mature and old-growth forest are protected.

3 "How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity Be Maintained or Improved?"

Minimizing adverse site-disturbing activities and rehabilitating areas degraded as a result of past activities would maintain and improve fish habitat, water quality, and soil productivity As with the previous Planning Problem, land allocations to Management Areas that either do not allow or limit manipulation of vegetation and/or where site disturbance are most advantageous to the resolution of this Planning Problem Application of watershed constraints that disperse management activities over time and space can also reduce potential risks of cumulative impacts Many of the Standards and Guidelines, and associated Best Management Practices, which accompany the specific land allocations also provide for the protection of these resources Under current direction (Alternative A), 327,456 acres are allocated to Management Areas with little or no disturbance Substantive constraints on site disturbance are applied to another 170,157 acres (Scenic/Recreation River, Riparian, and Retention Visual Management Areas).

4 "How, and to What Extent, Should Lands In and Adjacent to River Corridors Be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?"

For planning purposes, areas of peripheral protection take into account all lands within view of the Wild and Scenic River segments Water quality aspects, too, enter into the evaluation While quality of tributary streams to the Wild and Scenic Rivers are maintained by the Standards and Guidelines governing all Management Areas, land allocations to those Management Areas that limit site disturbance and vegetative manipulation on high risk landtypes can provide an added degree of protection This aspect of the Planning Problem is presented and evaluated through the prior Planning Problem 3.

A similar situation exists for visuals Lands adjacent to the Wild and Scenic River corridors that are allocated to Retention or Partial Retention generally satisfy the Visual Quality Objectives (VQO's) for the area However, allocations that do not allow site disturbance may be preferred in specific instances. Under Alternative A, the existing direction for visual management within the river corridor viewsheds is complemented by the full assignment of inventoried VQO's. Additionally, an array of Management Areas other than General Forest either overlay or are immediately adjacent to the river corridors

5. "How Should Sensitive Plant Resources Be Managed?"

Standards and Guidelines for all Management Areas are designed to maintain or enhance the viability of sensitive plants to ensure that none become threatened or endangered. Allocations to Management Areas 1 through 9 that minimize site disturbance are generally advantageous to most plants (some plants require disturbance), while acres allocated to Botanical Management Areas are specifically oriented to management and protection of the more unique or important botanical features. Under existing management, 30 percent (327,456 acres) of the Forest is allocated to Management Areas 1 through 9, while 4,475 acres are specifically assigned to Botanical Management Area 4

6. "How, and to What Degree, Should Forest Scenic Values Be Protected Through Visual Resource Management?"

Resolution of this Planning Problem would require allocations to Management Areas that allow managers to reduce, meet, or exceed inventoried VQO's. The Forest is stratified into 44 viewsheds, each with VQO's ranging from Preservation to Modification Presently, all Management Areas meet their inventoried VQO.

7. "How Should Wildlife Habitats on the Forest Be Managed?"

Management Requirements (MR's) for the maintenance of wildlife habitat are incorporated in the allocation to Designated Wildlife Habitat Management Areas, and Forest-wide Standards and Guidelines Complete resolution of this Planning Problem would provide a diverse array of successional stages proportionately distributed over the entire Forest in space and time Genetic viability of wildlife populations would be maintained. Natural site productivity would regulate the number of individuals. Current direction (Alternative A) meets the MR's for species dependent on old growth through allocation to Designated Wildlife Habitat and other areas of no programmed timber harvest In addition, numerous Special Wildlife Sites exist from past and present set-asides

8 "How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?"

Wilderness and unroaded areas supply the majority of Primitive and Semi-primitive Non-motorized recreation opportunities on the Forest Management activities in and around existing Wilderness could change the character of the recreation experience Allocation of land to Management Areas (in general, Management Areas 1 through 9) that preserve the character of unroaded areas provides additional Primitive and Semi-primitive recreation opportunities. This is particularly so if the combination of the first nine Management Areas provides for a larger block of land area. Many of the unroaded areas also tend to geographically buffer existing Wilderness, minimizing the influence of development activities on Wilderness users and characteristics

Future demands for a variety of non-motorized opportunities may require management decisions that maintain options in and around existing Wilderness to continue providing the experience of solitude and primitive experience desired of such areas Under current direction (Alternative A), roadless areas remaining unroaded within Management Areas 1 through 9 is 47,214 acres. This does not include the existing 232,495 acres of Wilderness, large blocks of land that will not likely be roaded due to being unsuitable for timber production (such as in parts of the South Kalmiopsis), nor smaller parcels included primarily in allocations to Research Natural Areas and Supplemental Resource Management Areas

9. "How Should Mineral Resources of the Forest Be Developed in Coordination With Management of Other Resources?"

Mineral exploration and development are facilitated by land allocations that provide economically attractive opportunities with the least restrictions and good access while still maintaining environmental integrity of the land. Management with reasonable (low to moderate) restraints to operations, options as to access, and a multiple-value approach of mining proposals that coordinate, rather than conflict, with other sensitive resources is generally provided through land allocations to General Forest, Retention and Partial Retention Visuals, Riparian, and Backcountry Recreation These Management Areas with low to moderate restrictions to mineral exploration and development presently amount to 786,705 acres (Alternative A)

ABILITY TO SATISFY DEMAND

A change in land allocations may be required to resolve Planning Problems where the activities and uses characteristic of General Forest are not compatible Allocations to any of the first nine Management Areas will generally satisfy those Planning Problems where site disturbance is contrary to the condition necessary to resolve the "demands" described above The ability of the Forest to satisfy Planning Problems 2 through 8 is only limited by the amount of land under Forest Service jurisdiction (1,092,302 acres). Resolution of the first Planning Problem is limited by the amount of land tentatively suitable for timber harvest. Of the 787,000 acres existing in General Forest, 624,000 is considered tentatively suitable

CULTURAL RESOURCES

EXISTING CONDITION

The Siskiyou National Forest Cultural Resource Overview (Beckham 1978) describes the cultural heritage of southwestern Oregon The document lists known cultural resource values and presents the historical characteristics of the Forest as presently understood The inventory is updated periodically as additional land parcels are examined and previously unknown cultural resources are discovered and evaluated

The area within and adjacent to the Siskiyou National Forest has likely been inhabited by human beings for at least the past 8-9,000 years. Over the centuries, the small bands of nomadic hunters and gatherers were gradually succeeded by more permanently based groups who depended heavily upon major food resources such as salmon, acorns, camas bulbs, deer, and elk. These later people lived in semipermanent winter villages along low elevation rivers and streams, traveling into surrounding uplands during the warm seasons to hunt game and gather edible plants. Archaeological evidence of the prehistoric inhabitants is relatively sparse to date, although new information is continually collected.

Artifacts collected in recent studies are representative of a hunting and gathering subsistence. Projectile points, scrapers, drills, and knives of chert, jasper, and some obsidian dominate the flaked-stone tool kit. Ground stone bowls, pestles, and mortars characterize the plant processing implements. Due to the climate of southwestern Oregon, preservation of organic artifacts, made from such materials as plant fiber, shell, wood, and bone, is very poor Therefore, the Indian artifact collections on the Forest are notably dominated by tools made from stone

During the prehistoric period (pre-1840's) the native population living within lands now administered by the Siskiyou National Forest included the Takilma and Athabascan Indians The Takilma resided along the Upper Rogue and Illinois Rivers The Athabascan people lived along the southern Oregon coast and along the lower Rogue River Pockets of Athabascan villages, within the general Takilma territory, were located at Galice Creek and along the Applegate River

The historic period began approximately 150 years ago with the arrival of the first Euro-American trappers and explorers in the Rogue and Illinois River drainages and along the southern Oregon coastline The Indian villages and traditional use areas were eventually overtaken by the newcomers in a series of battles culminating in the Rogue River Indian Wars of 1855 to 1856. This was the demise of the native culture in southwestern Oregon. Survivors of the battles were forcibly relocated to reservations at Siletz and Grande Ronde in the northwestern part of the State Due to their removal, the native population had little or no effect on those who have resided in this area since.

Today, two Federally recognized Indian Tribes occupy lands adjacent to the Siskiyou National Forest. They have been consulted regarding their interests and concerns in management of the Forest lands The Tolowa are located near Smith River, California; the Coos, Siuslaw, and Lower Umpqua are centered in Coos Bay, Oregon The Siskiyou National Forest recognizes their treaty rights and respects their interests in this land and resource management planning. Contacts have been established between representatives of these Indian tribes and the Forest to provide communication and understanding among all interested parties. To the best of our knowledge, National Forest lands do not overlap lands within the territorial boundaries of the Tolowa or Coos/Siuslaw/Lower Umpqua Indians The service area of the Coos tribe, however, does include all lands within Coos and Curry Counties; this does overlap National Forest lands

A third Indian tribe, the Coquilles, is scheduled to receive Federal recognition in 1989 They, too, have been contacted A portion of their aboriginal territory was located on what in now the Powers Ranger District. Active dialogue with the Coquilles is underway on several issues, including mitigation measures taken on specific sites and public interpretation of prehistoric sites

The contemporary Indian population within the Forest accounts for 1 5 percent of the total population. Most of these individuals are not descendants of either the Takilma or Athabascan Indians, but of people of northern California or elsewhere No Indian groups within the Forest have Federal recognition as tribes

With the "gold rush" period of the early 1850's came permanent settlement of the area by miners, farmers, and ranchers. By 1900, mining, grazing, hunting, trapping, homesteading, logging, and recreation activities were gaining prominence in the area Evidence of the historic period is therefore relatively plentiful.

Probability for sites on the Forest is based upon determining environmental factors that are conducive to site presence, such as river terraces, meadows, ridgetops, saddles, and springs. Known site locations also help predict discovery of new finds in areas with comparable environmental characteristics.

The Sample Survey Design (1983) for the Forest classifies the land into three probability zones for cultural resource presence:

1. High probability for sites - 18,766 acres (1.6 percent),
2. Moderate probability for sites - 149,623 acres (12 9 percent), and
3 Low probability for sites - 993,636 acres (85.5 percent).

The majority of high and moderate probability zones occur on relatively flat land, as steep slopes are less habitable and desirable for human use Only 10 percent of the land on the Forest has slopes less than 30 percent This factor, in part, explains why moderate and high probability zones are so limited.

The cultural resource base of the Siskiyou National Forest includes a range of historic and prehistoric artifacts and sites representing perhaps 9,000 years of human use and settlement. They include:

1. Prehistoric campsites, villages, graves, quarries, trails, vision quest sites, house pits, lithic scatters, and petroglyphs;
2. Historic cabins, trails, mines, ditches, railroad grades, mills, logging camps, and homesteads; and
3 Historic Forest Service structures, including guard stations, lookout towers, camps, administrative centers, and Depression-Era CCC improvements

Many of these sites are unique in southwestern Oregon. They may provide the sole record of former inhabitants, ways of life, and past human activities. An understanding of human adaptation to the forest and coastal mountains, and nature of probable contact with neighboring areas may be gained.

All cultural resources are evaluated to determine eligibility for the National Register of Historic Places National Register eligibility identifies those cultural resources which are worthy of protection, preservation, enhancement, or other management. When determined eligible, a property is managed as if it were already listed on the Register. All sites will be evaluated for National Register eligibility within five years after completion of the Forest-wide cultural resource inventory. Sites that may be in conflict with proposed actions are evaluated immediately.

The significance of a cultural resource site is measured by the eligibility criteria used in nominating properties to the National Register of Historic Places. These criteria are listed in 36 CFR 60.4 and Section 101 (a)(1)(a) of the National Historic Preservation Act of 1966 Cultural resources are divided into three basic classes according to their potential eligibility to the National Register. Forest-wide there are 60 sites (totaling approximately 35 acres) identified as Class I cultural resources, 108 sites (approximately 60 acres) identified as Class II; and 58 sites (approximately 30 acres) identified as Class III. Table III-3 lists the number of known cultural resource sites on the Siskiyou National Forest.

Table III-3. Recorded Cultural Resource Sites by Ranger District (as of May 1986)

Site Types	Chetco	Galice	Gold Beach	Illinois Valley	Powers
Historic -					
Class I 1/	6	1	13	3	3
Class II 2/	6	21	25	20	13
Class III 3/	12	7	13	7	16
SUBTOTAL	24	29	51	30	32
Prehistoric -					
Class I	10	3	21	0	0
Class II	1	2	13	3	4
Class III	0	0	0	2	1
SUBTOTAL	11	5	34	5	5
TOTAL	35	34	85	35	37

1/ Class I - Properties evaluated as being eligible to the National Register of Historic Places
2/ Class II - Properties identified, but not evaluated
3/ Class III - Properties evaluated as being ineligible to the National Register.

CURRENT DEMANDS, WANTS, AND DESIRES

Various segments of the public interested in the heritage of southwestern Oregon request access to information and artifacts and request that proper care and security be given to the Forest cultural resource collections. In particular, current demands are summarized below:

1 Discovery of Sites
   a. Access to site information
   b Participation in authorized data recovery projects

2 Protection of Sites
   a Proper curation of cultural archives and artifacts
   b Protection of Class I sites in their natural setting

3. Interpretation of Sites
   a. Access to new information acquired via analysis of cultural data.
   b. Cultural resource presentations to public groups.
   c. Access to view artifacts recovered from authorized excavations for educational and interpretive purposes.

ABILITY TO SATISFY DEMAND

The ability of the Forest to satisfy the public demand for cultural resource information is limited to the size and nature of the site data base in southwestern Oregon and to the opportunity to conduct interpretive studies of appropriate sites presently managed. Numerous methods are employed in an attempt to satisfy current public desires for the resource

There are two general types of protection. (1) preservation in place and (2) data recovery and analysis using current professional archaeological methods Cultural resources eligible for the National Register will be preserved in place whenever practical.

In addition to potential disturbances to sites as a result of ground-disturbing activities, site vandalism and natural deterioration also warrant attention Vandalism is a recurring problem at certain sites on the National Forest. Unauthorized excavation and surface collection of artifacts is affecting the quantity and accuracy of the information these items contain To address this problem, the Forest Service periodically patrols and monitors known archaeological sites and historic structures for damages Educational and interpretive programs are given by the Forest Archaeologist to foster an appreciation for preserving our local heritage

Because of recent vandalism to Class I sites in the Rogue River corridor, this portion of the Forest is given close surveillance. Once identified, the ability of the Forest Service to preserve, interpret, and otherwise manage significant sites will improve. The probability of further site vandalism depends upon the degree of trail construction, recreation developments, and subsequent use of such improvements by Forest visitors

Although all areas proposed for timber harvest and road construction are surveyed, sites may be overlooked and inadvertently damaged Often, contemporary mineral development occurs in areas mined historically. Remains of cabins, trails, tunnels, ditches, and equipment frequently occur at such cultural sites. Conflicts may arise when possession of surface artifacts and/or features having historic significance are desired or damaged by a claimant Often in areas where such conflicts are anticipated, known sites can be protected by means of adjusting a miner's operating plan

Road alignments are surveyed for cultural resources. As with timber sales, sites may exist but remain undiscovered prior to actual construction. Frequently, roads are aligned on top of historic trails. It is no coincidence that a given path chosen by the Indians or early settlers is judged today as the most economical and/or efficient for a road location.

Natural deterioration results from precipitation, high winds, landslides, and flooding Efforts are made to minimize the adverse effects these forces have on the Forest's significant sites by means of stabilizing river banks, maintaining the exteriors of historically significant structures, and other measures, as needed.

Enhancement opportunities include· interpretation of sites (using exhibits, articles, brochures, signs, public talks and slide programs); restoration and rehabilitation of buildings; offering research opportunities to professional archeologists and historians; and collection and curation of artifacts, documents, and photographs. Many of these means of interpreting the cultural history of southwestern Oregon are currently in use

The American Indian Religious Freedom Act of 1978 (AIRFA), states that the United States shall protect and preserve for American Indians "the inherent right of freedom to believe, express, and exercise their traditional religions " This includes, but is not limited to, access to sites, use and possession of sacred objects, and the freedom to worship through ceremonial and traditional rites. AIRFA does not grant free use of Forest products, ownership of antiquities or other cultural resources, exclusive use of areas, or access without consideration for other existing or potential uses or activities It does protect religious freedom for American Indians without apparent regard for Federal tribal recognition.

Approximately 225,000 acres (20 percent) of the Siskiyou National Forest have been inventoried for cultural resources. Currently, 246 prehistoric and historic sites are recorded Table III-4 provides a summary of the cultural resource site inventory by current and projected types of sites.

Table III-4 Cultural Resource Site Inventory

Site Type	Current 1986	Projected 1996	Projected 2006
Historic	186	400	600
Prehistoric	60	200	400
TOTAL	246	600	1,000

With respect to the Forest Plan, land allocations and their associated Standards and Guidelines will contribute to the resolution of current public demands and serve to integrate these demands into the management of cultural resources The land allocations which protect high probability parcels (such as Wild and Scenic/Recreation Rivers, Special Wildlife Sites, and Riparian areas) concurrently best meet the demand for preservation-in-place of cultural sites Land allocations which permit site development and ground-disturbing activities (such as General Forest and Partial Retention Visual Management Areas) best meet the public demand for discovery of new sites and new information, as every proposed ground-disturbing activity must comply with Federal mandates requiring survey and evaluation of cultural resources in these areas



ENERGY

EXISTING CONDITION

The Siskiyou National Forest has potential for energy production from oil, coal, and natural gas sources. See **MINERAL DEPOSITS** for information on energy minerals. In addition, the Forest has potential for windpower and hydroelectric power. The Forest does have a large firewood resource (fuelwood).

Due to upslope and across-ridge winds, there is a source of energy for wind turbines However, there are presently no windpower projects or proposed sites on the Forest As a result of the Cape Blanco Windfarm Project north of Port Orford, Oregon, there has been some consideration given to wind turbines on National Forest lands

Although many potential Forest sites have been identified by various agencies, no major hydropower sites are either in the planning stages or generating power. The largest recent proposal was the Eden Ridge Pump Storage Hydroelectric Project in the South Fork Coquille River headwaters. Within or directly affecting the Forest, there have been approximately 20 small hydropower applications made through the Federal Energy Regulatory Commission (FERC) process since 1980, few have actually been constructed. The others have been rescinded.

Fuelwood is currently the dominant energy source derived from the Forest. With both hardwoods and softwoods available for fuelwood, wood is an attractive, renewable energy source. Hardwoods are abundant and comprise approximately 17 percent of the total standing board-foot volume. Potential fuelwood from hardwood species, principally tanoak, Pacific madrone, red alder, and golden chinquapin, is available from standing trees, as residue from type conversion projects, and as by-products from timber sales.

CURRENT DEMANDS, WANTS, AND DESIRES

The U.S. Geological Survey is responsible for classification of public lands as to their mineral content, water conservation potential, and potential for water power. Utility companies and other government agencies (U.S Army Corps of Engineers, U.S. Bureau of Reclamation, State of Oregon, and counties) have completed inventories of potential sites

Hydroelectric Power

Currently, there are approximately 60 water rights for power within, or downstream from, the Forest. Total appropriation of water is about 10,000 cubic feet per second on numerous streams and rivers. Not all of these rights are currently being exercised as many individuals, corporations, or agencies file for water rights in anticipation of future development

Pumped-storage waterpower denotes a hydroelectric system in which off-peak power of limited value is converted into valuable power during peak use periods Many sites were previously identified as potential pumped-storage hydropower projects

Fuelwood

The primary use of wood from the Forest as a source of energy is in heating residential dwellings. The wood products industry also uses wood residue as an energy source for its facilities. When compared to fossil fuel, wood suffers from bulk (in proportion to energy content) and lacks homogeneity.

Actual consumption depends upon distance from population centers, proximity to roads, and species of wood. From 1974 through 1982, Siskiyou National Forest fuelwood permits increased from 1,000 to more than 8,500 per year. The woodchip market competes directly with other firewood users for these residues

Fuelwood cutting permits are sold to many local residents for their personal home use Professional fuelwood cutters also obtain wood through commercial wood-cutting permits for standing hardwoods and logging residues There are many individuals who occasionally supplement their primary sources of income by cutting and selling a truckload of fuelwood In addition, several large-scale fuelwood business ventures ship fuelwood by rail or truck to California cities Despite the increase in permits, the present rate of fuelwood consumption for residential use is likely to remain constant, at least in the short term. According to the Coos-Curry Electric Cooperative, most homes that can be retrofitted with wood stoves, and most people who have the inclination to do so, are probably burning wood now.

The value and convenience of using wood for heating residential dwellings are major factors affecting use levels. Due to recent laws regarding wood-heating stove construction and Forest Service regulations that require pay-permits for collection of fuelwood, the cost of wood heat could actually reduce the present consumer value. As the quantity of fuelwood close to local population centers and roads becomes depleted, consumer value will decrease unless substantial changes in the methods of collecting fuelwood occur. As state laws and local ordinances are developed to deal with numerous concerns related to residential wood heating, and as the Forest Service develops policies dealing with wood gathering, the convenience of wood heat could drop.

Some optimism surrounds the future of wood for many industrial applications. Use of wood residues for industrial purposes is promising, but is currently limited to wood products facilities A preliminary biomass energy study (Perry 1983) encompassed the southern Oregon coastal area and indicated 100 megawatts of electrical energy could be generated for 20 years from several biomass energy fuel sources. These sources include standing hardwoods, unused mill residues, logging residues, and municipal solid wastes. Two locations outside the Forest boundary were evaluated as power generating sites It was expected that about 20 percent of the logging residue and 30 percent of the hardwood biomass materials would come from four Ranger Districts on the Forest At present there are no known plans to utilize the material at those locations. In the long term, large increases in fuelwood demand would probably come from industry.

ABILITY TO SATISFY DEMAND

Reservoir sites large enough to store winter and spring flows for use during the long, dry summers are quite limited. In most cases power can be generated with only seasonal assurances Another obstacle to hydropower development has been the long distance from load centers. Other major factors limiting hydropower development include designations of five rivers as National Wild and Scenic Rivers and the importance of anadromous fisheries

Substantial development of the Forest's hydropower potential could be tapped in the future to meet regional demands Currently, demand for added hydroelectric power is low in the Pacific Northwest. Likewise, the impetus to develop the better proposed sites on the Forest has waned.

Of all the potential sites identified, only Eden Ridge has survived preliminary feasibility studies The Eden Ridge facility could be designed with a generating capacity of 90 megawatts The applicants, Pacific Power & Light Company and the City of Bandon, have set the proposal aside for future consideration

The total volume of hardwoods on suitable land is about 1,150,000 cords. Activity-generated fuelwood volume is dependent on regular timber harvest The Forest presently generates about 49,000 cords of fuelwood per year as a result of timber harvest activities

MINERAL DEPOSITS

EXISTING CONDITION

The Siskiyou National Forest is a geologically diverse area which contains occurrences of gold, silver, nickel, chrome, cobalt, copper, manganese, molybdenum, mercury, coal, and limestone Of these, nickel, cobalt, chrome, manganese, and mercury are classified as strategic minerals With these significant deposits, Planning Problem #9, "How should mineral resources of the Forest be developed in coordination with management of other resources?," becomes extremely important to the mineral industry relative to exploration and development opportunities. The discussions in this section are pertinent to the resolution of this Planning Problem

Metallic Minerals

More than any other metallic mineral, gold has been the most sought-after mineral on the Forest, with a prospecting and production history (from both placer and lode deposits) dating back to 1850 Gold placer activity is concentrated heavily along the Illinois River and Josephine, Sucker, Althouse, Galice, and Silver Creeks Prospecting and production are likely to continue into the distant future Recreational gold panning and dredging have also been increasing Mining will most probably be from placer deposits located along and near various stream courses long known to contain gold-bearing gravels. A few open pit and underground lode operations of small to medium size may become active within the next 10 years

Between 1850 and 1965, Oregon produced 5 8 million fine ounces of gold and 5 4 million fine ounces of silver. Most of this production was in southwestern and northeastern Oregon, the Siskiyou National Forest playing a significant role in this production. Recently production has been down, however, it is believed future potential exists at a somewhat reduced rate

Beginning in the 1970's and continuing to date, exploration of low-grade laterite deposits for nickel and cobalt has increased in the serpentinite-peridotite areas in the southern half of the Forest. Actual production from these deposits may begin 10 to 15 years into the future, with an expected life of 20 years. A 1976 estimate of 13 lateritic prospects indicated a total net tonnage of 28 million metric tons, with an average content of 0 82 percent nickel, 1 3 percent chromium, 0.08 percent cobalt, and 26 percent iron. These deposits may become very important nationally. The known significant deposits in the United States are in Alaska, Montana, northern California (Gasquet area), and southwestern Oregon. The deposits in Montana are the largest but are very low grade. Known deposits would not supply the United States for more than 15-20 years if we were suddenly denied foreign sources

Chromite was extracted, particularly from Forest podiform deposits, during both World Wars and as part of a Federally supported chromite stockpiling program in the mid-1950's. Present work by the U S. Bureau of Mines indicates that both massive and disseminated deposits of chromite could well be workable when chrome prices increase. Little production is expected unless incentive prices are paid, as in the past

Although there has been production of copper ore in the past (1860's to 1920's), no production has occurred recently. Future copper production from volcanogenic sulfide deposits would be affected by a significant increase in the price of copper. However, copper deposits in the area appear to be limited

The remaining metallic minerals appear to be located in small, insignificant deposits. These notably include manganese, molybdenum, and mercury.

Other Minerals

Limestone is present in the southeastern portion of the Forest. The known locations (all south of Oregon Caves National Monument) are small and scattered Development of these areas is not expected

Past coal production on the Forest was in the Eden Ridge area during the late 1800's Some of these coal beds may be developed in the future. More than 50 million tons of coal are estimated to occur in this area Underground mining methods will most likely be used because of the depth of the beds. Depending upon the method of use, the coal could be extracted over a 20-year period at a rate of 2.5 million tons per year Deposits are very significant statewide, but not nationally In addition, this coal is high in sulphur, low in BTU's, and not in demand

While there are no known oil or gas deposits on the Forest, a few known geologic sites could be favorable for oil and gas development

Mineral materials suitable for road construction needs are generally available, but may become scarce for some localized areas of the Forest In 1980, the Siskiyou National Forest used over 600,000 tons of rock, almost all from bedrock quarries, for road-related purposes. In 1984, the usage was 372,000 tons. Currently, this is the largest mineral usage on the Forest. The need for suitable rock for road-related purposes (e.g , surfacing aggregates and riprap) will continue.

A small quantity of mineral material has been used for building stone. In 1984 this use amounted to about 25,000 tons The use is expected to continue and may even increase in the future.

The Forest has a limited variety of lapidary materials. Some items found include agate, jasper, rhodonite, grossularite, and chert. The extensive areas of serpentinite and peridotite may have some cutting-grade serpentinite and minor nephrite Two rare minerals, Oregonite and Josephinite (both metallic nickel-iron alloys) occur near Cave Junction. Petrified wood and fossils of clams and crabs are also found.

Mineral Potential

Figure III-4 shows the general location of the mineral potential on the Forest. A preliminary estimate of potential for locatable and leasable minerals on the Forest has been made Broad areas of Forest land have been apportioned to one of the following mineral potential categories:

Rating	Characteristics of Mineral Potential
High (145,300 acres)	Lands where geologic, geochemical, and/or geophysical characteristics favorable for resource accumulations are known to be present Evidence shows that mineral concentration/mineralization in a broad sense has taken place.
Moderate (298,700 acres)	Lands where geologic, geochemical, and/or geophysical characteristics favorable for resource accumulations are known or can reasonably be interpreted to be present Evidence of mineralization is less clear or has not yet been found.
Low (648,300 acres)	Lands where geologic, geochemical, and/or geophysical characteristics are unfavorable for resource accumulation. Evidence indicates the mineral concentrations are unlikely. This rating embraces areas with obvious, but dispersed and apparently uneconomical mineral occurrences
Unknown	Lands where the level of knowledge is so low that to classify otherwise would be unjustified (No lands are inventoried in this category)

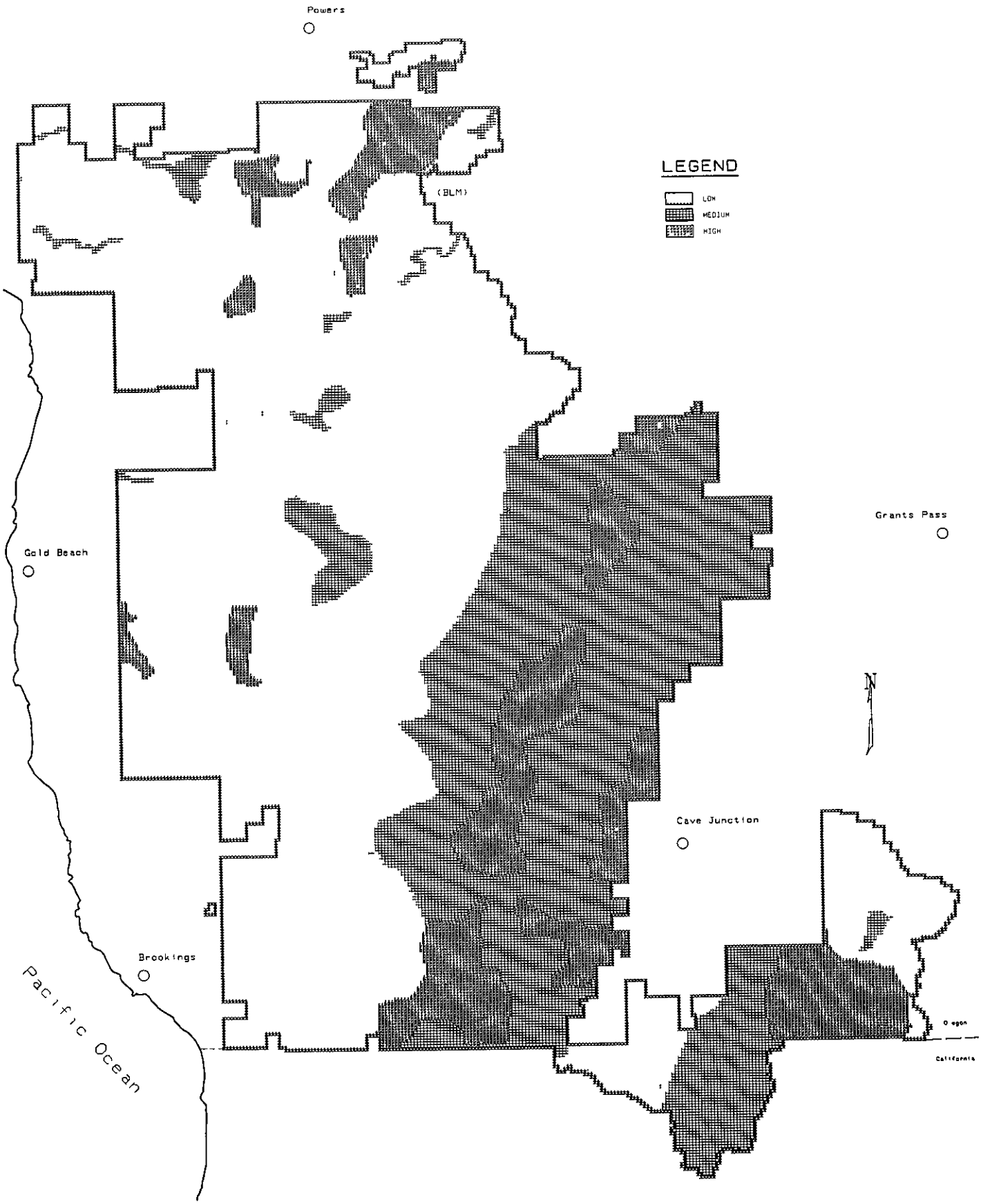


Figure III-4. Mineral Potential - 1985 Map

Mineral Access

The accessibility constraints under current direction (Alternative A) for Siskiyou National Forest lands have also been reviewed For analysis in this document, these lands were placed in one of the following access restriction categories:

Restrictions	General Characteristics of the Restriction
Withdrawn (267,000 acres)	Lands withdrawn from mineral entry Includes statutory and administrative withdrawals In comparing land management alternatives, this category will also include areas where preservation of other resource values require subsequent withdrawal from mineral entry
High (39,000 acres)	Lands where mineral activities are permitted, but administrative designations preclude or highly restrict access and/or ground-disturbing activities. This category includes statutory or regulatory designations where mineral development is permitted, but access is highly restricted due to resource constraints Also included are lands where through changes in landownership status, some portion, or all, of the mineral rights were retained by a prior landowner. Leases usually would contain no surface occupancy stipulations
Moderate (203,000 acres)	Lands where management designations or other resource considerations require special mitigative measures. Special lease stipulations or plan of operation considerations are needed to accomplish resource coordination
Low (584,000 acres)	Lands where management designations would not require special mitigative measures over extended areas Restrictive lease stipulations or operating conditions may be required to mitigate site-specific resource coordination needs For the most part, however, standard field practices for mining and mineral lease activities can be utilized

When considered together, these two factors (mineral potential and access restrictions) tend to indicate the potential for development of the mineral resource Areas more likely to be developed would have a High potential of minerals being present and a limited (Low to Moderate) restraint on access.

Protection of Surface Resources

Some areas on the Forest are required by law to receive special considerations in mineral operations, such as Wilderness, Wild and Scenic Rivers, and cultural resource areas Nearly 267,000 acres of land have been withdrawn from mineral entry Approximately 232,500 of the withdrawn acres are located in existing Wilderness. In the case of Wildernesses, operations are to be conducted in a manner that is compatible with the preservation of wilderness character.

The existence of threatened or endangered plant species in some of the mineralized areas may present special problems. These problems will have to be resolved on a case-by-case basis according to Forest Standards and Guidelines

CURRENT DEMANDS, WANTS, AND DESIRES

On the Forest in 1984, there were approximately 8,100 mining claims recorded with the Bureau of Land Management, up from about 2,560 recorded in 1980 Currently, a vast majority of claims are being located for placer gold. There are also surface and underground operations for gold and other minerals.

There were 125 approved operating plans, up from 38 in 1980 Two coal leases were in effect in 1984, along with 27 active mineral material permits. The coal leases have since been abandoned.

In most cases less than five acres per site are impacted. Although exploration of broad areas may encompass more acres, the total impact per operation is normally less than five acres.

Aggregate production for road-related purposes represents the highest continuing mineral use. Alluvial sand and gravel are not utilized. The approximately 200 existing sources are bedrock or talus quarries located throughout the Forest.

Mining activities on the Forest, from prospecting through production, are expected to continue. Demand for minerals is variable Those mineral commodities in high demand are gold and quarry rock; in moderate demand are coal and lapidary materials. The remaining mineral commodities are in low demand.

The current gold market, coupled with recent employment trends, could contribute to more gold mining in the future Recreational gold panning and dredging is increasing, as is prospecting for semiprecious gem stones. The increase in mining claims and approved operating plans, described previously, indicate the amount of increase in use levels

Although not as important as it was 50 to 100 years ago, mining does support a segment of the labor force. These jobs in turn help support other jobs at the local, regional, and National levels With the nickel-laterite and coal potentials on this Forest, there could be a significant effect on the local labor market, and on local and regional economies.

ABILITY TO SATISFY DEMAND

The Bureau of Land Management (U S Department of Interior) is primarily responsible for the management of minerals on Federal lands Through various laws, regulations, and inter-departmental agreements and rules, the Forest Service has various levels of responsibilities with regard to surface management on mining claims on National Forest System lands.

Forest Service minerals program objectives are to manage National Forest System lands to accommodate and facilitate the exploration, development, and production of mineral resources, while integrating these activities with the use and conservation of other resources to the fullest extent possible

Many parts of the Forest have essentially unlimited supplies of bedrock suitable for production of crushed aggregate for road surfacing and riprap In some areas, quality rock has to be hauled for less-than-desirable distances. This problem may increase in the future, particularly on the west side of the Forest. Visual Quality Objectives or other reasons may restrict or prevent access to potential rock sources in some places.

Citizens have a statutory right to prospect, locate, and develop locatable minerals on lands open to such entry. The basic law predates the establishment of National Forests. On lands open to location of minerals, the Forest Service has established surface-use regulations on prospecting, exploration, and mining activities These and other Federal mineral regulations integrate mineral development and use with the management of the surface resources

With regard to the leasable minerals, the Forest Service provides advice on how to protect surface resource values and gives recommendations or consent to leasing Where the Forest Service is permitted to sell certain mineral materials, the permit includes requirements for adequate protection of other resource values

The Forest Service has a responsibility to identify areas which have competing resource values that could be affected by mining activities. Where the Forest Service believes the value of the competing resource exceeds those of the known (or potential) mineral values, the Forest Service will recommend that the Bureau of Land Management remove the area from mineral entry.

As a surface resource manager, the Forest Service protects the interest of the United States by requiring operator compliance with the mining laws and regulations, and preventing unauthorized uses on mining claims. The mining laws and regulations governing Forest Service administration of this resource are:

1 Placer Mining Act of 1870, 16 Stat. 217;
2. General Mining Law of 1872, 17 Stat 91;
3. Public Law 167, Multiple Surface Use Act of July 23, 1955, 69 Stat. 367, (also known as the Surface Resources Act);
4. Section 314, Federal Land Policy and Management Act of 1976, 90 Stat. 2743;
5. 43 CFR 2860 - Mineral Patent Applications;
6. 36 CFR 228, Subpart A - National Forest Surface Use Under U.S. Mining Laws; and
7. 36 CFR 228 4 Subpart C - Mineral Material Regulations

On some lands that are acquired for National Forest purposes, and where a prior landowner has not retained the mineral rights, what would have been locatable hard rock minerals are included in the leasable minerals category.

Forest Service policy for managing minerals is to·

1. Provide professional assessment of mineral resources;
2. Keep lands available for exploration and evaluation of mineral potential,
3. Respond to proposed mineral activities in a timely and reasonable manner;
4 Ensure prompt reclamation of lands to productive uses;
5 Cooperate actively with appropriate agencies, and
6 Manage the minerals program consistent with applicable laws and multiple use principles.

IMPROVEMENTS

The existing constructed improvements used by the Forest Service and the public include:

1. Roads - the roadway and structures, e.g , bridges, culverts, retaining walls, cattle guards, and gates;
2. Trails - the trailway and structures;
3. Developed Recreation Sites - roads, structures, and utilities;
4. Administrative Sites - roads, structures, and utilities,
5. Utility and Transportation Corridors - strips of land for electrical power transmission (greater than 69kV), and State and Federal highways used for interstate commerce,
6. *Water Storage Developments - dams and pond developments; and*
7. Miscellaneous Improvements - Forest Service, public and private improvements within the National Forest boundary, e g., lodges and campgrounds.

EXISTING CONDITION

Roads

In 1984, the Siskiyou National Forest transportation system had 2,645 miles of road, including 2,538 miles in Oregon and 107 miles in California. Current maintenance emphases on these roads are displayed in Table III-5. Each of the maintenance levels is discussed in the Transportation System Maintenance Handbook (FSH 7709.15).

The majority of the Forest road system is single laned; several major roads are double laned. Almost all have gravel surfacing, while a few have some portion of their length asphalt paved. The arterial/collector road system for the Forest is provided in Figure III-5.

Sections of US Highway 199 (Redwood Highway) cross through the Siskiyou National Forest. The portion in California is listed as eligible for designation as a California Scenic Highway by the State of California. The eastern 11.5 miles of Oregon State Highway 46 (Oregon Caves Highway) is part of the Oregon Historic and Scenic Highway Program; a significant portion is on the Forest.

There are five through-Forest routes that are used by the public and by commercial concerns·

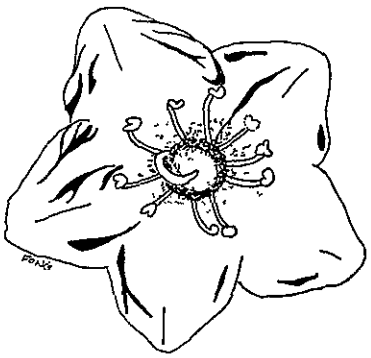
1. Agness Road (56 miles) between Gold Beach and Powers;
2. Bear Camp Road (25 miles) between Galice and Agness;
3. Happy Camp Road (1 mile) between Cave Junction and Happy Camp;
4. Wimer Road (7 miles) between O'Brien and US Highway 199 in California at Patrick Creek; and
5. Grayback Road (11 miles) between Oregon State Highway 46 and Williams.

There are 108 road bridges on the Forest Over 135 gates are located to limit access for a variety of reasons.

Table III-5 Road Mileage by Current Condition Classification and Maintenance Level (Miles) 1/

	Current Condition			
Identified Management Maintenance Level 2/	Total Miles	Closed	Available for Public Use	Suitable for Passenger Cars
Arterial Roads 3/				
1	0	0	-	-
2	0	-	0	-
3	0	-	0	0
4	114	-	114	114
5	0	-	0	0
Collector Roads 4/				
1	0	0	-	-
2	58	-	58	9 6/
3	615	-	615	615
4	50	-	50	50
5	0	-	0	0
Local Roads 5/				
1	258	258	0	-
2	1,301	-	1,301	195 6/
3	243	-	243	243
4	6	-	6	6
5	0	-	0	0
Total Miles	2,645	258	2,387	1,232

1/ 1984 data
2/ Maintenance levels Level 1 - Long-term storage between use, Level 2 - Limited passage of traffic, primarily for high ground clearance vehicles, Level 3 - For public passenger car passage at prudent driving speeds averaging 20 mph, Level 4 - Similar to Level 3 but with higher speeds and more user comfort given consideration, and Level 5 - Same as Level 4 with safe travel speeds in excess of 35 mph
3/ Primary roads that provide main access into the Forest and connect with other Forest arterial or public roads
4/ Secondary roads accessing smaller land areas than arterial roads and generally provide the linkage between Forest arterial, public, other Forest collector roads, and local roads
5/ Terminal roads in the transportation system or provides linkages with other roads
6/ Represents a portion of the road system adequate for passenger cars for a period following timber sale maintenance activities



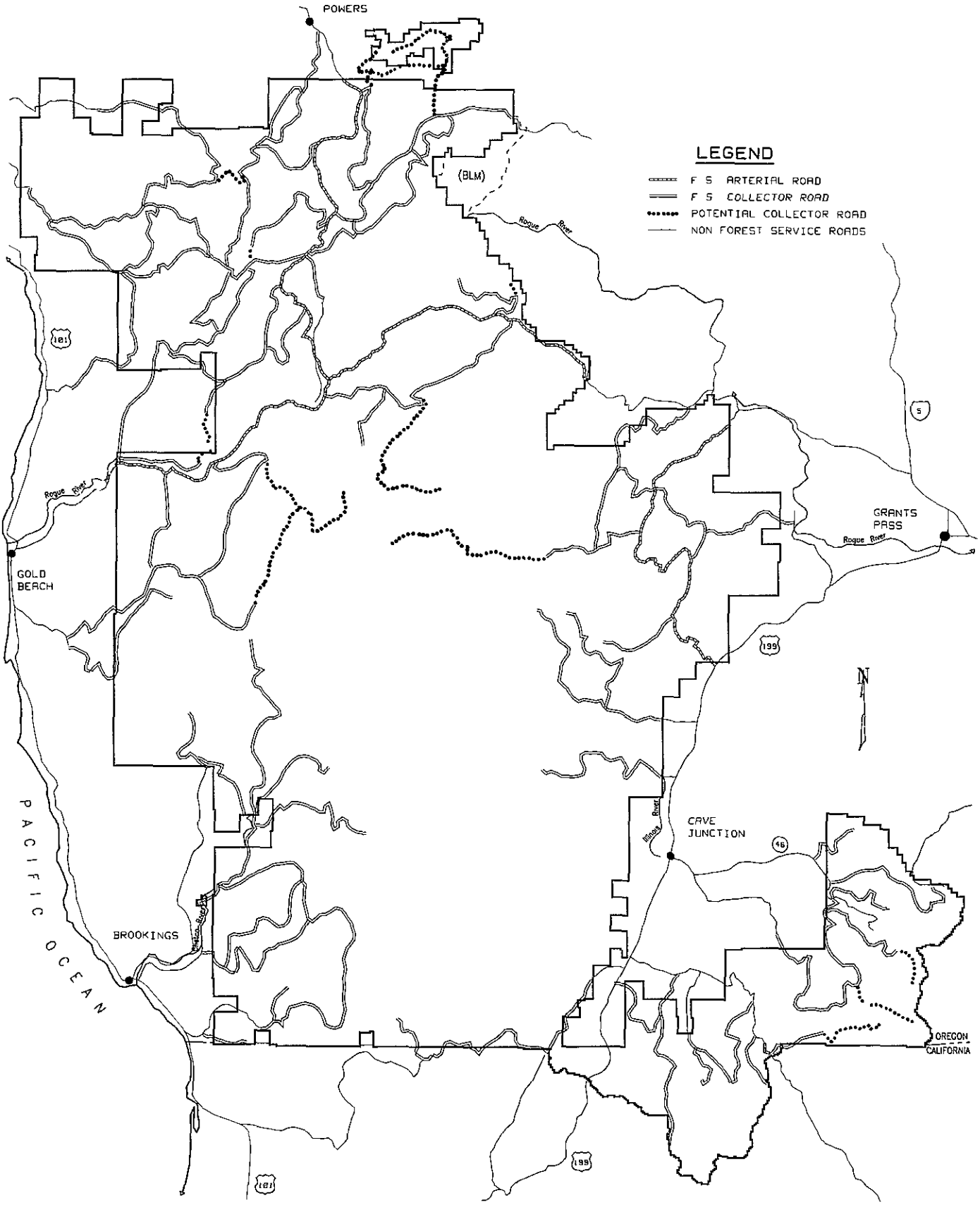


Figure III-5. Arterial and Collector Road System Map

Trails

There are 450 miles of maintained trail on the Siskiyou (Figure III-6) In addition, there are uncounted miles of abandoned trails scattered about the Forest See **RECREATION SETTING** for limitations on trail use. Table III-6 displays the availability and suitability of trails for various users.

Three National Recreation Trails on the Forest total 36 miles in length. The three trails are the Boundary Trail, a portion of the Illinois River Trail, and the Rogue River Trail. Due to past road construction, the Forest no longer has any through-Forest trails.

Table III-6. Summary of Trail Mileages by Trail Type 1/

Trail Type	Total Miles	Wilderness	Non-Wilderness
Hiker	450	217	233
Pack and Saddle	417	204 2/	200
Motorized vehicle 3/	171	- 4/	171
Cross-country ski	0	0	0
Snowmobile	0	- 4/	0
Barrier Free	0	-	0
Interpretative	2	-	2

1/ 1986 data
2/ 13 miles of Rogue River Trail within Wild Rogue Wilderness closed, as well as remainder of trail, to pack and saddle stock use
3/ Vehicles less than 40 inches wide Also includes mountain bicycles
4/ All vehicle use prohibited without a special permit

Developed Recreation Sites

There are 46 established recreation sites on the Forest currently open An additional 4 sites are closed Table III-7 summarizes developed recreation sites on the Siskiyou National Forest.

Table III-7 Number of Recreation Sites and Total Number of Units by Site Type 1/

Site Type	Total Sites	Camp Units	Picnic Units	Boat Ramps
Minimum Developed 2/	25 3/	41	23	0
Developed 4/	21 5/	223	51	4
TOTALS	46	264	74	4

1/ 1986 data
2/ Formalized dispersed recreation sites, does not include three closed sites
3/ Includes five sites with trailer units
4/ Does not include one closed site
5/ Includes 12 sites with trailer units, eight sites with drinking water, and five sites with handicap access

Administrative Sites

In all, there are 245 buildings of all sizes, including 31 for housing, 56 for storage, and 7 offices. Several buildings built before 1937 have National historic significance

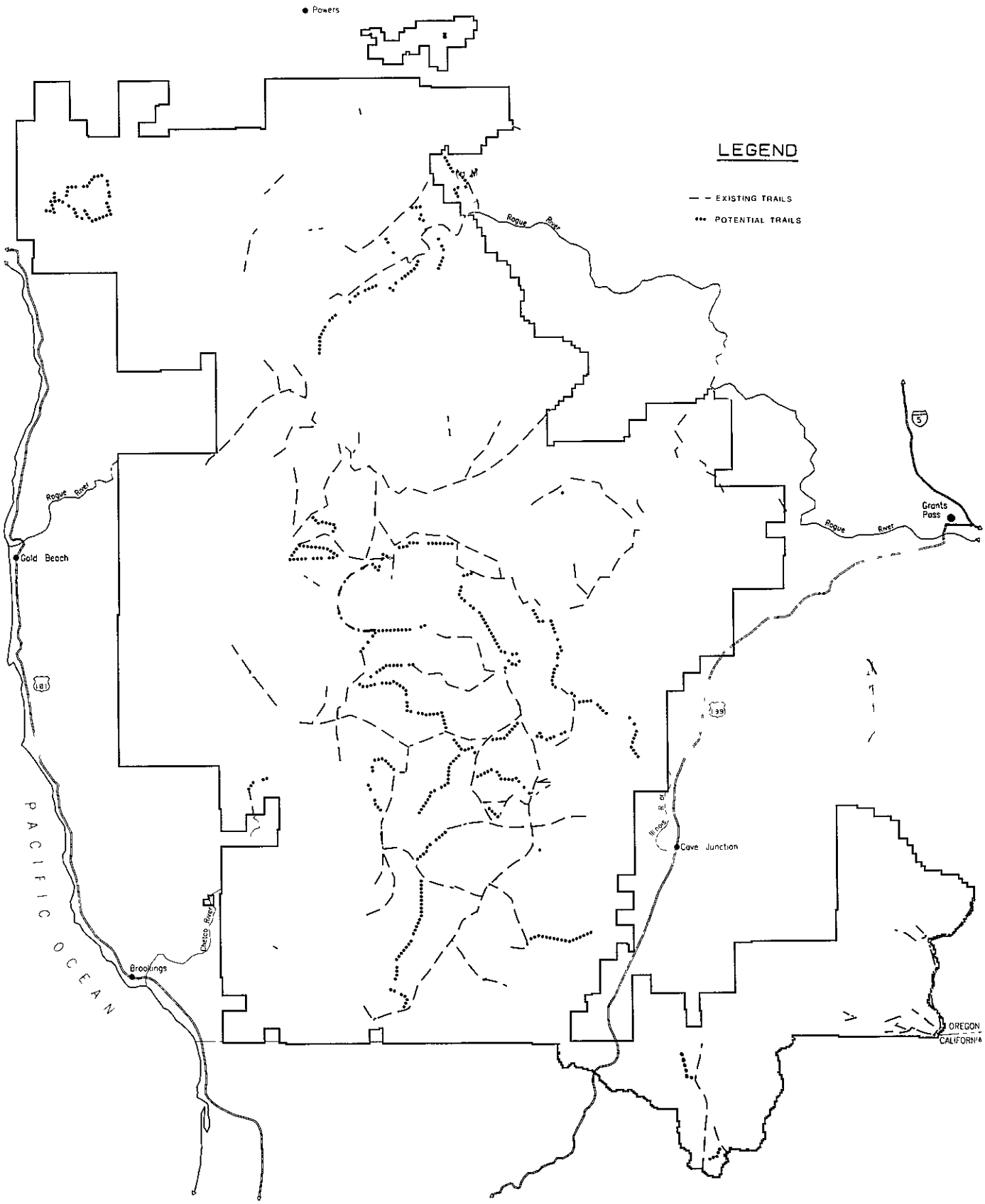


Figure III-6 Trail System Map

Utility and Transportation Corridors

Portions of the Happy Camp and O'Brien electrical power transmission corridors are within the Forest These corridors are shown on the Land Status Map, Figure III-2 These lines are not considered Utility Corridors by the Klamath or Six Rivers National Forests The O'Brien corridor contains the O'Brien and Whiskey Creek transmission systems A brief description of the corridors is displayed in Table III-8

Table III-8 Electrical Power Transmission Corridors

Corridor	Length	Existing Width	Kilovolt Limitation
Happy Camp	5 1 miles	100 feet	100
O'Brien	7 7 miles	200 feet	200

Another powerline just crosses a corner of the Forest next to U S Highway 199 Although meeting criteria for a utility corridor, this line is simply considered part of the highway corridor.

Within the Forest boundary, U S Highway 199 is a two-lane highway This highway continues into the Six Rivers National Forest through the Collier Tunnel in California

Water Storage Development

The only dam on the Forest is at Bolan Lake It is 14 feet in height and impounds 165 acre-feet of water. There are 109 constructed water sources used for fire suppression, of which 23 have been designed for use by helicopters. There are several mine development settling ponds

Miscellaneous Improvements

There are miscellaneous Forest Service, other government, and private improvements throughout the Forest Many of these require a permit or agreement to utilize National Forest System land In 1986, there were 155 Special Use Permits covering private use of National Forest lands, a summary of these is displayed in Table III-2 in the **LAND ALLOCATIONS** section Included within the Forest boundary are the Oregon Caves National Monument and the Agness townsite. Both include numerous improvements including roads, trails, lodges, stores, residences, a private landing strip, and other structures

CURRENT DEMANDS, WANTS, AND DESIRES

The existence of present and future improvements is in response to needs for use, protection, and management of Forest resources.

Roads

Various publics and Forest Service personnel utilize the road system for a variety of activities Wood production requires transportation of the raw materials (logs or chips) to a processing plant (plywood, lumber, or pulpwood mill) Much of this transportation is provided by the existing road system Where the timber resource is beyond the economic reach of logging systems (e g , helicopter, skyline, and highlead), additional roads may be required The amount of road needed per acre harvested varies in response to many factors, e g , logging system used, topographic relief, and environmental factors Needs are identified in the Ten-year Timber Sale Action Plan (Appendix C of the Forest Plan)

Trails

During the public involvement process, displacement of trails by roads was a topic of concern. The Forest-wide Standards and Guidelines have provisions which deal with this In recent years, there have been some efforts towards a "Coastal Trail" system in Oregon and most recently a "New Oregon Trail"; both would utilize some portion of the Forest

Developed Recreation Sites

With increased tourism, the expected concentration of use along the rivers will require facilities which protect recreationists' health and safety needs and meet their demands for this form of recreation.

Administrative Sites

Efficient management of the Forest will continue to require administrative sites based on resource program needs, and budget and personnel limitations

Utility and Transportation Corridors

The 1986 Western Regional Corridor Study, an update to a 1980 study, shows a long-range plan for a utility corridor from the Murphy-Wilderville area to the vicinity of Buzzards Roost, near Agness. A potential future corridor, on or near this same location and extending to Agness and Gold Beach, has been suggested by Bonneville Power Administration and Pacific Power and Light as an option for a crossing of the coastal mountains in southwestern Oregon

A 1984 environmental report by Coos-Curry Electric Cooperative displays two alternative corridors between Gold Beach and Brookings which traverse a western portion of the Forest This corridor study suggests a 230 kilovolt electrical power transmission system may be needed by the year 2030, or sooner, to serve their customers in the Brookings area The corridor has potential for an intertie with the electrical power transmission system in the Crescent City, California area.

The Happy Camp Road crosses through the Forest and connects the Cave Junction, Oregon area with the Happy Camp, California area. This route does not meet the Regional Guide definition for a Transportation Corridor In the long term, the road has potential to become a state highway. Within the Siskiyou National Forest boundary, all but one mile is under Josephine County, Oregon jurisdiction, the remaining mile is under Forest Service jurisdiction

Water Storage Developments

There is not much demand for water storage development on the Forest. There are several minor diversions for domestic purposes. There are several proposals on file for hydroelectric projects which would require impoundment of water. There has been no recent activity on these proposals There is work being done to develop a small dam and pond at the Spalding Mill recreation site.

Miscellaneous Improvements

As more commercial firms expand their area of activities, there will be additional needs for electronic sites. Improvement and extension of existing power and telephone lines can be expected. These types of miscellaneous improvements were not identified as a concern during the public involvement process Future special-use emphasis areas may include permits associated with coal mining and hydroelectric power generation

ABILITY TO SATISFY DEMAND

Roads

Roads are built to satisfy a demand Over time, the initial reason for a road may fade or road usage may change. Historically, mining and timber harvest activities have initiated construction of the major portion of the road system Many of these roads have acquired other purposes since construction

Within the limits of environmental and financial constraints, roads could be built almost anywhere The objective, however, is to ensure that the total transportation system best serves the identified resources at the lowest cost with the least impact to the environment

For planning purposes, potential new constructed road density varies by Planning Basin The new construction road ratio ranged from 1 5 to 2 5 miles per square mile in areas with existing roads, and from 2 9 to 5 1 miles per square mile in areas that are presently unroaded. Future roading density in areas currently having no roads will be lower than those areas where road development has been ongoing The existing road density does not represent the total needs for a developed system. Included in these factors are the minor mileages projected to satisfy the access needs for recreation, mining, and other activities.

In the benchmark analysis, 1,596 miles of new construction was the highest mileage indicated as being needed to complete the road system. New construction would be mostly local roads There is a potential for the construction of 44 miles of collector roads, 43 miles of existing local roads may be reclassified to collector status. Some collector and local roads may be upgraded to arterial status to meet future management objectives

The user or benefiting resource program (e.g , recreation, timber, and fire) pays for the construction and maintenance of the road. Funding sources include purchaser road credits, capital investment program, Oregon and California Railroad, Forest Highway, and other miscellaneous sources

Public and commercial use of roads is controlled through road management plans which are flexible to accommodate changes in use, to assure safety of users, and to meet legal obligations

Access to motorized, developed, and dispersed recreation areas is provided over the Forest road system. Roads constructed for other purposes are generally available for recreation access. However, the current trend is to close many newly constructed roads to reduce maintenance costs and complement other resource values

Trails

Trails can be constructed almost anyplace in response to demands Trail system capital investments are based on the Forest Trail Plan New trails (130 miles of new trails, 95 miles being within Wilderness) have the potential to satisfy some of the user demands Use of volunteers or groups to accomplish trail work has and will continue to be fostered Proposals for through-Forest trails would require some construction to make a continuous trail system

Developed Recreation Sites

Potential recreational development projects have been identified and can be variously incorporated in land management alternatives to support increased recreational demand (see Table II-4) These projects include an information center, picnic sites, campgrounds, boat launch sites, and vista points Some of the projects would upgrade existing facilities

Administrative Sites

A Facilities Master Plan for administrative sites will be prepared as part of the implementation of the Forest Plan. It will guide overall management of each administrative site used in management of the Forest. The plan will coordinate individual sites and facilities to provide support for management objectives in a cost-effective manner. The completed Facilities Master Plan may identify additional projects for the Capital Investment Program.

Utility and Transportation Corridors

Uses in these corridors are approved through issuance of special use permits or through grants of right-of-way. It should be recognized that few additional uses might occur in these corridors Corridors are considered a part of the Management Areas they traverse

The existing Happy Camp and O'Brien electrical power transmission corridors will be designated as Utility Corridors in the Forest Plan Provisions for adding new electrical power transmission corridors are covered in the Standards and Guidelines.

The Buzzards Roost power site proposal was dropped when the State of Oregon included the Illinois River as a part of the Oregon Wild and Scenic River System The dam site and reservoir would have been located within the Wild section of both the State and National Wild and Scenic River systems Section 7 of the National Wild and Scenic Rivers Act prohibits the Federal Power Commission from licensing water-related projects on Wild and Scenic Rivers. Therefore, this utility corridor is no longer a viable option

The possible extension of this Buzzards Roost utility route to Agness and Gold Beach needs to be delineated before any judgment beyond "it looks possible" can be made For the Forest Service to identify a specific corridor between Grants Pass and Gold Beach is purely speculative as to need and adequacy of location It is the intent of Forest Plans to eliminate or lessen the need to consider routing alternatives by proponents However, the selection of a corridor is based on the assumption that "...the project proponent agrees to locate within a designated corridor." Future actual locations of potential transmission systems may be different due to changes in technologies and the level of service envisioned Therefore, this undefined corridor has not been evaluated or given more indepth consideration in this planning period

The alternative corridors proposed by Coos-Curry Electric Cooperative in the western section of the Forest will need additional environmental review

Those sections of US Highway 199 within the National Forest boundaries will be designated as Transportation Corridors in the Forest Plan The Hays Hill section of this route (which also carries a power transmission line) will be a joint-use corridor The Happy Camp Road will be identified as a potential transportation corridor within the National Forest boundary.

Miscellaneous Improvements

Structural improvements for fish and wildlife have varying lengths of useful life. They will need replacement more often than other types of improvements. The average life of wildlife structures is 10 years; for fish structures, 20 years.

In general, existing right-of-ways for roads and special use permits for utility lines on the Forest pose few problems Utility lines to private property within the Forest have the potential of creating problems if the private land is highly developed. The problem can be solved by combining the lines and controlling location with the special use permit.

WILDERNESS AND ROADLESS AREAS

EXISTING CONDITION

Discussions in this section are pertinent to the resolution of two Planning Problems While not directly related to the old-growth issue, Wilderness and the resolution of roadless areas through allocations arrayed in the alternatives will have an effect on the amount of remaining old growth Planning Problem #2, "How much old-growth forest should be preserved?," bears on this subject. Background information for Planning Problem #8, "How will management direction affect recreation opportunities in the Wilderness and unroaded areas?," is also provided

DESIGNATED WILDERNESS

Kalmiopsis Wilderness

The Kalmiopsis Wilderness is located in the Siskiyou Mountains of southwestern Oregon Established under Secretary of Agriculture Regulation U-2 in 1946, it was originally known as the Kalmiopsis Wild Area (then containing 76,000 acres). The Wilderness Act of 1964 converted the Wild Area to Wilderness The Endangered American Wilderness Act of 1978 then added 102,950 acres to the Wilderness, making its present size 179,850 acres

The area is characterized by deep, rough canyons; sharp, rock ridges, and clear, rushing, mountain streams. Elevations range from 500 to 5,100 feet. The area is geologically unusual and contains plants that are found principally in the Kalmiopsis Wilderness. An endemic shrub, *Kalmiopsis leachiana*, first located near Gold Basin in 1930, gives the Wilderness its name In fact, the initial set-aside was for this plant and other unique botanical features.

The wilderness character of the area is nearly intact, but is compromised in a few isolated locations by the presence of mines and roads accessing them. Topographic and vegetative diversity are abundant. The interior of the Wilderness is completely screened from the influence of management so that opportunities for solitude and self-reliance are readily available. The area is capable of providing a high quality, rugged wilderness experience.

There are 13 trailheads that provide access to 153 miles of trail in the Wilderness Most of the recreation use is concentrated on that system since cross-country travel is extremely difficult, if not impossible, to the average Wilderness user The Illinois River receives a light to moderate amount of use (approximately 1,700 RVD's), and Babyfoot and Vulcan Lakes receive relatively heavy use due to easy access.

Wild Rogue Wilderness

This Wilderness was established by Congress under the Endangered American Wilderness Act of 1978. The Wilderness consists of approximately 26,708 acres that is bisected by the Rogue Wild and Scenic River corridor. Through a cooperative agreement with the Bureau of Land Management, the Forest Service manages the remaining 9,000 acres of this Wilderness that is outside, but contiguous to, the Forest boundary. There are approximately 400 acres of private land ownership within the Wild Rogue Wilderness.

The area is characterized by deep, rough canyons, with rocky ridges and forested slopes Elevations vary from approximately 300 feet above sea level along the Rogue River to more than 4,300 feet at Mt. Bolivar. The landform is characteristically steep (almost half the slopes exceed 70 percent) and provides a tangled geologic puzzle of chaotically-arranged rocks

The character of the Wilderness is compromised somewhat by the degree of human influence (lodges, airstrip, and motor boats) With the exception of the Wild section of the Rogue River, the encompassing Wilderness is one of the least-visited and least-known in the Wilderness system

Grassy Knob Wilderness

Established by the Oregon Wilderness Act of 1984, this area is characterized by deep, steep canyons and heavily forested slopes Elevations range from 200 feet along Dry Creek and Elk River to almost 2,400 feet at Anvil Mountain

Recreational access and passage through the area presents a challenge for even the most avid hiker The Grassy Knob Road, off Highway 101 on the west, provides access onto the ridge separating the Elk River and Dry Creek drainages. From here, visitors can see the Pacific Ocean, but the steep terrain, dense vegetation, lack of water, and lack of suitable campsites or trail access into the Wilderness greatly limit recreation use.

The wilderness character is nearly intact, but is compromised by past private-land logging activities in Section 36 (now in public ownership) and the access road Section 36 is in advancing stages of natural revegetation The access road has not been maintained for years It does, though, provide access for hikers to the interior. Otherwise, cross-country travel is the only means of moving through the area; there are no developed trails.

Red Buttes Wilderness

Located in the Siskiyou Mountains, the Red Buttes Wilderness was established by Congress under the Oregon Wilderness Act of 1984. The 3,414 acre Siskiyou National Forest portion of the Wilderness is contiguous to and part of the much larger Wilderness located on the Rogue River National Forest Management of the area is coordinated through the designated lead Forest, the Rogue River National Forest

The Wilderness is quite scenic, consisting of sharp and steep, glaciated ridge systems. It is considered one of the more scenic areas on the Forest. Elevations vary from approximately 3,600 feet to 6,300 feet. The area is in a natural condition, with only minor alterations resulting from past grazing and mining activities. Red Buttes receives relatively heavy recreation use due primarily to the National Recreation Trail that passes through the area Opportunities for Primitive recreation experiences in the Siskiyou National Forest portion of the Wilderness are precluded by the close proximity of management activities.

Siskiyou Wilderness

Also located in the Siskiyou Mountains, this Wilderness was established under the California Wilderness Act of 1984. The area is part of the much larger Wilderness located on the adjacent Six Rivers and Klamath National Forests. The Klamath is designated as the lead Forest for management of this area

The Siskiyou Wilderness is also considered part of the more scenic portions of the Forest. The area presents a setting in which a high quality, Semi-primitive recreation experience can be obtained Primitive recreation opportunities are not available due to the close proximity of management activities. Recreation use in the area is low There are several old trails that receive only limited maintenance because of low visitor use.

ROADLESS AREAS

The Forest has 18 inventoried roadless areas that total 284,000 acres. Each of these areas has been analyzed for their Wilderness potential Complete disclosure of the area-specific analysis is found in Appendix C - Roadless Areas

In 1984, the inventoried area totalled 314,000 acres. The inventoried portion has been reduced by 30,000 acres due to continuing management activities, older activities, and the decision covering the Silver Fire. The decision covering the salvage timber sales and associated roading of the Silver Fire accounted for

19,000 acres. This reduction was all within the inventoried North Kalmiopsis Roadless Area The project received National coverage and extreme notoriety. For specifics, please refer to the Silver Fire Recovery Project FEIS (1988d).

Some reduction is attributable to two inventoried areas that were partially roaded years earlier but not updated in 1984. The balance of the change comes from timber sale activity between May of 1984 and the end of 1988. This includes sales completed, operating, or under contract. For specifics of inventory updates for each inventoried roadless area, refer to Appendix C.

Five of the roadless areas have demonstrable Wilderness potential. These are Grassy Knob (5,492 acres), North Kalmiopsis (88,812 acres), Siskiyou (3,284 acres), Kangaroo (6,656 acres), and South Kalmiopsis (104,823 acres). These acreages are also the updated 1988 figures. A complete description of each area and an area location map are provided in Appendix C.

Grassy Knob Unroaded Area

This roadless area is divided by the Grassy Knob Wilderness; the western portion is approximately 1,200 acres and the eastern portion 4,300 acres. The two portions are not easily manageable as separate roadless areas, but being contiguous to the Grassy Knob Wilderness provides options that would not otherwise be available. The terrain is extremely steep and rugged, with deeply incised canyons Elevation varies from near sea level to 2,900 feet at Mt. Butler.

The area is capable of providing a Semi-primitive Non-motorized recreation experience. Existing use is very low due to dense vegetation and steep topography; use primarily stems from local communities. There are no trails providing access to the interior of either portion. Being adjacent to the existing Wilderness is this area's strongest Wilderness attribute.

North Kalmiopsis Roadless Area

This large inventoried roadless area is contiguous to the existing Kalmiopsis Wilderness The roadless portion nearly encircles the northern half of the Kalmiopsis Wilderness. Numerous tributaries to the Illinois and Chetco Rivers are heavily wooded with steep slopes and very deep inner gorges. A large percentage of the area is extremely rugged, precipitous, and rocky, particularly in the Silver Creek Falls vicinity. The Wild section of the Illinois River flows through the lower six miles.

The primary attribute of the North Kalmiopsis is its relationship to the Kalmiopsis Wilderness and Wild and Scenic Illinois River. With topography being highly broken and most of the area densely vegetated, the natural screening provides ample opportunity for localized solitude and primitive experience. The overall opportunity is judged as moderate on the fringes not bordered by Wilderness, and high in the interior Silver Creek's lower reach is totally screened from external sights and sounds, and offers ample opportunities for solitude and remoteness.

Both Primitive and Semi-primitive opportunities are available. The area inventoried as Primitive is located within the Silver Creek drainage north of the Kalmiopsis Wilderness It is the only area on the Forest outside of the Kalmiopsis that offers this type of limited opportunity. Recreation of approximately 700 RVD's per year is very low for the area's size.

The majority of the North Kalmiopsis is capable of offering Semi-primitive Non-motorized opportunities. The area identified as Semi-primitive Motorized falls in this category because of current management which allows for the use of motorized bikes on trail systems within the area. If motorized use was restricted, this area would shift to the Non-motorized category.

Of the 96,540 acres involved in the 1987 Silver Fire, over 42,000 acres of the North Kalmiopsis were burned. The intensity of burn varied greatly and has temporarily altered the setting Inventory changes for this area and the other two major wildfires in 1987 are covered under **1987 FIRES** at the end of this Chapter Refer to the Silver Fire Recovery Project FEIS for a detailed discussion of the affected environment

Siskiyou Roadless Area

This roadless area is contiguous to the Siskiyou Wilderness. It offers essentially the same features and opportunities as does the Siskiyou Wilderness described above The roadless area offers the opportunity for localized solitude and Semi-primitive recreation experiences. Recreation use levels are low (estimated at 50 RVD's per year).

The entire area is classified as Roaded Natural due to proximity of management activities. The area can be effectively managed to provide recreation opportunities in an area exhibiting a landscape character that is limited on the rest of the Forest

Kangaroo Roadless Area

The Kangaroo is contiguous to the Red Buttes Wilderness Elevations vary from about 4,000 feet to 7,055 feet at Grayback Mountain The upper elevations offer considerable variety in both vegetation and topography.

Recreation use in the area is light to moderate (estimated at 1,200 RVD's per year). The Boundary National Recreation Trail enters the area from Oregon Caves National Monument and holds the ridgecrest position into the Red Buttes Wilderness. The area is capable of providing Roaded Natural and Semi-primitive Motorized experiences. This area can also be managed to provide recreation opportunities not available elsewhere on the Forest.

South Kalmiopsis Roadless Area

This area consists of four separate segments The area is adjacent to and contiguous with the southern half of the Kalmiopsis Wilderness. Elevations vary between 500 and 5,098 feet at Pearsoll Peak. The widest bodies of the unroaded area adjacent to the Wilderness provide the highest degree of solitude and primitive experience, and consequently exhibit the greatest Wilderness potential. Recreation use in the area is approximately 5,000 RVD's

The eastern portion is strongly influenced by serpentine soils which provide diversity to an otherwise steep, heavily forested, country. The greatest attractions are provided by the adjacent Wilderness and Scenic section of the Wild and Scenic Illinois River. A large number of unique or sensitive plants occur in association with the serpentine rock type. The soils on the northeastern segment are notably different. Developed mostly from metavolcanic rock, they provide a mixed-conifer forest setting

The western segments have broken and steep topography with deep canyons. Vegetation is usually dense. Douglas-fir is the dominant species as a result of moderate to highly productive sedimentary soils. The area is capable of providing Roaded Natural and Semi-primitive Non-motorized recreation opportunities

CURRENT DEMANDS, WANTS, AND DESIRES

Strong interests and vocal concerns have been expressed for keeping the North Kalmiopsis and portions of the South Kalmiopsis roadless areas in a natural state. Particular concern has been focused on that portion of the North Kalmiopsis within the viewshed adjacent to the last six miles of the Wild section of the Illinois River. The focus is on maintenance of the potential wilderness character in these areas rather than the Primitive recreation opportunities currently available.

Likewise, very strong input has been expressed by development- oriented interests. Many parts of these two areas contain highly productive forests. Removing the North and South Kalmiopsis areas from the lands suitable for timber production has been a long, hotly contested issue A more thorough discussion is provided for these two areas in the Status and Public Involvement portions of Appendix C Secondly, mining interests and activities are more prominent in these two large blocks of land than on many other parts of the Forest Potential for significant mineral deposits is moderate to high County governments have relied on this land base as a sustainable resource to aid community socioeconomic stability and income from timber sale receipts. The areas have been in the political forum and legal halls several times.

ABILITY TO SATISFY DEMAND

Of the 284,000 acres of inventoried roadless areas, all or portions of any of the 18 areas could be left in their existing condition in order to preserve their Wilderness potential From the above, five of the Forest's roadless areas have greater potential for Wilderness than the other areas described and evaluated in Appendix C.

Based on projected levels of use and estimated carrying capacities, the Forest has the ability to satisfy the demand for wilderness experiences Demand for Primitive opportunities in the existing Wildernesses will be met until the fifth decade when projected demand would exceed capacity. Semi-primitive opportunities would be met over the course of the planning period



WILD AND SCENIC RIVERS

EXISTING CONDITION

The discussions in this section are pertinent to the resolution of Planning Problem #4, "How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild and Scenic River attributes?"

Figure III-7 shows the locations of the Wild, Scenic, and Recreation rivers on the Siskiyou National Forest. The Forest is best known for its Wild and Scenic River system, particularly the Rogue River. The Rogue was one of the original rivers designated in the 1968 Wild and Scenic Rivers Act (PL 90-452) With its designation as "Wild and Scenic," the Rogue River gained widespread recognition as a major western white water river, attracting additional users seeking this particular recreation opportunity

The Illinois River was designated as "Wild and Scenic" by Congress in 1984 (PL 98-454). It is not as well known as the Rogue River, but does provide a high quality, technically difficult white water experience in an extremely rugged pristine river canyon, accessible primarily by watercraft The only limitation to an otherwise exceptional condition is flow Good white water rafting and kayaking conditions occur only during a rather narrow window of flows in the spring period, summer low flows make the river essentially non-raftable Forest river managers recognize that the Illinois offers one of the most primitive river experiences remaining in the western United States primarily because of its untouched character and lack of human influences throughout the entire length of the Wild section (Illinois Wild and Scenic River Management Plan, 1985).

The Chetco, North Fork Smith, and Elk Rivers were designated for inclusion in the National System under the Omnibus Oregon Wild and Scenic River Act of 1988 (passed in October) These previously inventoried and eligible rivers are treated differently by each alternative The very recent action by Congress has changed the emphasis on Planning Problem #4 (see Chapter I). In the DEIS, the three rivers were given a range of management options in order to analyze environmental impacts and tradeoffs associated with the alternatives. Any alternative would be brought into conformance with the Act prior to implementation.

Management plans for the three newly designated rivers will be prepared. Any management activity in the interim would be planned to meet the objectives for maintenance of the Wild and Scenic River characteristics and values for which they were established.

The five designated National Wild and Scenic Rivers provide users with opportunities ranging from an extremely primitive experience offering few interactions with other people, to recreation experiences in a relatively natural Forest setting where the frequency of human contact is common.

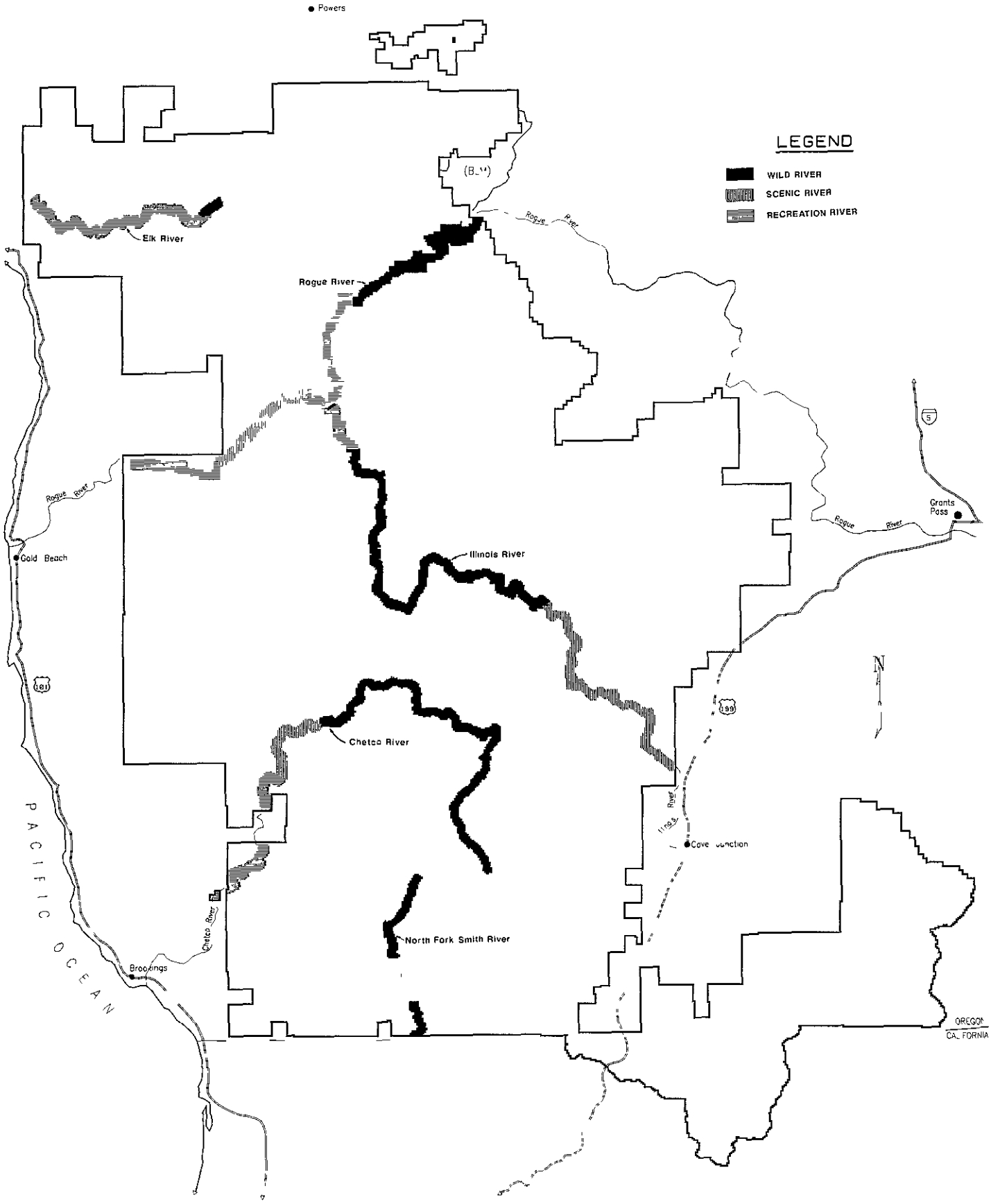


Figure III-7. Wild/Scenic/Recreation Rivers Map

Rogue River

The Forest Service has the responsibility for administering 37 miles (11,731 acres) of the Rogue River which are located within the Forest boundary, including sections designated as Wild, Scenic, and Recreation The highest values associated with the Rogue River are its potential for high-quality white water recreation opportunities, excellent fisheries, free-flowing condition, and the natural or near-natural character of the landscape throughout much of the river corridor

The Wild section of the River is encompassed by the Wild Rogue Wilderness; as such, the river corridor will remain in a natural condition over the course of the planning period. The landscape character varies from steep, nearly vertical canyon walls offering vivid focal points to a more open and extended river canyon with a variety of vegetative patterns. There are human influences within the lower section such as lodges, an air strip, and jet boats up to Blossom Bar These types of influences tend to detract from a truly wild river experience and affect the type of recreation opportunities available. This section will provide recreation users with a Semi-primitive experience influenced by motorized use on the river.

The Recreation and Scenic sections of the River extend from Watson Creek to near the bridge at Lobster Creek These river sections pass through a viewshed that encompasses approximately 70,000 acres of National Forest land There are obvious human intrusions which include roads, bridges at three locations, various lodges and recreation residences, campgrounds, boat launch facilities, the townsite of Agness, and timber-related road construction and harvest units both on public and private land Harvest activities have been tempered in order to maintain a near-natural condition in the landscape character More recent activities are noticeable on private land, but are mostly visible in the background

The river corridor offers open extended views to adjacent lands on both sides of the river between Watson Creek and Agness From there, the River runs through Copper Canyon where the character changes into a steep, rather narrow, scenic river canyon where human influences are least noticeable. Near Skookumhouse Butte, the character of the river changes again (within the Recreation section) to an open river corridor with extended views to either side. The viewshed is, with the exception of a few sites, in a natural or near-natural condition that provides a recreation setting that is compatible with the wide range of Roaded Natural and Semi-primitive Motorized recreation opportunities

Illinois River

The Forest Service has the responsibility to manage the entire 50.4 mile designated portion of the river (15,200 acres). The highest values associated with the Illinois River are its scenic, recreational, botanical, water quality, fisheries, and wilderness characteristics in the Wild section.

The Wild section of the River extends from Briggs Creek just outside of the Kalmiopsis Wilderness to Nancy Creek near the river's confluence with the Rogue River The last six miles of this section are located outside the Kalmiopsis Wilderness. Virtually the entire section is free of human influence Minimal impacts from historic uses exist in the vicinity of Pine Flat, but from there until Nancy Creek the river corridor and adjacent viewshed are free of human intrusions to the natural landscape

The River provides unity to the scenic experience, yet it is composed of an unlimited variety of elements. The variety stems from the water itself and is enhanced by the diverse geology and rugged mountain backdrops. The landform of the surrounding area approaches vertical, which conveys both a feeling of excitement and demands a sense of awe. The vegetative cover along the River is extremely diverse. The textural pattern, spring or fall color, plant form, and the wide variety of stem and leaf details add to the visual qualities The makeup and combination of the unlimited elements create the outstanding scenic values.

This value is further enhanced by the fact that nearly 28 miles of the River are virtually untouched by civilization (USDA 1978) Because of this, the River corridor provides a recreation setting that is compatible with some of the wildest and most primitive recreation opportunities available in the western United States

The Scenic section of the River extends from the Forest boundary to Briggs Creek The corridor and adjacent viewshed are in a natural or near-natural condition throughout this section. Some human influences in the form of roads, bridges, campgrounds, private residences, and harvest activities are apparent, but tend not to detract from the character of the landscape This section of the river corridor provides a recreation setting that is compatible with the Roaded Natural, and Semi-primitive (Motorized and Non-Motorized) recreation opportunities.

The Recreation section of the River extends from Nancy Creek to the confluence with the Rogue River Roads, a few residences, campgrounds, and timber harvest are apparent to river users, but are at a level that does not detract from the near-natural character of this portion of the river corridor This section will provide a recreation setting that is compatible with the Roaded Natural recreation opportunities available.

North Fork Smith River

The entire 4,325 acres in the Wild and Scenic corridor of the North Fork Smith River are National Forest System land The Oregon portion of this Wild and Scenic River extends from the border of California approximately 13 miles to the headwaters in the Kalmiopsis Wilderness. The entire California portion of the North Fork is currently designated as Wild and Scenic

The classification of the North Fork divides the river into three segments. The upper 6.5-mile section from the headwaters of the North Fork to Horse Creek and the two-mile section from Baldface Creek to the California border is classified as "Wild." Between the Wild sections is a four-mile section classified as "Scenic "

In response to public comment on the DEIS, the Interdisciplinary Team reassessed the classification from Horse Creek to a point approximately two miles downstream and concluded that it does meet the criteria for "Wild" classification. This two-mile adjustment was not made in the Omnibus Oregon Wild and Scenic Rivers Act of 1988, but is carried by the Forest as an inventoried Wild segment.

The first 4.5 miles of the Wild section from the headwaters downstream is encompassed by the Kalmiopsis Wilderness. This segment and the four-mile segment outside of the Wilderness are essentially free of human influences within the river corridor. Human intrusions to the adjacent viewsheds are virtually non-existent so that the area's recreation setting provides Primitive and Semi-primitive recreation opportunities

The four-mile Scenic section from Horse Creek to Baldface Creek is bordered on the westside by land suitable for timber harvest Some roads and limited harvest activities exist, however the area is in a natural/near-natural condition and provides a recreation setting compatible with Roaded Natural recreation opportunities The North Fork provides the boundary of the Kalmiopsis Wilderness, on the eastside, the corridor and viewshed are within Wilderness.

The two-mile section between Baldface Creek and the stateline is largely within lands unsuitable for the production of timber. Some mineral exploration activity has occurred upslope, but activities within the corridor and adjacent viewshed are quite limited This section exhibits a natural landscape compatible with the Semi-primitive recreation opportunities

Chetco River

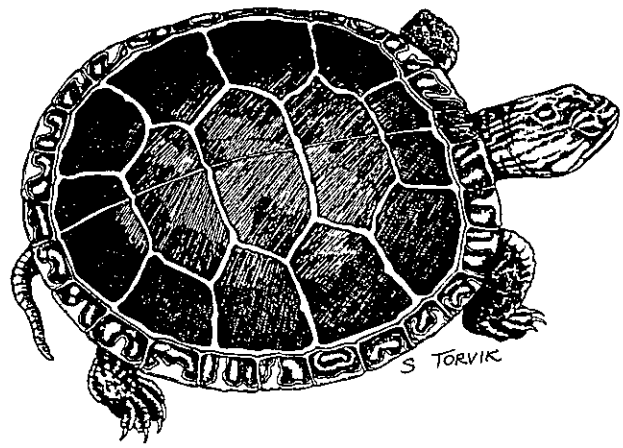
Approximately 44 miles of the Chetco River was designated in the Omnibus Oregon Wild and Scenic River Act of 1988. The corridor includes 14,357 acres of National Forest land, and additional parcels of private land at the mouth of Mislatnah Creek (Tolman Ranch) and approximately three miles in the lower reach of the River River sections have been classified as Recreation between the Forest boundary and Steel Bridge (11 miles), Scenic from the Steel Bridge to Boulder Creek (8 miles), and Wild from Boulder Creek to its source in the Kalmiopsis Wilderness (25.5 miles)

In response to public comments on the DEIS, an Interdisciplinary Team reassessed a two-mile section of the Chetco between Boulder Creek and Mislatnah Creek and found that it meets criteria for "Wild" classification. This two-mile adjustment was not made in the Omnibus Oregon Wild and Scenic River Act of 1988, but has been carried by the Forest as an inventoried Wild segment.

Virtually the entire length of the Wild section except for the lower two miles is encompassed by the Kalmiopsis Wilderness. The river corridor and the adjacent viewshed is in a natural condition along its entire length. Both the primitive character of the River and the recreation opportunities available are compromised somewhat by the presence of a mining road in the vicinity of Taggarts Bar and Slide Creek. The road is the only noticeable intrusion to the natural character of the River and the adjacent Wilderness viewshed. Topographic and vegetative diversity is abundant, providing a scenic backdrop enhanced by the presence of the river The recreation setting is compatible with the Primitive and Semi-primitive recreation opportunities available

The Scenic section of the corridor is in a natural or near-natural condition in both the river corridor and adjacent viewshed. There are intrusions to the natural character of the landscape in the form of roads, a residence, and some harvest and hardwood conversion activities The recreation setting is compatible with the Semi-primitive and Roaded Natural recreation opportunities

The inventoried Recreation section of the River is in a near-natural/modified condition along its entire length The River does exhibit a natural character in the immediate foreground, however, intrusions to the landscape by roads, campgrounds, bridges, and harvest activities, are obvious to river users The heavily modified character of much of the adjacent viewshed can be attributed, in part, to the extent of harvest activities on private land Within these visually impacted areas, it is doubtful that recreationists would have a meaningful experience Overall, the corridor and adjacent viewsheds provide a recreation setting compatible with Roaded Natural/Modified opportunities.



DETERMINATION OF ELIGIBILITY

A number of other rivers were analyzed in July 1988 for possible eligibility to the National Wild and Scenic River System. These included the Winchuck, Pistol, South Fork Chetco, Elk, South Fork Coquille, and the South Fork Sixes Rivers. Only the Elk River was found to qualify as eligible for possible inclusion

The eligibility of a river for inclusion in the National System is determined by applying the criteria cited in Section 1(b) and 2(b) of the Wild and Scenic Rivers Act as interpreted by the USDA-USDI Guidelines. To be eligible for inclusion, a river must be free-flowing or restored to a free-flowing condition and possess one or more "outstandingly remarkable" values For a river to be eligible for designation to the National System, one or more of the following values within the river area must be outstandingly remarkable.

1 Scenic,
2 Recreational,
3. Geological,
4. Fish and Wildlife,
5 Historical,
6 Cultural, and
7 Other values, including ecological values.

Studies of rivers other than those mandated by Congress may be discontinued upon a finding of ineligibility in the Forest Planning Process or a subsequent Wild and Scenic River study. It was determined by the 1988 evaluation that these rivers, except for the Elk River, do not have any outstandingly remarkable characteristics and are not eligible for inclusion in the National System Documentation is on file in the Planning Record.

Elk River

The eligibility assessment conducted in July 1988 found 19 miles of the Elk River meets the criteria due primarily to its high quality anadromous fisheries Within months of this assessment, the Elk was included in the Congressional designation of Oregon rivers under the Omnibus Oregon Wild and Scenic Rivers Act. Designation affects 5,405 acres of National Forest land Some private land occurs in the lower reach of the Elk River.

Two sections of the River have been classified The main stem of Elk River is classed as Recreation from Anvil Creek near the Forest boundary to the confluence of the North and South Forks (17 miles). The Wilderness borders the river for 9 5 miles Approximately 1,550 acres on the north side of the Elk River corridor are within the Grassy Knob Wilderness The North Fork is classified as Wild for approximately 2 miles (to a fish blockage).

The river corridor and adjacent viewshed are in a natural or near-natural condition along their entire lengths. The Elk River road and tributary roads in the corridor provide the most noticeable human intrusion to the natural character of the river and adjacent viewshed. Topographic and vegetative diversity abundant throughout the entire corridor provides a dramatic scenic backdrop that is enhanced by the presence of the river. The steep narrow canyon and the fast-flowing crystal clear water combine to provide a natural or near-natural Forest setting compatible with Roaded Natural and Semi-primitive recreation opportunities available in the area

CURRENT DEMANDS, WANTS, AND DESIRES

Due to the consistent and growing interest in river-related recreation activities, particularly white water rafting, it is reasonable to assume that there will always be a demand for the recreation opportunities associated with Wild and Scenic Rivers.

Demand, too, exists for mineral and timber resources occupying the river corridors and viewsheds Much of the area is tentatively suitable for the production of timber, many feel that harvesting within the visual guidelines is quite compatible with recreational uses, and that opportunities for multiple use should not be foregone. A similar concern was expressed about changes in State water quality standards as they apply to the antidegradation policy, the change occurs upon Wild and Scenic River designation. Timber management in tributary drainages some distance from the rivers can be indirectly affected by the potential for constraints being applied to this resource.

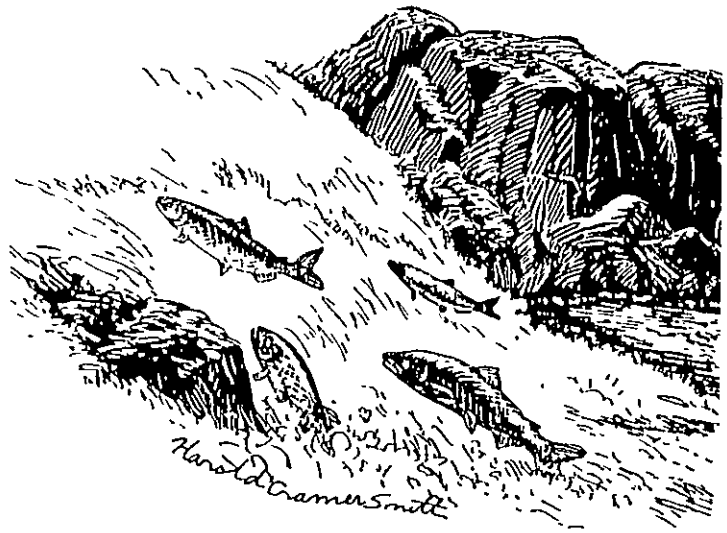
There has been concern expressed for the degree of protection provided for the visual resources within the viewsheds adjacent to the Rogue and the Illinois Rivers, and to a limited extent on the Chetco, North Fork Smith, and Elk Rivers. Particular concern has been expressed for the maintenance of the viewshed adjacent to the last six miles of the Wild section of the Illinois River (between Silver Creek and Nancy Creek) in an undisturbed condition

ABILITY TO SATISFY DEMAND

The Forest has the ability to satisfy the demand for recreation opportunities associated with Wild and Scenic Rivers Recreation use on these rivers is within the estimated capacities so that demand can be satisfied over the course of the planning period.

The current inventory of Visual Quality Objectives reflects the amount of recreation use that is occurring within river corridors, and is designed to maintain the corridors and the adjacent viewsheds in a natural or near-natural condition. The ability to reduce or increase the degree of visual resource protection in all of the river corridors exists.

The visual resource management for these river viewsheds is an important aspect in the maintenance of a quality experience associated with the five Wild and Scenic Rivers. While the degree of visual protection in the viewsheds outside the river corridor is not directly tied to Wild and Scenic River status, it certainly has a bearing on retaining complementary visual objectives.



SOIL AND WATER

The discussions in this section, when combined with those in the **FISH** section, are pertinent to resolution of Planning Problem #3, "How can the Forest's fish habitat, water quality, and soil productivity be maintained or improved?"

EXISTING CONDITION

Water that originates on the Forest is of high quality A general description of the soil and water resource on the Forest and of each Planning Basin is provided Additionally, features of each basin are described in the accompanying tables and figures.

An excellent description of the water resources conditions within the entire Rogue River basin is contained in the Oregon Water Resources Department study (OWRD 1985). The report describes the geology, soil, water, reservoirs and potential sites, and beneficial uses of water in the Rogue River basin. The present and future demand for water in the basin is also provided. The South Coast Basin Report (SWRB 1963) presents a similar, but briefer description of the water and related resources of the South Coast Drainage Basin.

SOIL

Soil is a fundamental, largely nonrenewable, resource which must be conserved to assure high-level sustained yields of water, recreational opportunities, and wildlife and fisheries habitat All renewable resources of the Forest are dependent on a viable and healthy soil resource. Soil conditions and plant growth of the Forest are exceptionally complex and diverse, due in large part to the variability of parent material. Rock weathering and soil formation rates are largely influenced by the combination of mild and moist winters, hot and dry summers, steep mountainous topography, and range of plant associations.

The Forest Soil Resource Inventory (SRI), in which soils of the Forest are mapped and analyzed, was completed in 1979 (USDA 1979c). The SRI provides descriptions and interpretations for 85 landtypes of which soil is the primary component Landtype interpretations are designed for planning and managing the transportation system, as well as the timber, recreation and wildlife programs The SRI is most complementary to broad planning levels; it was not designed for site specific project level use

The Forest has 22,206 acres classified as unsuitable for timber management due to the potential for irreversible soil damage by mass wasting and erosion Another 153,362 acres have been classified unsuitable for timber management due to low potential for regeneration following timber harvest. These lands are usually associated with thin soils over rock, a chemical imbalance in the soil, rock outcrops, or rock talus slopes Lands of varying soil productivity comprise the remaining 624,240 acres of forest land tentatively suitable for timber production

The variable nature of Forest soils can be linked to geologic history and to topography, as well as to local soil properties. Some soils lack the cohesion provided by clays or plastic silts and are prone to surface erosion and ravelling. Cohesive soils high in silt and clay are prone to mass wasting. Other soils throughout the Forest are very thin, with high rock content Surface litter and duff layers, important for soil protection, water storage, and nutrient cycling, are often thin or absent

WATER

Water originating on the Forest's watersheds is the life source for many beneficial uses, such as fish habitat and other aquatic life, wildlife habitat, and riparian vegetation. Water is also the focus of on- and off-Forest recreation and domestic uses, such as boating, camping, fishing, and irrigation.

Precipitation and Streamflow

As a result of heavy precipitation in the winter and spring, the Forest annually yields about 8.2 million acre-feet of water that is unevenly distributed throughout the year As much as 70 to 80 percent of the total annual water yield runs off during the winter period (December - March). The summer months often experience seasonal drought.

Streamflow on the Forest responds rapidly to changes in precipitation due to high runoff efficiencies in most watersheds Intense winter storms saturate the soil and produce high streamflow, causing both surface and channel erosion. These periods of high soil moisture also increase soil instability on the mountain slopes and within the inner gorges of many streams.

Nearly 50 percent of the Rogue River's streamflow reaching the Pacific Ocean originates from the Siskiyou National Forest. The Illinois River, a major tributary of the Rogue River, receives 90 percent of its flow from the Forest. While the greatest percentage of the Forest drains into the Rogue River basin, the remainder feeds directly into the Pacific Ocean via smaller coastal streams and rivers

Summer flows on the west side of the Forest are adequate for the maintenance of fish and wildlife resources. Summer flows on the east side are seriously depleted on many streams by irrigation and domestic use withdrawals. To highlight this problem, summer withdrawals, combined with naturally low summer flows, result in a severe rating for water temperatures in the Illinois River and segments of the East and West Forks (ODEQ In Press). The severe rating indicates that there is a substantial or near complete interference with the beneficial use Summer anadromous fish habitat in the Wild and Scenic Illinois River is seriously impacted by the elevated temperatures. A substantial adverse effect on the survival of juvenile and adult salmonids exists. Most of the diversions and consumptive uses for the irrigated lands occur outside the National Forest boundary.

Minimum stream flows have been established for selected streams and rivers in both the South Coast and Rogue River basins to support aquatic life and minimize pollution (OWRD 1984a and 1984b) However, in these basins where summer flows are already critically low, water quality and associated beneficial uses on specific reaches of Forest streams are expected to further degrade due to increasing upstream demand for domestic water.

Groundwater

Except for large alluvial valleys like the Illinois, groundwater resources in the Rogue River basin are generally limited (OWRD 1985) Groundwater quality in the Forest portion of both the Rogue and South Coast basins is good. Aside from providing drinking water at developed recreation sites, there are no significant uses of Forest groundwater resources

Stream Classification and Beneficial Uses

Forest streams are classified according to their beneficial uses. Class I and II streams are either domestic water supplies or important fisheries Class III streams are generally smaller, perennial non-fish-bearing streams Class IV streams flow intermittently. Both Class III and IV streams are managed to protect downstream values in the Class I and II streams and rivers. For more information about this classification system and management of the riparian ecosystem, refer to the Siskiyou National Forest policy contained in FSM 2526 (Supplement No. 1), and Best Management Practices (Appendix G, Forest Plan) as applied to the riparian area through the Standards and Guidelines.

There are approximately 175,500 acres of riparian areas on the Forest Of these, about 99,000 are tentatively suitable for timber production

Water Quality

Protection of water quality is required by the Organic Administration Act which created the National Forests, the Clean Water Act, and the National Forest Management Act (NFMA) The Clean Water Act gives States authority to enforce water quality standards on Federal land. NFMA states that National Forest lands will be managed "to prevent detrimental changes in water flow and water quality "

Implementation of the State of Oregon and State of California Water Quality Management Plans on lands administered by the Forest Service is described in the following memoranda of understanding:

> **Memorandum of Understanding.** The Oregon Department of Environmental Quality and U S. Department of Agriculture, Forest Service (2/79), including Attachment A - Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest (12/78)
>
> **Memorandum of Understanding:** The State Water Resources Control Board, State of California, and U S Department of Agriculture Forest Service, Pacific Southwest Region, 1981

The agreements provide for annual meetings between the Regional Forester and the respective state agencies (Oregon Department of Environmental Quality and the California Water Resources Control Board) to evaluate the program and progress being made.

The quality of water flowing into the Forest from the middle Rogue River (above river mile 65) is good, and the quality of the lower Rogue River (below river mile 65) is very good The quality of water in the Illinois River basin is generally good (OWRD 1985) Despite the fact that good water quality exists within the Forest, above-optimum stream water temperatures in the summer (due to low summer flows, water withdrawals, and lack of streamside vegetation) and high turbidity (natural and human induced) during the major winter storms are primary water quality concerns

In 1978 the DEQ completed the first statewide assessment of nonpoint source pollution The report and accompanying maps provide an overview of existing water quality conditions both on- and off-Forest Generally, the worst conditions for elevated water temperatures and sedimentation on the Forest do not exceed "moderate" severity (ODEQ 1978) In response to requirements in Section 319 of the Clean Water Act (1987 Amendments), the DEQ updated the assessment. A final report is due in 1989

Current sediment production for the Forest is estimated to be about 623,000 tons per year. This value is an index of current sediment production; it includes natural erosion and human-induced erosion from existing road systems On the average, this background value is equal to about one-half ton per year (or one-half cubic yard) for each acre of the Forest.

Stream power, i.e., the ability of water to move material, is a function of channel gradient and streamflow Stream power is great enough over most of the Forest to transport sediment through the river systems Only in cases of extreme amounts of material delivered into smaller streams over a short period will stream power be insufficient to recut and transport sediment out of the system The principles of sedimentation, e g , aggradation or degradation, in forest and mountain aquatic systems apply similarly to the Siskiyou National Forest The balance of inputs with outputs is key to maintaining a healthy and properly functioning ecosystem There are, however, significant differences in natural and altered conditions, and in the responses and outputs of each. One of the more notable variables is the change in channel morphology and resource values associated with low and higher stream gradients Likewise, major differences in channel characteristics are associated with various parent rock and landforms

Existing soil and geology monitoring on the Forest includes landslide inventories, landslide movement, soil compaction, soil erodibility, soil productivity, effective ground cover, and mycorrhiza Water quality-related monitoring includes water temperature and streamside canopy shade, turbidity, chemical (e g , herbicide

and fertilizer), drinking water, stream flow, and Best Management Practices (BMP) implementation and effectiveness monitoring Considerable surveillance has also occurred through formal and informal field reviews of project activities. Soil, geology, and water monitoring for the Silver Fire Recovery Project is described in the Project FEIS (USDA 1988d).

Watershed Improvement

The Forest maintains a Watershed Improvement Needs (WIN) inventory Examples of restoration projects to improve watershed condition on the Forest are road and landing sidecast pullback, surface erosion control, and channel stabilization. Potential projects are annually prioritized.

BASIN DESCRIPTIONS

The Forest is divided into 19 Planning Basins (Figure III-8) to provide greater site specificity in the analysis of effects for various resources. Planning basin size ranges from 34,566 to 93,802 acres Appendix B includes a description of the basins and rationale for their use in the model. Soil, water, and fisheries resource discussions in this chapter use inventories within Planning Basins to describe the affected environment.

For reader clarification, references to Planning Basins indicate a total of 19, but are numbered to 20 Basin 18 was deleted; the basin area was distributed between adjoining Basins 15 and 19.

Another clarification relates to **Basin 14 - Upper Chetco.** This basin is treated separately in the inventory and analysis from other Planning Basins in that the entire area is within the Kalmiopsis Wilderness.

Tables and figures that describe some soil and water features of each Planning Basin are briefly described below.

Municipal Supply Watersheds. Table III-9 lists the municipal supply watersheds on the Forest.

Descriptive Indices by Planning Basin. Table III-10 contains descriptive indices for each basin, ranging from total basin acreage to the percentage of National Forest System land in each Planning Basin harvested from 1950 to 1970, and from 1970 to 1980.

Beneficial Uses of Water by Planning Basin. Table III-11 lists the beneficial uses of water in each Planning Basin, and categorizes them as either major, moderate, or minor.

Beneficial Uses and Water Quality Condition Relationship With Existing Beneficial Uses. Table III-12 summarizes the baseline water quality condition relationship with the existing beneficial uses. Table III-21 in the **FISH** section presents a summary of baseline habitat conditions for the fish production.

Soil Erosion Hazard Figures III-9 and III-10 show the percentage of tentatively suitable land in each Planning Basin with high potential soil erosion hazard (surface and mass movement) for timber management (including harvest and regeneration activities) and roads. The bar graphs provide a means of comparing the sensitivity of each Planning Basin with respect to timber management and road construction The graph indicates where special care must be taken when planning for such activities.

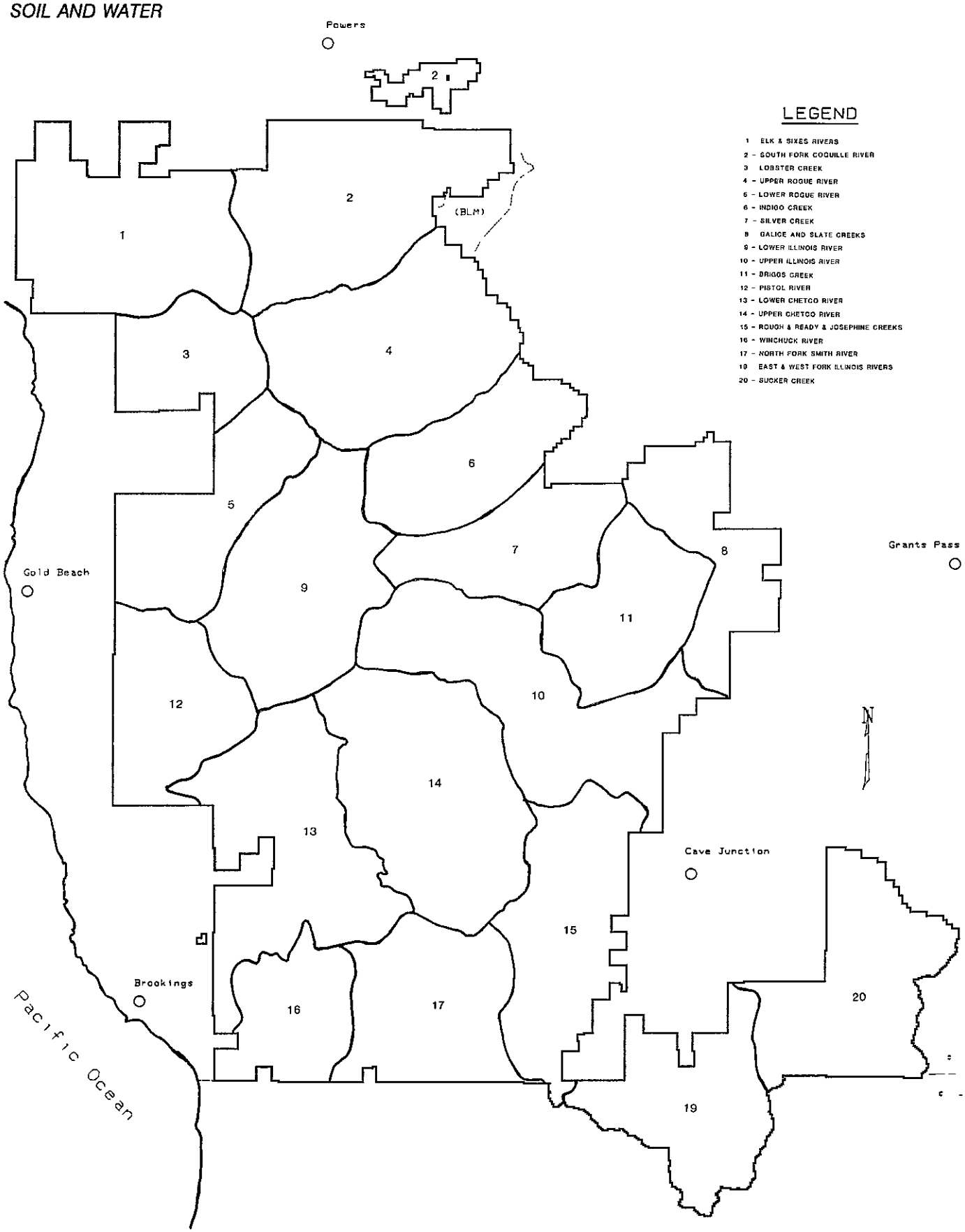


Figure III-8 Planning Basin Map

Table III-9. Municipal Supply Watersheds

Watershed Name	Domestic Supply System	Water Type	Population Served	Consumption (Gal/Day)	Watershed Area (Acres) N F.	Other	Total
Lost Valley Creek	Youth Camp (County)	Surface	200 1/	2,000	2,432	0	2,432
Lake Creek	Oregon Caves Natl. Mon. (NPS)	Surface	1,000 1/	10,000	780	0	780
Chetco River	Brookings	Surface (Indirect)	4,000	480,000	163,840	65,280	229,120
S. F. Coquille R.	Powers	Surface (Indirect)	930 1/	135,000	62,738	40,160	102,898
E. F. Illinois R.	Cave Junction	Surface (Indirect)	1,000+	135,000	90,496	53,888	144,384
TOTAL			7,030	762,000	320,286	159,328	479,614

1/ Seasonal (Powers - summer source)

Table III-10. Descriptive Indices by Planning Basin (Percents are Proportion of Planning Basin)

Planning Basins	Acres Total Planning Basin	Acres Within NFS Boundaries (including private)	Percent						Acres Riparian Tent. Suit.	Percent			Inches Annual Precipitation
			Planning Basin NFS mgmt.	Pvt. Land In NFS Boundaries	NFS Acres Tent. Suit.	Harvest Tent. Suit. 1950-1970	Harvest Tent. Suit. 1970-1980	Roads Inside NFS (incl. pvt.)		Acres Class 1 & 2 Stream	Acres Class 3 Stream	Slope 55%+	
01-Elk/Sixes	138,323	78,144	49	13	66	18	20	1.0	7,647	56	44	26	112
02-S.F. Coquille	120,890	84,812	59	17	90	16	20	2.0	9,070	51	49	7	95
03-Lobster	67,022	34,967	44	16	93	8	18	1.5	4,087	41	59	10	115
04-Upper Rogue	81,359	81,359	97	3	60	6	6	1.0	6,413	33	67	11	100
05-Lower Rogue	73,920	50,603	61	11	87	6	12	1.0	5,834	34	66	5	93
06-Indigo	49,368	49,368	100	0	81	3	5	1.0	6,095	35	65	17	112
07-Silver	51,230	42,565	83	0	64	1	<1	0.6	4,704	41	59	19	112
08-Galice/Slate	87,115	42,892	48	3	77	4	2	2.0	5,688	56	44	6	69
09-Lower Illinois	69,845	69,845	96	4	51	5	8	0.7	5,389	35	65	10	101
10-Upper Illinois	154,662	86,170	55	2	25	3	2	0.7	3,431	50	50	14	97
11-Briggs	43,690	43,690	95	5	78	4	3	2.3	5,161	48	52	10	81
12-Pistol	94,254	49,189	45	14	88	4	13	1.4	6,208	42	58	1	115
13-Lower Chetco	128,397	81,685	61	4	74	11	18	1.4	9,514	47	53	7	115
14-Upper Chetco	93,802	93,802	100	0	0	<1	<1	0.2	-----	--	--	15	130
15-Rough/Josephine	80,926	63,064	77	2	10	<1	4	0.3	904	9	81	22	112
16-Winchuck	36,733	34,566	88	6	92	10	15	1.3	5,710	57	43	13	113
17-N.F. Smith	57,429	57,429	100	0	22	6	10	0.5	2,412	54	46	5	130
19-E.& W.F. Illinois	78,829	52,165	58	13	60	14	10	2.1	3,900	52	48	11	84
20-Sucker	103,419	65,680	60	6	71	11	11	2.2	6,901	41	59	7	74

Table III-11. Beneficial Uses by Planning Basin 1/

	Public Water Supply	Private Water Supply	Industrial Water	Irrigation	Livestock	Anadromous Fishery	Resident Fishery	Wildlife	Fishing	Boating	Water Contact Recreation	Visual Quality	Hydropowe	Navigation
01-Elk/Sixes		o		/	o	X	o	/	X	/	o	/		
02-S.F. Coquille	X	o	o	X	/	X	/	/	X	/	/	/		o
03-Lobster	o				o	X	o	o	/	o				
04-Upper Rogue	o	o		o	o	X	/	X	X	X	o	X		/
05-Lower Rogue	/	o	o	o	o	X	/	X	X	X	/	X		X
06-Indigo						X	o	/	o					
07-Silver						X	o	/	o					
08-Galice/Slate		X		/	o	X	/	o	o		o	o		
09-Lower Illinois					o	X	o	X	X	/	o	X		
10-Upper Illinois				o		X	/	X	X	/	/	X		
11-Briggs			o		o	X	o	/	/					
12-Pistol		o		o	o	X	o	o	/			o		
13-Lower Chetco	/	/	o	/	o	X	o	X	X	X	/	X		X
14-Upper Chetco						/	/	/	o			/		
15-Rough/Josephine						/	o	o	o		/			
16-Winchuck		X	o	/	o	X	/	/	X	/	/	X		
17-N.F. Smith						/	o	o	/	o	o	/		
19-E.& W.F. Illinois	/	X	o	X	o	X	o	o	/		/	X	o	
20-Sucker	o	o	o	X	o	X	/	o	/		o	/	o	

1/ X = Major, / = Moderate, o = Minor

Table III-12. Summary of Baseline Water Quality Condition Relationship with Existing Beneficial Uses 1/

Planning Basin Name	Stream Size	Existing Beneficial Uses 2/ Major	Moderate	Minor 4/	Water Quantity and Quality Condition on Beneficial Users 3/ Streamflow	Temperature	Turbidity	Sediment
01 Elk/Sixes	Rivers	4,6	3,5,7,9	2	Low-Mod*	Mod	Low-Mod	Low-Mod
	Creeks	4,6	3,5	2	Low*	Low-Mod	Mod	Low-Mod
02 SF Coquille	River	1,3,4,6	5,7,8,9	2	Low-Mod*	Mod	Mod	Mod
	Creeks	3,4	5,6	2	Mod*	Low-Mod	Mod	Low-Mod
03 Lobster	Creeks	4	6	1	Mod*	Low-Mod	Mod	Mod-HIGH
04 Upper Rogue	River	4,5,6,7,9	10	1,2	Low	Mod	Low	Low
	Creeks	4,5,6		2	Mod*	Low-Mod	Low-Mod	Low-Mod
05 Lower Rogue	River	4,5,6,7,9,10	1,8	2	Low	Mod	Mod	Low-Mod
	Creeks	4,5,6,9	8	2	Mod*	Low-Mod*	Mod	Mod
06 Indigo	Creeks	4	5		Mod*	Mod*	Low-Mod	Low-Mod 5/
07 Silver	Creeks	4	5		Mod*	Low-Mod*	Low-Mod	Low-Mod 5/
08 Galice/Slate	Creeks	2,4	3		Mod-HIGH*	Low-Mod*	Mod#	Mod#
09 Lower	River	4,5,6,9	7		HIGH	HIGH	Low	Low-Mod
Illinois	Creeks	4,5,6,9			Mod	Mod	Low-Mod	Mod*
10 Upper	River	4,5,6,9	7,8		HIGH*	HIGH*	Mod	Low-Mod
Illinois	Creeks	4,5,6,9	8		Mod*	Low, HIGH*	Low	Low-Mod*
11 Briggs	Creeks	4	5,6		Mod*	Low-Mod*	Low	Low-Mod
12 Pistol	Rivers	4	6	2	Low-Mod*	Mod-HIGH	Mod	Mod
	Creeks			2	Low*	Low	Mod	Mod
13 Lower Chetco	Rivers	4,5,6,7,9,10	1,2,3,8		Mod*	HIGH	Mod	Mod
	Creeks	4,5,6,9	2,3		Mod*	Low-HIGH	Mod#	Mod#
14 Upper Chetco	River		4,5,9		Mod*	Mod*	Low	Mod*
	Creeks		4,5,9		Mod*	Mod-HIGH*	Low	Low-Mod*
15 Rough/Jose	Creeks		4,8		HIGH*	HIGH*	Low	Low
16 Winchuck	River	2,4,6,9	3,5,7,8		Mod*	Mod	Mod	Mod
	Creeks	4,6,9	2,3,5,8		Mod*	Low-Mod	Low-Mod	Low-Mod*
17 NF Smith	River		4,6,9		Mod*	Mod	Low	Low-Mod
	Creeks		4,6		Mod*	Low-Mod	Low	Low-Mod
19 E & WF	Rivers	2,3,4,9	1,6,8		Mod-HIGH	Mod	Low-Mod	Low-Mod
Illinois	Creeks	2,3,4,9	1,6,8		Mod	Mod-HIGH	Low-Mod	Mod
20 Sucker Cr.	Creek	3,4	6,9	1,2	Mod-HIGH	Mod-HIGH	Mod#	Mod#

1/ Table of beneficial uses by Planning Basin is Table III-11.
2/ 1 = Public Water Supply, 2 = Private Water Supply, 3 = Irrigation and Industrial, 4 = Salmonid Fish, 5 = Wildlife and Livestock, 6 = Fishing, 7 = Boating, 8 = Water Contact Recreation, 9 = Visual Quality, and 10 = Navigation
3/ Streamflow, Temperature, Turbidity, and Sediment
HIGH - High — Substantial or nearly complete interference with the beneficial uses or opportunities to use the water
Mod - Moderate — Some interference with the beneficial use or opportunity to use the water.
Low: - Low — Minor interference with the beneficial use or opportunity to use the water
None: - Negligible — None or insignificant interference with the beneficial use or opportunity to use the water.
* Next to rating indicates a primarily natural condition.
\# Indicates a primarily human-created condition.
4/ Shown only if beneficial use is a public or private water supply.
5/ Related to 1987 Silver Fire.

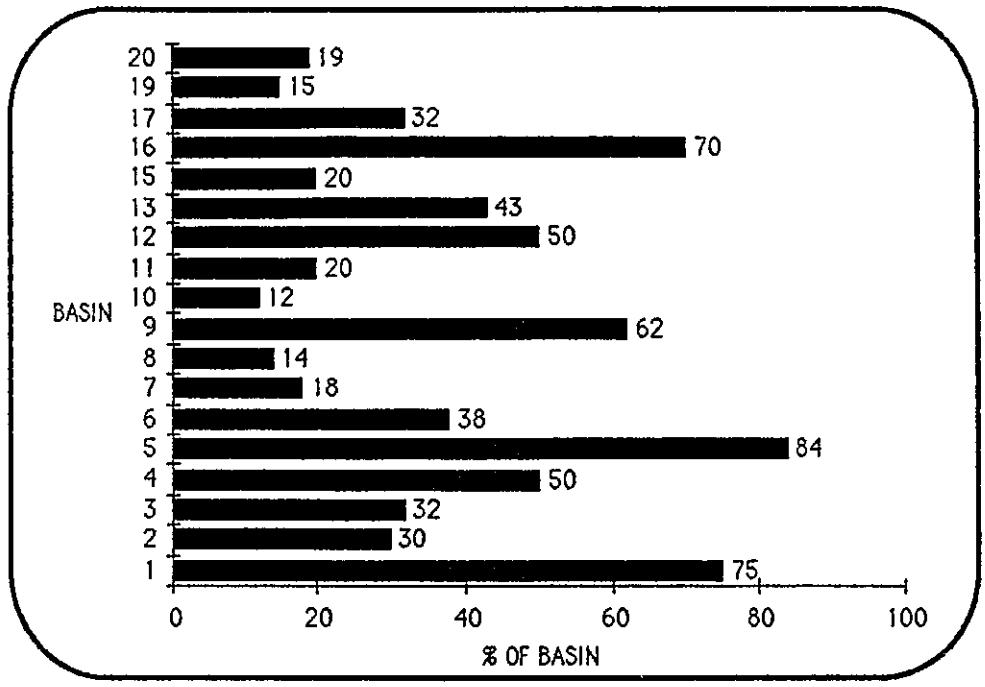


Figure III-9 Percentage of Tentatively Suitable Lands Within Each Basin With a High Potential Erosion Hazard for Timber Management (Harvest and Regeneration Activities)

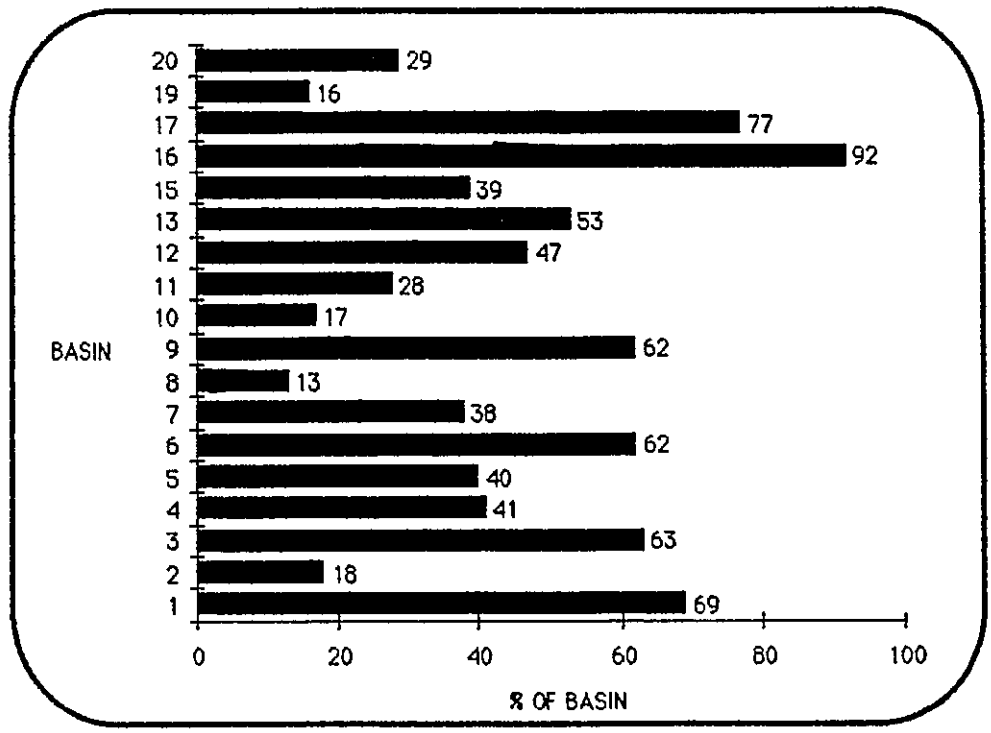


Figure III-10 Percentage of Tentatively Suitable Lands Within Each Basin With a High Potential Erosion Hazard for Road Construction

CURRENT DEMANDS, WANTS, AND DESIRES

SOIL

To meet the sustained demand for renewable resources and clean water from the Forest, adequate soil cover, stability, porosity, and soil productivity must be maintained Severity of impacts on soil resources depends upon the properties of individual soil types, and the type and intensity of management actions. Owing to their importance in maintenance of long-term productivity, protection of litter and duff layers cannot be overemphasized in planning and implementation of all activities

In areas where site conditions indicate a potential for mass wasting, proper selection and skillful applications of management activities must occur. Activities which compact soils and reduce porosity must be avoided Similarly, activities that degrade site quality and long-term productivity must also be avoided.

The intensity of management activity, rather than the type of activity, often determines the degree of adverse soil impact. Thus, activities that drastically alter soil properties and processes should be avoided By dispersing watershed disturbances over time and space, off-site watershed impacts are reduced Forest-wide Standards and Guidelines limit specific soil disturbances and impacts so that many resource demands can be met

WATER

In order to maintain beneficial water uses and comply with Oregon and California requirements for water protection in accordance with the Clean Water Act, the Forest requires that Best Management Practices (BMP's) be implemented for management activities. For more information on the relationship between State requirements, beneficial uses, and BMP's, see Chapter IV, **SOIL AND WATER** Beneficial uses by Planning Basin are shown in Table III-11

The quality of water leaving the Forest is important to the welfare of downstream individuals and communities. Several municipalities withdraw water downstream from the Forest boundary. Although there are no formally designated municipal watersheds, individual landowners and communities (Table III-9) depend on the water that originates on the Forest. Also, there are over 1,075 water rights filed on or downstream from the Forest.

The time of greatest water yield is generally mismatched with demands, especially those of irrigation and fisheries The naturally low summer stream flows are directly affected by dewatering for agricultural and domestic purposes, seriously depleting flows critical to instream fish habitat needs

Timing and rate of runoff are other considerations. The rate of runoff, in terms of high flows, can be extreme Floods areas are a frequent and costly problem on the Forest. The cost of road damage prevention work and flood repairs is exceptionally high Greater maintenance work and road reconstruction to effectively handle areas where water drainage is concentrated would be beneficial to both the transportation system and the resources

The goal for water management is to meet or exceed State and Federal water quality standards, and to maintain the existing water yield while preventing unacceptable environmental impacts to both on- and off-site values and uses

ABILITY TO SATISFY DEMAND

SOIL

The ability of each soil type to respond to future demands depends on the inherent characteristics of the soil and the way it is managed. Practices which minimize soil erosion, nutrient loss, duff reduction, and compaction will help maintain soil productivity.

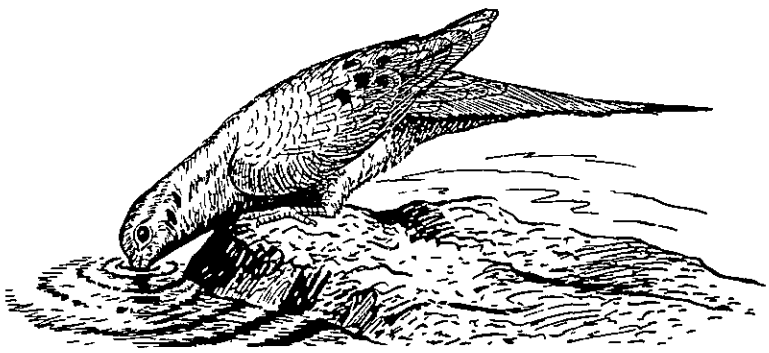
WATER

The Forest will continue to maintain present levels of water yield regardless of Forest management actions Low summer flows will continue to be fully utilized for fish, recreation, irrigation, and domestic use. The demand for water rights of others on the west and east sides of the Forest is expected to increase. Off-Forest water withdrawal can seriously reduce water quantity and increase water temperatures on selected streams.

Because of natural low flows during the summer growing season and the consumptive uses, water produced on the east side of the Forest is severely limited Both Sucker and Althouse Creeks, as well as their tributaries, have been closed by the State to further appropriation since 1934. New water rights in the rest of the East and West Forks of the Illinois River drainage can only be granted for irrigating less than one half acre of land for domestic and stock watering use, provided that the minimum stream flows established in the State's Rogue River Basin program are maintained.

The total supply of water yielded from the Forest, however, greatly exceeds the demand Purchase of water rights, supplementation of water during low-flow periods by reservoir storage, restrictions on water uses and rights, and changes in consumptive use practices are means to satisfy the demand. Such efforts, though, have to be coordinated Secondly, the effort has to be oriented to improved timing of yield and conservation of the water resource

The ability of the Forest to absorb and respond to increased future demand depends largely on the way watersheds are managed. Resource management activities will not be implemented where there is sufficient reason to believe the soil and water resource or beneficial uses of water will be significantly degraded, and State requirements for protection of waters are not met



FIRE

EXISTING CONDITION

Fire is a complex phenomenon with a natural role in the energy budget of many ecosystems. As human interactions with those ecosystems increase, the dichotomy of fire as a useful tool (prescribed fire) and a natural hazard (wildfire) becomes more intense. At one extreme is the seemingly unavoidable catastrophic wildfire. At the other extreme is the need for fire to play its natural role and for human beings to use it as an effective, economic management tool (Arnold 1972)

The fires that occurred in southwestern Oregon in the summer of 1987 are most noteworthy in context of the following However, for additional discussion and a specific update of the affected environment and changes in Forest conditions, see **1987 FIRES** section at the end of this chapter.

Fire Environment

The fire environment is defined by Countryman (1972) as the conditions, influences, and modifying forces that control fire behavior these include vegetation, weather, and topography The components of the fire regime, i e fire type, intensity, size, and frequency (Heinselman 1981), are dependent upon the fire environment In the Pacific Northwest, a broad range of fire environments and resulting fire regimes are present They range from ecosystems where fires are frequent but of low intensity (surface fires), to those where the frequency is low but intensity is high (crown or stand replacement fires), and some where fire occurrence is not significant (Agee 1981).

Only one factor of the fire environment, vegetation, is within the direct control of land managers It is the key factor in providing fuel for fire, determining conditions of fire hazard, and most immediately and directly affected by fire (Kozlowski and Ahlgren 1974). The other components of the fire environment, weather (climate) and topography, are beyond direct control. Climate and air mass characteristics are highly variable, and little can be done to modify them. Micro-climate, however, is strongly influenced by management activities which alter the vegetative cover. Topography is usually considered static

A key concept related directly to fire environment is that of "risk" and "hazard " These two factors serve as the link between the fire environment and fire regimes, and the fire management program on the Siskiyou National Forest In fire management terminology (USDA 1979b), "risk" and "hazard" are defined as follows: Risk is "the chance of fire starting as determined by the presence and activity of causative agents." The two causative agents present are human activity and lightning. Hazard is "a fuels complex defined by kind, arrangement, volume, condition, and location that forms a special threat of ignition or of suppression difficulty." The hazard presented by fuels on the Forest is the result of resource management activities, previous fire suppression, fire exclusion policies, and natural disturbance events (e g , wind, insect, disease, and wildfire).

The natural fuels on National Forests in Oregon and Washington have been classified by Dell (1980) using Kuchler's Potential Vegetation Types He identified five vegetation types on the Forest, two of which are found only on the Siskiyou National Forest The vegetation on the Forest has been identified in greater detail by Atzet and Wheeler (1984) Eleven plant series with over 90 plant associations have been identified

Three broad fire environments can be used to characterize the Forest Fire Environment A is influenced by coastal fog and tends to be cool and damp relative to the other two fire environments Also, it tends to have more rugged terrain without significant topographic relief when compared to the others. The fuels complex is dominated by the Western Hemlock Series (Atzet and Wheeler 1984) and is characterized by heavy fuel loadings, particularly in the larger diameter classes The fuels are best represented by National Fire Danger Rating System fuel model G (Bradshaw and others 1983, Deeming and others 1977)

Fire Environment B can be characterized as warm and damp. The fog influence in this zone is much less than in A, and the topography is less rugged The fuels complex is dominated by the Tanoak Series This complex is characterized as having a live fuel ladder with only light to moderate amounts of fuels accumulations because of rapid decomposition Some large fuels are associated with the conifer component of this series Fuel models F and G provide the best broad-scale representation of the fuels complex in this zone.

Fire Environment C is warm and dry as it is located in the rain shadow, east of the crest of the coastal mountains. The topography is similar to that of B but with greater topographic relief The fuels complex is dominated by the White Fir and Douglas-fir Series. Large fuels, a good fuel ladder, and an accumulation of fine fuels and surface litter characterize the Douglas-fir Series. The White Fir Series has only limited large fuels, but does have an excellent fuel ladder and some accumulation of fine fuels and surface litter. Fuel models F and G also provide a good representation of the fuels in this particular fire environment.

Relative to fire environments throughout the remainder of the Pacific Northwest Region, the Siskiyou National Forest can be classified from warm and dry, to hot and dry.

Natural Role of Fire

Fire has always been an integral part of the forest environment of North America (Wilson and Dell 1971) It has been recognized as an agent of change in forest ecosystems (Omi and Laven 1982) The degree of change generated by fire is highly dependent on the intensity and duration of the fire, the return frequency, and the extent of the area burned

Fire has interacted with Pacific Northwest forests for thousands of years (Agee 1981) While we are aware of the influence of fire on local forest structure, species composition, species diversity, and nutrient cycling, little is known of the local pre-1800 fire regime and, therefore, of the natural role of fire on the Siskiyou National Forest Atzet and Wheeler (1982) report that detailed fire history studies have been completed in many areas of the Pacific Northwest, but that southwestern Oregon has been virtually ignored. Moreover, the uniqueness of the environment and vegetation in the area precludes extrapolation of results from other areas.

From the mid-1800's through the early 1930's, white settlers had a tremendous influence on the frequency of wildfires During that period, many areas on the Forest under-burned, on the average, every 20 years. This is most noticeable in the white fir and Douglas-fir plant associations. These frequent, low-intensity surface fires eliminated much of the natural fuel accumulations and understory vegetation. The fire prevention and suppression efforts, beginning in the early 1900's, reversed this trend. As a result of fire exclusion, the natural species composition in the local forest ecosystems is changing and the fuels complexes are becoming more flammable. White Fir, for example, is currently replacing Douglas-fir over large areas of the Forest Similarly, fire-dependent species, such as kalmiopsis (*Kalmiopsis leachiana*), are slowly being relegated to subordinate positions in their respective ecosystems And, the area of meadow habitat has decreased by at least one-third in the last four to five decades.

More long-term fire patterns have been tentatively recognized. Catastrophic or stand replacement wildfires seem to occur, on the average, at 200-year intervals in Fire Environment A and parts of B. These extensive, high intensity burns are associated with the natural fuels buildup in old-growth Douglas-fir stands, drought conditions, and "east wind periods" which are characterized by very low humidities and strong winds The conditions leading to the 1987 fires exemplify this Historically, the ignition source was lightning and prehistoric inhabitants, since the early 1800's the influx of settlers has altered the ignition sources.

Fire frequency of 70 to 100 years seems to occur in the southern part of Fire Environment B. Even shorter intervals, 50 years in white fir and 20 years in Douglas-fir, seem apparent in Fire Environment C.

Forest Wildfire History

Southwestern Oregon and the Siskiyou National Forest have a long history of major wildfires (Pyne 1983, Haefner 1975; Cooper 1939, Morris 1934) Long summers, high to extreme fire weather conditions, east wind periods, lightning, steep terrain, heavy fuel loading, and limited ground access were all factors involved in the catastrophic wildfires of the past, and they are all relevant today. Some significant fire seasons on the Forest since its establishment in 1907 include 1917, 1918, and 1987 when 179,000, 152,000, and 112,000 acres, respectively, were consumed by wildfire Other major years include 1910, 1915, 1924, 1929, 1931, and 1932, when 20,000 to 40,000 acres were lost annually to wildfire. In 1938, 50,777 acres burned.

During the 1970's, the Forest experienced 495 fires which burned 2,884 acres. This represented a sharp increase in fire activity over the previous 30 years The trend in burned acres, however, has been downward over the last 50 years. A summary of the fire activity for the 1930 through 1970 decades is presented in Table III-13 A detailed analysis of fire activity from 1970-1979, by fire management analysis zone (see Figure III-11), is presented in Table III-14

Table III-13. Summary of Fire Activity by Decade for the Period 1930 through 1979

Decade	Lightning Fires	Human-Caused Fires	Total Acres Burned
1930	114	623	153,822
1940	179	96	4,893
1950	165	114	5,805
1960	124	153	4,601
1970	140	355	2,884

NOTE: The acres protected by the Forest Service have decreased from 1,539,461 (1936) to 1,105,178 (1979).

Table III-14 Summary of Fire Activity and Acres Burned by Wildfire For the Years 1970 through 1979 by Fire Management Analysis Zone

	Lightning		Human-Caused		Total	
Fire Management Analysis Zone	Fires	Acres	Fires	Acres	Fires	Acres
1	5	10	29	49	34	59
2	5	2	142	1,486	147	1,488
3	126	32	148	125	274	157
4	3	0	6	24	9	24
5	1	0	30	1,156	31	1,156
Total	140	44	355	2,840	495	2,884

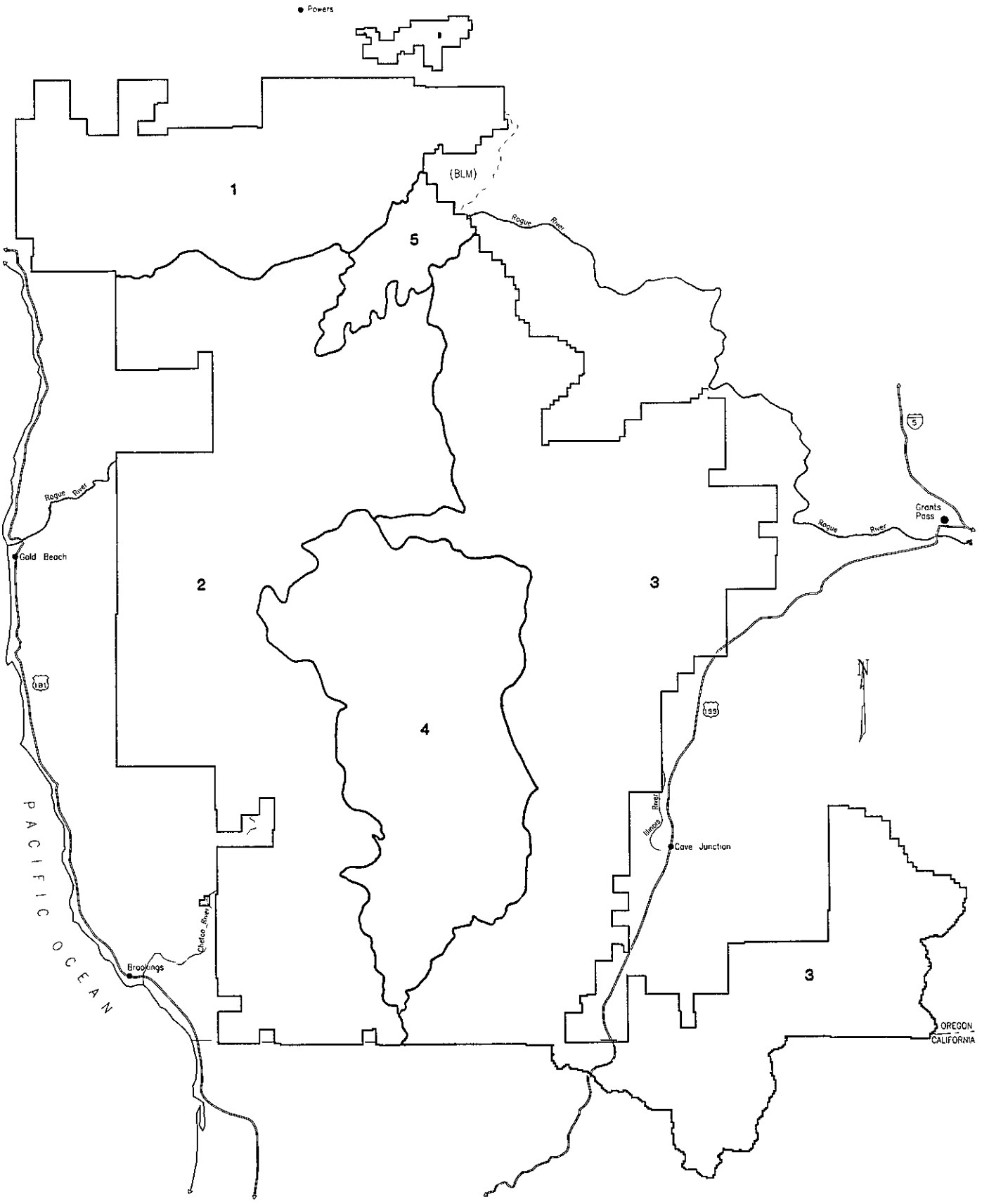


Figure III-11. Fire Management Analysis Zones Map

Wildfire Suppression

Historically, the Forest's fire management policy has been to aggressively attack and extinguish all fires as quickly as possible, regardless of vegetative type, fuel loading, burning conditions, resource values, or management objectives This policy is currently evolving to one which stresses a cost-efficient fire suppression action based on resource values and management objectives

In many locations, other Federal or State-protected lands lie within or adjacent to National Forest System land The Forest has entered into fire protection agreements with the Oregon Caves National Monument, Oregon State Department of Forestry, Coos Forest Protective Association, and the California Department of Forestry (with their respective cooperators) for fire protection. These cooperative and mutual-aid agreements are within the same context as National Forest System policy These agreements provide for the sharing of trained personnel and equipment for initial attack and support purposes for up to 24 hours at no cost to the benefiting agency. An average of 20 mutual-aid responses per year have been initiated by the Siskiyou National Forest in the past five years, with the number increasing yearly.

Prescribed Fire

Because of the importance of fire in the major ecosystems on the Forest, prescribed fire has traditionally been used for the removal of logging residues and the preparation of sites for reforestation after timber harvest In the past five years, it has come to play an important role in the hardwood site conversion program Annually, the Forest utilizes prescribed fire to treat an average of 3,800 acres. Hardwood site conversion adds an average of 200 acres yearly. Right-of-way burning and the burning of handpiles and decks adds another 1,000 acres annually Detailed accomplishments are presented in Table III-15

Table III-15 Prescribed Burning Accomplishments, 1970-1979

	Acres Burned		
Year	Logging Slash	Hardwood Conversion	Estimated Tons Consumed 1/
1970	1,369	--	--
1971	3,936	--	--
1972	4,798	--	--
1973	2,840	--	--
1974	1,345	--	--
1975	4,157	--	230,119
1976	4,700	13	353,707
1977	5,987	255	293,447
1978	5,623	439	363,973
1979	3,487	62	164,616

1/ Data extracted from the Oregon Smoke Management Plan Annual Report and does not include fuel consumed by prescribed fire on the California portion of the Forest

Prescribed fire has also been used to a limited extent in meadow and wildlife habitat management programs. It has yet to be used in the management of the array of natural fuel complexes on the Forest. The objective of this use would be to reduce the consequences of moderate and high intensity wildfires while meeting other resource needs

All prescribed burning operations are conducted under the Oregon Smoke Management Plan (OAR 629-43-043) which is promulgated by the Oregon Department of Forestry

CURRENT DEMANDS, WANTS, AND DESIRES

Early scoping identified several concerns among the public and local forest resource managers related to fire An expressed concern was for the potential of catastrophic fire being greatly increased if the Forest could not treat activity fuels and stay within economic and environmental guidelines

Management also expressed a desire that fire be used to both improve and protect Forest resources. Others have indicated the same desire, that fire be allowed to play out its natural role in various Forest ecosystems

ABILITY TO SATISFY DEMAND

The Forest has an array of skills and technology available to deal with the wants and concerns expressed about fire and the potential buildup of activity fuels. The timing and spatial distribution of activity units (e.g , timber harvest and thinning units), utilization standards, and prescribed fire are all tools and techniques that can be employed to meet the demands, wants, and desires expressed by the public and management relative to fire.

Cost of maintaining effective fire suppression forces increases as fuel hazards increase. Any wildland area protected from fire will have a set of probabilities on the occurrence of wildfires of various sizes and intensities (Zivnuska 1972). As fuel hazards increase on a yearly basis and fuel conditions become uniformly high, the probabilities of large intense wildfires increase If fire suppression is to be effective, an appropriate adjustment in the fire suppression forces must be made. Greater crew numbers, added air support, and more sophisticated equipment result in much higher costs which may not provide equivalent benefits

The careful timing, spatial distribution, and management of agency activities such as timber harvest, manual and chemical release, precommercial thinning, and wildlife habitat improvement projects can do much to improve the ability of the Forest to provide cost effective fire protection and reduce the risk of a catastrophic fire The timing, spacing, and treatment of fuels associated with these activities will create a mosaic of acceptable fuel profiles and greatly reduce the risk of a wildfire spreading quickly through vast acreages of highly flammable and continuous fuels The timing and spatial distribution of the agency activities must, however, be coupled with cost-effective fuels treatment before fire management efficiency is truly recognized

Increased utilization standards and opportunities would remove additional activity fuels or residues from the forest environment and greatly reduce the fire hazard Better utilization of forest residues depends largely on market conditions and the needs for raw materials (Wilson and Dell 1971) Costs of collecting, transporting, and processing forest residues in most situations would exceed the market value of the existing products (Henley and Clarke 1976). The only exception is in cases where residues can be removed from landings and transported 30 miles or less to markets (Marcus 1983).

Prescribed burning is an invaluable forest management tool (Resler 1976). It is an effective tool for insect and disease control, wildlife habitat improvement, and silvicultural treatments It has also been used successfully in southwestern Oregon for several years in site preparation and in reducing the fire hazard created by management activities which, if not treated, would remain a wildfire hazard for many years (Dell and Green 1968).

Presently there is no practice substantially equivalent to burning that achieves the major objectives of forest management and regeneration Options that could minimize the need for burning or mitigate its adverse effects include different methods of site preparation, planting, harvesting, and marketing (Marcus 1983)

Long-term studies in Oregon Douglas-fir stands have shown that the use of prescribed fire reduced the resistance to control for 12 years and reduced the estimated rate of spread for 16 years (Morris 1970). Estimates of this benefit are probably greater today, considering the effects of current utilization philosophies and fuel treatment standards

The use of prescribed fire is also an appropriate tool when restoring fire to its natural role in Wilderness ecosystems (Heinselman 1981). In Wilderness ecosystems modified by prolonged exclusion of fire, prescribed burning may be used to reduce fuel loading to natural levels, thereby reducing risks and effects of wildfire to acceptable levels. Risks and consequences of wildfire crossing into or out of the Wilderness would also be reduced. Actual ignitions may be on either a planned basis or from lightning, in either case they must conform to a detailed burning prescription which prepared prior to the ignition, identifies the conditions under which the prescribed fire will burn.



VEGETATION

EXISTING CONDITION

Vegetation on the Siskiyou National Forest occurs along complex environmental gradients that are related to geology, climate, and topography. Localized disturbances caused by storms, fires, and past grazing blur these "natural" patterns Consequently, it is often difficult to determine site potential or limitations.

The Siskiyou Mountains are rugged, steep, and very diverse geologically Parent rock varies from acid-igneous rocks, such as the granites common in the Grants Pass area, to infertile ultrabasic rocks, like the serpentines in the hills west of Cave Junction The area has been severely folded and faulted, creating new combinations of rocks that are scrambled into a jigsaw mosaic These highly variable rocks, and the soils developed from them, produce an extremely diverse substrata for vegetation.

The climate is recognizably different from the rest of Oregon. It is not consistently dry, like the east side of the Cascades, nor is it consistently wet as expected west of the Cascade crest. There is a mixture of both climates, including wide variation in temperature and precipitation. The major difference between the Siskiyous and the rest of western Oregon is the number of days without cloud cover and the accompanying high rates of evapotranspiration. High evapotranspirational demand is one of the most important factors limiting plant growth in the area.

This combination of climate, geology, and topography has produced such a mix of habitats that the Siskiyou National Forest supports both a large and complex set of ecosystems. This highly productive forest contains a set of biologically diverse plant communities not exceeded in vegetative complexity anywhere in the States.

SUITABILITY

Of the 1,092,302 acres of Siskiyou National Forest land, 624,240 acres are classified as tentatively suitable for timber production, as defined in 36 CFR 219 12 (b). The location of the various classifications of tentatively suitable land is displayed on Figure III-12. Table III-16 summarizes the suitable acreage for the Forest, and Figure III-13 provides a more detailed breakdown of the Forest acres by land types Many of the terms used in these tables are defined in the GLOSSARY. Refer to Appendix B for further discussion of suitability.

Table III-16 does not display the changes resulting from the Omnibus Oregon Wild and Scenic Rivers Act of 1988, nor adjustments in suitability resulting from the Silver Fire Recovery Project field inventory of 1987-88. The newly designated rivers cause withdrawal of 1,684 acres from the available land base due to "Wild Rivers" outside Wilderness. Most of these acres are either unsuitable for the production of timber or are overlapped by Management Areas 3-9. About 6,000 acres were found unsuitable following intensive field investigations of the Silver Fire. For this FEIS, land suitability is fixed as of 1984 for purposes of alternative comparisons. These adjustments would be applied to the alternative selected in the Record of Decision

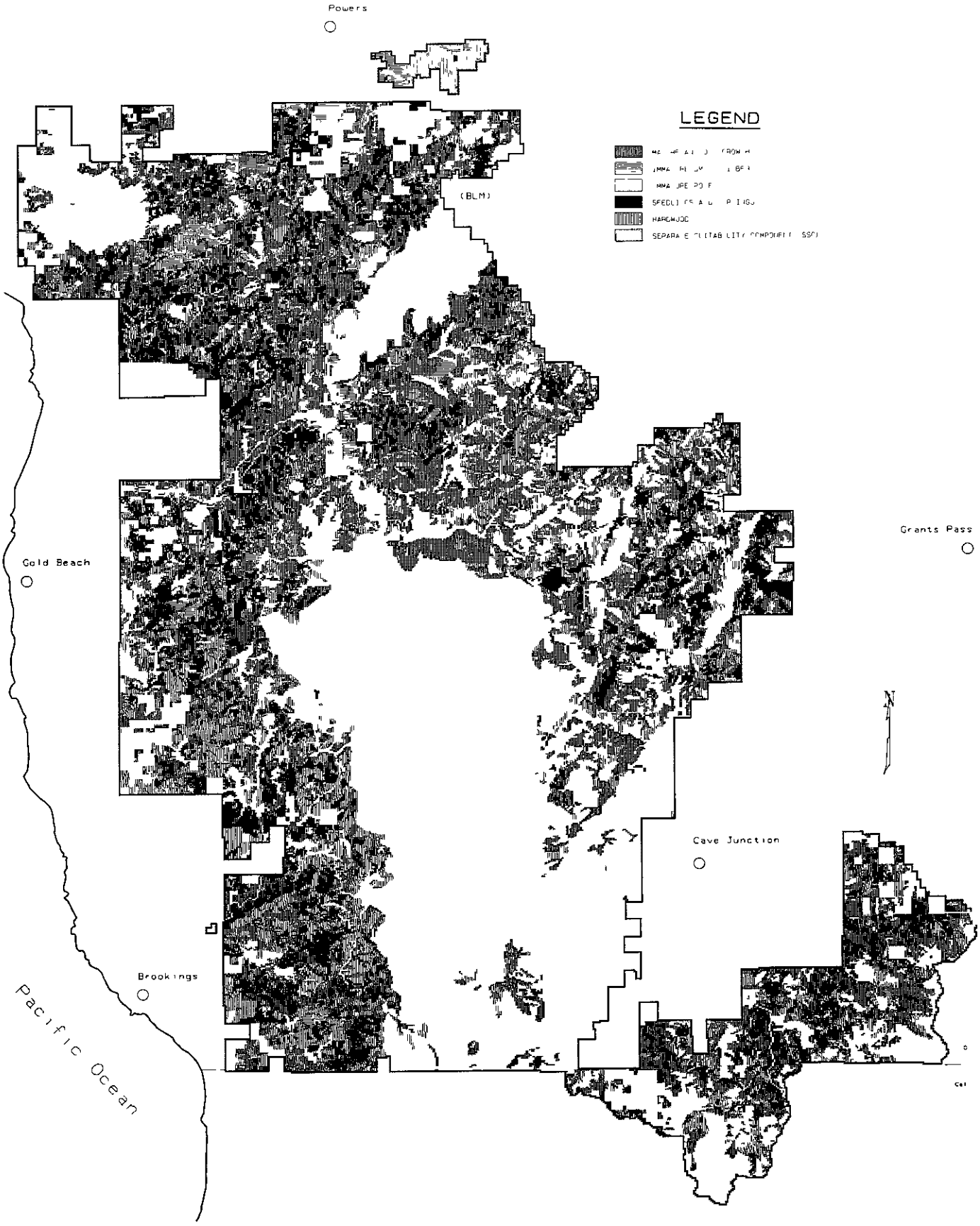


Figure III-12 Tentatively Suitable Timber Map

Table III-16 Siskiyou National Forest Land Suitability Summary

Land Status	Acres	Not Suited for Timber Production	Separate Suitability Component	Totals
Total National Forest Area				**1,162,030**
Other ownerships		**69,728**		
Net National Forest Area				**1,092,302**
Unavailable Forest Land				
Wilderness	**(232,495)**			
Kalmiopsis	(179,850)			
Wild Rogue	(26,708)			
Grassy Knob	(17,200)			
Red Buttes	(3,414)			
Siskiyou	(5,323)			
Research Natural Areas	**(1,957)**			
Coquille River Falls	(501)			
Port Orford Cedar	(1,120)			
Wheeler Creek	(336)			
Botanical and Wild River	**(Net 3,110)**			
Botanical Areas	(Net 1,067)			
Big Craggies	(3,803)			
Babyfoot	(352)			
York Creek	(320)			
Wild Rivers 1/	(Net 2,043)			
Rogue	(5,226)			
Illinois	(9,275)			
SubTotal		**237,562**		
Net National Forest Area Available				**854,740**
Non-Forest Land				
Water	1,570			
Stocked <10% tree cover	36,412			
Administrative sites/roads	16,950			
SubTotal		**54,932**		
Forested Land				**799,808**
Unsuitable Forest Land				
Irreversible Soil Damage	22,206			
Regeneration Difficulty	153,362			
SubTotal		**175,568**		
Land Tentatively Suitable for Timber				**624,240**
Land Growing <20 Cu.Ft./Acre/Year			**18,713**	**605,527**
Current Timber Management Plan		**227,142**		**574,602**

1/ Rivers designated by Omnibus Oregon Wild and Scenic Rivers Act, 1988, are not included

Land Types	Acres	Land Types	Acres
Tentatively Suitable for Timber (57%)		**Non-Forest Land (5%)**	
Mature	305,743	Non-Forest	36,412
Immature-Small Timber	20,422	Water	1,570
Immature-Poles	93,994	Roads	13,789
Seedlings and Saplings	137,604	Administrative Sites	3,161
Hardwoods (Nonstocked)	47,764		
Separate Suitability Component (SSC)	18,713		
Total	624,240	**Total**	54,932
Unavailable Forest Land (22%)		**Unsuitable Forest Land (16%)**	
Wilderness	232,495	Irreversible Soil Damage	22,206
Wild Rivers	2,043	Regeneration Difficulty	153,362
Research Natural Areas	1,957		
Botanical Areas	1,067		
Total	237,562	**Total**	175,568
		Grand Total	1,092,302

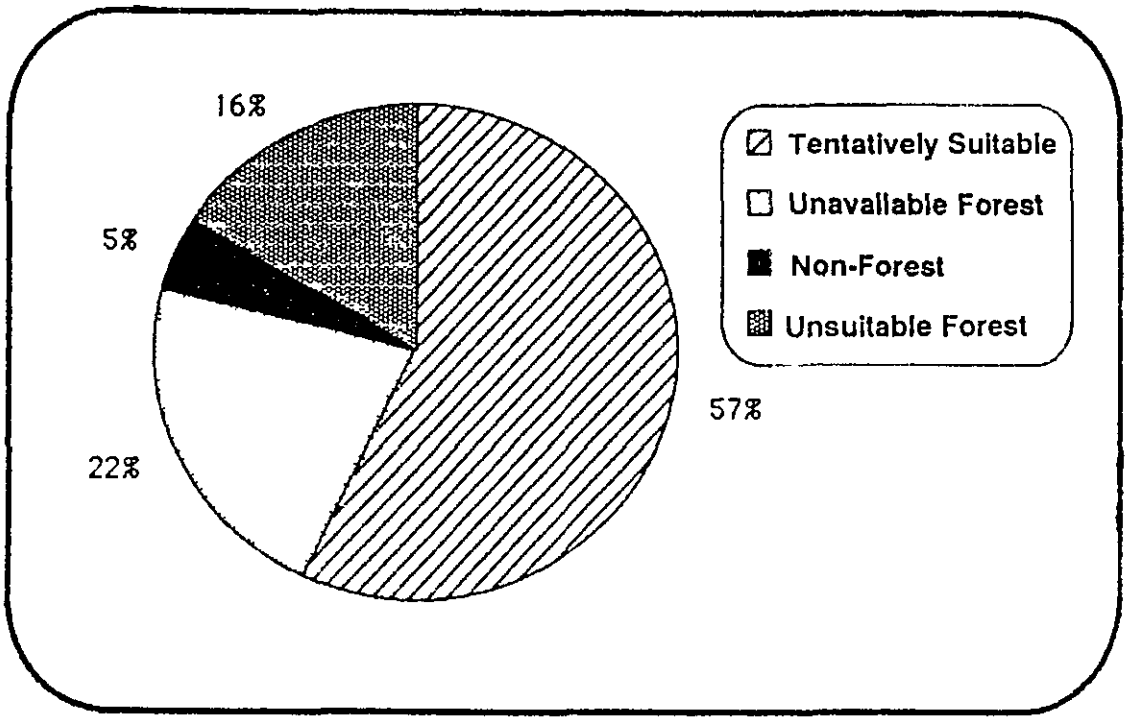


Figure III-13. Land Types

ROLE OF FIRE

Before the Indians, settlers, miners, and ranchers learned to use fire for clearing the forest, lightning-caused fires commonly performed that task. Natural fires were frequent enough to consume accumulated fuels before they built to a level that would sustain a major forest fire Most burned young trees and understory vegetation. This "natural" fire regime was prevalent during the evolution of many plant species and consequently some became "fire dependent." For example, Douglas-fir relies on fire or other disturbance to eliminate its more shade-tolerant competitors such as white fir Similarly, redwood tolerates fire, but tanoak succumbs Redwood depends on the help of fire to dominate and reproduce on sites where tanoak is the climax species.

The natural fire regime varies greatly in the Siskiyous. The coastal side is characterized by infrequent but relatively intense fires that have produced hardwood-dominated stands. The inland side is similar to the east side of the Cascades where fire is frequent, but of low intensity Low intensity fires generally change species composition and eliminate, temporarily and/or locally, some soil pathogens Fire suppression efforts in the last half century have played a major role in reducing many populations of fire-dependent plants, causing overstocking of some sites, and allowing fuel levels to build and stand health to decline

Local fire history is the key to understanding present age-class structure and successional stages on the Forest. Most of the Douglas-fir dominated stands were established as a direct or indirect result of burning. Many of the 70- to 170-year-old age classes are on sites burned by settlers and miners. Because the intent was to burn off as much of the vegetation as possible, these burns were often more intense than natural fires; many were ignited during the driest, hottest weather. The older age classes in these fire-generated stands are now declining in vigor and being replaced by more tolerant species, such as tanoak on the coastal side and white fir inland.

As succession toward climax occurs (climax is the end point of stand development where productivity equals decomposition and stand structure and composition are relatively static), much of the forest will be dominated by white fir and tanoak. This will occur providing the effects of fire are minimized and there is no interruption of natural succession by man. Whether species are successional such as redwood, Douglas-fir (on some sites Douglas-fir may be climax), and ponderosa pine, or climax such as tanoak, white fir, and western hemlock, some form of management will be necessary for their maintenance. Otherwise, wildfire will be the determinant of the composition and structure of the forest.

When fire is the major disturbance, it directly affects the health of a stand by eliminating or setting back susceptible species and leaving more resources for the survivors. Their general vigor improves and they become less susceptible to insect attack. Fire also often reduces the populations of soil pathogens, usually favoring the pioneer species For example, fire eliminates damping-off disease that attacks redwood seedlings

Ecosystem health seems to be the result of two opposing forces. One force tends to stabilize the site by keeping species composition and stand structure the same over long periods of time. Climax species tend to dominate where disturbances are infrequent In such cases, pioneer species (those that tend to invade after a disturbance) would be reduced or eliminated. On the other hand, nature consistently introduces disturbances that assure the continued existence of the pioneers. Thus, the forces of nature maintain a diversity of both pioneer and climax species to assure the health and potential of the system regardless of the severity of the disturbance.

SPECIES DIVERSITY

There are a number of issues related to the diversity of species, or species composition of the forest or site. For example, the viability of sensitive plants, the availability of commercial conifers, and the management of redwood are issues related to the variability of species rather than the variability in seral

stages or age class Some issues are related to both species composition and age class distribution. The issue of hardwood conversion is an example The Forest is concerned with the diversity of both rare and common species Rare species, endemics or species at the limits of their range (Brewer spruce and redwood, respectively), are often managed through land allocations such as Research Natural Areas and Botanical areas Maintaining the diversity of the more common species is accomplished by Standards and Guidelines. Both rare and common species are monitored

Meadows

Most meadows on the Forest are climax to tree species. Many were burned by the Indians to provide hunting grounds and later by ranchers to maintain forage for game and stock The meadows provide edge (the transition from forest to meadow) for wildlife species, and a concentration of grass species They are now gradually returning to forest

Sensitive Plants

A plant classified as sensitive generally (1) needs special habitat; (2) is at the limit of its range and is only locally rare, or (3) can survive on a variety of habitats, but has a limited range The Siskiyou National Forest has all three types. The Forest Service is particularly concerned about endemics and species requiring special habitat (Webb 1988). The objective is to maintain the genetic diversity and viability of all species, but endemics may require special consideration

To maintain diversity and viability, some species (such as *Kalmiopsis leachiana*) require disturbance; others require protection (like *Darlingtonia Californica*). Requirements for many sensitive species are still unknown, more information is needed to understand their population dynamics. Many sensitive plants are in areas where no activities will take place, as such, options for maintaining population viability remain open Some sensitive species which occur in General Forest may actually benefit from timber harvest activities; reproduction is stimulated. However, if management activities are detrimental, sensitive plants are protected from significant reduction by Standards and Guidelines A more detailed discussion of sensitive plants can be found in the **SENSITIVE PLANTS** section of this chapter

Botanical Areas and Research Natural Areas

Both Botanical and Research Natural Areas help maintain species diversity on the Forest. For a detailed discussion of these important areas, refer to the **SENSITIVE PLANTS** section

Riparian Areas

From a vegetative standpoint, riparian sites are unique They are moist habitats surrounded by moisture-limited systems. The complement of species near the water's edge is usually quite different than the adjacent area. There is often more structural diversity, and the age-class distribution is usually more complete They have some of the oldest trees because fire is often less influential than erosional processes as the cause of vegetational changes. Younger trees are in the newly flooded or recently eroded areas; the older trees are scattered throughout

Hardwoods

Hardwood species include tanoak, Pacific madrone, red alder, manzanitas, canyon live oak, Pacific rhododendron, golden chinquapin, and various others. There has been little commercial market for these species, although some tanoak and red alder have been harvested for pulp Most of the hardwoods are cut by local residents for firewood

Some hardwood sites are climax to tanoak, others are climax to western hemlock, white fir, or Douglas-fir Those on the southern coast of Oregon are generally climax to tanoak and will, therefore, remain as such

unless converted to an early seral stage and regenerated with coniferous species. These sites are productive sites. Their potential to produce timber is usually high, and they are prime areas for many species of wildlife Sites climax to western hemlock are also productive, but they will gradually and naturally return to western hemlock They are most common on the north end of the Forest

Inland hardwoods are quite different. They are usually dominated by seral hardwoods such as Pacific madrone, golden chinquapin, and tanoak. They are climax to white fir on the better sites, and to Douglas-fir on the less productive sites Most stands are in the mid-seral stages (70 to 120 years) and are only beginning to seed in with conifers.

Conifers

SPECIES COMPOSITION Coniferous timber is the most important commercial product on the Forest. The 1979 timber inventory indicates that 85 percent of the coniferous timber on the Forest is Douglas-fir. The remaining 15 percent is sugar pine, Port-Orford-cedar, redwood, western and mountain hemlock, Jeffrey and ponderosa pine, Shasta red and white fir, and minor amounts of other species. Brewer spruce, a species with a very limited range, is found at mid to high elevations on some parts of the Forest

SPECIAL MANAGEMENT CONSIDERATIONS. Three conifer species are currently given special management considerations. These include Port-Orford-cedar, redwood, and Brewer spruce.

1. Port-Orford-cedar (*Chamaecyparis lawsoniana*) occurs only in northwestern California and southwestern Oregon. This is somewhat surprising given the wide range of conditions under which the species occurs. Its habitat includes sand dunes along the the coast to elevations over 4,000 feet in the Siskiyou Mountains and interior valleys, and from swampy sites to dry rocky ridges, including serpentine soils. Some of the largest concentrations, and the largest tree of this species, occur on the Forest.

   Special efforts are made to plant Port-Orford-cedar on sites where they were harvested and sites where there is potential to grow them. The species is being monitored to insure it remains a viable species on commercial sites; seed is also being collected for reforestation.

   Two Research Natural Areas (RNA's) were established to provide examples of virgin old-growth Port-Orford-cedar. These are the Port Orford Cedar RNA (1,122 acres) established in 1937, and the Coquille River Falls RNA (500 acres) established in 1945

   Port-Orford-cedar root disease (*Phytophthora lateralis*) has been killing Port-Orford-cedar for more than 60 years The fungus was discovered in the Puget Sound area as early as 1922 and has since worked its way south, probably through movement of infected seedlings in the horticultural market. The disease was found in the Coos Bay area in 1952 and has since spread into the Forest through movement of the spores in mud on vehicles and hoofs of grazing animals. Primary areas of concern are roads and streams since resting spores are moved in mud and swimming spores are transported in water Specific management strategies for Port-Orford-cedar are displayed in the Forest Plan Standards and Guidelines These standards and guidelines are based on the Region Five-Region Six Port-Orford-Cedar Root Disease Action Plan of June 1988 which was developed through a concensus process (group) whose membership included industry, agency, environmental, and university personnel and citizens. Figure III-14 displays the areas of Port-Orford-cedar occurrence Also shown are known areas of root disease infection.

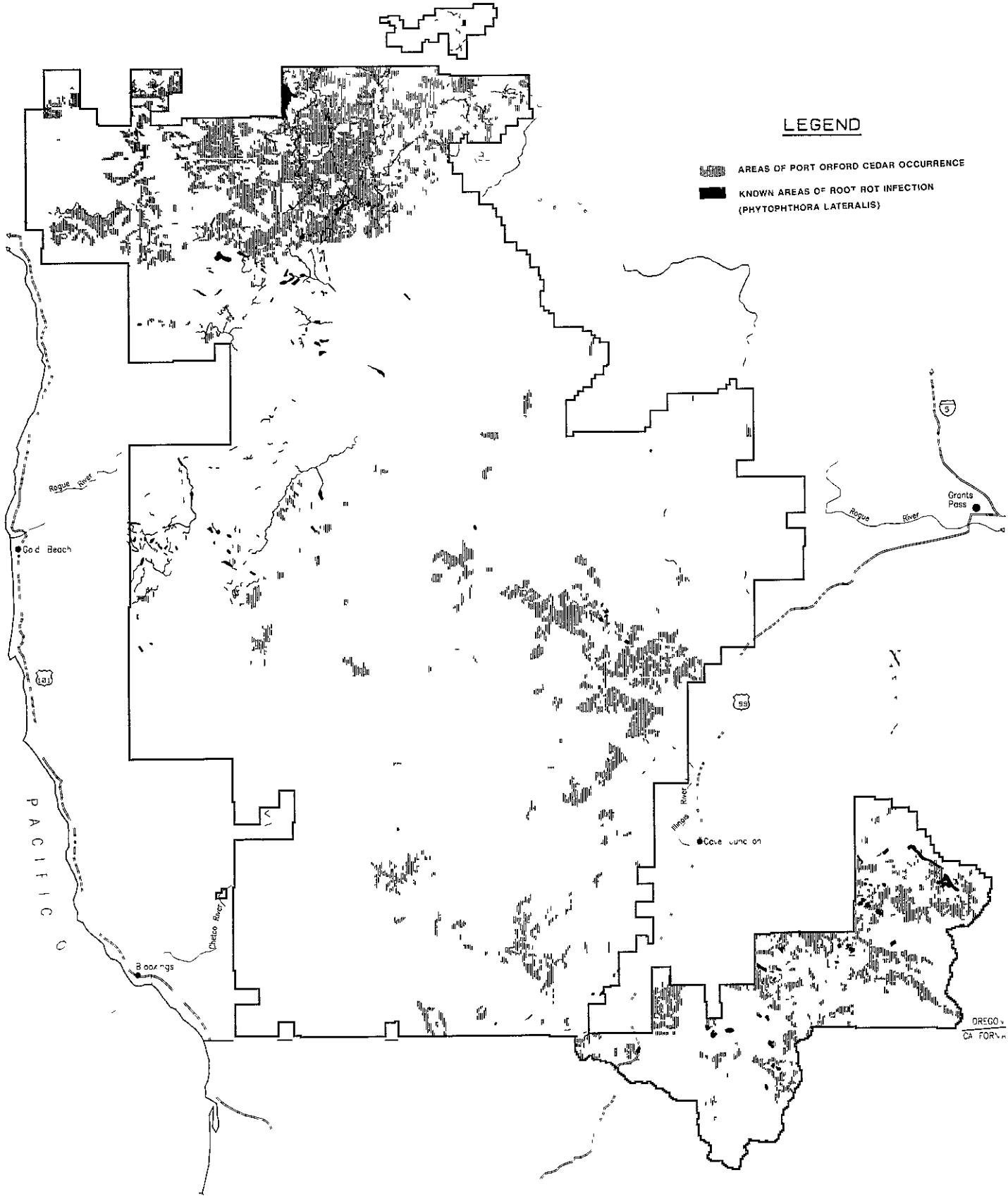


Figure III-14 Port-Orford-Cedar Occurrence and Known Areas of Root-Rot Infection Map

2 The range of redwood (*Sequoia sempervirons*) extends south along the coast from two stands near the Chetco River in southwestern Oregon to Monterey County, California. There are about 18,540 acres of the redwood type, or land capable of growing redwood, on the Forest Redwood is a major species on approximately 4,000 acres, approximately 1350 acres contain old-growth redwood. Though redwood has a much larger range than Brewer spruce or Port-Orford-cedar, it reaches its northern limits on the Forest

The Wheeler Creek RNA (334 acres) was established in 1972 specifically to preserve an example of redwood forest near the northern limits of its range. The 120-acre Chetco-Redwood Recreation Area also contains a stand of redwoods This property is an isolated parcel of National Forest land located adjacent to the Alfred A. Loeb State Park.

Special efforts are made to plant redwood on sites where they were removed and onto sites where there is potential to grow them The species is being monitored to insure it remains a viable species on commercial sites, seed is also being collected for use in reforestation. A Redwood Management Plan is available (Planning Records).

3 Brewer spruce (*Picea breweriana*) is found only in a few remote locations of southwestern Oregon and northwestern California The majority of Brewer spruce stands occur within National Forest boundaries, including the Siskiyou. The tremendous vegetational diversity and complexity associated with the occurrence of Brewer spruce magnifies the importance of this uncommon species (Amaranthus 1982)

Prospects for expanding the range of Brewer spruce are low. However, special efforts are made to plant Brewer spruce on sites where they were removed and where there is potential to grow them. The species is being monitored to insure its viability on commercial sites; seed is also being collected for use in reforestation

The Babyfoot Unusual Interest Area (Botanical) (352 acres) was established in 1963 to protect Brewer spruce and other rare plant species The Big Craggies Botanical Area (3,800 acres) was established in 1964, primarily to protect Brewer spruce and *Kalmiopsis leachiana*.

REFORESTATION. Since timber harvesting began on the Forest, approximately 100,000 acres have had a regeneration harvest. Of the total, about 99,300 acres meet minimum stocking levels. Stocking levels are 150 trees per acre for Site Class III and better, and 125 trees per acre for all other productivity levels. For additional details, a reforestation report (October 1988) is available in the Planning Records.

To determine whether the Forest is meeting its five-year reforestation objective, all harvested acres during the 10-year period 1974 through 1983 were tracked through reforestation. Each year's total acreage was tracked until all of that acreage was satisfactorily stocked. This analysis showed that essentially all acres regeneration harvested were successfully reforested within five years (27,322 acres were harvested; 163 acres were not satisfactorily stocked within five years).

Additional analysis of the reforestation program was done in regard to whether plantations contain unsatisfactorily stocked holes. For this purpose, a hole is defined as an area of one acre or larger that contained less than the minimum stocking level. An 18 percent sample of all plantations on the Forest was randomly selected and evaluated These plantations totaled 15,748 acres; of this total, 581 acres did not meet minimum stocking levels. These holes contain about 60 crop trees per acre and are 3.7 percent of the total sample. This is within the 10 percent adjustment for yield projections for holes created by unsatisfactory stocking, landings, and temporary roads.

AGE-CLASS DISTRIBUTION

The amount and distribution of seral stages, including early grass/forb stages, mature stages that provide timber products, and old growth that provides special habitat for a number of management indicator species, are issues related to the age class of the forest and its structure. The general forest will be in various stages that reflect the Forest's ability to provide for the wants and desires of Forest users.

Successional Stages

Vegetation on the Forest can be divided into a series of age classes, or successional stages, each with a specific vegetative character Seven stages have been categorized, from grass/forb to old growth Each age class is an important component of habitat diversity Young stages (0-10 years, low-growing vegetation) presently account for five percent of the Forest land base Mid-age stages (large shrubs to small trees, 11-100 years) account for 31 percent And, mature/old growth (101+ years) account for 41 percent

Other habitats are also important for maintenance of habitat diversity on the Siskiyou. Hardwood stands and brushfields account for 9 percent, serpentine sites for 14 percent, and cliffs/rock balds/talus for 1 percent of the Forest. Riparian habitat occupies 17 percent. A very small portion of the Forest is meadow habitat (316 separate sites comprising 6,677 acres). These successional stages and habitat types constitute existing habitat diversity on the Forest (Table III-17).

Old Growth

Old growth refers more to structural character than age. For example, many of the Jeffrey pine stands on ultrabasic parent rock are over 300 years old, yet they are not considered old growth The number of species, canopy structure, and the distribution and amount of woody material on the forest floor are the most important characteristics (see GLOSSARY definition) Old-growth and mature timber are well distributed throughout the Forest (Figure III-15) The coastal side and the northern half of the Forest has slightly more than the southern and eastern half

Table III-17. Successional Stages and Other Habitats (Private Land not Included) 1/

	Age (Years)	Acres	Percent
Successional Stages			
Grass/Forb 2/	0-3	20,000	2
Low Shrub	4-10	36,000	3
Tall Shrub	11-20	51,000	5
Pole/Sapling	21-40	101,000	9
Young	41-100	186,000	17
Mature	101-200	50,000	5
Old Growth	200+	393,000	36
Habitat Types			
Hardwood Stands		94,000	9
Cliffs, Rock Balds, Talus		11,000	1
Serpentine (scattered trees)		150,000	14
Totals		1,092,000	100

1/ Data primarily from ecoclass mapping project, 1978-79, some data from TRI data base and LIM System 175,500 acres (16 percent of the Forest) of riparian habitat is included as part of all types listed in the table Riparian habitat, as used here, is that land within 150 feet of the edge of Class I and II streams, and within 100 feet of Class III streams

2/ Grass/Forb stage includes 6,677 acres of meadows, otherwise, successional stages describe coniferous Forest land

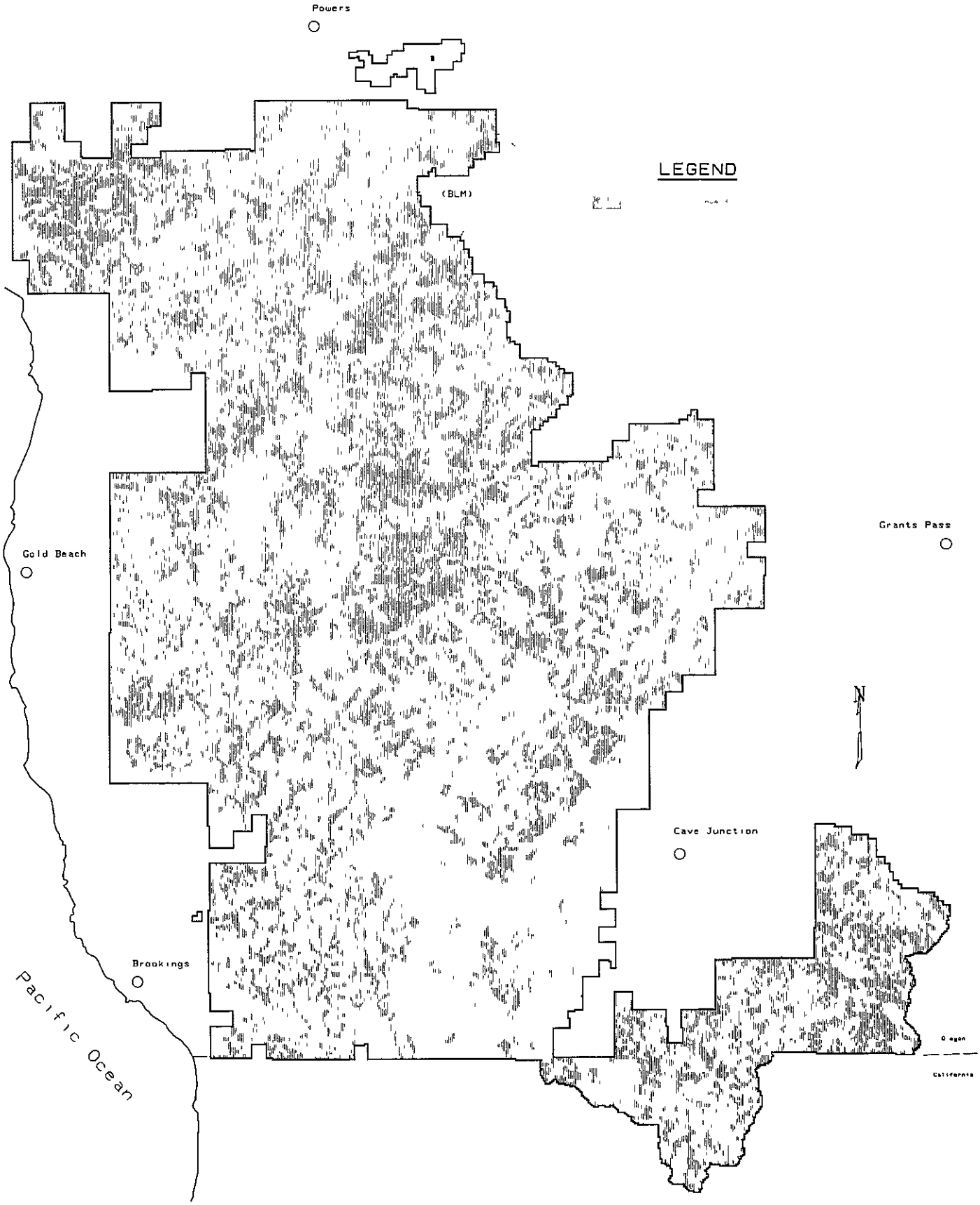


Figure III-15. Mature/Old-growth Forest Map

Although generally younger than old growth found in the Cascades, it is usually in better health. Most of the sites are in mid-seral stages and are not at high risk due to insects or fire Risk, though, increases with time. As these stands age, their character and health will change significantly. Management will be required to maintain old-growth character, or natural processes will prevail, i.e., fire, insects, or disease.

Existing inventory data indicate the Forest contains 443,000 acres of mature and old-growth trees. Wilderness areas contain approximately 95,000 acres (21 percent) of the mature and old-growth trees. Another four percent has been withdrawn from the Forest's suitable land base and placed in RNA's, Wild River corridors, and other land allocations with no programmed timber harvest Area currently unroaded is 28 percent (124,900 acres), most of these acres are tentatively suitable for timber production The remaining 208,000 acres, or approximately 47 percent of the total mature and old-growth acreage, is scattered throughout the Forest, and is mostly on lands tentatively suitable for timber production A new resource inventory scheduled to begin in 1990 will provide updated acreages

General Forest Allocation

General Forest is expected to provide the potential for timber products Age-class distribution is an important consideration, the ideal being a balance between young managed stands and mature stands. This distribution would provide a continuous flow of mature timber over the rotation. A diversity of age classes would also serve to reduce the risk of catastrophic losses from pests, disease, or other causative agents

General Forest also provides a great deal of species diversity and habitat in addition to timber products Over 500 species were found on 700 ecological plots. 35 species of trees, 86 shrubs, 362 herb, and over 50 grass or grass-like plants Most of these species remain even after harvest operations Dyrness (1973) reported that only 6 of 48 species were eliminated on the immediate site after timber harvest and site preparation activities. In fact, there was a net increase of 24 early seral species within the first six years after harvest. General Forest will continue to contribute to overall diversity regardless of age class or seral stage

The 624,240 acres of land tentatively suitable for timber production on the Forest contain a total standing inventory volume of 10,695 MMBF (2,090 MMCF) of conifer timber, and 1,279 MMBF (272 MMCF) of hardwood timber. This compares with a total standing inventory volume for all acres on the Forest of 15,486 MMBF (2,899 MMCF) of conifer timber, and 1,982 MMBF (427 MMCF) of hardwood timber (Table III-18). Percent Forest acreage by Timber Condition Class is represented in Figure III-16. Timber Condition Classes are mapped for tentatively suitable lands in Figure III-12.

Table III-18 Acreage and Volume by Timber Condition Class on Tentatively Suitable Forest Land

Timber Condition	Acres	Softwood Volume MMBF	Softwood Volume MMCF	Hardwood Volume MMBF	Hardwood Volume MMCF
Mature	305,743	8,696	1,549	613	111
Immature-Small Timber	20,422	584	127	37	8
Immature-Poles	93,994	1,118	253	210	47
Seedlings and Saplings	137,604	1/		1/	
Hardwoods (Nonstocked)	47,764	180	45	419	105
SSC 2/	18,713	117	26		
TOTALS	624,240	10,695	2,090	1,279	272

1/ Small Growing Stock
2/ Separate Suitability Component

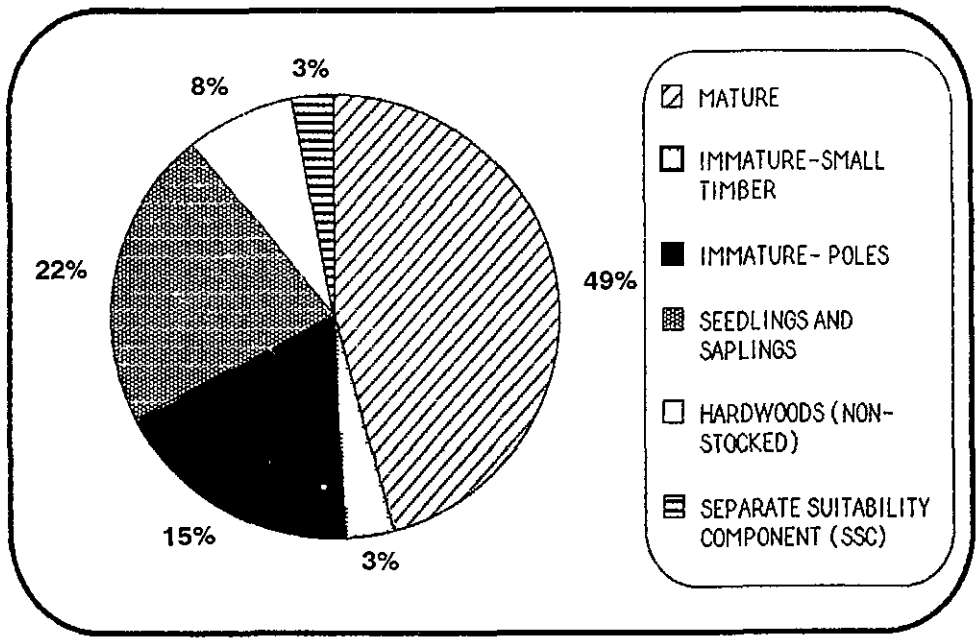


Figure III-16 Timber Condition Classes (Percent of Tentatively Suitable Forest Land)

CURRENT DEMANDS, WANTS, AND DESIRES

Public demands that relate to species diversity include the establishment of Research Natural Area, Botanical, and Riparian Management Areas. Maintaining the viability of sensitive plants, meadow maintenance, and conversion of hardwood areas are also part of diversity management. It is evident that most people want to maintain the Forest's species diversity Some want diversity perpetuated for research, others simply feel diversity is strongly tied to ecosystem health and its ability to respond to various needs, disturbances, or even changes in climate.

Demands associated with age-class distribution are the perpetuation of old growth and the provision for a sustained flow of managed age classes for timber harvest The separation of demands into those associated with diversity and age helps to categorize the problems, but the two concepts should not be considered as separate. Many species only do well in the environmental conditions accompanying certain seral stages, the diversity of species is linked to age diversity

ABILITY TO SATISFY DEMAND

DIVERSITY

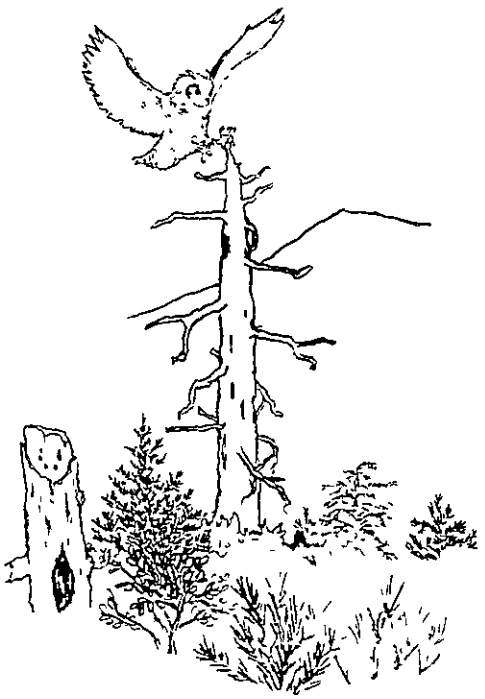
Biologically, the Forest is capable of maintaining the present complement of species, barring an extensive catastrophe. Land allocations may be key to maintaining viable populations of some plants, but the greatest need is for information on life cycles and environmental requirements of sensitive species and even some timber species. The use of "minor" species (less common trees in a forest stand) in forestry practices is becoming commonplace, but information on their performance is lacking. Harvested units are being planted with a species mix similar to preharvest conditions, but predicting yields in such mixtures is in its infancy

Allocations to Botanical, Research Natural Area, Special Wildlife Site, Designated Wildlife Habitat, and selected Supplemental Resource Management Areas all basically maintain plant or animal diversity. Wilderness, Wild Rivers, Unique Interest, Backcountry Recreation, Scenic and Recreation Rivers, Riparian, and Retention Visual Resource Management Areas are primarily allocated for other purposes, but, in essence, acres placed in these categories receive medium to low consumptive use Plants that thrive on infrequent disturbance will do well in these areas. Partial Retention Visual and General Forest, on the other hand, will be intensively managed Plants requiring disturbance will do well in both these areas If plants requiring infrequent disturbance are found here, they will be protected If plants requiring frequent disturbance are found in areas other than General Forest and Partial Retention Visual, a method of introducing disturbance in the proper frequency and intensity would be needed to assure total species diversity

AGE CLASS

Mature timber and old growth are well distributed throughout the Forest Both age classes are renewable. Mature sawtimber is being harvested and regrown, but there is a gap in age classes that must be considered if sustained yield is a goal and other resources are not sacrificed. Intensive silvicultural practices and allocation of resources to the better sites show promise for increasing future productivity and yield

While old growth will always be present on the Forest, individual stands cannot be sustained forever. Management can prolong their existence, but they will eventually have to be replaced Since structural characteristics, not age, are the primary value, it may be possible to develop stands with old-growth characteristics in less than the assumed 200 years It is becoming more common to leave shelterwood or seed trees for the next rotation rather than removing them after the new stand is established. These larger, older trees provide snags and large woody material needed for bird and small mammal habitat They also provide genetic and structural continuity between rotations.



SENSITIVE PLANTS

EXISTING CONDITION

The unique geologic and climatic history of the Siskiyou Mountains of southwestern Oregon and northwestern California is responsible for the evolution of a number of rare plants not found elsewhere The ranges of some of these plants are almost entirely within the Forest.

Two categories of rare plants receive special consideration from Siskiyou National Forest land managers:

1. Federally listed or proposed endangered or threatened species must be protected from adverse impact (presently, none known on the Forest).

2 Regional Forester identified Sensitive species are those plant species for which viability is a concern, as evidenced by (a) significant current or predicted downward trends in population numbers or density, or (b) significant current or predicted downward trends in habitat capability that could reduce a species' existing distribution The Forest harbors 64 sensitive species, and an additional 30 may occur here

Ten other species are potential candidates for the Regional Forester's list of sensitive plants (nine are known to occur on the Forest) Management of sensitive species is closely coordinated with the Oregon Natural Heritage Data Base (ONHDB 1985) and the California Native Plant Society (Smith and York 1984).

The Forest also manages endangered, threatened, or sensitive plants in accordance with Oregon's Endangered Species Act of 1987 (ORS 496 004, 498.026, and 564.040), and California's Endangered Species Act (1984 amendments) and Plant Protection Act (1977)

Common and scientific names of all rare plants are listed in the current *Status List of Endangered, Threatened, Sensitive and Rare Plants on the Siskiyou National Forest* (USDA 1988a) Various plant lists are described in Appendix F. *A Guide to Sensitive Plants of the Siskiyou National Forest* (Webb 1988a) and the *Guide to Common Forest Plants Rogue River, Siskiyou, and Umpqua National Forests* (Wheeler and Atzet 1985) are used by Forest Service employees and volunteers to identify sensitive plants in the field.

Four indicator habitats for sensitive plants are designated in the Forest Plan: (a) open slopes, fields, meadows, (b) dry rocky places, serpentine/nonserpentine, (c) moist rocky places; and (d) bog and wet/moist places, with serpentine and non-serpentine subgroups. Indicator habitats will be monitored during the life of the Plan to document any changes in sensitive plant populations. See Appendix F and the **MONITORING AND EVALUATION PLAN** in Chapter V (LRMP) for more detail.

BOTANICAL AREAS

Concentration areas of rare plants occur frequently on the Forest Botanical areas are allocated to provide protected habitat for a species or a combination of species, including rare and sensitive plants. An area's ability to support a diversity of species is directly dependent on the variability of their environment. The likelihood of variation is somewhat dependent on size. Generally, the larger the area, the greater the diversity until a point of diminishing returns occurs, where more area does not "mean" more diversity.

One strategy to maximize diversity and capture the integrity of specific sites is through land allocations. Generally, many small scattered areas are more efficient than a few large areas To include the widest variation in environments, sites should be selected from both sides of the coastal crest, from low and high elevations, and include a variety of parent rock Existing and potential Botanical areas represent a variety of environments, but many are restricted to serpentine soils Figure II-6 shows the location of these areas on the Forest. Each of the existing and proposed Botanical Areas is detailed in Appendix F.

Existing Botanical Areas

The Forest contains three existing Botanical areas totalling 4,475 acres Of these acres, 3,401 acres (or 76 percent) are within the Kalmiopsis Wilderness. Sensitive plant species are present in all three areas The 352-acre Babyfoot Unusual Interest Area (Botanical) was established in 1966 to protect Brewer spruce and other rare plant species The 3,803-acre Big Craggies Botanical Area was established in 1964, primarily to protect Brewer spruce and *Kalmiopsis leachiana*. The 320-acre York Creek Unusual Interest Area (Botanical) was established in 1966 primarily to protect an extensive patch of *K leachiana*

Potential Botanical Areas

Two types of potential Botanical areas have been identified· (1) those designed to protect sensitive plants, and (2) those designed to preserve outstanding examples of old-growth stands (very large, old trees)

1. **Sensitive Plant Botanical Areas**. There are 19 potential Sensitive Plant Botanical areas (35,596 acres) identified throughout the Forest. Eight Dollar Mountain is probably the best known site. Over 20 sensitive plants are present (almost one-third of those known to be on the Forest); this same assemblage is not known to be present elsewhere (as a group). Sensitive species are located on both bog and dry sites at a variety of locations, the largest Darlingtonia bogs on the Forest are within the Eight Dollar Mountain site. This site has been continually botanized since the 1880's, and is of much historical interest in regard to early-day botanists. A number of species were first collected in this area. Another outstanding example is the Bigelow Lakes site. A large variety of sensitive species are present Some plant species are at their most northern or western limits This concentration of plants is not known elsewhere on the Siskiyou or adjacent National Forests

2 **Old-growth Botanical Areas** There are five potential Old-growth Botanical Areas (1,321 acres) on the Forest The best example is the Lobster Grove site which is dominated by very large Douglas-fir *(Picea breweriana)* and Port-Orford-cedar, some approaching 8 feet in diameter There are also outstanding examples of large tanoak, Pacific madrone, and Oregon myrtle (the world's largest myrtle tree is located within the Grove).

RESEARCH NATURAL AREAS

Research Natural Areas (RNA's) are allocated for research and education These ecosystems are unaffected by man and are intended to be baseline representatives for the study of natural processes and the maintenance of gene pools Representatives of both rare and common ecosystems are included. A system of RNA's has been set up throughout the Pacific states to preserve representatives of plant communities Many plant communities are not yet represented by RNA's. The present representation of cells (ecosystems, species, or special areas earmarked for inclusion by the RNA Committee) falls short of the Committee's recommendations for this Forest The Siskiyou presently has three RNA's Four additional RNA's have been proposed by Forest Service researchers and others for inclusion into the RNA system (Dyrness and others 1975) See Appendix F for more detail on individual areas

Existing Research Natural Areas

Three RNA's (1,957 acres) exist on the Forest The Port Orford Cedar RNA (1,120 acres) was established in 1937, it contains six plant communities (cells) not represented in other RNA's. Most of the RNA is covered with old-growth Port-Orford-cedar and Douglas-fir. Although ages are not accurately known, many of the dominant specimens are undoubtedly 400 to 500 years old. The Coquille River Falls RNA (501 acres), established in 1945, contains two plant communities It was established primarily to provide examples of virgin old-growth Port-Orford-cedar. Both RNA's with Port-Orford-cedar have been infected since about 1967 with Port-Orford-cedar root disease, an introduced pathogen The ability of the RNA's to retain Port-Orford-cedar is receiving much attention The Wheeler Creek RNA (336 acres) was established in

1972 to preserve an example of redwood forest near the northern limits of its range This RNA contains three plant communities

Potential Research Natural Areas

Ecologists have identified four sites on the Forest suitable for establishment of new RNA's Hoover Gulch, Lemmingsworth Gulch, Cedar Log Flat, and Craggy Peak (Figure II-5) See Appendix F for detailed descriptions. Hoover Gulch (1,292 acres) contains three plant communities (cells) not represented in other RNA's. Lemmingsworth Gulch contains eight plant communities on 965 acres. It is marked by a sharp contrast between geologic substratum which results in a dramatic contrast in vegetation types, including seven sensitive plant species. Cedar Log Flat (441 acres) contains 10 sensitive plants and one plant community type (Jeffrey Pine-Grass at low elevations) The Craggy Peak site contains six plant communities. Two plant communities on 100 acres occur in the Siskiyou portion Another 1,100 acres, containing the remaining four plant communities, are located on the adjoining Rogue River National Forest.

CURRENT DEMANDS, WANTS, AND DESIRES

Three Planning Problems, which reflect current demands, pertain to management of sensitive or unique plant resources.

2. "How Much Old-Growth Forest Should Be Preserved?"

Some people have expressed a desire to preserve unique stands of old growth in various locations in the general forest. They feel these areas should be set aside for purposes of study, and aesthetic and biological diversity values.

5 "How Should Sensitive Plant Resources Be Managed?"

Approximately 40 percent of the Forest is habitat for sensitive and rare plants. The large variety of plants present has generated considerable local, state, and national notoriety Citizens interested in the botanical resources of the Siskiyou National Forest (including RNA's) feel that unique concentrations of rare plants should be protected from detrimental change There is concern that some sensitive plant areas could be overused. A decision can be made to either ignore sensitive plants and their habitats, or manage these resources to protect their inherent values.

9. "How Should Mineral Resources of the Forest Be Developed in Coordination With Management of Other Resources?"

Some citizens are concerned that protection of botanical resources may have a detrimental effect on mining operations (and to a lesser extent, timber).

ABILITY TO SATISFY DEMAND

2 "How Much Old-Growth Forest Should Be Preserved?"

Five sites (total acreage 1,321) have been identified which contain outstanding examples of old-growth stands (very large, old trees). Some or all of these sites can be excluded from timber harvest through land allocations such as Botanical Management Areas, or they can remain as areas which will eventually be harvested.

5 "How Should Sensitive Plant Resources Be Managed?"

Nineteen potential Sensitive Plant Botanical areas have been identified along with four potential RNA's (all containing sensitive or rare species). Potential Botanical areas total 36,917 acres, proposed RNA's total 2,799. These sites can be individually allocated as Botanical areas or RNA's, or the sites can retain their present land allocation status If, in the future, new data on plant habitat requirements show a need for increased allocations of certain types of habitat, the Forest will have the ability to make those allocations for at least the next two decades, and possibly longer.

Standards and Guidelines can be developed to manage (protect, enhance, and rehabilitate) sensitive plant resources Forest wide. Special precautions can be taken in layout of timber sales and location of roads to make sure the needs of sensitive species are met Vegetation management activities can be altered or avoided in areas where sensitive species are known to exist In some cases, individual management plans can be devised for specific species, such as *Bensoniella oregana*, a plant which could be heavily impacted by timber management activities More intensive inventories can be conducted in sensitive plant concentration areas; intensive surveys can be made for specific sensitive species Capital investments can be made to improve habitat for sensitive species.

9 "How Should Mineral Resources of the Forest Be Developed in Coordination With Management of Other Resources?"

The Forest Service has the opportunity to work with mining interests to design, prescribe, and recommend ways to prevent resource damage to sensitive plant habitats Areas with significant sensitive plant values may be withdrawn from mineral entry. Restrictions (high, moderate, or low) on mineral extraction activities can be developed to protect sensitive plant resources. Standards and Guidelines can be developed to provide basic management direction for conservation of sensitive plants



AIR QUALITY

EXISTING CONDITION

Air quality degradation from forest fires has been an output of natural ecosystems for thousands of years, cycling carbon and other materials into the atmosphere (Komarek 1970). Forest fires, along with natural hydrocarbon emissions from plants and emissions from volcanic eruptions, are major sources of natural air pollution (Pecora 1970, Went 1960). During 1984, wildfires accounted for about 13 percent of the state-wide fine particulate emissions in Oregon which impair visibility (ODEQ 1985).

The combination of good air circulation along the Pacific coast and relatively limited industrial development have resulted in only minor air quality problems west of the coastal crest. East of the crest, however, inversion layers combine with topography, trapping pollutants and causing serious air quality problems in the Rogue River valley. This condition occurs most commonly in the fall and winter months and to a limited degree in the early spring. For Medford, the afternoon ventilation index is classed as "poor" over half the time from October through February. The Medford/Ashland air quality maintenance area, 30 miles east of the Forest, frequently exceeds Federal and State standards for particulates, carbon monoxide, and photochemical oxidants (smog). The particulates, in the form of soot, dust, and fumes, are mostly the result of industrial emissions, and residential and industrial woodburning. Smog and carbon monoxide are produced by automobiles and, to a lesser extent, industries. Grants Pass also has a particulate problem, but it has not reached noncompliance levels.

Of all the current management practices on the Forest, prescribed burning has the greatest impact on local air quality. This impact is only temporary in nature and, unlike major emitting facilities such as factories, is difficult to quantify.

Total suspended particulate (TSP) emissions from National Forest lands in southwestern Oregon have been analyzed (U S Forest Service 1984) and individual Forest baselines developed as a result of that analysis The baseline level for the Siskiyou is 7,300 tons annually This baseline value represents the arithmetic average of the annual TSP production for the Forest for the years 1975 through 1979 (see Table III-19). The average annual production of TSP from forest lands in Oregon during the same period was 92,835 tons. In 1982, TSP output from the Forest was less than 3,000 tons while the State-wide production was approximately 45,600 tons Estimated TSP emissions for broadcast burning on the Siskiyou range from 1,000 to 2,600 pounds per acre burned, with an average of 1,750 pounds of TSP per acre burned

Table III-19. Estimated Production of Total Suspended Particulate (TSP) Emissions for 1975-1979

Year	Estimated Fuel Consumed (Tons) 1/	Estimated TSP (Tons) 2/
1975	230,119	5,753
1976	353,707	8,843
1977	293,447	7,336
1978	363,973	9,099
1979	164,616	4,115

1/ Data extracted from the Oregon Smoke Management Plan, Annual Report, and does not include fuel consumed by prescribed fire on the California portion of the Forest
2/ An emission factor of 50 pounds of TSP per ton of fuel consumed was used in the estimates (Ward and others 1976)

Class I areas are special areas protected for their air quality related values The Federal Class I area located on the Forest is the original portion of the Kalmiopsis Wilderness as defined by the Clean Air Act (PL 88-206, as amended) Preliminary results of visibility monitoring within the Kalmiopsis (ODEQ 1985) indicate that the visual range is quite good The median summertime standard visual range is 95 miles. Ten percent of the time the standard visual range exceeds 178 miles Visibility is temporarily impaired by smoke from prescribed burning operations or pollutants from unknown sources. Sources of natural impairment include fog, high humidity, rain, wildfire smoke and aerosols associated with vegetative emissions of terpenes.

Other nearby Class I areas that could be impacted by Forest activities include Marble Mountains, Diamond Peak, and Mountain Lakes Wildernesses, administered by the Forest Service; and Crater Lake and Redwood National Parks, administered by the National Park Service. Redwood National Park, located approximately 15 air miles south of the Forest, is a Class I area with the most potential for impact

Four Designated Areas (i.e , smoke sensitive areas) are located within 35 miles of the Forest boundary. These are Coos Bay, Medford/Ashland, Grants Pass, and Roseburg All of the Designated Areas have a ceiling (maximum vertical boundary) of 2,500 feet except Coos Bay, which has a ceiling of 2,000 feet. Over the past 10 years, smoke from prescribed fire operations on the Forest has intruded into these Designated Areas on five occasions

CURRENT DEMANDS, WANTS, AND DESIRES

Air quality was not raised as a separate issue during the initial scoping of the Forest Plan It is closely tied to issues relating to residue management, visuals, and management concerns about using fire to protect and enhance Forest resources Air quality and smoke management were raised, however, as a public issue in the scoping process for the Regional Guide

National Ambient Air Quality Standards have been developed by the Environmental Protection Agency under authority of the Clean Air Act Amendments (PL 91-604). The standards establish acceptable levels for certain criteria pollutants. One is TSP, the visible component of smoke; the maximum annual geometric mean for TSP shall not exceed 75 micrograms per cubic meter of air. A 24-hour concentration limit of 260 micrograms per cubic meter was also established, and it shall not be exceeded more than once per year. The 1977 Clean Air Act Amendments (PL 95-95) contained specific provisions for dealing with visibility and visibility impairment in Class I Areas.

ABILITY TO SATISFY DEMAND

The potential exists for serious air quality problems in the Rogue Valley. The specific problems, however, are likely to be most heavily influenced by industrial development, residential woodstove use, and population growth rather than by management practices on the Siskiyou National Forest.

If ways are found to create less smoke from each acre burned, the use of fire can be maintained at near-present levels while improving air quality (Sandberg 1983). The Forest utilizes a number of methods, techniques, and strategies to reduce the amount of smoke from prescribed burning operations. These have been incorporated into the Standards and Guidelines (Chapter IV, Forest Plan).

The average slash burn in western Oregon likely emits 1,800 to 2,800 pounds of TSP per acre burned if no special actions are taken to reduce emissions (Sandberg 1983). Harvesting of firewood is estimated to further reduce TSP production, i e , removing 3 cords per acre could reduce emissions by 6 to 10 percent. A YUM provision in the timber sale contract to yard material to a 6-inch by 6-foot specification would reduce TSP emissions by an estimated 17 to 30 percent A 4-inch by 4-foot YUM provision would reduce emissions by 30 percent or more Also, for each 1 percent fuel moisture increase in the large-fuels (3" to 9" in diameter), a 3 percent reduction in emissions should be experienced Burning in the spring or wetter periods should reduce emissions by 50 percent or more (Sandberg 1985)

Smoke management is not without costs. Management efforts to meet air quality standards and direction, while not exceeding the TSP baseline, will compound resource management complexities and raise the overall costs An analysis of the direct and indirect costs of smoke management programs by Sandberg and Schmidt (1982) indicated that complying with the programs on the west side of the Cascades increased costs $26 per acre burned.

Wildfires are a random occurrence in a complex environment No efforts other than suppressing the fire will be made to manage the smoke from these situations.

A permanent visibility monitoring station is located at Quail Prairie Mountain adjacent to the western edge of the Kalmiopsis Wilderness. This site monitors visibility across the northern portion of the Wilderness and provides information as to actual visibility changes.



FISH

Discussions in this section, when combined with those in the **SOIL AND WATER** section, are pertinent to resolution of Planning Problem #3, "How can the Forest's fish habitat, water quality, and soil productivity be maintained or improved?"

EXISTING CONDITION

Management responsibilities for the Forest's fish resources are shared between the Forest Service and state fish and wildlife agencies The state manages fish populations while the Forest manages fish habitat

Forest fish indicator species include fall chinook salmon, steelhead, and resident cutthroat trout. Habitat condition and population of these species directly correlates with all other Forest salmonids.

The Forest is known for its quality salmonid habitat Some of the highest quality anadromous fish habitat and fish populations in Oregon are located within the Siskiyou National Forest. Most of the salmonid habitat is provided by rivers and streams The Forest has a few small lakes which offer habitat for resident rainbow and brook trout.

All 19 of the Forest's Planning Basins contain streams that support salmonids (Figure III-17). Salmonids are known to occupy more than 1,150 stream miles on the Forest. Of this total, anadromous fish utilize at least 620 miles No major dams block upstream passage of fish to Forest streams.

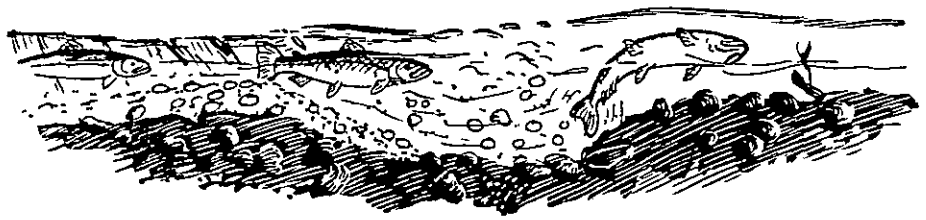
The condition of Forest fish habitat is a critical factor in the establishment and maintenance of fish populations The following evaluation of existing conditions is based on our present knowledge of the stream systems·

1. Each of the Forest drainages has an adequate escapement potential for adult fish, to ensure sufficient reproduction and maintenance of salmonid stocks,

2 Forest spawning gravel quantity and quality is sufficient to provide for incubation and emergence of enough fry to fully stock existing rearing habitat; and

3. The quantity and quality of rearing habitat are critical components which influence the survival of juvenile salmonids and the carrying capacity in each stream

Many off-forest activities (e g , commercial ocean harvest) can also be important limiting factors for salmonid populations utilizing Forest streams



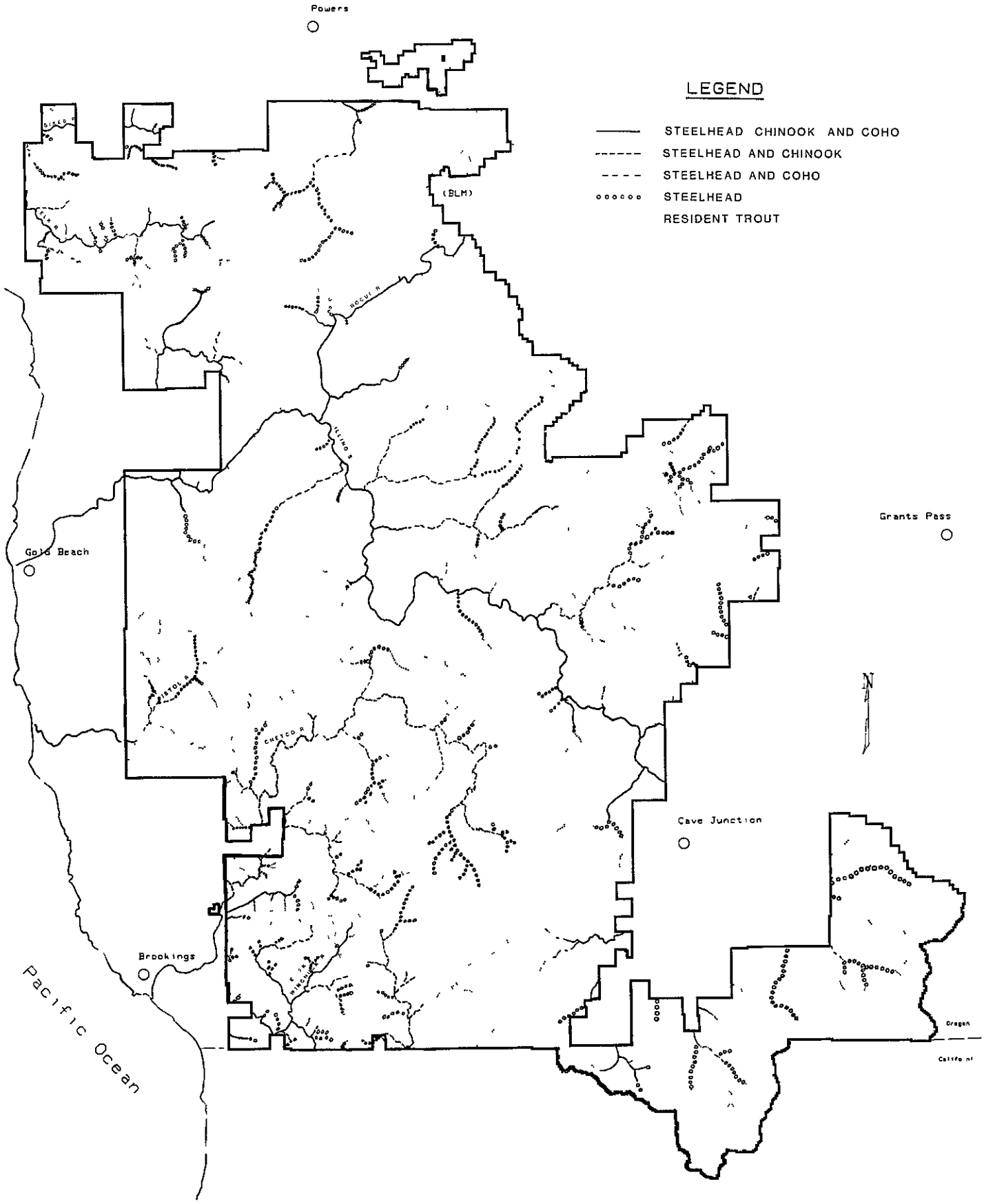


Figure III-17. Anadromous/Resident Fish Habitat Map

HABITAT CAPABILITY

In June of 1988 Forest biologists began a new inventory procedure for evaluating habitat capability of Forest streams. This procedure (Hankin and Reeves 1986) allows Forest biologists to evaluate fish habitat changes over time and provide them with a more extensive data set on key fish habitat factors. Such data is extremely valuable in determining salmonid habitat quality.

Recognized aspects of rearing habitat that present limitations to salmonid capability include flow, water temperature, pool depth, and instream cover (Physical and Biological Stream Survey 1935-1986). Major components of these limitations include the following.

Flow

Low summer flows are inherent to Siskiyou National Forest rivers and streams. Natural contributors to poor summer flow include geology, low elevation, and climate. The problems of natural low flows are today compounded by water withdrawal. Planning Basins currently having the most serious flow problems include the Upper Illinois, Lower Illinois, Galice/Slate, Rough/Josephine, and Sucker. Flow into and out of the Forest basins is essential to survival of salmonids in entire river systems. Juvenile salmonids which are excess to Forest rearing capability must rear off-Forest. However, as human demands for water increase, these displaced fish will face increasing stress and mortality.

Water Temperature

A serious threat to juvenile and adult salmonid survival during summer months is water temperature Forest water temperature problems are a result of geology, low elevations, low summer flows, high groundwater temperatures, and stream shade canopy. Forest summer stream temperatures are inherently high. Removal of stream shade and water withdrawals have increased temperatures in some streams

Stream survey reports in 1936 identified water temperatures of 78 degrees Fahrenheit at the mouth of the Illinois River (Ziesenhenne 1936). Optimum water temperature of 54 degrees Fahrenheit is listed for chinook salmon and 50 degrees Fahrenheit for steelhead (Reiser and Bjornn 1979) Summer water temperatures in portions of all nine major river systems exceed these temperatures In some Forest streams, the water temperatures exceed the upper lethal limits for salmonids. Of importance to *understanding impacts of water temperature upon aquatic life is the analysis of cumulative impacts from* natural and human activities upon aquatic habitat both on- and off-Forest.

Salmonid survival in all river systems transecting the Forest is highly dependent upon cooler inflow from well-shaded tributary streams Those Planning Basins mentioned as having flow problems also have serious water temperature problems for selected reaches. Other Planning Basins having serious temperature problems include the Lower Chetco and Coquille

Instream Cover

The more important instream cover components for survival of Forest salmonids include pool depth, instream woody material, large boulders, and surface turbulence. The interaction of these components are factors that determine the quality of rearing habitat Figure III-18 shows the relationship between fish density and temperature in Forest streams

1. **Pool Depth** During low summer flows, pool depth of medium and small Forest streams becomes *critical and is considered an important limiting factor for 1+ age class steelhead, coho, and resident* trout Forest stream surveys have identified the need for pool depths of three feet minimum for low-flow survival of juvenile steelhead and coho to the smolt stage (King and others 1984).

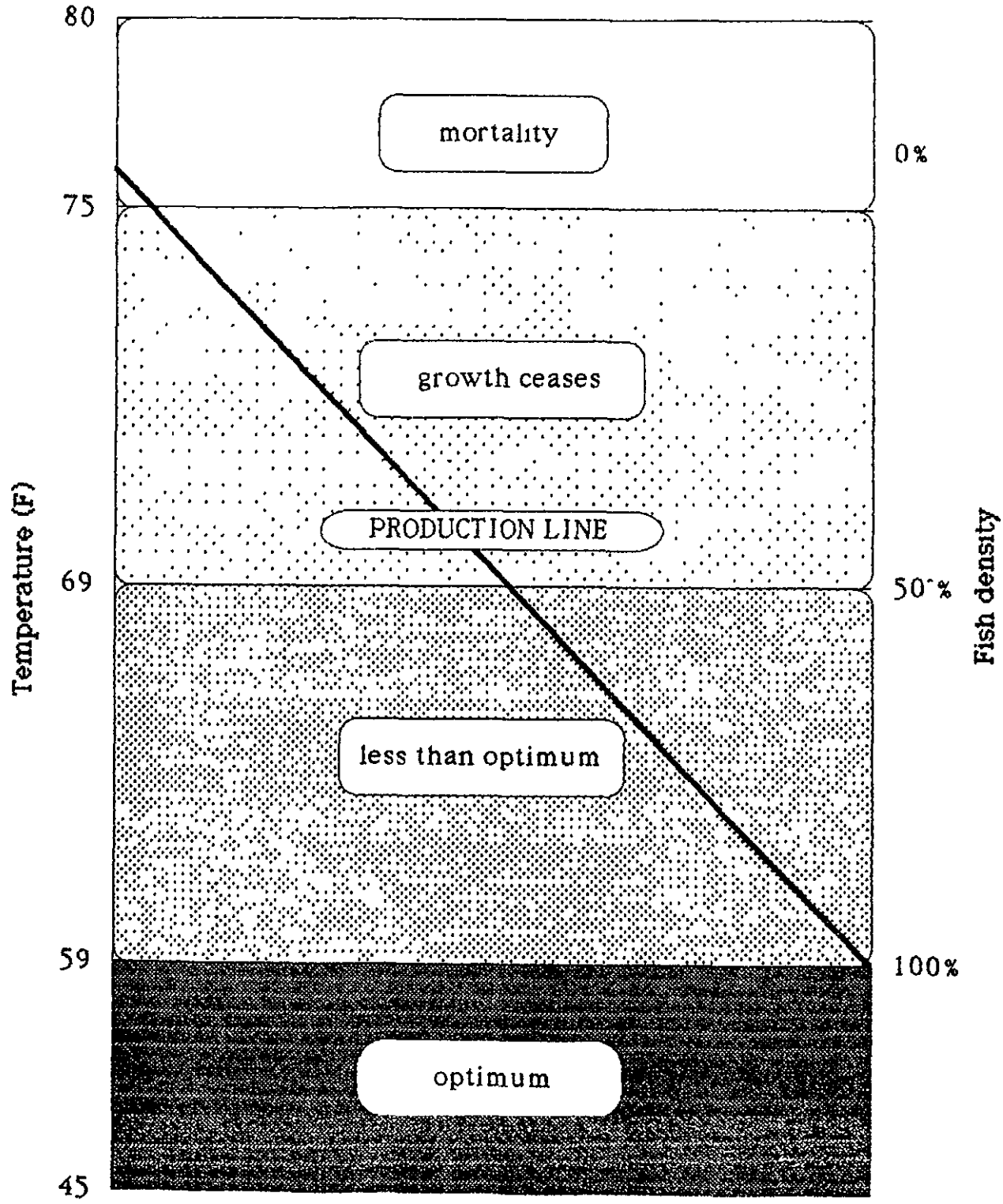


Figure III-18 Estimated Relationship between Stream Temperature and Fish Density for the Siskiyou National Forest

Pool depth is strongly associated with juvenile salmonid abundance, especially steelhead The average summer pool depths are less than three feet in most third, fourth, and fifth order Forest streams (Physical and Biological Stream Survey 1935-86)

2. **Large Woody Material.** Stream surveys have shown that large woody material, which is defined as material over 18 inches in diameter and 15 feet long, is an extremely important component of salmonid habitat The presence of woody material is positively correlated with juvenile fish abundance For a review of the importance of woody material to stream ecosystems, refer to Bisson and others (1986)

   Forest Class I and Class II streams generally have low levels of naturally-occurring large woody material. The retention of large wood is low in Forest streams due to high stream gradient, confined narrow channels, and high winter flows To varying degrees, lack of woody material in the Forest streams limits the ability to rear juvenile salmon, steelhead, and resident trout in all 19 Planning Basins.

3. **Large Boulders.** Large boulders are very important to maintaining channel stability by providing roughness, thereby reducing stream velocity during peak flows Large boulders benefit salmonid habitat much the same as large woody material, especially by providing escapement areas for small fish. Large boulders are generally abundant in Forest streams, particularly in the upper stream reaches

4. **Surface Turbulence.** In addition to depth and woody material, juvenile and adult salmonids are strongly associated with areas of increased surface turbulence. Turbulent areas provide cover, increased access to food, and more oxygen Surface turbulence is generally associated with riffles, cascades, and heads of pools

Bedload Sediment

Sediment, above background levels, can affect both spawning and rearing of salmonids. Stream bedload is closely correlated to soils, geology, climate and land management activities Excess sediment loading in lower gradient stream reaches promotes channel instability. This has been identified as a major factor which can contribute to the poor survival of salmonid eggs and fry Chinook salmon spawning success is especially vulnerable to stream channel aggradation and associated channel instability during high winter flows (Frissell and others 1987) Oregon Department of Fish and Wildlife (ODFW) biologists have found a direct correlation between Rogue River Basin chinook salmon juvenile production and intensity of winter storm events (Satherwaite 1988). Intense winter storm events can adversely affect spawning success for all salmonid species, especially chinook salmon

Excess bedload sediment can also affect salmonid rearing habitat by reducing the number, depth, and quality of pools, and thus reduce habitat complexity. Streams on Forest administered lands have generally higher energy or "stream power" due to steeper gradients, coupled with high winter stream flows and confined, narrow reaches Stream power is normally sufficient during winter months to move annual bedload sediment without excessive or adverse aggradation.

Wide, low gradient stream reaches are most susceptible to channel aggradation and meandering In particular, the lowest gradient reaches of small to medium-sized rivers (e g , Euchre Creek and Pistol River) on coastal alluvial plains are recognized as being extremely susceptible to cumulative impacts from excessive coarse sediment inputs and physical disturbance The potential for activities to cause channel aggradation will be evaluated both for direct and cumulative effects (Refer to Appendix D, Forest Plan)

Summary of Habitat Capability

Major habitat aspects currently limiting Forest salmonid rearing capability are shown by Planning Basin in Table III-20 Rearing habitat limitations are expressed as a high, medium, or low, along with estimated reduction in juvenile salmonid habitat capability potential. This table can be used to estimate the percent loss in salmonid rearing capability for Forest Planning Basins The numbers indicate the estimated percent reduction in rearing capacity The values are additive. For example, in Basin 20 (Sucker) the total estimated loss in capability would be 5+5+5+5 = 20 percent.

Table III-20 Major Habitat Aspects Currently Limiting Forest Salmonid Rearing by Planning Basin (in Percent) 1/

			Instream Cover	
Planning Basin	Flow	Water Temp	Pool Depth	Large Wood
01 Elk/Sixes	M - 5	M - 5	M - 5	H - 5
02 S F Coquille	M - 10	M - 5	H - 10	H - 5
03 Lobster	M - 5	M - 5	M - 5	H - 5
04 Upper Rogue	M - 5	M - 5	M - 7	H - 5
05 Lower Rogue	M - 5	M - 5	M - 7	H - 5
06 Indigo	M - 5	L - 5	M - 5	H - 5
07 Silver	L - 5	L - 0	M - 5	H - 5
08 Galice/Slate	H - 10	H - 5	H - 10	H - 5
09 Lower Illinois	H - 10	H - 20	H - 10	H - 5
10 Upper Illinois	H - 10	H - 20	H - 10	H - 5
11 Briggs	M - 5	M - 10	M - 10	H - 5
12 Pistol	M - 5	M - 5	M - 10	H - 5
13 Lower Chetco	M - 5	M - 10	M - 10	H - 5
14 Upper Chetco	L - 5	L - 5	L - 10	L - 5
15 Rough/Josephine	H - 10	H - 20	H - 10	H - 5
16 Winchuck	M - 5	M - 5	H - 10	H - 5
17 N F. Smith	M - 5	M - 5	M - 5	H - 5
19 E & WF Illinois	H - 5	M - 5	H - 10	H - 5
20 Sucker	H - 5	H - 5	H - 5	H - 5

Based on stream survey information as gathered by Forest Service and ODFW Biologists, 1975-1988
1/ Limitations to achievement of maximum habitat capability, expressed as High = (H), Medium = (M), and Low = (L)

A summary of major fish producing streams, fish distributions, habitat quality, fish life stage sensitivity, and management risk are shown by Planning Basin in Table III-21.



Table III-21 Qualitative Assessment of Main Fish Producing Areas by Planning Basin

Planning Basin No./Name	Stream Size	Fish Use Primary Species 1/	Sensitivity Ratings of Fish Habitat 5/ Gradient 2/ (0-2%)	Streambed Stability 3/	Water Temp Suitability 4/	Life Stage Most Sensitive to Change Rearing 1/	Spawning 1/	Management Risk by Planning Basin 6/ Forest	Total
01 Elk/Sixes	River	ST CH CT,CO	75	-/0	0/-	CH	CH	L	M/H
	Creeks	ST,CH,CT	20-50	+/0/-	0/+	ST	CH	L/M	L/M/H
02 S.F. Coquille	River	ST,CT,CH	85	0	0	ST	ST	L	M
	Creeks	ST,CT	20-50	0/+	0/+	ST	ST	M	M
03 Lobster	Creeks	ST,CH,CT,CO	5-60	0	-/0/+	ST	CH	M	H
04 Upper Rogue	Rivers	ST,CH,CT,CO	75	0	0	CH	CH	L	M
	Creeks	ST,CH,CT	35-45	0	0/+	ST	CH	M	M
05 Lower Rogue	River	ST,CH,CT,CO	95	0	0	CH	CH	L	M
	Creeks	ST,CH,CT	5-55	0	0/+	ST	CH	M	M/H
06 Indigo	Creeks	ST,CH,CT	10-65	0	-/0/+	ST	CH	H	H
07 Silver	Creeks	ST,CH,CT	0-60	0	0	ST	CH	H	H
08 Galice/Slate	Creeks	ST,CT	5-50	0/-	0/+	ST	ST	M	M/H
09 Lower Illinois	River	ST,CH,CT,CO	65	0	-	ST	CH	L	H
	Creeks	ST,CH,CT	0-25	0	0	ST	ST	L	L
10 Upper Illinois	Rivers	ST,CH,CT,CO	90	0	-	ST	CH	L/M	H
	Creeks	ST,CT	0-95	-/0/+	-/+	ST	CH	L/M/H	L/M/H
11 Briggs	Creeks	ST,CH,CT,CO	15-90	0/+	0/+	ST	CH	M	M
12 Pistol	Rivers	ST,CH,CT	80	-/0	-/0	CH	CH	L	H
	Creeks	ST,CT	25-40	0/+	+	ST	ST	M	M
13 Lower Chetco	Rivers	ST,CH,CT	100	0	-	CH	CH	L	M
	Creeks	ST,CH,CT	5-50	0/+	0/+/-	ST	CH	M	M/H
14 Upper Chetco	River	ST,CH,CT	55	0	-	ST	CH	L	L
	Creeks	ST,CT	10-30	0/+	-/0	ST	ST	L	L
15 Rough/Josephine	Creeks	ST,CT	15-35	-/0	-	ST	ST	L/M	L/M/H
16 Winchuck	River	ST,CH,CT,CO	100	0	0	CH	CH	M	M
	Creeks	ST,CH,CT	60-100	+/0/-	0/+	ST	CH	M	M
17 N.F. Smith	River	ST,CH,CT	40	0	0	ST	CH	L	L
	Creeks	ST,CH,CT	0-30	0/+	0/+	ST	CH	L/M	L/M
19 E & WF Illinois	River	ST,CH,CT,CO	20	0	0	ST	CH	M	M
	Creek	ST,CH,CT,CO	20-50	0	0/-	ST	CH	M	M/H
20 Sucker	Creek	ST,CT	0-60	-/0	0/-	ST	ST	M	M/H

1/ Species code: ST = steelhead; CH = chinook salmon; CT = cutthroat trout; and CO = coho salmon
2/ High sensitivity to impacts. 0-2 percent gradient.
3/ Relates to stability of spawning gravel; the factor rating is based on the energy of high flows and evidence of aggradation. (+) = Spawning habitat would be considered excellent; spawning gravel is expected to be relatively stable in most storm events. (0) = Spawning habitat of average quality. Spawning gravel would be stable in average winter flows. (-) = Spawning habitat would be considered poor. Spawning gravel would be unstable in most winter storms.
4/ (+) = Peak summer water temperatures are excellent for streams in this area; temperatures would rarely exceed 68 degrees F. (0) = Peak water temperatures are moderately high (68 to 72 degrees F) and would be expected to have some negative impacts on salmonid growth and density. (-) Peak water temperatures are often very high (> 73 degrees F); and extremely stressful for salmonids.
5/ Ratings with single entries (0) represent the average condition for all fish bearing streams within the basin Ratings with multiple entries (0/-/+) represent the range of conditions for various creeks, indicating that major differences occur between individual streams.
6/ Risk of water temperature increase, channel aggradation, or reduction of large woody material in various watersheds could detrimentally affect fish habitat. (H) = High Risk (M) = Moderate Risk (L) = Low Risk.

FISH POPULATIONS

The aquatic habitats of the Forest support several types of fish (see Table III-22) Anadromous salmonids utilizing Forest habitat for spawning, rearing, or migration include fall chinook salmon, spring chinook salmon, coho salmon, winter steelhead, summer steelhead, and searun cutthroat trout. Non-salmonid anadromous fish using Siskiyou National Forest habitat include green sturgeon, white sturgeon, and American shad.

Stream surveys verify 1,150 stream miles of resident trout use. Brook trout have been stocked by the Oregon Department of Fish and Wildlife in some Forest lakes

Four *warm water game fish* species are found on the Forest. Limited habitat presently restricts distribution to only a few areas. Ten *nongame fish* species occur on the Forest River and stream habitats support both native and introduced species. Invasion of new areas by nongame fish is often an indicator of habitat change.

Table III-22. Species of Fish Occurring on the Forest

Game Fish		Nongame Fish
Cold Water	Warm Water	
Salmonid Chinook Salmon Fall Chinook Spring Chinook Coho Salmon Rainbow Trout Anadromous Rainbow (Summer Steelhead) (Winter Steelhead) Resident Rainbow Brook Trout Cutthroat Trout Sea-run Cutthroat Resident Cutthroat Non-salmonids White Sturgeon Green Sturgeon American Shad	Largemouth Bass Bluegill Black Crappie Brown Bullhead	Redside Shiner Carp Sucker Klamath Small Scale Bridgelip Longnose Sculpin Coast range Prickly Reticulate Stickleback Squawfish

At least 400 miles of Forest stream contain populations of 8-inch (minimum length) fish. Average resident trout angler success on the Forest is approximately 1.6 hours per fish harvested Harvest is approximately 36,130 trout from Forest stream or river habitat per year (King 1985).

Ten lakes and one pond on the Forest produce approximately 8,200 trout per year; these waters are stocked by the Oregon Department of Fish and Wildlife Bolan, Babyfoot, and Tannen Lakes receive the majority of angler pressure.

The approximate annual production of adult anadromous salmonids attributed to Forest habitat is shown in Table III-23.

Table III-23. Annual Production of Adult Anadromous Salmonids Attributed to Forest Habitat

Species	Number of Smolts 1/		Smolt to Adult Survival (%) 2/		Adults
Chinook Salmon	2,025,275	X	5 8	=	117,466
Coho Salmon	83,345	X	5 5	=	4,584
Steelhead	335,700	X	10 0	=	33,570
1/2-lb Rogue Steelhead	600,000	X	10 0	=	60,000 3/
Sea-run Cutthroat	127,600	X	5 0	=	6,380

1/ Smolt production from Siskiyou habitat determined in cooperation with the ODFW was based on (1) Total miles of quality anadromous fish habitat, (2) Estimated escapement, and (3) Angler harvest
2/ Smolt to Adult Survival Fisheries Input, Forest Land and Resource Planning, USFS-Pacific Northwest Region, December 1981, plus consultation with ODFW Biologists R Hasselman and R Berry (1985) (Available in the Planning Records)
3/ Immature Steelhead

Contributions of individual Planning Basins to annual adult anadromous salmonid production are shown in Table III-24.

Table III-24 Current Adult Anadromous Salmonid Production Attributed to Forest Smolt Habitat Capability (Wild Fish Only) 1/

Planning Basin	Chinook Fall	Chinook Spring	Coho	Adult Steelhead 2/	Rogue 1/2 lb Summer Steelhead 3/	Searun Cutthroat
01 Elk/Sixes	6,296		835	2,654		825
02 S F Coquille	59	1,653	1,252	5,258		2,250
03 Lobster	1,718		86	2,914		
04 Upper Rogue	6,701	39,556 4/	458	3,565	24,000	
05 Lower Rogue	12,302	26,383	538	3,996	33,000	440
06 Indigo	154		65	327		
07 Silver	252		104	564		
08 Galice/Slate	59		56	324	3,000	
09 Lower Illinois	792		320	986		325
10 Upper Illinois	387		65	659		
11 Briggs	77		77	423		320
12 Pistol	175			248		640
13 Lower Chetco	12,726		79	2,579		600
14 Upper Chetco	4,249		24	4,782		100
15 Rough/Josephine	153		137	515		
16 Winchuck	3,361			907		700
17 N F Smith	1,177		24	1,643		180
19 E&WF Illinois	441		380	848		
20 Sucker	135		77	375		

1/ Total average annual adult production including both catch and escapement Data compiled from ODFW catch to escapement records and personal correspondence with ODFW biologists Does not include catch and release (King 1985)
2/ Includes both summer and winter adult steelhead
3/ Immature steelhead of 14-20 inch length
4/ Spring chinook not produced on the Forest but reared in lower reaches of the Rogue River on Forest habitat

FOREST FISH HARVEST

Anadromous Salmonid Harvest

The approximate numbers of salmon, steelhead, and sea-run cutthroat trout derived annually from Forest habitat production which enter sport and commercial fisheries are shown in Table III-25.

Table III-25. Annual Anadromous Salmonid Harvest Derived from Forest Habitat

Species	Total Adults	Catch/Escapement 1/	Catch/Average Annual Harvest 2/
Chinook Salmon	117,466	3 1	88,100
Coho Salmon	4,584	5 1	3,820
Steelhead (adult)	33,570	0 55 1	11,912
1/2-lb Rogue Steelhead	60,000 3/	1.1	30,000
Sea-run Cutthroat	6,380	1 4	1,276

1/ Derived in consultation with the ODFW (King and others 1985) Harvest estimates and ODFW creek census data available in the Planning Records
2/ Includes both sport and commercial harvest for salmon and inland sport catch for steelhead and cutthroat
3/ Immature summer steelhead

Marine and Freshwater Catch

Division of marine and freshwater salmon sport catch (of fish production attributable to Siskiyou National Forest habitat) is approximately 66 percent ocean commercial harvest, 27 percent offshore harvest, and 7 percent inland sport harvest (developed from Pacific Fisheries Marine Council Records 1982-83). Division of commercial harvest and salmonid sport is shown by Planning Basin in Table III-26

Table III-26. Average Annual Salmonid Commercial and Sport Fishing Existing Capability by Planning Basin

Planning Basin	Pounds	WFUD's
01 - Elk/Sixes	49,734	3,418
02 - S F Coquille	7,967	3,928
03 - Lobster	12,961	1,909
04 - Upper Rogue	340,722	19,339
05 - Lower Rogue	285,611	18,619
06 - Indigo	1,405	296
07 - Silver	2,301	440
08 - Galice/Slate	668	813
09 - Lower Illinois	7,197	1,212
10 - Upper Illinois	3,115	938
11 - Briggs	906	409
12 - Pistol	1,275	421
13 - Lower Chetco	93,539	4,446
14 - Upper Chetco	31,214	3,687
15 - Rough/Josephine	1,725	465
16 - Winchuck	24,615	1,540
17 - N F Smith	8,729	1,320
19 - E & W F. Illinois	4,903	816
20 - Sucker	1,326	1,021
Total (Base)	879,913	65,037

Resident Trout Harvest

The annual resident trout harvest from Forest river or stream habitat is over 36,000 fish, while the lakes and pond trout harvest is approximately 8,000 trout per year (King and others 1985).

CURRENT DEMANDS, WANTS, AND DESIRES

Both sport and commercial fishermen desire more fish from Forest habitat Desires relate not only to harvest, but also to the aesthetic values of seeing fish or just knowing that fish are in streams or rivers. Increasing numbers of people enjoy observing adult salmon or steelhead moving upstream over low falls or spawning on shallow rivers and stream riffles.

The demand for the anadromous fisheries has grown steadily A regional projection of a 1.6 percent annual growth results in an additional 16,900 WFUD's by the year 2000 This demand for sport and commercial fisheries greatly exceeds supply. State and Federal harvest restrictions, in terms of season lengths, gear, and total allowable tonnage, all regulate angler success and business expansion opportunity Even with stringent State harvest regulations, the future demand for Forest fisheries will increase.

Approximately 50 percent of the anadromous fish within the rivers of the four-county area are produced on-Forest Current average annual harvest in terms of commercial harvest and WFUD's, attributed to Forest habitat, is shown by Planning Basin in Table III-26.

OFFSHORE FISHERIES

Anadromous fish produced in Forest habitat provide a very prominent offshore sport and commercial fishery. Commercial fishing is one of the most important industries in terms of income and employment within Coos and Curry Counties. Coos and Curry Counties rank high in terms of total commercial salmon landing in the State Information provided by the ODFW shows that, of the Oregon Offshore Commercial salmon troll fishery for 1980-1987, 53 percent of the Chinook and 40 percent of the coho harvest come to Coos or Curry Counties (Osis 1988) Salmon derived from Forest habitat production contribute to offshore sport and commercial fishing from central California to Alaska Commercial harvest involves international planning efforts Recommendations for offshore harvest are presented by the Pacific Fisheries Management Council and ODFW based upon projections of ocean habitat conditions and stock size. Seasonal angling restrictions are a reflection of adult abundance

RECREATIONAL FISHERIES

The Forest provides sport fishing opportunities for local residents and tourists, thus contributing to the area's tourism-related employment. An important factor which enhances this recreational fishery is the access to Forest land provided by roads, trails, campgrounds, and boat launches. Off-forest, streams are more inaccessible due to private ownership along the banks

Resident trout and juvenile steelhead provide an important inland sport fishery. Native trout, and the habitats they occupy, provide high aesthetic value to recreationists Angler use of Forest lakes averages approximately 1,100 WFUD's per year Forest river and stream trout anglers enjoy approximately 4,000 WFUD's per year

ABILITY TO SATISFY DEMAND

Presently the demand for the salmon in offshore commercial and sport fishery far exceeds supply Availability of port docking and facility capacities during the peak angling seasons limit or discourage angler access The Forest's ability to satisfy the increasing demand for salmonid fish centers around resolution of Planning Problem #3, "How can the Forest's fish habitat, water quality, and soil productivity *be maintained or improved?*"

The following actions offer excellent means to potentially satisfy demand for salmonid fisheries derived from forest habitat production

Riparian Management

Retaining streamside vegetation for shade and other purposes will also maintain riparian zone integrity and minimize excessive entry of sediments into stream channels Important woody material sources will be retained. Distribution and transport of organic nutrient sources will also be provided, along with maintenance of instream productivity.

Riparian Prescription B is designed as the Management Requirement to meet water quality standards through maintaining current water temperature Integrity of the riparian area is achieved through limitations on activity within the Streamside Management Unit Both overall habitat capability and existing high quality habitat conditions would be maintained.

Application of Riparian Prescriptions C or Minimum Level would provide for varying reductions in summer water temperatures over the Planning Basins Fisheries habitat improvement would be achieved through increases in effective canopy cover (shade) By the end of the third decade in basins where timber harvest already occurs, temperature would drop by an estimated 2 degrees Fahrenheit for Prescription C Either Prescription C or Minimum Level would enhance riparian conditions in excess of Prescription B over time through reduction in water temperature and the addition of large woody material and organic detrital nutrients to stream and river systems. Application of Riparian Prescription C is modeled to increase salmonid capability by approximately 10 percent in those basins where it is applied (King and others 1984)

Supplemental Resource Management Areas

Thirty streams and rivers containing 39,606 acres have been identified as potential Supplemental Resource Management Areas These areas represent to varying degrees higher salmonid rearing capability, high risk landtypes, recreation values, and critical wildlife habitat Long-term salmonid habitat capability in these streams can be given added protection by providing a one-eight mile corridor on each side of the stream No programmed timber harvest within the riparian area and adjacent slopes (inner gorge) would provide an extra measure in protecting long-term salmonid habitat capability.

Capital Investment

Rearing habitat capability for anadromous salmonids can be increased through capital investments designed to improve features such as stream pool depth, gravel and fish passage Capital investments are planned to enhance the existing habitat Selection of areas for enhancement will consider predicted benefits to the fishery and existing habitat conditions. Streams with natural temperature or bedload conditions unfavorable for fish may not gain much from the addition of structures. The need and desirability for instream fish habitat work will be evaluated on a site-specific basis. Instream structure work on the Forest must be designed to be aethetically acceptable; thereby, native materials such as rock or logs are preferred.

Habitat enhancement includes not only instream structures, but incorporates total management of the riparian and upslope areas as well. Beyond land allocations, capital investments designed to improve salmonid spawning, rearing, and migration habitat offer opportunities to expand salmonid habitat capability In those Forest areas where capital investments have been made, salmonid capability and populations have been improved by approximately one-third above background levels.

Timber Harvest Activity

Utilizing BMP's (see Appendix G, Forest Plan), biologists generally agree that harvest evenly distributed in terms of time and space over suitable lands offers the best management options for maintaining fish habitat capability (conclusion reached by local biologists Jennings, Mullarkey, Riickula, and King in 1986) This option reduces the potential for accelerated sediment yields from Forest activity to Forest streams or offsite rivers and estuaries. When planning timber management and other resource activities, consideration must be given to the potential cumulative impacts on the aquatic environment. Good planning and implementation of land management practices offer the best options for maintaining and improving Forest salmonid habitat capability. Capital investment for instream project work would only be undertaken where land management practices are at least maintaining watershed conditions

Project-Level Planning

The Forest contains key habitat reaches that are extremely important. The identified key streams or stream reaches having special attributes in terms of salmonid production need full consideration for their protection and maintenance of capability during project-level planning.

SUMMARY OF POTENTIAL HABITAT IMPROVEMENT

The anticipated change in salmonid habitat capability due to habitat improvement is displayed in Table III-27

Table III-27. Management Option and Anticipated Gain in Salmonid Habitat Capability by Planning Basin 1/

Planning Basin No	Name	Riparian Rx C and Min Level	Supplemental Res Mgmt. Areas	Timber Harvest Dispersion	Capital Investment
01	Elk/Sixes	H 2/	H 3/	H 4/	L 5/
02	S F Coquille	H	M	M	M
03	Lobster	H	H	H	M
04	Upper Rogue	H	H	M	M
05	Lower Rogue	H	M	M	H
06	Indigo	H	H	H	L
07	Silver	H	H	M	L
08	Galice/Slate	H	L	L	H
09	Lower Illinois	H	H	H	M
10	Upper Illinois	H	M	L	H
11	Briggs	H	L	M	H
12	Pistol	H	M	M	M
13	Lower Chetco	H	H	H	H
14	Upper Chetco	0	0	0	L
15	Rough/Josephine	M	L	L	L
16	Winchuck	H	H	H	H
17	N F Smith	H	M	M	L
19	E & WF Illinois	H	M	L	H
20	Sucker	H	M	M	M

1/ H-High, M-Moderate, L-Low, 0-Negligible (all in Wilderness)
2/ Gain primarily from water temperature reductions, naturally occurring woody material, and decreased risk of sedimentation
3/ Based on criteria which includes capability to rear juvenile salmonids, water temperature influence over offsite salmonid production, percent of Forest land within drainage being evaluated, and streamflow as it relates to fish habitat
4/ Based on percentage of tentatively suitable lands within each Planning Basin with high erosion hazard rating
5/ Based on Forest prioritization of Planning Basin for capital investment (Forest memorandum 1983, Planning Records)

WILDLIFE

EXISTING CONDITION

Management responsibilities for the Siskiyou National Forest's wildlife resources are shared between the Forest Service and state fish and wildlife agencies. The states manage individual animal species, while Forest Service responsibilities are fulfilled primarily through habitat management The Oregon Department of Fish and Wildlife (ODFW) provided criteria for use in developing and assessing DEIS alternatives (ODFW 1985a).

More than 250 wildlife species occur on the Forest, with only 22 classified as game animals or furbearers The Forest harbors 70 species of mammals, over 150 bird species, and 38 species of reptiles and amphibians Bird species include both migrants and residents These animals occupy a diverse array of habitats

ENDANGERED/THREATENED/SENSITIVE SPECIES

Two Siskiyou species, the bald eagle and peregrine falcon, are classified endangered or threatened. The bald eagle is discussed below Peregrine falcons are classified as endangered. They were not known to be present on the Forest until the first nesting pair was discovered in 1987; two additional pair were discovered in 1988. This bird is a cliff nester The species is managed in accordance with the *Recovery Plan for Peregrine Falcon (Pacific Population)* (USDI Fish and Wildlife Service 1982). As required by the Endangered Species Act, the Forest has consulted with the Fish and Wildlife Service during development of the FEIS and Forest Plan. Consultation in regards to endangered and threatened species is a crucial step in the planning process.

Of species found on the Oregon portion of the Forest, one bird is listed as sensitive, along with one amphibian, one reptile, and three mammals. The northern spotted owl is discussed below. The Siskiyou Mountain salamander is a resident of moist rock rubble areas east of Cave Junction The western pond turtle inhabits still waters of larger rivers such as the Rogue and Illinois. The white-footed vole, Townsend's western big-eared bat, and California wolverine occupy different habitats The vole resides in riparian habitat along small coastal streams. The bat feeds in a variety of habitats, but depends on caves (and sometimes buildings) for roosting The wolverine uses a variety of habitats, and does best in large undisturbed areas A wolverine was sighted on the Forest in 1985, and a handful of other sightings have been reported, beginning in the 1970s.

Sensitive species in California include the northern spotted owl, California wolverine, pine marten, fisher, and northern goshawk The first two species are also sensitive in Oregon. The marten, an indicator species, is discussed below. The fisher, rare on the Siskiyou, inhabits dense stands of many forest types The goshawk is an inhabitant of mature and old-growth coniferous forests

One species not listed as sensitive has generated considerable public interest in the last few years: marbled murrelet. This small seabird feeds in the ocean, but appears to nest in large conifers up to 30 or more miles inland. They have been detected flying in or around mature and old-growth forests at six locations in the Chetco River drainage. Research needs to be done to better locate and characterize forest habitat used by this species.

INDICATOR SPECIES

Forest management efforts consider all native vertebrate species. Several groups of species have special management needs These groups include: (1) species dependent on specialized habitat conditions, such as cavity-nesters; (2) species requiring early, mature, or old-growth forest conditions for optimum habitat; (3) popular game species; and (4) endangered, threatened, and sensitive species.

Eight Forest wildlife species have been selected as management indicator species (Table III-28). An indicator species represents all other wildlife which utilize the same habitat type. The species selected are commonly hunted, representative of specific habitats, or classed as endangered, threatened, or sensitive. Indicator species act as barometers for the health of various habitats and will be monitored to quantify habitat changes predicated by alternatives considered in this document.

Table III-28 Management Indicator Species - Wildlife

Species	Habitat Represented
Bald eagle 1/	Habitat corridors along major rivers
Osprey 2/	Habitat corridors along large creeks and rivers
Spotted owl 2/	Old-growth forest
Pileated woodpecker 2/	Mature forest
Pine marten 2/	Mature forest
Woodpeckers 2/	Wildlife trees (snags)
Black-tailed deer 3/	Early successional forest stages
Roosevelt elk 3/	Early successional forest stages

1/ Selected because of endangered/threatened status
2/ Selected because it represents specific habitat
3/ Selected because the species is commonly hunted

Bald Eagle

The bald eagle is Federally listed as threatened in Oregon and endangered in California A few of these birds are occasionally sighted on the Siskiyou National Forest, mainly along the Rogue and Chetco Rivers. Approximately 58,000 acres of the Forest are thought to be potential bald eagle habitat, however, extensive habitat inventories have not been conducted and only a small portion of the habitat is presently occupied. Sighting reports are collected and nesting sites are examined. Historically, these birds have nested along the Rogue River, and possibly the Chetco River In the past few years, two active nests were discovered on the lower Rogue River One nest is within the Wild Rogue Wilderness, the other is located on private land outside the Forest boundary.

The Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986) lists the Rogue, Sixes, Chetco, and Illinois Rivers as key habitat areas. The Rogue is targeted for four recovery territories; the other Rivers for one each (targets are for all ownerships combined).

American Osprey

On a Nation-wide basis, the status of the American osprey is undetermined (USDI Fish and Wildlife Service 1973). At least 308 (+/-28) pairs of osprey nested within Oregon in 1976 (Henny and others 1978). In 1988 a minimum of 22 active osprey nests were located within the Forest boundaries. Most nests occurred along the Rogue River, but a few were located on the Illinois, Coquille, and Chetco Rivers Productivity figures for active nests are not known However, since 1975 the Forest osprey population has, at a minimum, remained stable, and may actually have increased. At least 58,000 acres of the Forest is osprey habitat, much of it occupied by nesting osprey. Osprey represent other species, such as river otter, which use the Forest's riverine habitat

Northern Spotted Owl

The State of Oregon classifies the northern spotted owl as threatened, while the California Department of Fish and Game considers it a "bird species of special concern " The Forest Service designates this owl as sensitive. Spotted owls are associated with multi-layered old-growth forests primarily confined to public lands. Old growth is defined in the Regional Guide (USDA 1984b, 3-40 to 3-41) A four-way interagency

agreement in August 1988 between the Forest Service, Bureau of Land Management (BLM), Fish and Wildlife Service, and National Park Service focuses on the fact that all Federal land managing agencies are integral to the success of maintaining spotted owl populations Spotted owl habitat areas on the Forest connect to networks on surrounding National Forests and BLM Districts

The Northern spotted owl represents over 150 other wildlife species which use old-growth forest habitat for all or part of their life cycles (Guenther and Kucera 1978, Brown 1985). Spotted owls have been sighted at over 150 different locations on the Forest from 1974 through 1988.

The Final SEIS for an Amendment to the PNW Regional Guide (USDA 1988b) provides a general description of suitable spotted owl habitat Specifically, the Siskiyou's spotted owl habitat occurs predominately in California Mixed Evergreen and Mixed Conifer vegetation types The Forest also supplies relatively small amounts of habitat for spotted owl in the Redwood and Cedar/Hemlock/Douglas-fir vegetation types. For a description of the Forest's spotted owl habitat, as related to the Spotted Owl Final SEIS, see Chapter IV of the Forest Plan (Management Area 8).

Lands mapped as mature or old growth in the 1979 timber inventory were generally considered to be spotted owl habitat. There were exceptions A significant proportion of the old-growth habitat in the Kalmiopsis Wilderness is fragmented; these stands were classified as not suitable for spotted owls. Most old-growth stands above 5,000 feet elevation were also classified as not suitable Because our planning data base does not differentiate between mature and old-growth forest, some mature forest stands are classified as spotted owl habitat However, this does not result in significantly skewed data; mature stands are few on the Siskiyou and are usually interspersed with old-growth Mature forest also serves well as feeding habitat. Approximately 90 percent of the mature and old-growth forest displayed in Figure III-15 is spotted owl habitat (a map showing the broad range of spotted owl habitat on the Forest is available at the Supervisor's Office)

Existing old-growth habitat on the Siskiyou can support approximately 153 pairs of spotted owls (maximum biological potential) (USDA 1988b) Although approximately 443,000 acres of mature and old-growth forest exist on the Forest, a maximum of 393,000 acres is considered suitable habitat for spotted owls

The Siskiyou National Forest SOHA network conforms to standards and guidelines established in the preferred alternative of the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide: Spotted Owl Guidelines (USDA 1988b). The Siskiyou's SOHA's each contain 1,000 acres of suitable habitat, within 1.5 miles of the nest or suspected nest area. For more specifics on Standards and Guidelines for designated SOHA's, see Chapter IV, Forest Plan (Management Area 8).

To meet Management Requirements (MR's) for spotted owls, the Siskiyou National Forest needs to provide enough capable habitat to support a minimum network of 47 reproductive pair-sites Twenty-two sites are located in wildernesses and areas unsuitable for timber management; the other 25 (termed SOHA's) are located in areas which otherwise would support some level of programmed harvest (the effect on programmed harvest varies considerably from site to site). Wildernesses contain enough extra habitat (above MR needs) to support an additional 15 to 24 pair-sites Although extensive surveys have not been conducted in the 37 pair-sites in Wildernesses and areas unsuitable for timber management, owls have been found at 18 sites (Figure III-19, also See Chapter II for a more detailed discussion of MR's)

Most of the 25 non-Wilderness SOHA locations have been surveyed for spotted owls in the last five years The current status of these areas is listed in Table III-29. There are no viable alternatives to the three SOHA's listed as unknown; they are needed to insure proper distribution of habitat sites. The Forest will continue to monitor all sites (see Chapter V of the Forest Plan for details).

Table III-29 Status of Designated SOHA's (1984-1988)

Reproduction	Occupancy (pair)	Presence (single)	Unknown
5	10	7	3

Pileated Woodpeckers And Pine Marten

Pileated woodpeckers and pine marten represent the composite needs of over 160 wildlife species which utilize mature forest (Guenther and Kucera 1978, Brown 1985) For specific details on habitat needs of pileated woodpecker and pine marten, see Chapter IV of the Forest Plan (Management Area 8). The Forest contains an estimated 690 separate habitat areas suitable for breeding pairs of pileated woodpeckers (approximately 414,000 acres of suitable habitat) An estimated 2,700 separate habitat areas could support marten family groups, which include the female with young (approximately 432,000 acres of suitable habitat) Figure III-19 depicts habitat which must be allocated to meet MR's for pileated woodpeckers and pine marten The combined habitat networks for spotted owl, pileated woodpecker, and pine marten, along with intertwined Riparian areas, serve as an interlocking habitat system for all wildlife species which use mature and old-growth forest

Woodpeckers

The composite snag needs of woodpeckers represent all wildlife species which use cavities for nesting or denning. Over 75 of the Siskiyou's wildlife species use snag habitat (Guenther and Kucera 1978, Brown 1985)

In order to measure the ability to support cavity nesters, an index called "percent habitat capability" is used. It is based on data in Brown (1985) that indicates approximately 300 snags per 100 acres are required to support woodpeckers at the 100 percent level, or maximum population potential. For example, 150 snags per 100 acres would support woodpeckers at the 50 percent level.

Approximately 900,000 acres on the Forest are presently in an unmanaged condition and provide snags at background levels Of the remaining 192,000 acres, 52,000 acres are nonforested; the balance is cutover land. Timber stands harvested after installation of snag guidelines in 1976 retain enough wildlife trees to support woodpecker populations at 50 to 60 percent of potential. Areas harvested before installation of snag guidelines retain snags at various levels from 0 to 20 percent or more

Primary cavity excavators provide ecological diversity and habitat for many snag dependent species. By consuming forest insects, these birds may provide a suppressive influence on destructive forest pests. For these reasons a highly viable population of these birds is essential

Regional Management Requirements (MR's) for cavity excavators are set at 20 percent of their potential level (barely viable; not a functioning part of the ecosystem). An effective, highly viable, population level for these excavators is probably between 40 and 60 percent Consequently, the *Siskiyou Dead Tree (Snag) Guidelines* mandates that the Forest provide snags at the 60 percent level (the minimum acceptable population level for cavity nesters is 40 percent [FSM 1988]) See *Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington* (Brown 1985) and *Wildlife Habitats in Managed Forests, the Blue Mountains of Oregon and Washington* (Thomas 1979) for further discussion of management of this specialized habitat.

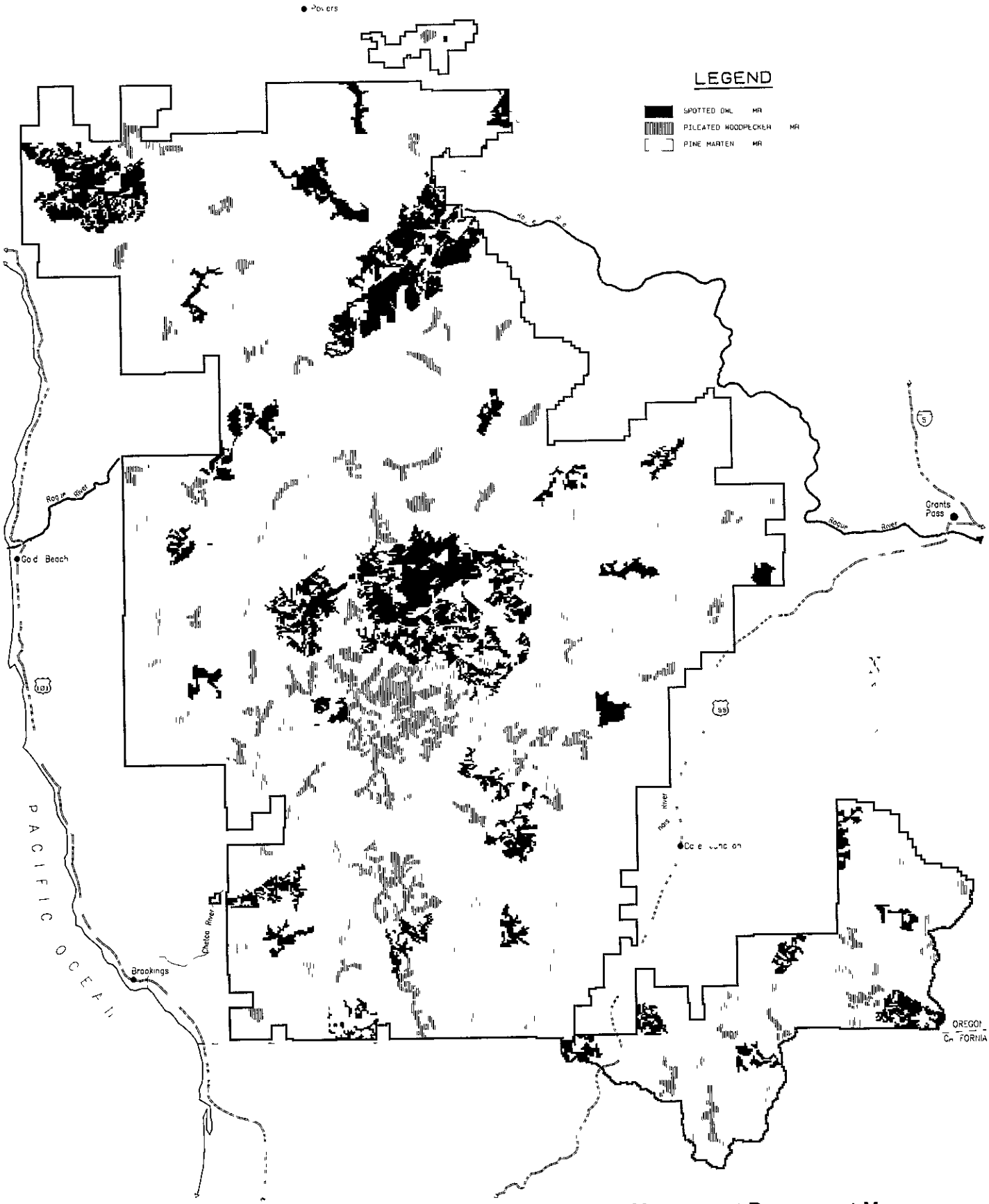


Figure III-19. Spotted Owl, Pileated Woodpecker, and Pine Marten Management Requirement Map

Blacktail Deer

Deer (and elk) use all successional stages, but natural or created openings provide the bulk of the feeding habitat (assumed to be the most restricted habitat component) Consequently, deer (and elk) represent over 180 other wildlife species needing young successional stages to meet all or some of their life requirements (Guenther and Kucera 1978, Brown 1985).

The actual size of the deer population is unknown, but the Siskiyou National Forest's habitat is probably capable of supporting 25-35,000 animals, based on the planned rotation of approximately 100 years for stands managed for timber harvest For planning purposes, habitat capability for the Forest's deer herd is estimated at 28,300 animals at the end of winter (April), private inholdings included This is approximately one deer per 42 acres. Areas managed for timber harvest have considerably higher deer populations; other areas have considerably less. Detailed information on modeled deer habitat capability is on file at the Supervisor's Office.

Oregon Department of Fish and Wildlife has suggested a population objective of 32,600 deer for the Siskiyou National Forest (ODFW 1980). Forest Service and ODFW estimates of habitat capability vary because different procedures were used to generate the numbers. Detailed criteria for forage/cover needs were outlined in a memo to the Forest Service (ODFW 1985a). In this document, the ODFW proposed a cover/forage ratio of 80 20 for the Siskiyou National Forest Both estimates recognize a stable cover/forage ratio of 80 20. The 80.20 ratio will be achieved in areas managed for timber, but generally will not be achieved in areas with no programmed harvest

The California portion of the Forest is not considered in the above calculations The deer population in this area is managed by the California Department of Fish and Game (McLaughlin 1984)

Approximately 905,000 acres (78 percent) are considered deer winter range, including private inholdings Included in the total are 514,000 acres (44 percent) of primary winter range. Winter range is not evenly distributed throughout the Forest. Primary winter range varies by Planning Basin from 2 to 97 percent; total winter range (primary and secondary) varies from 26 to 100 percent Aside from a few high elevation sites, the Forest has adequate habitat to support its deer population year round. A map of deer and elk winter range is available at the Supervisor's Office.

Roosevelt Elk

As with deer, elk represent a variety of other wildlife species. Elk provide exciting hunting and viewing experiences to many Forest users The ODFW (1980) suggested an April population objective of 6,700 elk for the Siskiyou National Forest The 80 20 cover/forage needs were detailed in a more recent letter (ODFW 1985a).

Elk presently inhabit one-third of the Forest, or approximately 388,000 acres, private inholdings included Approximately 329,000 acres (85 percent) of this total are considered winter range. Because so much of the Forest's elk habitat is at lower elevation and under a strong coastal influence, winter range is not a critical need On the Siskiyou, elk are still expanding their range; it is likely they will eventually inhabit as much as two-thirds of the Forest The Siskiyou's herd presently numbers approximately 1,350 animals, or an average of one elk for every 290 acres of occupied habitat.

A majority of the Siskiyou (private inholdings included) is classified as thermal (57 percent) and hiding (9 percent) cover for deer (and elk); foraging habitat accounts for 12 percent Planning Basins range from 18 to 80 percent total cover, cover percentages in some basins are naturally low because of the presence of serpentine plant communities.

Deer and elk do not fully utilize habitat along roads open to vehicle use (Brown 1985). Average density of roads in areas which are predominately roaded is 2.33 miles for each square mile of land (640 acres).

HABITAT TYPES NOT REPRESENTED BY INDICATOR SPECIES

Riparian Habitat

This habitat type includes all land within 150 feet of Class I and II streams or 100 feet of Class III streams Riparian habitat encompasses 175,500 acres, or 16 percent of the Forest, and is extremely important habitat for wildlife For instance, small-mammal communities in riparian ecosystems are more diverse and generally more dense than in neighboring habitats (Cross 1985). Riparian areas serve as habitat for over 180 wildlife species, they serve as protective travel corridors for animals moving between blocks of mature/old-growth habitat

Meadows

Meadows are an important component of habitat diversity for wildlife; 4,872 acres of meadow habitat were mapped during the 1979 timber inventory and 1,805 additional acres have been identified since that time. Suppression of wildfires has resulted in considerable habitat change, meadow habitat on the Siskiyou National Forest has decreased by at least one-third in the last four to five decades. Fifty years ago the Siskiyou National Forest contained over 9,000 acres of meadow habitat.

Wildlife Sites

During the past 10 years a number of important, but relatively small Special Wildlife Sites were identified by Ranger District employees during project-level planning for timber sales (184 sites, 6,932 acres). Those sites on land suitable for the production of timber were temporarily withheld from activities pending their disposition in the Forest Plan. Additionally, during the planning process Forest personnel identified many other special wildlife sites not associated with timber sale activities.

Special Wildlife Sites include meadows (discussed above), meadow buffers, lakes/ponds/wet sites, botanical sites, elk areas, osprey nest sites (those not in Wild and Scenic River corridors), band-tailed pigeon areas, rock bluffs, hardwood sites, wildlife areas, and dispersed old-growth. Special Wildlife Sites encompass 45,142 acres (approximately one-third classed as tentatively suitable for timber production).

Wildlife areas include sites with a variety of attributes important to wildlife. Examples include Fish Hook Peak (meadow/forest complex; important elk area), Pebble Hill (Jeffrey pine/grass meadow complex), Horse Creek (variety of habitats in close proximity), and Windy Valley (meadow/forest complex). Most dispersed old-growth sites are small areas unsuitable for timber management. As more and more of the forest is brought under rotation, this mature "connecting habitat" will begin to serve as "stepping stones" between some of the habitat areas for spotted owl, pileated woodpecker, and pine marten (Management Area 8).

Acres of Special Wildlife Sites are displayed by category in Chapter II, Table II-3 Management strategies *for Special Wildlife Sites are described in Chapter IV of the Forest Plan (Standards and Guidelines for* Management Area 9).

CURRENT DEMANDS, WANTS, AND DESIRES

Three Planning Problems pertain to management of wildlife resources and current demands, wants, and desires of the public:

1. "How Much Timber Should the Forest Produce?"

Most people realize that the level of timber harvest will have major effects on wildlife habitat. Timber harvest, if done within established guidelines, can result in increased habitat capability for deer and elk, and other species which utilize early seral stage vegetation. At the same time, however, populations of wildlife species dependent on mature and old-growth forest will be reduced. Many citizens feel the potential land base available for timber harvest should be managed to do more than just "meet" MR's for wildlife (the legal requirement under NFMA). Other people are concerned that the amount of timber available for harvest will be unduly restricted to meet overly considerate goals for wildlife habitat.

2. "How Much Old-Growth Forest Should Be Preserved?"

Some people feel that all existing old-growth stands should be protected and continue to serve as habitat for a variety of wildlife species. Many people think only enough old growth should be preserved to insure that there is little likelihood that dependent wildlife species will be extirpated from the Forest.

7. "How Should Wildlife Habitats on the Forest Be Managed?"

Wildlife and wildlife habitats are an important component of the Siskiyou National Forest ecosystem. The public and Forest managers realize that the Siskiyou must meet MR's for wildlife, and that we must maintain viable populations of all native and desirable nonnative wildlife species existing on the Forest. People disagree as to how this should be done. What should the levels be for populations of individual species, and how should land (habitat) be managed to meet population objectives? What are the potential maximum and minimum habitat levels?

CONSUMPTIVE USE

Hunted species on the Siskiyou collectively provide recreation for thousands of people. Based on license sales and participation rates, demand for all hunting in the Pacific Northwest is expected to increase by 1.3 percent annually from 1985 to 2030 (USDA 1984). Hunter-days attributed to hunting of game animals on the Siskiyou are estimated at 43,150 annually. At 1.3 percent per annum, demand would increase to 77,162 by the year 2030.

The black-tailed deer is the most important game animal on the Siskiyou. Deer hunting annually attracts more than 3,000 hunters, resulting in an annual average harvest of 1,000 deer. Hunter-days attributable to deer hunting on the Siskiyou have more than doubled in the last 25 years; total hunter-days increased by an average of 4.4 percent per year from 1960 to the mid 1980's.

In recent years, over 860 hunters have annually harvested an average of 74 elk. Each year, approximately 500 hunters harvest 45 black bear on the Siskiyou. An estimated 640 hunters harvest approximately 3,300 game birds including quail, grouse, and band-tailed pigeon. Although quail and grouse are under-utilized by hunters, they are an important component of the Siskiyou fauna.

Desires of big-game hunters are directed toward maintaining or increasing the numbers of deer and elk, especially the latter. Road closures are seen by some hunters to be a way of fostering quality hunting experiences; other hunters prefer access to as much of the road system as possible.

NONCONSUMPTIVE USE

Of the over 250 wildlife species inhabiting the Siskiyou, only 22 are classified as game animals or furbearers; and even these animals frequently serve the public in nonconsumptive ways. Nongame wildlife are recognized as an important natural resource by the ODFW (Marshall 1986).

Although no accurate figures for nonconsumptive use are available for the Forest, the 1975 National Survey of Fishing and Hunting showed that for every day a hunter spent in the field, three other individuals were bird-watching, photographing, or observing wildlife (USDI Fish and Wildlife Service 1977). During 1980, 2.2 million Oregon residents participated in some kind of nonconsumptive wildlife use activity (USDI Fish and Wildlife Service/USDC Bureau of the Census 1982).

Thousands of people boat or hike along the Rogue and Illinois Rivers every year; "watchable wildlife" are an important part of their recreation experience. On the Siskiyou, recreation-days attributable to nonconsumptive use of wildlife resources are at least as high as recreation-days attributable to hunting.

Most people enjoy seeing wildlife in their natural habitat. Most people agree that all wildlife species presently existing on the Forest should continue to be part of the Forest ecosystem People differ on how much of each vegetative type should be maintained to achieve the most desirable mix of habitats.

ABILITY TO SATISFY DEMAND

Three Planning Problems pertain to management of wildlife resources and the ability of the Forest and the Forest Service to satisfy demand:

1. "How Much Timber Should the Forest Produce?"

The Forest could adjust the allowable cut to meet a wide range of wildlife objectives. Specifically, in areas managed for timber the Forest is physically able to meet ODFW criteria for elk and deer cover/forage requirements (ODFW 1985a).

2. "How Much Old-Growth Forest Should Be Preserved?"

There is a wide range of options. Old growth can be reserved for wildlife that need this type of habitat; land allocations to meet MR's for wildlife can be expanded (increased from 159,949 acres; a minor portion is mature forest). If no more old growth is cut, the Forest could maintain approximately 393,000 acres of old-growth forest indefinitely (including dedicated areas). If present mature stands (50,000 acres) are allowed to progress into old growth, and if lands cut over in the last 40 years (138,000 acres) are allowed to grow back into old growth, an additional 188,000 acres could be managed as old growth.

7. "How Should Wildlife Habitats on the Forest Be Managed?"

Wildlife and their habitats are an important part of the Siskiyou ecosystem. If all wildlife species presently occurring on the Siskiyou are to remain as viable components of the Forest ecosystem, then this entails preservation of at least minimum amounts of the various habitats. Examples of the most essential habitats are meadows, riparian areas, snags, early successional stages, mature and old-growth forest, and hardwood stands.

Primary land allocations can be made to protect the various habitats supporting specific wildlife populations on the Forest, such as Designated Wildlife Habitat, Special Wildlife Sites, and Supplemental Resource Management Areas. Wildlife objectives can be furthered through secondary allocations such as Research Natural Areas and Botanical areas. Standards and Guidelines can be used to establish

management objectives to meet specific habitat needs (such as snags) Habitat improvement projects can be designed to meet wildlife objectives, such as increased carrying capacity for deer and elk (including transplanting elk to unoccupied habitat). Better opportunities for wildlife viewing could be developed The Forest's Comprehensive Fish and Wildlife Plan (Public Law 93-452) can be integrated into the capital investment program, and K-V funding (Knutson-Vandenberg) can be used to implement projects in timber sale areas (most projects are presently funded through the K-V program)

Bald Eagle and American Osprey

The objectives of the Pacific Bald Eagle Recovery Plan are to provide secure habitat and increase populations in specific geographic areas to levels where it is possible to delist the species (USDI Fish and Wildlife Service 1986) The Recovery Plan will govern habitat management for the bald eagle on the Siskiyou National Forest. A potential feeding area has been identified at the confluence of the Rogue River and a major tributary The Forest contains a minimum of 58,000 acres of primary bald eagle and osprey habitat along the Rogue, Illinois, and Chetco River corridors. Additional secondary habitat exists for osprey in the Rogue River drainage and along smaller rivers such as the Winchuck, Coquille, and Sixes.

Northern Spotted Owl, Pileated Woodpecker, and Pine Marten

Habitat for these three indicator species can be provided at various levels, from meeting MR's (159,949 acres, including habitat in Wildernesses) to preserving all existing mature and old-growth forest (443,000 acres) Figure II-10 displays the maximum number of sites *specifically* identified during the planning process as habitat areas for these three species (the maximum identified habitat network is approximately 200,000 acres).

Woodpeckers

Snag management guidelines have been in effect on the Siskiyou since 1976. One to two snags per acre (average 1 85), depending on habitat type, must be available to snag-dependent wildlife at any time during a rotation (minimum snag size 11" diameter). These snags provide for 60 percent of the maximum possible population levels of all woodpecker species (primary cavity excavators) on land suitable for the production of timber. Approximately three snags per acre provide for 100 percent levels; at that point territorial demands become limiting.

Wildlife trees are retained at the 100 percent level in areas not available for timber harvest Population levels for woodpeckers on land within timber management areas are reduced to 60 percent as stands are harvested and brought into a managed rotation. Some areas with a programmed timber harvest, such as Riparian areas or sites with Visual Quality Objectives of Retention or Partial Retention, may be able to support populations in excess of 60 percent

Deer and Elk Herds

If timber harvesting continues at the present rate, the size of the deer herd will remain relatively constant for the next three decades However, habitat capability will diminish in 40 to 50 years when the number of clearcut acres created each year begins to decline and commercial thinnings begin to comprise a significant proportion of the programmed timber harvest. Habitat capability for elk will follow the same general pattern as deer However, because elk presently occupy only one-third of the Forest land base, elk numbers will increase during the next few decades as new areas are colonized.

Higher levels of timber harvest (departure from an even-flow policy of timber production) would temporarily result in significantly increased deer and elk numbers. However, when future timber harvests are necessarily reduced, herd levels would decrease significantly A prolonged reliance on timber harvest within existing roaded areas will eventually create long-term fluctuations in the cover/forage ratio for deer and elk

One challenge facing the ODFW and Forest Service is how to meet the expected increase in demand for big-game hunting in the face of constant or declining habitat capability. A deline in habitat capability could be partially mitigated by installating shorter harvest rotations, allocating more land to timber harvest, prescribing fire to rejuvenate specific forage areas, or increasing capital investments in habitat improvement projects

Distribution of the deer and elk populations (and, concurrently, hunter distribution) may be improved when unroaded areas (nonreserved) are accessed by roads. However, as more logging roads are built, their adverse effect on deer and elk populations will be more pronounced. Forest managers could develop policies to alleviate the detrimental effects of open roads on deer and elk populations.

Special Habitats - Riparian, Meadows, and Wildlife Sites

The Forest's riparian ecosystem policy protects fish and wildlife habitat within Riparian areas. Meadows can be managed to maintain their wildlife values, and meadow acres lost in past decades can be reclaimed. Buffer areas (200 feet average width) surrounding the meadows can be managed for the benefit of wildlife species utilizing this type of habitat. Special Wildlife Sites can be withdrawn from timber harvest and managed to meet wildlife objectives. Many other identified wildlife sites undoubtedly exist on the Forest; a concerted effort can be made to find and manage these sites.



BIOLOGICAL DIVERSITY

EXISTING CONDITION

Biological diversity is the distribution and abundance of different plant and animal communities and species. Biological diversity should be gauged from several aspects: (1) spatial, such as throughout a forest stand, or across a forest landscape, (2) biological, such as genetic variation within a population of species; and (3) temporal, which relates to processes and conditions, such as short-term change, long-term productivity, and evolutionary change. Diversity is determined by ecosystem function, patterns of biotic communities, and human activities.

FLORAL AND FAUNAL DIVERSITY

The Siskiyou National Forest is the most floristically diverse Forest in the western United States and one of the most diverse in the Nation (Whittaker 1960) It supports over a quarter of all the sensitive species listed in the Pacific Northwest Region. It is the type locality for many rare species and supports well known endemics such as Brewer spruce, Saddler oak, kalmiopsis, and Waldo gentian.

In total, there are more than 1,400 plant species and 92 plant associations in the area of the Siskiyou National Forest The 92 plant associations were stratified into groups and separated by successional stages Table III-30 compares the abundance of each plant association group and successional stage by area (acres). The Siskiyou Mountains are the southern limit for northern conifers such as Alaska-cedar and silver fir, and the northern limit for southern species such as Jeffrey pine, redwood, and Andrew's bead lily Port-Orford-cedar, Pacific yew, and redwood are thought to have evolved in the area (Axelrod 1976, Detling 1961)

There is high species richness of both plants and animals on the Forest. There are more than 250 wildlife species occupying the diverse habitats in the area. The Siskiyou National Forest provides habitat for 70 species of mammals, over 150 bird species, and 38 species of reptiles and amphibians. An occurrence list of wildlife by seral stage and habitat type is available from the Supervisor's Office The list was prepared from data collected by Brown (1985), Guenther and Kucera (1978), and by Forest personnel and others

Several sensitive vertebrates occur in the area, such as the northern spotted owl, Townsend's western big-eared bat, and California wolverine. The bald eagle, a Federal threatened species, and the peregrine falcon, a Federal endangered species, both nest within the Forest. Grizzly bear and gray wolf once inhabited the area, but are now extirpated

Over 24 species of fish occur within the Siskiyou National Forest. Green and white sturgeon and various commercially important salmonids are included.

Four major factors play a role in the faunal and floral diversity of the Forest These are the transverse orientation of the Siskiyou Mountains, the geographic location (latitude), the diverse geology, and the fire history. The transverse orientation and rugged terrain of the Siskiyou Mountains provide a variety of drainage orientation, aspect, and elevation that add to environmental diversity and niche breadth. Latitude of the Forest assures a variety of weather; tropical and arctic influences both affect the weather throughout the year. Unique geological niches occur in serpentine areas and other geology complexes Evidence of fire exists in all areas. Vegetation in various successional stages, including relatively unaffected islands in late seral stages, provides structural diversity and testifies to the importance of fire.

Table III-30. Abundance of Successional Stage by Plant Association Group 1/

Plant Association Group	Successional Stages (Acres) Grasses & Forbs	Shrubs Low	Shrubs Tall	Trees Pole	Trees Young	Trees Mature	Trees Old	Series Total (Ac)	Percent
Shasta Red Fir-White Fir/Sadler Oak	1,694	3,106	4,425	8,656	15,993	4,324	33,874		
Shasta Red Fir-White Fir	642	1,177	1,676	3,279	6,058	1,638	12,831	99,372	9.1
White Fir/Warm, Xeric (SWO)	385	706	1,006	1,967	3,635	983	7,699		
White Fir/Hot, Xeric (SWO)	462	847	1,207	2,361	4,362	1,179	9,238		
White Fir/Brewer Spruce	411	753	1,073	2,098	3,877	1,048	8,212		
White Fir/Warm, Mesic (SWO)	1,925	3,530	5,029	9,836	18,174	4,914	38,493		
White Fir/Mesic (SWO)	154	282	402	787	1,454	393	3,079		
White Fir/Cool, Mesic (SWO)	77	141	201	393	727	197	1,540	145,236	13.3
Western Hemlock/Swordfern-Oxalis	1,026	1,883	2,682	5,246	9,693	2,621	20,530		
Western Hemlock/Rhododendron-Salal	693	1,271	1,810	3,541	6,542	1,769	13,857	73,164	6.7
Port-Orford-Cedar/Oak	154	282	402	787	1,454	393	3,079		
Port-Orford-Cedar/Shrub	975	1,788	2,548	4,984	9,208	2,490	19,503	48,048	4.4
Tanoak/Conifer	1,078	1,977	2,816	5,508	10,177	2,752	21,556		
Tanoak/Oregongrape	1,950	3,577	5,96	9,967	18,416	4,980	39,006		
Tanoak/Canyon Live Oak	1,463	2,683	3,822	7,476	13,812	3,735	29,255		
Tanoak/Evergreen Huckleberry	2,207	4,048	5,766	11,279	20,839	5,635	44,139		
Tanoak/Rhododendron	2,207	4,048	5,766	11,279	20,839	5,635	44,139		
Tanoak/Coffeeberry	231	424	603	1,180	2,181	590	4,619	388,752	35.6
Douglas-fir/White Fir	488	894	1,274	2,492	4,604	1,245	9,752		
Douglas-fir/Dry Shrub	693	1,271	1,810	3,541	6,542	1,769	13,857		
Douglas-fir/Tanoak	1,796	3,295	4,693	9,180	16,962	4,586	35,927	126,672	11.6
Jeffrey Pine/Grass	975	1,788	2,548	4,984	9,208	2,490	19,503		
Jeffrey Pine/Forb	821	1,506	2,146	4,197	7,754	2,097	16,424		
Jeffrey Pine/Shrub	2,900	5,318	7,577	14,820	27,382	7,404	57,996	199,836	18.3
Cliffs, Rocks Balds, Talus								10,920	1.0
TOTALS	25,405	46,595	66,378	129,838	239,892	64,865	508,108	1,092,000	100.0
Percent	2.3	4.3	6.1	11.9	22.0	5.9	46.5		

1/ Tables III-37 and III-38 are based on sampling by the Ecology Program. They estimate the present condition of the Forest relative to seral stages. Acreages were projected from 685 sample plots representative of the Forest as a whole. However, Wilderness areas were not sampled, making the projections somewhat biased. Rather than using all 92 Plant Associations, a stratification was used. The groups were based on Region-wide ecological analysis and were compiled collectively by Forest Service ecologists and inventory specialists. The groups will potentially be used in the upcoming resource inventory as strata and as a comparative base for monitoring changes in seral stages. The figures do not correspond to Table III-17 because: (1) ecological sampling is biased to later seral stages, (2) there are five seral classes in ecological sampling based on stand structure rather than the seven seral stages based on stand age, and (3) allocating ecological status to age classes, such as mature or old-growth, is subjective and is dependent on the definitions of each class and the vegetation under consideration

The existing diversity of the Forest is a valuable legacy of past geologic history and natural processes. Progenitors of species such as redwood, Pacific yew, and possibly Port-Orford-cedar and incense-cedar developed in the Klamath Mountains, the only local land area above sea level during the Jurassic Period, about 160 million years before present (MMBP). By the Cretaceous Period (135 MMBP), a mixture of ferns, palms, gingkos, cycads, conifers, and flowering plants occupied the landmass that we now call the Klamath Mountains

Long-term, sweeping climatic changes (including warm, dry and cool, wet eras) during the Tertiary period (60 to 2 MMBP) significantly changed the floral composition as the North American continent moved toward its present position The overall effect was mixing of flora from as far south as Mexico and as far north as Alaska, including oaks, locust, pines, hemlock, and fir

Before the Pleistocene (the epoch of the Ice Ages), the flora included old conifers (redwood, Pacific yew, and cedars), new conifers (pines, true firs, and Douglas-fir), and hardwoods and flowering plants from various origins (walnut, birch, beech, alder, maple, and ash). Hardwoods that could not tolerate dry summers or compete for moist niches gradually disappeared from the area Shrubby and herbaceous species also occurred, but left fewer fossil remains

During this period, species such as Alaska-cedar and Pacific silver fir began to occupy high elevation, north-facing, cold pockets during interglacial hot periods Species of southern origin requiring hot, dry conditions came to occupy low elevation, hot sites with shallow soils They expanded their range during the Xerothermic period (4 degrees Centigrade increase in average annual world-wide temperatures, Detling 1961) when elements of the California chaparral migrated as far north as the Columbia Gorge (4,000 years ago) Again the species requiring cold conditions took refuge in niches at the high elevations, and the Siskiyou Mountains received another influx of California species.

The 0.5 degrees Centigrade depression during the Little Ice Age (1,350 to 1,800 years ago) caused crop failure and famine throughout Europe and was the period when most of the old-growth forest stands of the Siskiyou originated. The most significant changes in species composition and structure since the onset of the Little Ice Age have been caused by fire, both natural and human-caused Most rare, endemic, and sensitive species have also survived the dramatic changes during the Ice Ages, Xerothermic Period, Little Ice Age, and the recent disturbances caused by trappers, miners, loggers, ranchers, and settlers.

ECOSYSTEM FUNCTION

Ecosystem functions can be categorized as physical and biological processes Examples of physical processes include weathering and erosion, while some biological processes include photosynthesis, nitrogen fixing, and reproduction. Many functions in an ecosystem, such as root activity, decomposition, and mychorrhizal associations, can be influenced by natural disturbances and human activity. Maintaining ecosystem function is key to long-term productivity. Forest management activities are thought to influence a number of ecosystem functions. For a full discussion of this topic refer to USDA 1988b.

Both natural and human-caused disturbances shape the biotic composition, structure, and function of the forest Disturbances can be catastrophic in nature, or periodic. They include insect outbreaks, disease, windstorms, flood, geologic actions, fire, and timber harvest Disturbances create mosaics of successional stages and forest patterns across the forest landscape

Fire has been the major agent of change in forest ecosystems (Omi and Laven 1982) Within the Siskiyou National Forest catastrophic wildfires occur, on the average, at 200 year intervals in the area influenced by coastal conditions East of the coastal area, but still west of the crest of the Siskiyou Mountains, the fire frequency is generally every 70 to 100 years East of the crest of the Mountains, in the rain shadow, the fire frequency is 50 years in white fir and 20 years in Douglas-fir communities.

In addition to fire, timber harvest also has a major effect on ecosystem function and productivity Timber harvest generally occurs in the late seral stages of coniferous forest These forests are complex ecosystems which have complex functions. The late seral stage coniferous forest consists of large long-lived trees forming a broken canopy with a variable distribution of dominants and codominants A vertical foliage distribution is present with a patchy understory which provides niches for vertebrates and invertebrates (Harris 1984)

These forests also contain snags and broken topped trees that provide roosting and nesting sites for birds and mammals. Underground mychorrhizal fungi provide food for many mammal species and assist trees in the uptake of nutrients for growth and survival. Fallen logs support insects, which serve as food for many vertebrates. Vertebrates, such as amphibians, also live in the decaying logs. The decaying logs, also provide sites of nutrient cycling and contribute to the maintenance of long-term site productivity (Harris 1984).

Patterns of timber harvest have consequences to diversity at the landscape level The contiguous nature of late seral stages is replaced by a patchwork interspersed with early seral stages. This condition has been referred to as "forest fragmentation." The degree of fragmentation may influence the abundance of forest interior species.

On the Siskiyou National Forest, much of the timber harvested has been on productive lower elevation sites, where vertebrate species density is generally higher The amount of late seral stage forest has also been reduced nearly 26 percent since 1940 The existing acres of late seral stage (mature and old growth) are displayed in Table III-30.

CURRENT DEMANDS, WANTS, AND DESIRES

The National Forest Management Act requires that Forest plans "preserve and enhance the diversity of plant and animal communities...so that it is at least as great as that which would be expected in the natural forest" (36 CFR 219.27). Additional direction states, "Management prescriptions, where appropriate and to the extent practicable, shall preserve and enhance the diversity of plant and animal communities, including endemic and desirable naturalized plant and animal species, so that it is at least as great as that which would be expected in a natural forest and the diversity of tree species similar to that existing in the planning area "

Several respondents to the DEIS mentioned the need to maintain the species diversity of the Forest, especially botanical resources Many comments mention establishment of Research Natural Area, Botanical, and Riparian Management Areas. Several species were mentioned specifically, including redwood, Brewer spruce, and Port-Orford-cedar

Perpetuation of old-growth forest ecosystems and the need to consider old growth preservation at the landscape scale were common themes Some respondents emphasized uneven-aged management Other public desires includes meadow maintenance, maintaining species viability, and retaining hardwood components in forest stands. Some respondents recognized that much is to be learned about providing biological diversity in the forest. They recommended inventories, monitoring, and research to develop future guidelines and practices.

ABILITY TO SATISFY DEMAND

Biologically, the Forest is capable of maintaining the present complement of species, barring an extensive catastrophe. Land allocations are one tool to maintaining viable populations of some plants and animals. Other tools, such as management plans and Forest-wide Standards and Guidelines, may be appropriate for some species. Redwood, Port-Orford-cedar, and Brewer spruce are examples of plant species that can be maintained by using more than one approach Table III-31 relates biological diversity to management issues and strategies

Botanical, Research Natural Areas, Special Wildlife Sites, Designated Wildlife Habitat, and selected Supplemental Resource Management Areas are all designated, in part, to maintain plant and animal diversity. There are plants and animals which also occupy land allocated to General Forest, Retention, and Partial Retention Visual Management Areas In these areas, sensitive plants and animals that thrive on infrequent disturbance will be considered on a case-by-case basis during project planning Emphasis is placed on the development of Species Management Guides for all of these species to allow evaluation, protection, and maintenance at the landscape scale. If plants requiring frequent disturbance are found in areas other than General Forest and Partial Retention Visual, a method of introducing disturbance in the proper frequency and intensity to assure species viability will be considered.

Remarkable groves of old-growth forest and unique plant habitats can be allocated to Botanical Management Areas In addition to these allocations, late seral stage forest would be provided in areas allocated to no harvest prescriptions (Management Areas 1-9) Mature and old-growth forest is also present on lands unsuitable for timber management within Management Areas 10-14

The combination of mature and old-growth forest on unsuitable lands and Management Areas 1-9 can be evaluated for each alternative to determine if late seral stages will likely be present in Planning Basins through the planning period. The potential pattern of late seral stages over the forest landscape can also be compared for each alternative.

The ability of the Siskiyou National Forest to provide significant quantities of old-growth forest in some plant associations may be impaired by the natural fire frequency in some areas of the Forest Fire frequencies are also affected by human activity. High fire frequencies on the lower slopes of the inland valleys were maintained by the Indians and are perpetuated by today's culture Many of these lower slopes have reburned as many as three times in the last two decades. Several plant associations of the Douglas-fir Series and the drier associations of the White Fir Series are not likely to persist in an old-growth condition for long periods of time.

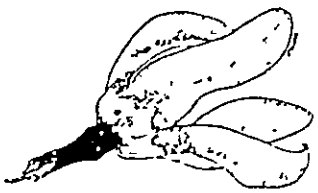


Table III-31. Management Strategies and Issues Related to Biological Diversity

Biological Diversity Considerations	Related Management Issue	Comments/Concerns	Strategies: Land Alloc.	S&G's	Monitoring	Other
MAINTAINING SPECIES DIVERSITY OF PLANTS AND ANIMALS						
Rare/Endemics	Port-Orford-cedar	Spread of Pathogen	X	X	X	District and Interregional Plans
	Redwood	Genetic Diversity	X	X	X	Management Plan
	Sensitive Species	Population Viability	X	X	X	Continuing Surveys and Species Management Guides
Management Indicators	Spotted Owl, Pine Marten, Woodpeckers, etc.	Species Range, Population Viability	X	X	X	
Common Species	Forest Diversity, Viability	Species Range		X	X	
MAINTAINING HABITAT DIVERSITY						
Unusual or Unique Sites	Wilderness	Also Cover in Management Areas 2-11	X	X	X	
Common Sites	Vegetation Management,			X	X	
	Wildlife Habitat			X		Deer/Elk Management Plan
Seral Stages	Old Growth,	Maintenance and Replacement	X	X	X	Forest-wide Resource Inventory
	Meadows	Maintain through Active Management	X	X	X	Forest-wide Resource Inventory
	Hardwood Conversion			X	X	
MAINTAINING FUNCTIONAL DIVERSITY						
Long-Term Productivity	Residue Management,	Includes Large Woody Material		X	X	
	Soil Productivity, Nutrient Cycling, and Nitrogen Fixation	Lands Not Suitable for Timber Management		X		Remove Unsuitable Land from Timber Base Active Research
Fish Production	Riparian Area Management		X	X	X	Enhancement Projects
	Aquatic Habitat Management		X	X	X	Enhancement Projects
Forest Fragmentation and Linkage	*Wildlife Habitat*	Adequate Network	X	X	X	Research
	Management Indicator Species	Adequate Network	X	X	X	Research
	Old Growth	Stand Viability	X		X	Research

VISUAL RESOURCE

EXISTING CONDITION

Discussions presented in this section are pertinent to the resolution of Planning Problems 4, 6, and 8. Planning Problem #4, dealing with Wild and Scenic River corridors, was covered in that section. Planning Problems #6, "How, and to what degree, should Forest scenic values be protected through visual resource management?" and #8, "How will management direction affect recreation opportunities in the Wilderness and unroaded areas?" are treated below.

The characteristic landscape of the Siskiyou National Forest is identified with rugged, mountainous terrain with dissected drainage patterns The ridges are often narrow and similar in elevation, with canyons that are deep and narrow This landtype is clothed with a mixture of conifers and hardwoods These characteristics provide the basis for development of the current Visual Quality Objectives (VQO's) inventory.

Varying degrees of human-caused impacts exist Some are historic, the result of mining during earlier periods Others, such as road construction and timber harvest, are more recent. While visual conditions are not static, many impacts last long enough to affect the quality of the scenery for many Forest users.

VISUAL INVENTORY AND VISUAL QUALITY OBJECTIVES

The original Forest visual inventory in 1973 was modified to its present status in 1978 based on guidelines for the Forest Service Visual Management System (USDA 1974). The visual inventory is the result of the following independent variables (1) landscape variety classification; (2) viewer sensitivity; and (3) viewer distance (USDA 1974). The visual inventory provides measurable Standards and Guidelines for management of the Forest's visual resource.

Visual Quality Objectives are measurable degrees of acceptable deviation from a pristine environment and constitute the Forest's current visual inventory. The current inventory of VQO's is shown in Table III-32. The objectives are defined as:

Preservation - Management activities, except for very low visual impact recreation facilities, are prohibited. Ecological changes only continue uninterrupted

Retention - Management activities are not visually evident to the casual Forest visitor.

Partial Retention - Management activities are evident, but remain visually subordinate to the characteristic landscape

Modification - Management activities may dominate the characteristic landscape, but should be designed so as to resemble the natural appearance of the landscape when viewed in the background. This is a combined area with the *Modification/Maximum Modification* objective.

Table III-32 Visual Quality Objectives

Objective	Acres	Percentage of Forest
Preservation	235,310	22
Retention	81,480	7
Partial Retention	287,700	26
Modification	487,812	45

CURRENT FOREST VISUAL CONDITION

The Existing Visual Condition inventory (Pugh 1981; available in the Planning Records) provides a measure of the current condition of the Forest's visual resource. The Existing Visual Condition process used stratifies Forest lands into six landtypes that are shown in Table III-33.

Table III-33. Current Visual Condition Land Types as Defined by the Existing Visual Condition Inventory

Landtype	Acres	Percentage
I Untouched	483,355	41
II Unnoticed	192,514	17
III Minor disturbance	105,911	9
IV Disturbance	222,254	19
V Major Disturbance	139,545	12
VI Drastic disturbance	19,904	2

The Forest has identified 44 viewsheds as displayed in Figure III-20 (Pugh 1984, see Planning Records). The viewsheds can be described as *natural appearing* (landtypes I and II), *near natural* (landtype III), and *modified* (landtypes IV, V, and VI) Natural appearing implies little or no visible evidence of management activities; *near natural implies some evidence of management, but the natural character of the landscape* remains dominant; and Modified implies the evident modification of the natural character of the landscape. The visual condition of the viewsheds is shown in Table III-34.

Table III-34. Visual Condition

Viewshed Condition	No of Viewsheds	Acres
Natural Appearing	8	235,924
Natural/Near-Natural	11	277,278
Near-Natural/Modified	13	282,831
Modified	12	296,269

The final step in describing the current visual condition involves the overlay of the Existing Visual Condition with the visual inventory This process revealed that 47 percent of the acreage inventoried for Retention does not meet the criteria for that objective; 33 percent of the inventoried Partial Retention area is over-impacted; and 26 percent of the Modification area would not meet the criteria for the Modification objective To achieve the various visual objectives, all of these areas would require rehabilitation

CURRENT DEMANDS, WANTS, AND DESIRES

The demand for aesthetic values is difficult to quantify However, it is evident based on the level of recreation use and attendant concern for the recreational settings

As indicated in the **ECONOMIC AND SOCIAL** section of this chapter, population growth is expected to continue in southern Oregon This can be partially attributed to the ready availability of amenity resources. It is expected that the demand for visual resource management will continue. Demand, taken in this context, is not presented as a price-quantity relationship, but as a nonquantifiable attitude expressed by the public for the aesthetic quality of their Forest environment.

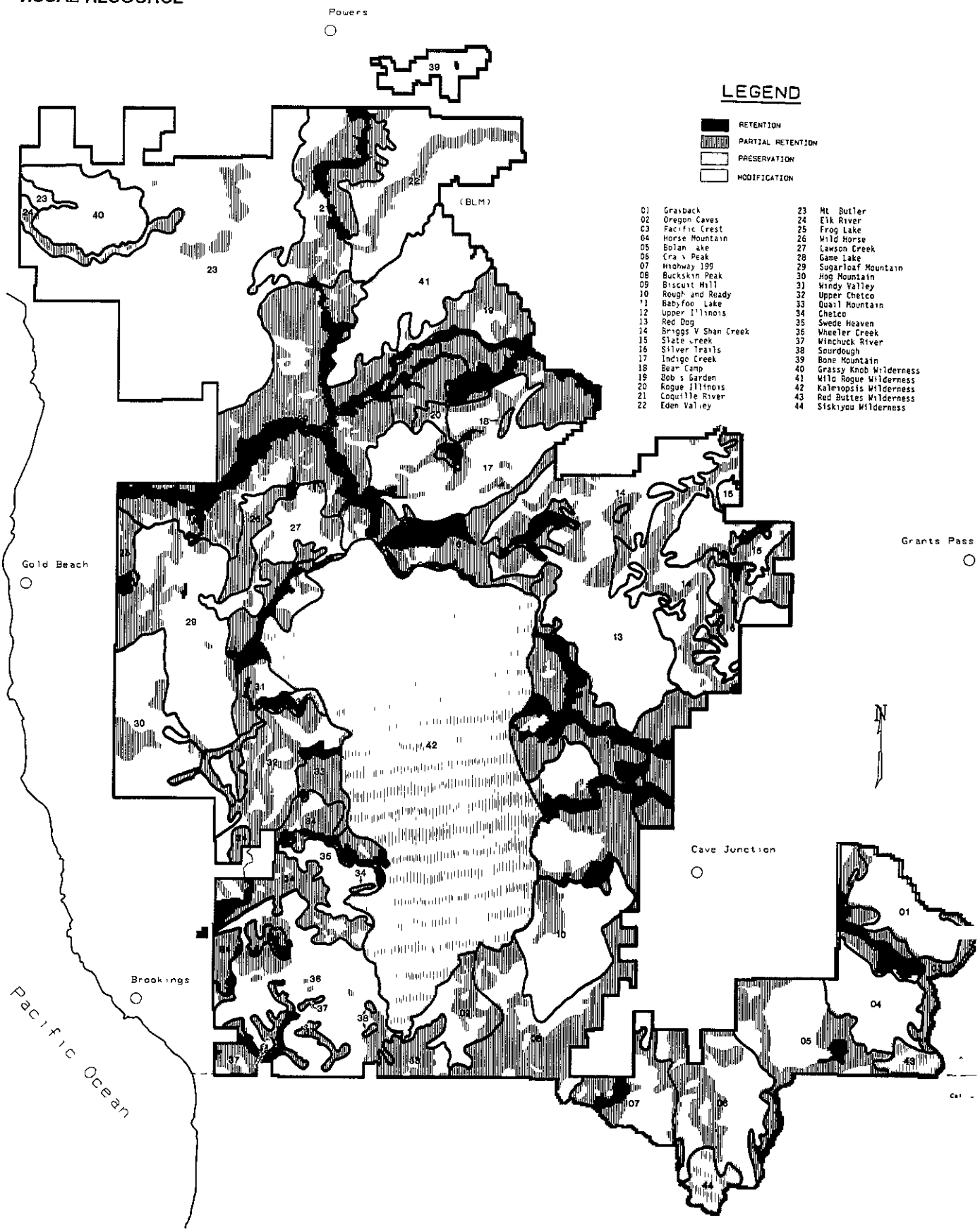
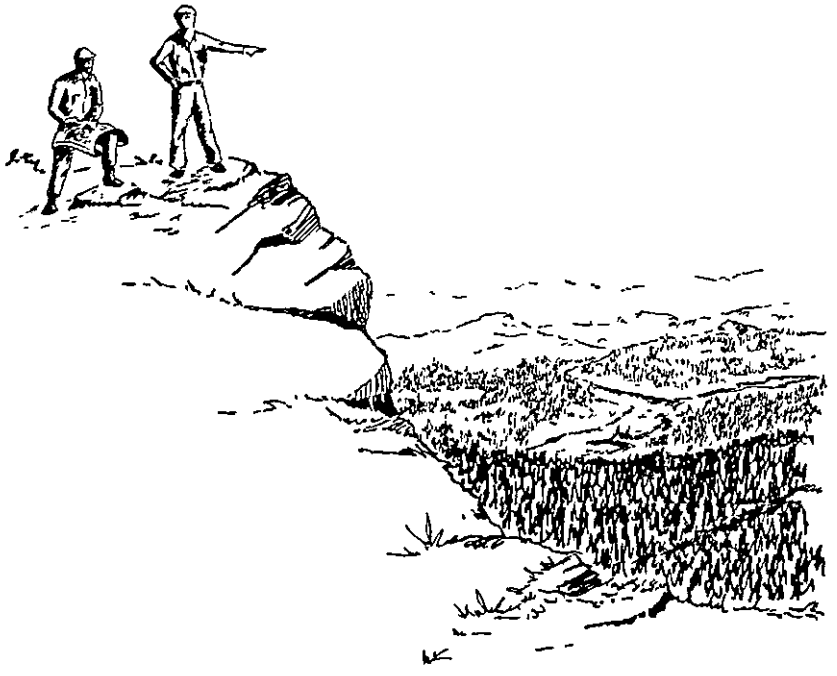


Figure III-20 Visual Quality Objective Map with Forest Viewsheds

ABILITY TO SATISFY DEMAND

The Forest can satisfy the concern for the quality of the visual resource by managing to meet or exceed the current inventory of Visual Quality Objectives Visual management can be reduced or increased depending on management emphasis. The Existing Visual Condition inventory indicates that the visual resource is in relatively good condition so that areas experiencing high levels of recreation use can be maintained in a natural or near-natural condition. In other areas of the Forest, the inventory can be reduced in response to relatively light use and managed more for other resource emphases.



RECREATION SETTINGS

EXISTING CONDITION

Discussions presented in this section are pertinent to the resolution of Planning Problems 4, 6, and 8. These Planning Problems deal with Wild and Scenic River and adjacent land management, the visual resource, and opportunities pertaining to Wilderness and unroaded areas

Recreation plays an important role in the management philosophy of the Forest However, relative to other National Forests in the Pacific Northwest, the Siskiyou is not considered to be a major recreation Forest However, river travel is the one recreation activity for which the Siskiyou National Forest is renowned The Rogue River draws the most attention and use Other rivers that have moderate to high recreational values are the Illinois, Chetco, Coquille, Winchuck, and Elk.

The Forest has four categories of recreation. (1) Developed; (2) Undeveloped, Dispersed, (3) Wilderness, and (4) Wild and Scenic Rivers.

Developed Recreation

The 46 developed recreation sites on the Forest range from very primitive (level I) to highly developed (level IV) These sites are located in areas of the Forest that exhibit a landscape character that is natural appearing, although evidence of management activities may be visible in the background from many of the sites Facilities are designed to blend with the Forest character and provide a setting that is appropriate for the types of recreation opportunities offered. User fees are charged for the more developed sites. The Forest has a developed capacity for approximately 1,960 people at any one time Current recreation use is at capacity at several developed sites and is expected to remain at or exceed capacity in the future Other sites are little used; they could be eliminated to provide more efficient use of recreation maintenance funds. Table III-7 in the **IMPROVEMENTS** section of this chapter displays the current inventory of developed recreation sites on the Forest

The trail system on the Forest began when people first inhabited the area Indians, early settlers, miners, and the military all contributed to the development. In more recent times, road building has displaced many trails. Others have become impassable due to lack of use and maintenance Presently, most of the trail system is maintained for recreation purposes. Table III-6 in the **IMPROVEMENTS** section displays mileages and the availability and suitability of trails for various uses.

Three National Recreation Trails (total of 36 miles) are located on the Forest These are the Boundary, Illinois River, and Upper Rogue River Trails. Two miles of interpretive trails (Japanese Bomb Site and Redwood Nature Trail) are located on the Chetco Ranger District. Three historic trails (totaling 38 miles), plus another 12 trails (58 miles) that have historic significance, are given consideration during project planning Eleven trails (99 miles) in undeveloped, non-Wilderness areas are closed to motorized use based on the need for public safety, resource protection, and law. The Rogue River Trail (15 5 miles) is restricted to hiker use only The Illinois River Trail (26 miles) is closed from May 15 to September 15 to ORV's

The recreation setting for the Forest's trail systems varies with the location of specific trails In general, trails located within Wilderness or Wild and Scenic River boundaries are natural appearing and generally uninfluenced by management. Some evidence of management activities may be in the background Other trails located in undeveloped, non-Wilderness areas will have a recreation setting that may be natural appearing or heavily altered depending on the intensity of management in proximity to the trail The reader can get a better "feel" for recreation settings by referring to Table III-33, Current Visual Condition, and comparing the trail location to the description of the viewshed (Figure III-20) through which the trail passes

Undeveloped, Dispersed Recreation

This category is used to describe recreation activities that are occurring in undeveloped areas outside of Wilderness or Wild and Scenic River corridors These activities may be motorized or non-motorized, or occur with or without significant levels of interaction with other users Dispersed recreation use exceeds developed recreation by a six-to-one ratio, and accounts for approximately 80 percent of recreation use on the Forest. These types of recreation opportunities can occur in a forest setting that ranges from an unroaded, unmodified, natural appearing landscape to a modified forest setting Popular recreation activities on the Forest are water-related, such as swimming, fishing, and floating in the river corridors, hiking and camping, sightseeing, and gathering forest products. Use statistics indicate that there are approximately 1,000 people involved in recreational activities each day on the Forest

Wilderness Recreation (Including Wilderness Potential)

The five Wildernesses have been inventoried according to criteria developed for the Wilderness Resource Spectrum (WRS); see next page for definitions The Kalmiopsis Wilderness provides the opportunity for Pristine, Primitive, and Semi-primitive recreation The other four provide Semi-primitive opportunities. Recreation use in all of the Wildernesses is low when compared to other Wildernesses in the Pacific Northwest Region. Of the total Wilderness use, 88 percent occurs in the Kalmiopsis, 8 percent in the Wild Rogue, 1 percent in Grassy Knob, 6 percent in Red Buttes, and 1 percent in the Siskiyou Wilderness (the latter two areas are for the Siskiyou National Forest portion only).

Portions of the inventoried North and South Kalmiopsis roadless areas offer Primitive and Semi-primitive recreation opportunities (See Table III-36 Undeveloped, Dispersed Recreation).

Wild and Scenic Rivers Recreation

Of the Forest's five designated Wild and Scenic Rivers, recreation use is heaviest on the Rogue, followed by the Chetco and the Illinois Recreation use is moderate on the Elk and low on the North Fork Smith There are approximately 22,400 RVD's of use occurring on the Chetco and 200 RVD's use on the North Fork Smith. Approximately 6,139 RVD's of use occur on the Elk River (See Table III-38).

CURRENT DEMANDS, WANTS, AND DESIRES

Developed Recreation

The demand for developed recreation is shown in Table III-35 Full utilization of a developed site is considered to be 30-40 percent, as theoretical capacity is based on every campsite being fully occupied for every day during the season of use Demand projections indicate that the Forest has the capacity to sustain use until approximately the seventh decade of the planning period. There is a consistent demand for trail-related recreation opportunities The desire for development of day hike trail systems within both the periphery of the Wilderness and in undeveloped areas have been expressed And, there has been a concern voiced for maintenance and preservation of the Boundary, Illinois River, and Hobson Horn/Silver Peak Trails

Table III-35 Developed Recreation Demand and Capacity (M RVD's)

Use	Forest Capacity	Percent Capacity
116	157	74

Undeveloped, Dispersed Recreation

Also, the demand for undeveloped, dispersed recreation opportunities will continue over the course of the planning period The Recreation Opportunity Spectrum (ROS), an inventory system which recognizes the quality aspects of recreation opportunities, is used to characterize demand (levels of use) over the range of available opportunities in undeveloped, non-Wilderness areas Current levels of recreation use are shown in Table III-36. Definitions of the ROS classes are:

Primitive - An area that is characterized by essentially unmodified natural environment of fairly large size. Interaction between users is very low and evidence of other users is minimal.

Semi-primitive Non-motorized - An area that is characterized by a predominantly natural or natural-appearing environment of moderate to large size User interaction is low, but there may be evidence of other users.

Semi-primitive Motorized - An area that is characterized by a predominantly natural or natural-appearing environment of moderate to large size Motorized use is permitted.

Roaded Natural (Modified) - An area that is characterized by predominantly natural-appearing environment with moderate to heavy evidence of the sights and sounds of man.

Table III-36. Undeveloped, Dispersed Recreation

ROS Class	Acres	Use (M RVD's)	Capacity (M RVD's)	Percent Capacity
Roaded Natural	625,272	369	679	54
Semi-primitive Motorized	95,050	69	122	57
Semi-primitive Non-motorized	101,197	12	21	57
Primitive	14,370	1	2	50

Wilderness Recreation (Including Wilderness Potential)

Concern has been expressed for the availability of dispersed motorized opportunities and for the quality of the environment in which these opportunities are available. Expressed, too, is the concern for the availability of Semi-primitive and Primitive recreation opportunities in the undeveloped, non-Wilderness areas These opportunities are available primarily in the North and South Kalmiopsis roadless areas Based on projected levels of use and growing popularity of primitive recreation experiences, the demand for Wilderness recreation opportunities is expected to continue over the course of the planning period. Wilderness recreation use (demand) is shown in Table III-37. Definitions of the WRS classes are:

Pristine - Unmodified wilderness character; cross-country recreation opportunities only Frequency of user interaction is very low

Primitive - Trail associated wilderness recreation opportunities on maintained systems Frequency of user interaction is low

Semi-primitive - Wilderness recreation opportunities in a predominantly unmodified environment. Frequency of user interaction is moderate

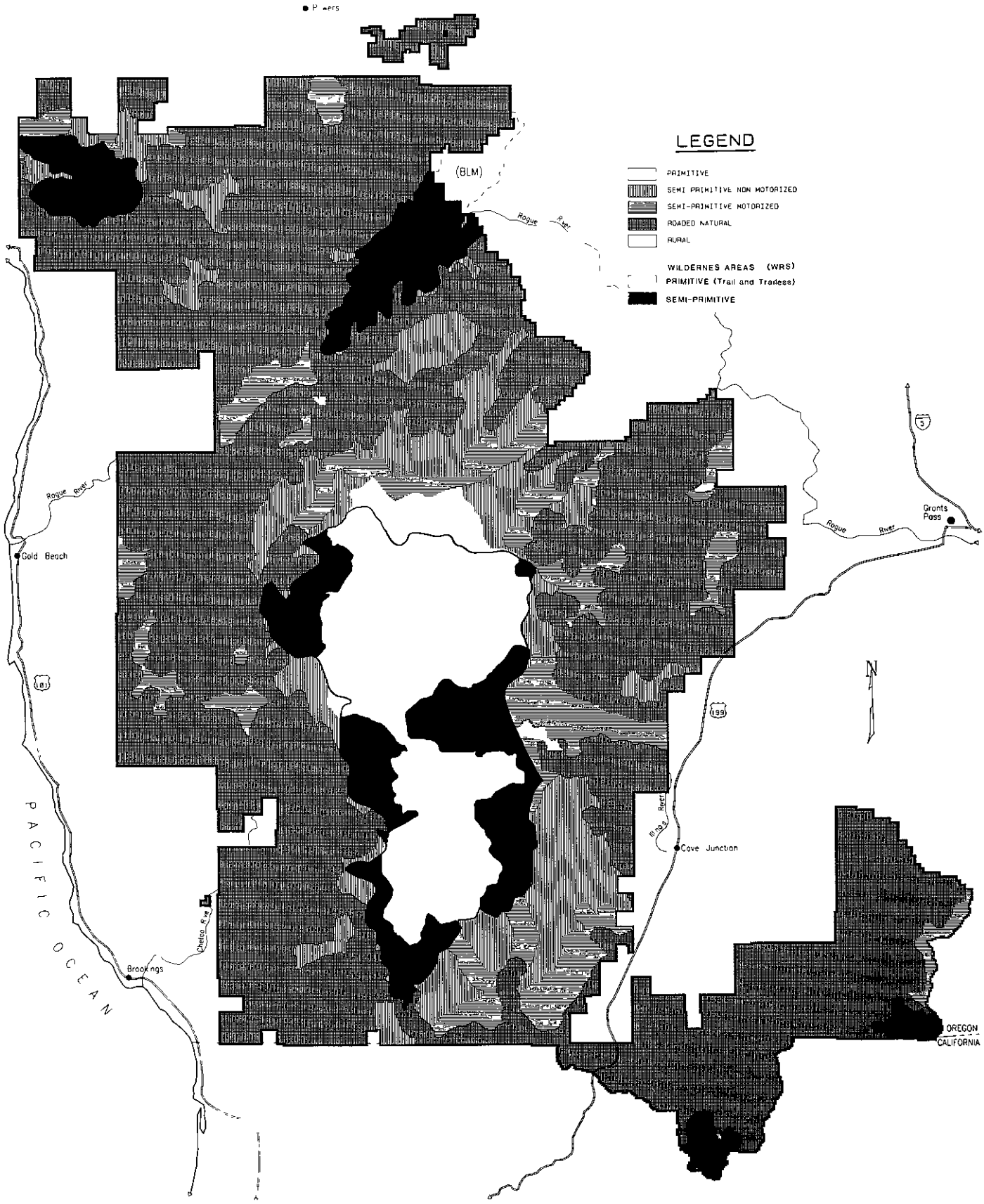


Figure III-21 Recreation Opportunity Spectrum Map

Table III-37. Wilderness Recreation Use

WRS Class	Acres	Use (M RVD's)	Capacity (M RVD's)
Primitive	93,462	1	1
Pristine	20,608	9	11
Semi-primitive	118,425	12	30

Wild and Scenic Rivers Recreation

Current use (demand) for the Forest's Wild and Scenic River system is shown in Table III-38 Use is assumed to increase at a projected rate of 0.5 percent per year over the course of the planning period

Table III-38 Wild and Scenic Rivers

ROS Class 1/	Acres	Use (M RVD's)	Capacity (M RVD's)	Percent Capacity
Roaded Natural	14,588	108	358	30
Semi-primitive Motorized	2,375	5	22	21
Semi-primitive Non-mot	11,986	2	25	8
Primitive	7,562	2	11	15

1/ See Table III-36 Undeveloped, Dispersed Recreation for the definitions of the ROS classes

ABILITY TO SATISFY DEMAND

The Forest has the ability to satisfy the demand for developed recreation opportunities over the course of the planning period. The Forest may not have the ability to sustain demand at specific campgrounds such as Quosatana, Grayback, and Cave Creek because of their location near attractions There are 18 potential developed sites on the Forest that can be constructed as the need arises. Some are scheduled for funding in the current investment program while the rest may be funded Furthermore, some of the existing sites can be reconstructed or rehabilitated to provide additional capacity.

Local counties and Federal agencies are entering into a number of partnerships to develop recreation and tourism opportunities The local counties chose tourism as their "Oregon Economic Comeback Strategy" which will result in lottery dollars coming to southwestern Oregon projects Several of the projects listed in the Recreation Capital Investments (see Forest Plan, Appendix B) reflect those the Forest is planning and funding jointly with the counties.

The Forest has the ability to satisfy the demand for trail-related recreation over the course of the planning period There are 122 miles of potential trails identified. Some are within Wilderness, others are located in other Management Areas Day hike opportunities exist at various areas in the Wilderness and throughout the rest of the Forest All or parts of the existing 457 mile trail system can be maintained or preserved depending on management emphasis

Based on projected levels of use, the Forest has the ability to satisfy the demand for the various recreation opportunities that are currently available The Forest has the capacity to sustain projected levels of use in the Semi-primitive Motorized and Roaded Natural ROS categories Under current direction, the Forest will not have the capacity to sustain the demand for Primitive and Semi-primitive recreation opportunities in the undeveloped, non-Wilderness areas over the planning period. Similar opportunities are available in the Wildernesses and on other Forests in southern Oregon and northern California

The Forest has the ability to satisfy the demand for wilderness recreation experiences within Wildernesses until approximately the fifth decade of the planning period when capacity will be reached for Primitive recreation. Other Primitive and Semi-primitive recreation opportunities are available on nearby National Forests in southern Oregon and northern California

The Forest has the ability to satisfy the demand for recreation opportunities associated with Wild and Scenic Rivers Recreation use of the rivers is within estimated capacities; demand can be satisfied over the course of the planning period.



ECONOMIC AND SOCIAL

EXISTING CONDITION

The purpose of describing the Forest's economic and social setting is to provide information on the existing condition, current demands, and the Forest's ability to meet those demands The major Planning Problems from Chapter I are used to focus the discussion. For additional details, refer to Appendix B

The Siskiyou National Forest is influenced by conditions occurring at National and regional levels However, the area most affected, and which most affects the Siskiyou, is quite local in nature. Coos, Curry, Jackson, and Josephine Counties (in Oregon) have been defined as the Siskiyou's primary area of economic and social influence (Peterson 1980) These counties roughly correspond to both the physical location of Forest lands and the geographic area within which the local populace relate to the Forest.

There are several types of communities within this influence area. Grants Pass, Coos Bay, and Medford represent the urban services and government centers Communities, such as Powers and Selma, represent the eastside rural communities that are dependent on wood products and agriculture. Westside rural communities, such as Bandon and Brookings, have more diversified economies with tourism and fisheries Communities such as Takilma are more self-contained and have alternate lifestyles with cottage industries as the primary economic enterprise.

POPULATION DYNAMICS

The total population of the four-county area is approximately 271,000 The decade of the 1970's witnessed rapid increases in the growth rates of Jackson and Josephine Counties, most being in-migration largely attributable to a large influx of retired people. Population projections for the four counties (Figure III-22) reflect the rapid growth during the 1970's and the more recent slower growth of the 1980's

SOCIAL OVERVIEW

Many different lifestyles exist in the four-county area. Residents depend on outdoor activities such as fishing, wood cutting, and gardening for income or leisure time supplements. The outdoor activities require natural resources and can foster distinct and strongly-held value structures which are relevant to the forest manager. One such view, the human-centered view, holds that the human's relationship to nature is one of dominance, i.e., natural resources exist for human use alone, to not fully utilize them is wasteful. Another view, the humanity-in-nature view, holds that the natural environment has value apart from human use These highly polarized views, and the nearly infinite intermediate views, result in conflicting opinions on Forest resource management issues.

Further pressure on resources, and increasing diversity of values, is likely to result from the in-migration of people who are either more economically aligned with nonconsumptive uses of the Forest such as recreation, or are retired and therefore are not reliant on economic growth at all The Forest is in the position of being able to contribute to local community stability by responding to these economic and social needs for a supply of all Forest uses

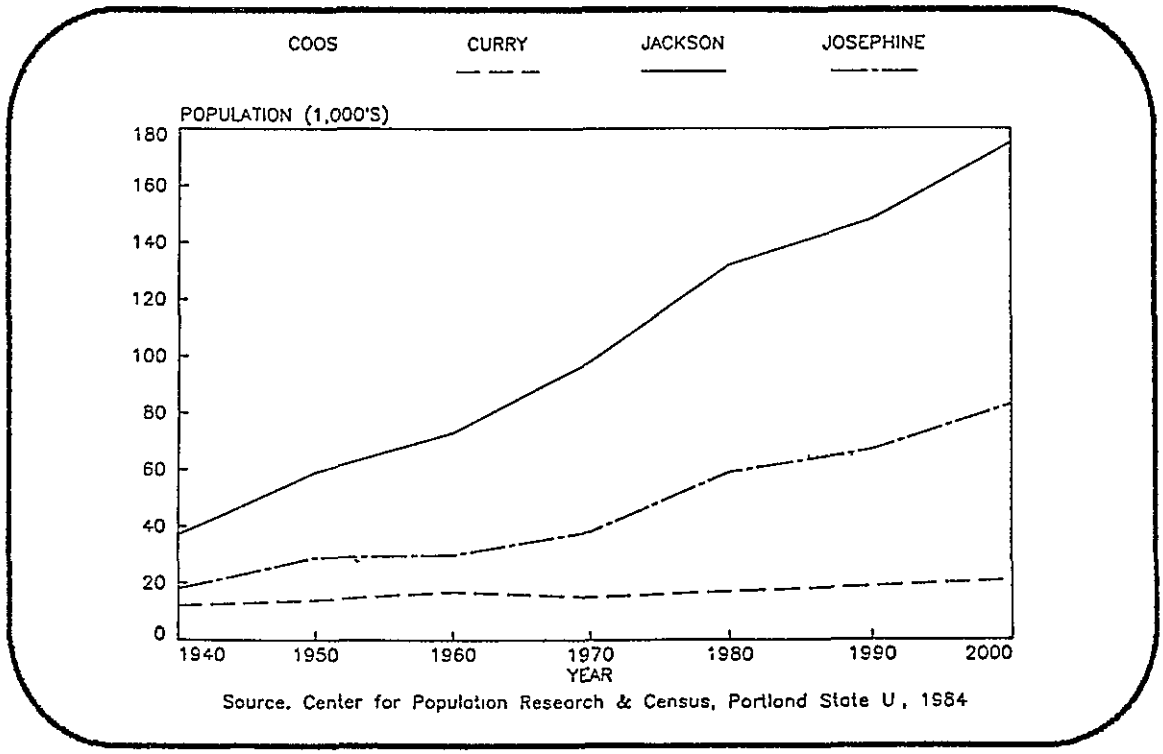


Figure III-22 Population Projections for the Four Counties

EMPLOYMENT

The most important employers are lumber and wood products, government, tourism, agriculture, and fisheries. Lumber and wood products manufacturing, which includes logging, is the largest employer, providing total employment of 17 to 18 percent in the four counties Lumber and wood products jobs have decreased in number from 1979 due to economic adjustments made by industry to remain competitive. Concurrently, other sectors have grown. In-migration (people moving into an area) has served to promote growth in finance, insurance, real estate, and other trade and service industries. Other industries which have provided basic employment growth include apparel, fiberglass, and electronics manufacturing. In Coos Bay, the transportation, communication, and utilities sector is relatively large primarily due to the shipping industry.

Government jobs provide a significant percentage of employment in all four counties, exceeding employment provided by the lumber and wood products industry in 1983. Covered employment, by economic sector in the four counties for 1979, 1982,and 1986, is displayed in Table III-39.

Table III-39. Nonagricultural Wage and Salary Employment for 1979, 1982, and 1986 1/

Coos - Curry Counties	1979		1982		1986	
Sector	Employ-ment	Percent of Total	Employ-ment	Percent of Total	Employ-ment	Percent of Total
TOTAL PAYROLL JOBS	27,020	100 0	22,610	100 0	23,190	100 0
Manufacturing Subtotal	7,670	28 4	5,420	24 0	5,510	23 8
Durable Goods	6,580	24 4	4,290	19 0	4,510	19 4
Lumber and Wood Products	6,130	22 7	3,940	17 4	4,180	18 0
Other Durable Goods	450	1 7	350	1 5	330	1 4
Nondurable Goods	1,090	4 0	1,130	5 0	1,000	4 3
Food and Kindred Products	670	2 5	680	3 0	600	2 6
Other Nondurable Goods	420	1.6	450	2 0	400	1 7
Nonmanufacturing Subtotal	19,350	71 6	17,190	76 0	17,680	76 2
Construction and Mining	1,050	3 9	550	2 4	700	3 0
Transportation, Communications, and Utilities	1,940	7 2	1,650	7 3	1,500	6 5
Trade	5,500	26 2	4,850	21 4	5,330	23 0
Finance, Insurance, and Real Estate	1,180	5 0	980	4 3	1,030	4 4
Service and NEC	3,640	13 5	3,530	15 6	3,900	16 8
Government	6,040	22 4	5,630	24 9	5,220	22 5

Jackson - Josephine Counties	1979		1982		1986	
Sector	Employ-ment	Percent of Total	Employ-ment	Percent of Total	Employ-ment	Percent of Total
TOTAL PAYROLL JOBS	60,010	100 0	53,810	100 0	63,250	100 0
Manufacturing Subtotal	12,400	20 7	9,450	17 6	12,240	19 4
Durable Goods	10,570	17 6	7,780	14.5	10,510	16 6
Lumber and Wood Products	8,440	14 1	5,600	10 4	7,740	12 2
Other Durable Goods	2,130	3 5	2,180	4 1	2,770	4 4
Nondurable Goods	1,830	3 0	1,670	3 1	1,730	2 7
Food and Kindred Products	590	1.0	390	0 7	380	0 6
Other Nondurable Goods	1,240	2 1	1,280	2 4	1,350	2 1
Nonmanufacturing Subtotal	47,610	79 3	44,360	82.4	51,010	80 6
Construction and Mining	2,930	4.9	1,440	2 7	2,250	3 6
Transportation, Communications, and Utilities	2,830	4 7	2,630	4.9	3,330	5 3
Trade	15,730	26.2	14,450	26 9	17,540	27 7
Finance, Insurance, and Real Estate	3,000	5 0	2,950	5 4	3,040	4 8
Service and NEC	10,110	17 2	11,100	20.6	13,260	21 0
Government	12,820	21 4	11,790	21 9	11,600	18 3

1/ Source Program Year 1988 and 1989 Business and Employment Outlook, JTPA Districts 7 and 8, State of Oregon, Employment Division, Department of Human Resources (Anderson 1985)

Table III-40. Personal Income by Major Source and Earnings by Major Industry (M $) 1/

Item	Coos		Curry		Jackson		Josephine	
	M $							
	1980	1984	1980	1984	1980	1984	1980	1984
INCOME BY PLACE OF RESIDENCE								
Total Personal Income	509,502	610,835	151,314	188,494	1,088,684	1,424,602	413,243	550,156
Net Earnings by Place of Residence	(340,937)	(360,897)	(86,546)	(88,466)	(690,333)	(816,364)	(218,706)	(251,160)
Dividends, Interest, and Rent 2/	(79,564)	(118,693)	(38,025)	(57,169)	(206,484)	(335,429)	(95,212)	(157,935)
Transfer Payments	(89,001)	(131,245)	(26,743)	(42,859)	(191,867)	(272,809)	(99,325)	(141,061)
POPULATION (M) 3/	63.9	61.2	17.1	16.9	132.7	136.1	59.0	63.5
PER CAPITA PERSONAL INCOME	8.0	10.0	9.0	11.1	8.2	10.5	7.0	9.0
EARNINGS BY PLACE OF WORK								
Components of Earnings								
Wages and Salaries	296,222	317,543	60,196	65,255	588,495	711,983	186,377	219,863
Other Labor Income	26,494	32,249	5,523	7,045	50,952	74,173	17,066	23,978
Proprietors' Income 4/	42,210	37,930	22,056	18,137	83,916	77,778	30,633	25,967
EARNINGS BY INDUSTRY								
Farm	9,973	7,618	9,677	4,275	28,515	23,242	3,140	2,993
International Organizations	7,304	6,488	3,316	2,718	5,310	6,597	5/	1,760
Mining	633	615	262	5/	1,669	1,584	5/	594
Construction	19,871	13,207	6,680	7,451	53,114	33,738	15,544	10,295
Manufacturing	105,344	112,924	26,909	27,258	156,647	208,416	65,887	85,502
Non-durable goods	(14,223)	(15,599)	(1,600)	(1,034)	(24,538)	(32,108)	(6,022)	(6,351)
Durable goods	(91,121)	(97,325)	(25,309)	(26,224)	(132,109	(176,308)	(59,865)	(79,151)
Transportation and Public Utilities	41,345	44,649	3,743	6,910	53,544	67,073	14,09	113,968
Wholesale Trade	13,161	13,725	778	5/	42,121	42,247	5,508	6,354
Retail Trade	39,716	42,428	9,690	10,653	105,801	130,077	36,506	41,114
Finance, Insurance, and Real Estate	12,193	11,015	2,199	1,873	26,660	30,372	9,871	8,897
Services	45,397	51,999	7,558	9,952	120,327	167,134	36,328	49,990
Government and Government Enterprises	69,989	83,054	16,963	18,574	129,655	153,454	44,509	48,341

1/ Source: Program Year 1988 and 1989 Business and Employment Outlook, JTPA Districts 7 and 8, State of Oregon, Employment Division, Department of Human Resources (Anderson 1985).
2/ Includes the capital consumption adjustment for rental income of persons.
3/ U.S. Bureau of the Census population estimates for 1982-84 reflect revisions available as of March 1, 1986
4/ Includes the inventory valuation and capital consumption adjustments.
5/ Not shown to avoid disclosure of confidential information.

INCOME

Table III-40 displays payrolls by economic sector for 1980 and 1984. Lumber and wood products comprise the largest share of payrolls in all counties except Jackson. They provide 40 percent of Curry, 34 percent of Coos, and 28 percent of Josephine County payrolls, respectively. Not surprisingly, the proportion of total income in each sector is closely allied with employment by sector. Wood products is also ranked as the highest paying sector for individual employee income Coos County has the highest overall payroll levels (in agreement with other income data) Curry County is below average in many sectors Transfer payments, which are generally government assistance of some sort, accounted for 24 percent of total income in Josephine County in 1979.

COUNTY REVENUES

The Siskiyou contributes to revenues of Coos, Curry, and Josephine in Oregon, and Del Norte in California. The counties receive both O&C payments and National Forest Fund (NFF) payments

Table III-41 displays the NFF and O&C payments received by the counties from 1980 through 1986. Payments increased throughout the 1970's when timber bid prices were high and much timber was being harvested. From 1979 to 1982, they fell dramatically. This was due to the decline in bid prices and slowdown in timber harvest activity, resulting in a decrease in timber revenues received by the Forest Service. Future payment trends depend, again, on National demand for wood products and the resultant creation of demand for stumpage.

O&C payments come from timber revenue generated on O&C land. This revenue is then allocated to counties by a percentage established by Federal statute. Approximately 173,000 acres of O&C land are located on the Forest.

Table III-41. Payments to Counties (M $)

	County						
	Coos		Curry		Josephine		Del Norte
Year	NFF	O&C	NFF	O&C	NFF	O&C	O&C
1980	330	160	3,870	100	1,950	320	420
1981	260	90	3,050	50	1,540	180	230
1982	90	20	1,010	10	510	40	50
1983	150	30	1,710	20	860	50	70
1984	180	70	2,050	40	1,030	130	170
1985	290	90	3,350	60	1,690	190	240
1986	300	60	3,500	40	1,760	120	150

SALES BELOW COST

Sales below cost occur where the cost of planning, preparing, administering, and implementing timber sale projects exceed cash benefits. They occur infrequently on the Siskiyou. From 1979 to 1984, receipts from the volume harvested on the Forest have exceeded total costs (Table III-42)

Table III-42. Timber Sale Costs and Receipts

Fiscal Year	Timber Harvested		Timber Sale
	MMBF	Values (M $)	Costs (M $) 1/
1979	221	41,311	1,994
1980	129	24,767	2,433
1981	93	16,180	3,126
1982	39	3,223	2,939
1983	103	10,500	2,420
1984	134	17,909	2,262

1/ Costs include all those related to the timber sale program except road costs

The cost of road construction and reconstruction associated with the timber program is a capital investment which is used for the present and future timber program, as well as other uses such as recreation and forest protection. The asset value of this capital improvement is the cost of road construction, engineering, design, and inspection (Table III-43).

Individual years when road costs exceeded gross or net timber revenues reflect mostly the conditions where roads were built but the timber was not removed due to the wood products recession. The average sale sold on the Forest has revenues exceeding costs by approximately $1,000,000 (for details, see Planning Records). However, there are some conditions where below cost sales may occur. These areas are characterized by a combination of factors such as low-valued species, low volumes of commercial species per acre, high logging costs, high site preparation and regeneration costs, and expensive road building Cost reduction reviews, scheduling of sales, and organization of units within sales are presently used to minimize the timber sale program costs.

Table III-43 Road Costs Related to the Timber Sale Program

Fiscal Year	Asset Value (M $)
1979	6,582
1980	12,801
1981	14,428
1982	17,319
1983	9,290
1984	8,447

CURRENT DEMANDS, WANTS, AND DESIRES

The word "demand" is used in many different ways. Its use here will be confined to the following definition: a quantity of output that users are willing to take at a range of prices with given conditions. For many Forest products, no exact price relationship has been determined. Therefore, many assumptions are used and are discussed below.

The discussion of demand is essential to making an informed decision on allocation of the Forest resources and productive capacity. The demands of the public and interest groups for timber harvest, preserved old growth, fish habitat, water quality, soil productivity, river recreation, sensitive plant preservation, scenic vistas, wildlife habitats, wilderness and unroaded recreation, and mineral resources are important considerations when allocating the Forest resources.

TIMBER HARVEST

Regional Timber Supply And Projections

The principal projections used in developing long-range plans and programs for management of the National Forests are contained in the Forest and Rangeland Renewable Resources Planning Act (RPA) Assessment and 1984 Update (USDA 1984a) These projects focus on the situation for the long term (50 years) and do not necessarily recognize current short-term regional fluctuations. A summary of the projected RPA trends (year 2030) for timber supplies follows.

Hardwoods

The current balance between growth of wood and its removal shows that hardwood forests and eastern softwood forests can support additional timber harvests However, this balance will change, and future harvests, particularly in the decade beyond 2000, could vary over a wide range Nonetheless, if commercial timberland owners continue to respond to price and inventory changes, then timber harvests can be increased substantially during the next few decades. The largest hardwood increase will be in the South, with an increase of 6.0 billion cubic feet in 2030 (USDA 1984a)

Softwoods

Total projected softwood harvests would rise 24 percent from 1980 to 11.9 MMCF per year by 2030. There are important differences among the major softwood timber producing regions In the Douglas-fir subregion, projected annual harvest from 1980 to 1990 is about 2 3 MMCF per year, then declines to about 2 MMCF per year This level is roughly maintained through the rest of the 50-year projection period.

In contrast, the other major source of softwood timber harvest is the South, which is projected to rise from about 4.1 MMCF in 1980 to 7.3 MMCF per year in 2030. However, most recent forecasts are now showing a downward modification in the rate of economic supply This may indicate that the South could be expected to be shifting to a slower rate of increase above present levels until the year 2030. Much of the expansion in the South with softwoods, as well as hardwoods, is due to the fact that its wood products production has become more diversified as compared to other regions of the country.

Short-Term and Long-Term Demand Trends

Over the next ten years, timber demand from the Pacific Northwest geographic region will grow slowly. Although there is a backlog of unfulfilled housing demand, the future will depend primarily on the continuing strength in personal income and the availability of affordable housing and financing. In addition, projections of exports to the Pacific Rim countries show a continuing slow economic growth. The analysis acknowledges there will be a declining trend in the construction sector. Structure replacement, rather than new construction, will characterize the housing market. Projections for increase in demand may be described as considerably restrained and cautious (Nomura 1981).

Evaluation of recent data and information indicates that the demand for timber is changing to a moderate rate of increase as compared to the slowdown that occurred in the early 1980's. The ability to sustain this increase is linked to the critical issue of costs The short-term future of timber and wood products demand is clouded by the severity and length of the housing and wood products recession that began in 1980.

The long-term trends in housing demand, the growing popularity of construction methods that use less wood, the availability of wood substitutes, and a shift in business management strategies all contribute to a potential shift in future demand (Adams and Haynes 1985).

Wood supply will continue to be an issue because it will be highly dependent on the ability of producers to lower costs to be competitive with wood substitutes (Schallau 1986) Although overall current timber supply levels in the Pacific Northwest Region may be capable of meeting future demand, the shifting of industry within the region, the shifting emphasis on the types of wood products produced, and the ability of the subregion to supply the various kinds of wood needed are subregional problems.

An effort by the wood products industry to broaden the economic base may enable the Pacific Northwest to regain much of its previous economic strength, this will take time The opportunity to increase exports to international markets by modernizing facilities, adopting state-of-the-art technology, reducing costs, and diversifying into other sectors of production (similar to what the South has done) could help to rebuild and stabilize the wood based sectors of the region (Schallau 1985).

Private and Public Land Interrelationships

Currently, part of the timber formerly supplied by the Pacific Northwest Region is being supplied by the South and Canada However, the situation with Canada can be expected to change as there are indications that the economic supply may begin dropping off within 6 years, or at least by 15 years. The projected change indicates a potential drop in supply capability of 30 to 50 percent from the current relatively high levels. The South should be able to maintain or show a slow increase in harvest because of its remaining inventory and some substitution of hardwoods However, both the economic and physical supply of softwoods from that area may begin to show a decline by the year 2030.

At about the same time this drop in supply capability begins to occur for the other sources, the growth of wood fiber on private lands in the Pacific Northwest would again be increasing its capability. The private lands in the Pacific Northwest could then become a major source of supply for softwoods to meet National and international demand. Further, during the period before the private lands in the Region regain their full supply potential, the public forests would be looked upon as a major source for a relatively stable supply of wood fiber (Schallau 1986).

The demand for timber harvest in the area surrounding the Siskiyou National Forest is assumed to be infinitely elastic This means any increase or decrease in local timber supply will not affect long-term price trends which are determined by the prevailing market conditions such as mortgage rates, strength of the U.S. dollar, and other factors at the National and regional level.

The total amount of wood harvested within the four-county area of Coos, Curry, Jackson, and Josephine for 1984 was 960 MMBF. About 240 MMBF were harvested on National Forest land. Approximately 350 processing firms use that wood to produce a variety of products including sawtimber, plywood, shakes, pulp, arrows, and other miscellaneous products Douglas-fir is the species most often bought, although pines, hemlocks, western red-cedar, and Port-Orford-cedar are also utilized. The demand for Port-Orford-cedar is high due to its use in Japan.

Lumber and wood products are the most important manufacturing industry in the area. Estimates of log flows from Siskiyou National Forest lands to mills in the area are shown in Table III-44. In addition to being the most timber dependent of the four counties, Curry County is also the most dependent on the Siskiyou, receiving more than half of its timber supply from this source. Josephine County mills obtain about one-fourth of the timber they process from Siskiyou lands. Relatively minor proportions are processed in Coos and Jackson Counties.

Table III-44. Total Number of Logs Consumed by Mills within Zone of Influence from the Siskiyou National Forest 1/

	Number of Logs (Year)					
	1972		1976		1982	
County	MBF	Percent	MBF	Percent	MBF	Percent
Coos	49,797	6	37,136	6	33,278	6
Curry	148,390	73	83,364	54	17,845	25
Jackson	-	-	573	-	10,673	3
Josephine	75,612	26	44,300	26	28,282	28

1/ Source 1972 data derived from Schuldt and Howard, (1974), 1976 data derived from Howard and Hiserote (1978), and 1982 data derived from Howard, (1984). The volume and percent figures are those amounts attributable to the Siskiyou National Forest

LOCAL TIMBER SUPPLY AND PROJECTIONS

The importance of the Forest supply potential is linked with the overall timber supply picture for the local area of influence and the timber market areas. Demand for wood products has been the major factor affecting the health of the local timber industry in recent years. However, concern that a shortage of raw material may affect the future health of the wood products industry requires projections of future timber supply.

The Forest has historically supplied significant volumes of timber for harvest. The current Timber Management Plan was completed in 1962 and established an annual potential yield of 191 million board feet (MMBF). Amendments have adjusted the potential yield to account for changes in the land base, the major changes being primarily Wilderness additions. Table II-36 displays the potential yield, as amended, and the net chargeable volume sold and harvested by year from 1963 to 1987.

Two timbersheds exist in the area of influence surrounding the Siskiyou National Forest. The Medford timbershed, defined as being Jackson and Josephine Counties, utilizes timber from the Galice and Illinois Valley Ranger Districts of the Siskiyou National Forest as well as from private lands, the Rogue River National Forest, and BLM lands within the two counties. The south coast timbershed, defined as Coos and Curry Counties, receives timber from Powers, Gold Beach, and Chetco Ranger Districts as well as from private, BLM, and other public lands. Though some timber from the Forest goes outside of these areas, such log flows are insignificant. For this analysis, the log flows between timbersheds and with adjoining areas are assumed to be equal in both directions.

Coos and Curry Counties

In Coos and Curry Counties, industry ownership covers the largest area with over 30 percent of the forested lands, but contains less than 20 percent of the standing sawtimber in the timbershed. National Forest lands, though smaller in area, contain approximately 40 percent of the existing sawtimber. BLM lands have about 25 percent of the existing sawtimber on about 13 percent of the forested land. Other ownerships, including State and county forests, and miscellaneous property owners, make up the remaining areas (Table III-45).

Table III-45. Timber Stand Conditions for Coos and Curry Counties

Ownership Class	Percent of Total Forest Land	Percent of Standing Sawtimber
National Forest	30	39
BLM	13	23
Other Public	5	8
Forest Industry	32	19
Other Private	20	11

Approximately 19 percent of the raw materials harvested in the south coast timbershed during the 1970's originated on the Forest. In the early 1980's, the Siskiyou National Forest's share of harvested material declined to 11 percent (Table III-46). Many stands on private land are just reaching merchantable age and opportunities to harvest volumes on private land are postulated to expand somewhat from that harvested in the early 1980's for the first decade. In the second decade, harvest volumes from private industrial lands are projected to decline by approximately 50 percent from the projected harvest in the first decade.

Table III-46. Projected Timber Harvest for Coos and Curry Counties (MMCF) 1/

	Private			Public	
Period	Other Owners	Industrial	Total	Siskiyou National Forest	Total
1970-1979	396	763	1,159	275	1,434
1980-1984	229	505	734	94	828
1989-1998	369	745	1,114		
1999-2008	369	329	698		
2009-2018	369	640	1,009		

1/ Projected Volumes from Fox (1988), and Relationship of Forest Plans to Other Timber Owners, Region 6, USDA Forest Service, available in the Planning Records

Jackson and Josephine Counties

Within these counties, Siskiyou and Rogue River National Forests cover the largest area with over 34 percent of the forested lands, and contain half of the existing sawtimber in the timbershed. BLM lands have about 33 percent of the existing sawtimber within the timbershed on about 27 percent of the forested land. Industrial forest landowners manage approximately 20 percent of the forested lands and presently have 10 percent of the existing sawtimber. Other ownerships make up the remaining areas and standing volumes (Table III-47).

Table III-47. Timber Stand Conditions for Jackson and Josephine Counties

Ownership Class	Percent Total Forest Land	Percent Total Standing Sawtimber
National Forest	34	49
BLM	27	33
Other Public	2	1
Forest Industry	20	10
Other Private	17	6

In Josephine and Jackson Counties, the Siskiyou National Forest supplied approximately nine percent of the total timbershed harvest in the seventies (Table III-48) In the early 1980's, its share of the harvest decreased to eight percent

Future harvests on private lands are projected to decline dramatically in the second decade due to the age distribution of the timber stands and the growing stock available Harvest levels from the Rogue River National Forest are assumed to follow the preferred direction stated in the Rogue River National Forest DEIS. If these assumptions overestimate the supply of timber, then the following demand for Siskiyou National Forest timber will be greater than that stated. If these assumptions underestimate the area's supply of timber, then the demand presented below for Forest timber will be overestimated

Table III-48. Projected Timber Harvest for Jackson and Josephine Counties (MMCF) 1/

Period	Other Owners 2/	Private Industrial	Total Other	Siskiyou National Forest	Total
1970-1979	662	314	976	96	1,072
1980-1984	510	203	713	65	778
1989-1998	611	241	852		
1999-2008	612	42	654		
2009-2018	612	318	930		

1/ Projected Volumes from Fox (1988), and Relationship of Forest Plans to Other Timber Owners, Region 6, USDA Forest Service, available in the Planning Records
2/ Includes all of the Rogue River National Forest

Total Supply and Consumption

The supply picture alone does not dictate the future condition of the timber industry, or the role of the Siskiyou National Forest in relation to this industry It is the interactions of supply and demand that establish the framework for future possibilities. As has been the case for Pacific Northwest Region demand as a whole, the demand for southwestern Oregon timber has been increasing back to historic levels. The combined effects of the influx of inexpensive timber from western Canada and the expansion of the wood products industry in the southern United States did precipitate a major slump in the southwestern Oregon market. However, the local market has revived in the last two years and is projected to grow at a slow to moderate rate over the next 10 to 20 years This growth may be sufficient to eventually return to a level close to that prevalent in the 1970's

When and if demand for timber grows to a level of that reached in the 1970's, the supply situation will become the critical factor for limiting the output of the local timber industry. Increased wood production from industrial land over that of the present situation is limited Private woodlot owners could increase their production. However, historically, they commonly have different objectives and respond to market conditions at levels far below the potential production

Another factor affecting supply conditions for local mills is the proportion of local harvest which is exported Of the volume harvested in 1982, approximately five percent was exported. That percentage has been increasing with increased market access to Japan, China, and other Pacific Rim countries. If log exports continue to increase, the supply shortage for local mills will be heightened, while a decrease in exports would serve to lessen the shortage

As the market conditions continue to improve, the supply situation in the four-county area of Josephine, Jackson, Coos, and Curry Counties could become the dominant factor in determining consumption for Forest timber. A quantitative estimate of future timber consumption, though highly uncertain, is useful for relating alternative Forest harvest levels to the four county area. Projections have been made for the future (Tables III-49, 50, and 51) based on the following assumptions:

1. The figures shown in Tables III-46 and III-48 will be used to estimate consumption. The average annual harvest level for the 1980-84 level and the 1970-79 level will be used to calculate the lower and upper limits of future consumption.

2. The lower limit of total consumption in the 1989-98 period, is postulated to gradually increase from the 1980-84 level to a point halfway between the 1980-84 level and the 1970-79 level. Similarly, the upper limit of consumption for the same period is postulated to be a point three quarters of the way between the 1980-84 level and the 1970-79 level. This increase reflects the initial stages of the anticipated recovery of demand for Pacific Northwest wood products.

3. In the second and third decades, demand continues to grow. The upper limit from the first decade now becomes the lower limit of consumption for the second and third decades. The 1970-79 level is regarded as peak consumption and is assumed to be the upper limit in the second and third decades.

4. Demand for Siskiyou National Forest timber can be projected by subtracting total other harvest from estimated total consumption. The projections of demand for National Forest timber represent estimates of the volume that would be purchased if it were available.

The above projected demand for the Siskiyou National Forest timber program varies from 90 to 316 MMCF for the first decade, and from 930 to 1154 MMCF the second decade (Table III-51). The demand for Forest timber will be higher in the future due to the projected inability of other ownerships to produce at levels equivalent to their production of the 1970's.

Table III-49. Projected Demand for Siskiyou National Forest Timber - Coos and Curry Counties (Million Cubic Feet per Decade)

Period	Estimated Total Consumption	All Other Harvest	Projected Demand Siskiyou Timber
1989-1998	1,131-1,283	1,114	17-169
1999-2008	1,283-1,434	698	585-736
2009-2018	1,283-1,434	1,009	274-425

Table III-50. Projected Demand for Siskiyou National Forest Timber - Jackson and Josephine Counties (Million Cubic Feet per Decade)

Period	Estimated Total Consumption	All Other Harvest	Projected Demand Siskiyou Timber
1989-1998	925-999	852	73-147
1999-2008	999-1,072	654	345-418
2009-2018	999-1,072	930	69-142

Table III-51. Projected Demand for Siskiyou National Forest Timber in Coos, Curry, Jackson, and Josephine Counties (Million Cubic Feet per Decade)

Period	Total Projected Demand for Siskiyou Timber
1989-1998	90-316
1999-2008	930-1,154
2009-2018	343-567

The projected demand for National Forest timber (Table III-51) represents estimates of the volume that would be purchased if it were available. The anticipated future supply conditions in the area are as follows:

1. An initial increase in harvest from industrial lands, compared to the early 1980's, will occur in the first decade with a subsequent drastic decrease in available harvest in the second decade.

2. As demand becomes greater in the second decade, increased demand is placed on harvests from the Siskiyou National Forest. The high demand continues into the third decade.

3 If supply becomes limiting, prices will increase because of the excessive competition on available supply. A disproportionate increase in price relative to Canada and other regions may make the local area less competitive in international markets until the economic adjustment of less mill capacity is achieved.

The average stumpage price weighted by species for the 1973-1982 period is $285/MBF (adjusted to 1982 dollars). For planning purposes, this price was projected to increase by one percent per year. This assumption is derived from the historic trends over the long term (Barnett and Morse 1963).

PRESERVED OLD GROWTH

Many resources other than timber have consumer demands including the desire for preservation of old-growth stands. The demand for preservation of old-growth timber is hard to quantify. Concern for retention of old growth and its perceived intrinsic value will intensify as old-growth stands are harvested and the human population increases. No quantification of this demand by corresponding changes in users' fees or recreational values was attempted. However, the concern is assumed to exceed existing supply levels as evidenced by public controversy, political lobbies, and national debates.

FISH HABITAT, WATER QUALITY, AND SOIL PRODUCTIVITY

As discussed in the **FISH** section, the demand for anadromous fisheries has grown steadily; the demand for sports and commercial fisheries greatly exceeds supply. Fish habitat, water quality, and soil productivity are interrelated. Maintenance of soil productivity and water quality results in quality fish habitat where the instream environment and upslope conditions can be maintained. As such, the demand for fish is used as a surrogate demand for the three resources.

For planning purposes, the expressed value of commercial anadromous fish was set at $1.05 per pound. The value of a fisherman's day for anadromous sport fishing was placed at $33 per day; for a resident sport fishing, $15 per day.

WILD AND SCENIC RIVERS

Recreational resources generate economic returns. Tourism is a key industry in all of the counties It has been growing in importance during the last decade Since tourism is not a homogeneous, or strictly-defined industry, measurement of its economic contribution is less precise than for other sectors. Economic support through tourist expenditures shows up in the trade and service sectors, primarily from the purchases of food, lodging, gasoline, and souvenirs

The Forest contributes to tourism-related employment mostly through the attraction of the Rogue River for rafting, boating, fishing, and hiking The recreational demand for Wild and Scenic Rivers use was estimated by projecting a one-half percent increase in annual use from the recorded use in 1980. Recently, a large increase in recreational use on the Rogue River required initiation of a permit system to properly manage the recreational impacts. The projected increase in recreational use appears to be a reasonable assumption due to National trends in lifestyles, personal habits, and available leisure time.

For all recreation including use of the Wild and Scenic Rivers, the following values developed Nationally by an RPA planning committee are used for a Recreation Visitor Day:

$11.30 per day for Primitive recreation,
$13.30 per day for Semi-primitive Non-motorized recreation,
$12 10 per day for Semi-primitive Motorized recreation,
$ 9 30 per day for Roaded Natural recreation,
$17.50 per day for Wilderness recreation, and
$ 6.00 per day for Developed recreation

RECREATION IN UNROADED AREAS

Unroaded areas, including Wilderness and non-Wilderness areas, contribute to the social environment and are important when describing the existing condition. Besides being useful for Semi-primitive and Primitive recreation, these areas can be considered attractions for the liveability of the area and are important to the mental attitudes of many people. Many of the area's features that draw tourists are not located on the Forest Many other recreation opportunities exist in the area of influence. Ocean beaches, snow and water skiing, hiking, camping, Shakespeare plays, and river and lake recreational opportunities exist within the area. Such specific attractions include the Shakespeare and Britt Festivals, Jacksonville Historic Landmark, Wildlife Safari, Crater Lake National Park, Redwood National Park, and five National Forests (Klamath, Rogue River, Siskiyou, Six Rivers, and Umpqua National Forest).

The actual demand for this form of recreation was estimated by projecting a one-half percent annual increase from the recorded use in 1980 Again, this assumption appears reasonable due to the trends in lifestyles, personal habits, and amount of recreation time. The same values for visitor days were used as documented for the Wild and Scenic Rivers recreational demand

SENSITIVE PLANTS

The contribution of sensitive plants found on-Forest is limited in its economic scope However, the social aspects of the sensitive plants, due to the public interest, is an important consideration in the existing environment. The demand for preservation of sensitive plants has been expressed by the public Anticipated concern is assumed to be reflected by existing condition and to increase as development encroaches on sensitive plant habitat. Increased human population will tend to increase pressure on the habitat of plant species.

VISUALS

Concerns expressed by the public for Forest aesthetic values will increase as the population increases The present demand level is assumed to increase as additional landscapes are modified by timber harvest. Most of this demand is connected with recreation. Such recreational use is also projected to increase at one-half percent annually from the actual recorded use in 1980. The values for such recreation use are similar to those used in the discussion under **WILD AND SCENIC RIVERS.**

WILDLIFE HABITAT

Many public groups are interested in wildlife habitat. Concern for wildlife habitat is assumed to include viable habitat for old-growth species (displayed as part of the preservation of old growth), dead and decadent tree habitat, and suitable areas for big-game habitat. Wildlife habitat diversity and protection of threatened and endangered species are also major concerns

The demand for big-game species habitat is assumed to increase at 1 3 percent per year as projected throughout the Pacific Northwest Region The demand for big-game habitat will exceed supply at the historic quality level given these assumptions, lower success rates may result For planning purposes, the following values derived from RPA planning are used·

$30 per day for a big-game user,
$19 per day for a small-game user, and
$25 per day for nongame wildlife use.

MINERAL RESOURCES

The anticipated demand for mineral resources is not available. However, present activity indicates potential for significant gold, nickel, cobalt, coal, and chrome mining depending on markets.

ABILITY TO SATISFY DEMAND

The major outputs and public expectations from the Siskiyou National Forest include areas related to timber production, fish habitat and watershed condition, old-growth preservation, sensitive plant areas, forest scenic values, wildlife habitat, recreation opportunities, and mineral development. "Benchmark alternatives" display the maximum supply of these resources (Table III-52). The Benchmark alternatives are constrained by legal requirements for managing National Forest land, such as those relating to the habitat needs for viable wildlife populations and multiple use requirements.

Table III-52. Benchmark Outputs and Effects

Output/Effect	Current Direction	Benchmark: Max. PNV	Recreation	Visuals	Unroaded	Watershed/ Fisheries	Wildlife	Timber	Minimum Level
Present Net Value (MM $) (rounded)	1,170	1,300	918	1,205	954	1,209	1,040	1,276	5
Harvest Levels									
1st Decade Annual Sale Quantity									
(MMBF)	160	175	121	165	125	157	139	181	0
(MMCF)	30	32	22	31	23	29	26	33	0
Long Term Sustained Yield									
(MMCF)	51	52	39	53	40	50	44	59	0
Old Growth Habitat									
Total Dedicated Area (M acres)	175	164	270	164	263	173	236	164	425
Soil, Water, and Fisheries									
Sediment (M Tons)	690	702	671	691	674	696	686	737	623
Visitor Days (M WFUDs)	69	65	69	69	69	71	69	69	NE
Commercial Fish (M lbs.)	934	880	934	934	934	958	934	934	NE
Sensitive Plants									
Botanical Areas (M Acres)	<----------				4.5	----------			----->
Research Natural Areas (M Acres)	<----------				2.0	----------			----->
Visual Resources									
Allocated Visual Quality Objectives (Acres)	370	9	9	370	9	9	9	9	N/A
Wildlife Habitat									
Dead and Defective Tree Habitat									
(% of Capacity - decade 5)	63	61	67	63	67	63	77	59	NE
Habitat Capability for Blacktail Deer									
(% change from present in decade 1)	-24	-19	-36	-23	-35	-22	-28	11	NE
(% change from present in decade 5)	-1	17	-13	1	-10	-11	4	16	NE
Recreation									
Visitor Days (M)	1,430	1,430	1,440	1,430	1,420	1,430	1,420	1,430	NE
RVD's Unroaded and Wilderness (M Acres)	233	233	547	233	547	233	366	233	547
Wild and Scenic Rivers Area (M acres)	12	12	21	12	12	12	12	12	NE
Viewshed (M acres)	845	0	845	845	0	0	0	0	NE
Minerals									
Restricted Areas (M Acres)	<----------				246	----------			----->

1/ NE - Not Estimated

TIMBER PRODUCTION

The Forest's maximum supply of timber (first decade output) with a nondeclining flow is 33.4 MMCF annual sell The maximum long-term average sell over a 150-year period is 40 6 MMCF. The Forest's ability to supply timber is associated with (1) opportunity costs for timber and other resources including recreational opportunities, fisheries, and wildlife values, (2) production costs including road construction; and (3) administrative costs of planning, implementation, and contract administration Different options for production and associated costs vary from 0 to 40 MMCF average sell (150-year period), and 10 to 30 million dollars (Figure III-23). All costs are for a 150-year period discounted at 4 percent At the low average annual production of 28 to 30 MMCF, the high opportunity costs of foregoing timber harvest on commercial forest land becomes the dominant cost At relatively high production levels, budget costs and opportunity costs for fish make up the dominant costs.

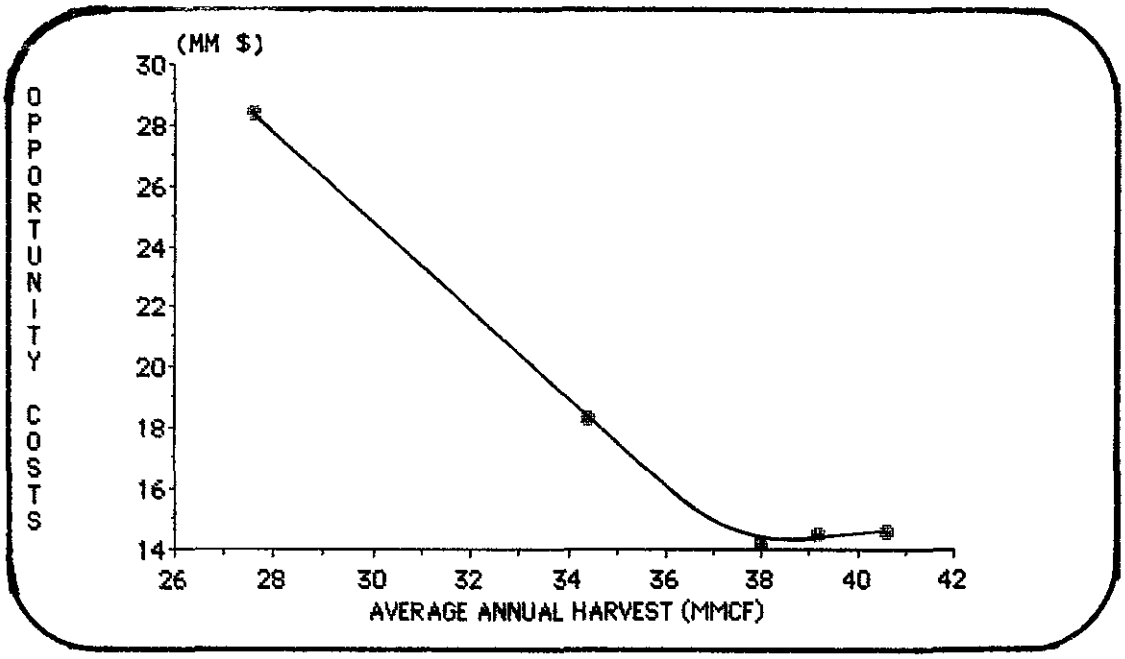


Figure III-23 Timber Production and Total Cost

OLD GROWTH HABITAT

The amount of old-growth habitat protected from harvest in all of Oregon and Washington is approximately 2 5 million acres The Siskiyou National Forest has a total of 0.4 million acres of existing mature and old growth In the local area, Crater Lake and Redwood National Parks, and the Umpqua, Rogue River, Six Rivers, and Klamath National Forests also have sizable acreages of old-growth forests However, the historic levels of old growth were much higher, particularly on much of the commercial forest land in the area of influence

The Forest's opportunity to protect forested areas containing old-growth characteristics is connected to opportunity costs of foregoing timber harvest on selected lands The range of production possibilities is illustrated in Figure III-24. The percentage of Forest in old growth in decade five is plotted against the opportunity cost of reducing the allowable harvest (discounted at 4 percent for 150 year period). Congressionally designated areas, such as Wilderness, and areas established to meet Management Requirements (MR's) provide protection of approximately 20 percent of the forest stands having old-growth characteristics. Since these areas leave the Forest few options, the resulting old growth has no opportunity costs displayed Opportunity costs previously calculated for wildlife MR's are provided in Appendix B As displayed, higher acreages of old growth involve higher opportunity costs of timber harvest. These opportunity costs are also associated with unroaded allocations (in general, Management Areas 1-9). Protecting areas of old growth may increase the amount of land allocated to an unroaded status.

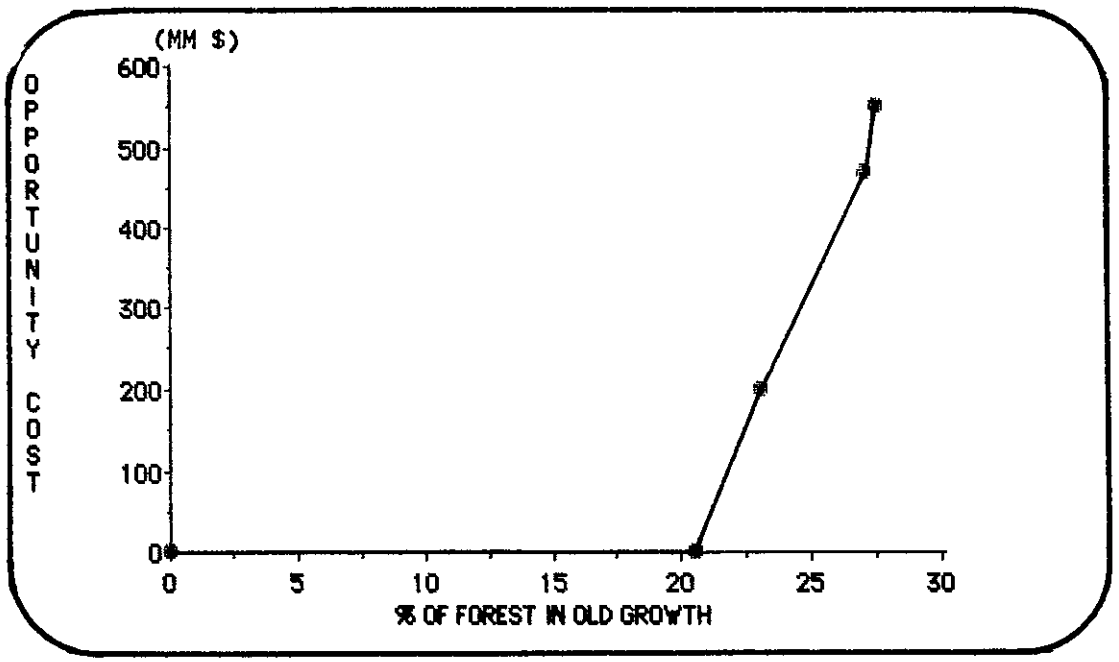


Figure III-24 Opportunity Costs of Foregone Timber Harvest in Preserved Old Growth

FISH HABITAT

The maximum amount of fish produced on the Forest is affected by both on- and off-Forest factors. Many off-site conditions affect the survival and return of the anadromous fish, including the commercial and sports fishing catch, seasonal streamflow extremes, and so forth Within the Forest there can also be wide swings in habitat capability by season or year. The Forest potential for providing fish habitat is affected by opportunity costs of foregoing harvests in Riparian Management Areas and capital investments At lower production capacity, capital investments provide increasing benefits To increase benefits even more requires reducing harvest along Riparian areas. At this point, the higher opportunity costs of foregoing timber harvest influence the steepness of the costs curve (Figure III-25). The potential for maximum production occurs over time when no timber is harvested in the Riparian areas and a high level of capital investments is maintained.

RECREATION

The recreational capacity of the Forest varies depending on land allocation. The Primitive and Semi-primitive recreational opportunities are the main concern The maximum amount of land that can be allocated, including existing Wilderness areas, to a condition suitable for Primitive or Semi-primitive recreational use is 547,000 acres

The Forest's ability to provide this type of experience outside of designated Wilderness has costs associated with foregoing timber harvest and the actual implementation costs (Figure III-26) These opportunity costs are also associated with the protection of old-growth. When areas are allocated to unroaded status, the protection of old-growth forests also occurs. Only implementation costs are associated with the lowest land allocation for Primitive recreation, while opportunity costs of foregoing timber harvest are associated with the maximum supply of Primitive recreation opportunities.

SENSITIVE PLANTS

The maximum acreage of land that may be allocated to Botanical and Research Natural Areas is 46,148 acres. The Forest capacity to provide adequate resources of sensitive plants is often associated with the opportunity costs of foregoing mineral extractions on selected Botanical and Research Natural Areas. These "costs" are presently not quantified due to uncertain markets and inadequate mineral surveys. However, the acres of mineral accessibility and restrictions to activity vary with the options of preserving sensitive plant habitat.

VISUALS

The maximum amount of area that may be allocated to Retention and Partial Retention Visual Management Areas is 88,000 and 300,000 acres, respectively. The supply of scenic vistas is directly related to the opportunity costs of timber harvest Slower rates of harvest on areas managed for scenic values are these opportunity costs. Increased amounts of pristine views are correlated with increased opportunity costs. These opportunity costs, therefore, may also be associated with the old-growth character of longer rotations. In other words, scenic vistas associated with a longer timber rotation also provide some old-growth characteristics

WILDLIFE HABITAT

Wildlife habitat measurements are varied depending on the objectives desired. Big-game habitat supply is more a result of Standards and Guidelines than major land allocations, assuming adequate openings are present Dead and defective tree habitat for species dependent on such habitat also varies with Standards and Guidelines There are few opportunity costs associated with such supplies, though higher logging costs, layout costs, and snag enhancement costs, such as tree topping, increase as one manages for an increased supply of dead and defective tree habitat.

MINERAL RESOURCES

Any change in Forest capacity to limit access for mineral extraction is primarily associated with areas allocated to an unroaded condition, conflicting resource values, and restrictive Standards and Guidelines Such restraints and requirements can affect the economic feasibility of mineral extraction.

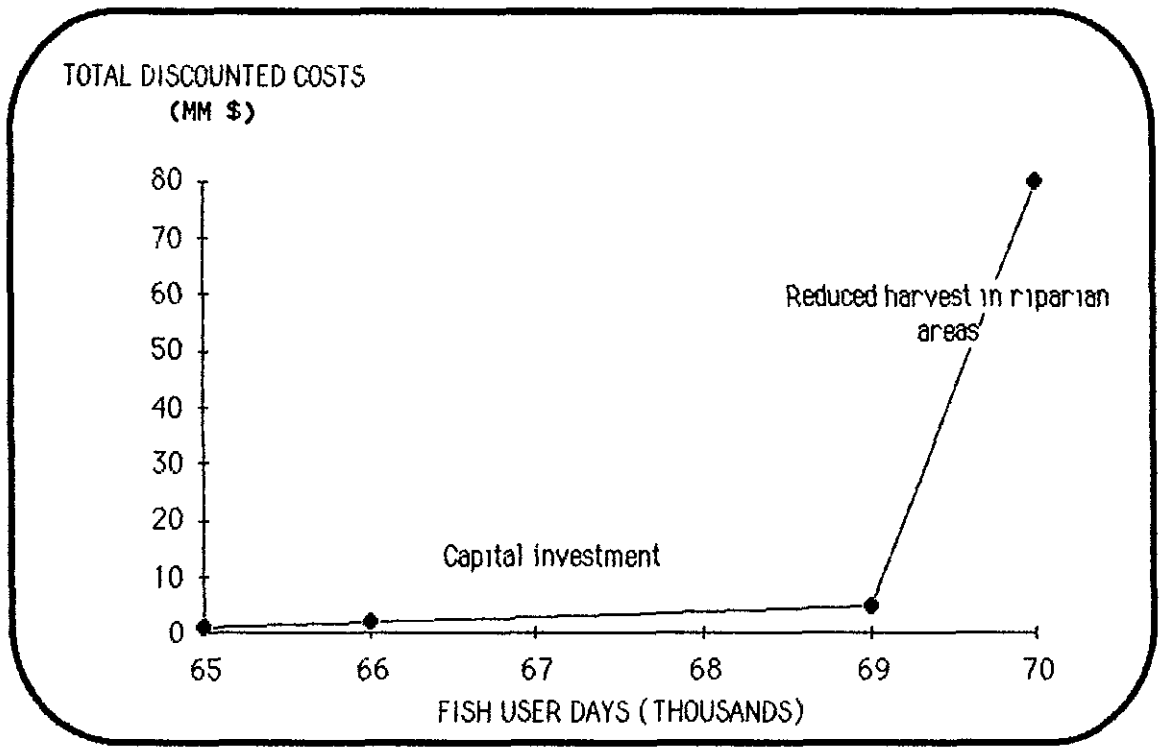


Figure III-25 Fish Production and Opportunity Costs of Reduced Harvest in Riparian Areas

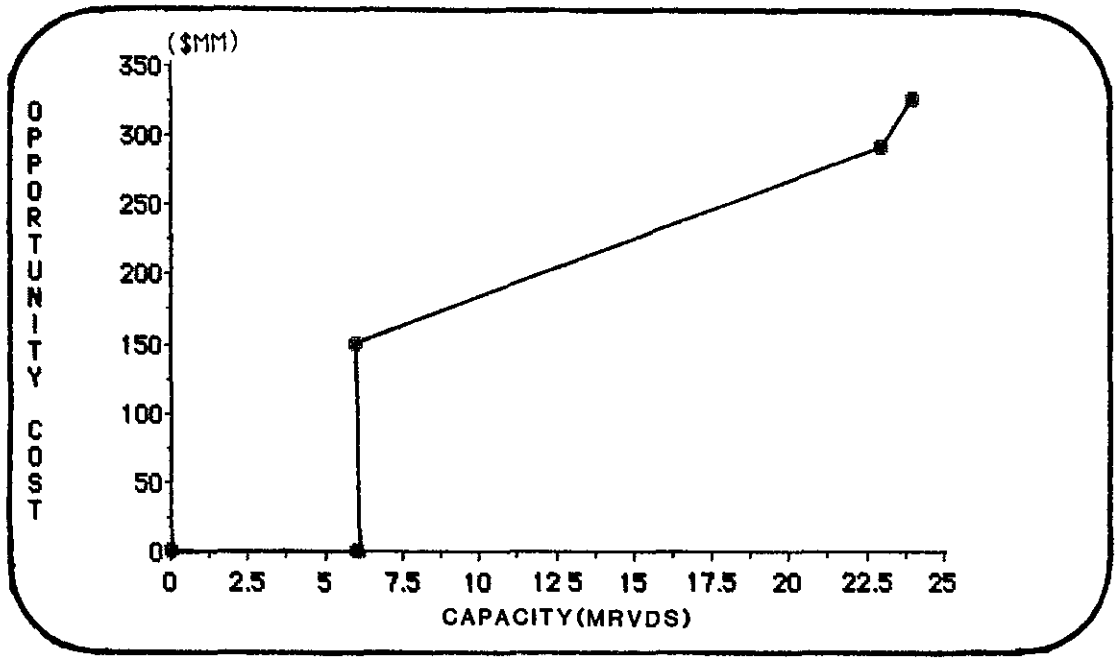


Figure III-26. Opportunity Cost of Reduced Timber Harvest in Primitive Recreation Opportunities Outside Designated Wilderness

1987 FIRES

During the public review period for the Forest DEIS, lightning ignited several major fires in southwestern Oregon Beginning August 30, 1987, and continuing for weeks and even months later, these fires swept over 128,252 acres, including 110,087 acres of Siskiyou National Forest land. During this period, several of the fires burned together forming the Silver, Galice and Longwood Fire Complexes. These fires burned a wide range of resources, including Wilderness, fisheries, and valuable timber and tree plantations.

Wide variation in burn intensity was characteristic throughout each complex Large areas within the fire perimeters were left unburned or merely underburned without killing the trees, leaving a mosaic of live and dead vegetation.

The environmental components most affected included soil and water, vegetation, fish, wildlife, visual resources, and recreation settings The discussion presented here concentrates on elements of these environmental components that specifically relate to the Planning Problems.

The most important resource changes relative to the planning analysis are changes in the timber inventory, the potential for changes in fish habitat and water quality conditions, and changes in wildlife habitat suitable for mature and old-growth dependent species. Other important considerations are the changes in other wildlife habitat and the recreation setting. Much of the area within the Silver Fire complex is unroaded (the inventoried North Kalmiopsis Roadless Area), the other fires have a moderately developed road system

For a full disclosure of the affected areas, a description of the resources impacted, site-specific management options considered in treating the resources and salvage of fire-killed trees, please refer to the following environmental documents (available in the Planning Records):

Silver Fire Recovery Project (FEIS and ROD, 1988);

Longwood Fire Salvage (Environmental Assessment and Decision Notice, 1988); and

Canfield-Chieftain (Galice) Fire Salvage Timber Sale (Environmental Assessment and Decision Notice, 1988).

VEGETATION TIMBER

The perception of the importance of the changes created by the fires based on the total fire area is quite misleading in terms of change in the timber resource Much of the Forest within the fire perimeter did not burn hot or long enough to kill the standing trees In addition, many of the areas burned were not suitable for timber production. Table III-53 displays the acres within each fire area, the acres within Wilderness, and the acres suitable for timber production

Table III-53. Land Status, 1987 Fires.

Fire Complex	Total Acres	NFS Acres	Wilderness	Unsuitable	Suitable
Galice	21,140	4,935	0	2,722	2,213
Longwood	10,572	8,912	656	3,861	4,395
Silver	96,540	96,240	53,340	20,463	22,437
TOTAL			53,996	27,046	29,045
Total NFS Acres		110,087			
Unavailable		53,996			
Net Available.		56,091			
Unsuitable		27,046			
Tentatively Suitable		29,045			

The intensity of the burn and the degree of change in the vegetation are important when assessing impacts on the timber resource. Table III-54 table displays the suitable acres within the fire perimeters by fire intensity, with a breakdown by vegetation class

Approximately 18,800 acres of tentatively suitable land burned at medium and high intensity Of this, 11,600 acres are mature timber and 5,600 acres are immature stands and plantations To put this in perspective, of the 624,240 acres of tentatively suitable Forest land, approximately 3 0 percent of the total has been impacted by fire. Tentatively suitable land contains 306,000 acres of mature timber; the burned portion represents 3.8 percent. The 5,600 acres of immature timber stands and plantations represent 2 2 percent of that category.

The volume of burned timber harvested in place of the normal green program will offset much of the inventory loss. The total volume of timber killed in all three fires was 332 MMBF. Volume planned for harvest that would offset green volume is approximately 190 MMBF. The estimated 142 MMBF lost from the inventory would affect the Forest's potential to produce timber in the future. Since the existing inventory must be metered out over 70-80 years to stay on a non-declining flow schedule, the maximum effect on the Forest's potential to produce timber is about 2 MMBF in Allowable Sale Quantity.

The salvage of burned timber in the immediate future will be balanced, in part, by shifting regular harvest activities to other parts of the Forest for the next few years This will result in a change in the scheduling of harvest activities under the Forest Plan.

Table III-54. Tentatively Suitable Timber Acres of High and Medium Burn Intensity by Vegetation Type

Galice Fire			
Vegetation Types	High	Medium	Total
Old-Growth/Mature	75	368	443
Immature-Poles	64	235	299
Seeds and Saps	117	400	517
Hardwoods	37	59	96
SUBTOTAL	293	1,062	1,355

Longwood Fire			
Vegetation Types	High	Medium	Total
Old-Growth/Mature	779	1,120	1,899
Immature-Poles	304	560	864
Seeds and Saps	443	587	1,030
Hardwoods	43	64	107
SUBTOTAL	1,569	2,331	3,900

Silver Fire			
Vegetation Types	High	Medium	Total
Old-Growth/Mature	1,781	7,504	9,285
Immature-Small Timber	91	59	150
Immature-Poles	736	1,755	2,491
Seeds and Saps	96	171	267
Hardwoods	299	1,067	1,366
SUBTOTAL	3,003	10,556	13,559
TOTAL	4,865	13,949	18,814

WILDLIFE

The recent forest fires were an agent of positive change in wildlife habitat diversity. Although some areas were severely burned, many were not The fires have created a mosaic of habitats which has markedly increased habitat diversity. Populations of species dependent on older forest stages are expected to decrease (e g., spotted owls, hermit warblers, and red tree voles) Populations of species that utilize younger forest habitat (e.g., bluebirds, brush rabbits, blacktail deer, and elk) should increase. Resetting of the cycles in meadows and creation of more openings will benefit many species. Forage quantity and quality will increase in burned areas with deer and elk as the major beneficiaries. Overall, populations of wildlife species do not appear to be seriously affected, either positively or negatively by the fires.

Forest-wide, there is no serious impact as a result of the fires on the habitat network proposed to maintain minimum viable populations of wildlife species dependent on mature and old-growth forest. An interesting footnote to the Silver Fire during the summer of 1988 spotted owls responded to imitated calls in two locations where fire intensity was less severe.

Of particular concern in light of the planning issues are the changes in habitat suitable for wildlife dependent on mature and old-growth forest As part of the Forest Planning process, a network of suitable habitats has been identified for spotted owls, pileated woodpeckers, and pine martens. Where identified

habitat areas within the network no longer contain suitable habitat as a result of the fires, opportunities for adjustment of areas within the network have been evaluated. Only additional areas which would be a logical part of the network were designated. All necessary adjustments have been made, resulting in only minor effects on the alternatives considered in this FEIS. Summaries of the evaluations of identified habitat areas within the fire perimeters are described below.

Gallce Fire Complex

No management areas for Spotted Owl, Pileated Woodpeckers, or Pine Marten proposed in the habitat networks were within the fire area.

Longwood Fire Complex

Two SOHA's are within the Longwood Fire One was not severely affected; however, the other was severely burned and has been replaced by another area. In the area where the SOHA was replaced, a marten area has been mapped (established) in the burned area. The boundaries of one proposed Pileated habitat area and two Pine Marten areas have been adjusted slightly to fit suitable habitat.

Silver Fire Complex

One SOHA and four pileated areas are located outside the Wilderness; all are still suitable habitat. The burned portion of the Kalmiopsis Wilderness is capable of supporting 12 separate home ranges for spotted owls. Six of the habitat areas were not significantly affected by the fire; the other six have been affected to various degrees and some may not contain adequate habitat.

SENSITIVE PLANTS

Research Natural Areas were not impacted by the fires The Craggies Botanical Area is within the perimeter of the Silver Fire and the inventoried Chrome Ridge Botanical Area (a candidate area in several alternatives) was partially burned in the Galice Fire The fire did not eliminate a significant number of rare individuals or affect their viability. On the contrary, these plant communities evolved with fire and most of the sensitive species benefit from the reduction in competition from shrubs and trees. Thus, the fire helped to maintain species diversity within the Botanical Areas

FISHERIES/WATERSHED

Much of the shade producing vegetation on the perennial streams is still in place. Many small streams in the upper reaches of the watershed and a few principal tributaries to Silver and Indigo Creeks, however, were severely burned and the vegetative shade canopy lost. These changes will impact both stream temperatures and sedimentation as they affect the primary beneficial use, fish habitat. Critical summer stream temperatures are expected to increase by one to eight degrees Fahrenheit in some drainages. This will affect fish habitat capability to some extent since these streams currently reach temperatures exceeding 70 degrees Fahrenheit The projected increase resulting from the fire will push them to near critical thresholds Regrowth of streamside vegetation has already begun; full recovery is expected in 15 to 20 years on smaller streams, with larger streams requiring more time.

Sediment delivered to some of the severely burned streams is expected to be as much as triple pre-fire base levels. The significance of increased sedimentation was evaluated relative to characteristics of the specific watersheds involved. Silver, Indigo, Galice, and Tincup Creeks are steeper gradient systems with high flow energy capable of moving large amounts of material during winter storms. Even with the increase in sediment production, significant channel aggradation or siltation of anadromous fish spawning gravels is not expected to occur. Resident trout populations in upper reaches of some streams could be impacted,

particularly where large areas of the watersheds are severely burned or local stream gradients are subject to sediment deposition. Most of these streams are quite remote and receive scant fishing use

Cumulative effects analysis of the Silver Fire area indicates a first year post-fire reduction of approximately 6,500 steelhead smolt from the Silver and Indigo Creek drainages. Again, this will only be a temporary loss as full recovery will occur within a decade. Based on Forest Plan data, total steelhead smolt attributed to Forest production is approximately 948,000 fish. Reduction of steelhead smolt resulting from the Silver Fire is less than one percent.

The Longwood Fire occurred in the mid-reach of the East Fork Illinois River drainage. Riparian areas of the main stem East Fork received only minor damage during the burn. Tributaries in the burn areas of the East Fork flow very little in the summer season and are either dry or flowing under gravel as they enter the East Fork. Assuming a 10 percent reduction in steelhead capability of the East Fork drainage as a result of the Longwood Fire, total capability loss would be approximately 900 steelhead smolts per year, or about one tenth of one percent of the total Forest production

RECREATIONAL SETTING

Major portions of the Wilderness have burned, changes in the vegetative character will be obvious to recreationists These changes do not affect the primitive nature of the experience and may, over time, enhance the visual variety through creation of snags and openings, and rejuvenation of meadows. The view along the Wild segment of the Illinois River has changed slightly, but management options are essentially unaffected The mosaic of vegetative changes outside of Wilderness in the Bald Mountain area has also been changed, but again this will not have any appreciable long-term effect on the nature and type of recreation opportunity

The greatest impact on visuals was localized in areas of the Longwood Fire which face toward the community of Takilma Visual considerations accompanied the project-level environmental analysis of the proposed salvage harvest of fire-killed trees.

The resulting changes in recreational setting and use in the aftermath of the fires do not appear to have any major implications in terms of the resolution of the issues addressed in this environmental analysis. In fact, the present setting is strongly influenced by evidence of earlier fires. In addition, substitution of opportunities in one area for another has not been a part of resolution of this issue (the issues center on individual areas more than the total supply of opportunities).

While the fires themselves did not appreciably change the recreation opportunities on the Forest, the proposed salvage logging and associated road construction of the Silver Fire Recovery Project would affect the roadless area and unroaded recreation opportunities. The Selected Alternative of the Silver FEIS and Record of Decision, as amended by the 1989 Appropriations Act, schedules construction of approximately 13 miles of road in selected parts of over 42,000 acres burned in the unroaded portions of the North Kalmiopsis. The decision affected change in the inventoried unroaded boundaries, with impacts on the Primitive and Semi-primitive Non-motorized recreation opportunities as noted above.

The roads have been built in the Bald Mountain and Indigo Creek areas Maps showing the changes in the unroaded boundary and changes in the ROS inventory are provided in Appendix C The former North Kalmiopsis Roadless Area would be reduced from 110,175 acres to 88,582 acres. The decision to road and salvage portions of the Silver Fire would contribute approximately 19,000 acres to the reduction in Forest-wide roadless area inventory. See **WILDERNESS AND ROADLESS AREAS** and Appendix C for an indepth discussion of changes in the inventoried roadless area. The changes in ROS class resulting from the Silver Recovery Project are shown for the project area in Table III-55 The changes in ROS inventory Forest-wide are shown in Table III-56.

Table III-55. Changes in ROS Class Inventory within Silver Recovery Project Boundary

ROS Class	Previous	Current
Primitive	5,200	0
Semi-primitive Non-motorized	20,400	5,700
Semi-primitive Motorized	11,800	2,500
Roaded Natural	5,500	34,700
Total	42,900	42,900

Table III-56. Forest-wide Changes in ROS Class Inventory Resulting from the 1987 Fires and Related Recovery Projects

ROS Class	Previous	Current
Wilderness Primitive	114,000	114,000
Wilderness Semi-primitive	118,000	119,000
Primitive	22,000	17,000
Semi-primitive Non-motorized	97,000	82,000
Semi-primitive Motorized	113,000	104,000
Roaded Natural	628,000	656,000
Total	1,092,000	1,092,000



CHAPTER IV

ENVIRONMENTAL CONSEQUENCES

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Chapter IV
ENVIRONMENTAL CONSEQUENCES

INTRODUCTION

The purpose of this chapter is to disclose the environmental consequences of implementing the alternatives described in Chapter II Relative to the existing conditions and affected environment described in Chapter III, each alternative potentially impacts various components of the environment. Those environmental effects are presented in this chapter, and form the scientific and analytic basis for the comparison of alternatives examined in Chapter II.

Impacts on components of the environment are discussed in terms of their significant direct, indirect, and cumulative effect(s). *DIRECT EFFECTS* are generally the result of land allocations to Management Areas that prescribe permissible activities on lands within the area's perimeter. Agency activities and the inherent capability of the land provide goods and services that may be consumed by the public. Government expenditures that finance agency activities are treated as a direct effect in the economics section of this chapter.

INDIRECT EFFECTS generally occur when the public takes advantage of the opportunities provided in each alternative. Public use of the Forest for recreation (including hunting and fishing), timber harvest, and mineral withdrawal, for example, can have adverse effects on various components of the environment. The value to society (benefits) of goods and services are treated as indirect effects in the economics section of this chapter, as are the impacts on revenues, jobs, and income

CUMULATIVE EFFECTS deal with both the synergistic effects over time and the incremental change from existing conditions given the combined actions of the agency and other ownerships in southwest Oregon and northwest California. The net effect on individual program efficiencies, jobs, income, and social parameters (such as community stability), are treated as cumulative effects in the economics section of this chapter Some of the effects are described in qualitative terms, while others are described in quantitative terms.

All effects disclosed in this chapter assume complete compliance with the Standards and Guidelines summarized in the FEIS, Appendix D, and the Forest Plan, Chapter IV. Environmental consequences would be far more severe, or unacceptable, in the absence of Standards and Guidelines and accompanying Best Management Practices (BMP's) These Standards and Guidelines contain many of the mitigations that avoid, minimize, restore, replace, reduce, or eliminate probable or potential environmental impacts. Standards and Guidelines also include the Monitoring and Evaluation Program requirements (detailed in the Forest Plan, Chapter V) that serve as the enforcement mechanism for achieving desired future conditions

The environmental effects that are expected to result from timber harvest are based on the use of even-aged timber management regimes and assume predominant use of the clearcut harvest method. Use of other systems is not precluded; final selection of silvicultural systems will be based on site-specific analyses. Appendix G - Selection of Silvicultural Systems describes the process and factors involved in making this determination.

The organization of this chapter is similar to that of Chapter III. Environmental components become the subject of analysis. The "existing condition" description of each component in Chapter III provides the foundation for the impacts discussed in this chapter. A thorough reading of Chapter III, Affected Environment, will improve the reader's understanding of material in this chapter. The structure of Chapter IV is designed to trace the natural progression of consequences (resulting from an agency action, such

as road construction) through the physical and biologic components of the environment, ending with the social and economic implications of the action.

Each environmental component is introduced with a description of the significant interactions which summarize the relationship between site-disturbing activities and impacts on the component Table IV-1 indicates the more important effects expected between causative agents (e g , land allocation proposals, agency activities, public consumption of goods and services) and environmental components Interactions shown are specific to the Siskiyou National Forest. The reader is encouraged to review the entire chapter in order to understand the complete ramifications of the proposed actions in this FEIS

Several special summaries follow the disclosure of impacts by environmental component. A review of potential conflicts with plans and policies of other jurisdictions for alternatives considered in this FEIS is provided, followed by a discussion of the adverse impacts that cannot be avoided, the relationship between short-term use and long-term productivity, and the irreversible and irretrievable commitment of resources associated with implementation. Environmental effects or conditions common to, or unchanged by the alternatives, are also outlined The chapter concludes with a series of specific disclosures required by NEPA and CEQ regulations for the proposed action.

Mitigation, as referenced in the above discussion of Standards and Guidelines, is extremely important in the design of the alternatives and during the implementation of any alternative. In general, "mitigation" is a measure taken to cause an action to become less harsh or less severe From the CEQ Regulations (40 CFR 1508 20), "mitigation" includes.

1. *Avoiding* the impact altogether by not taking a certain action or parts of an action;
2. Minimizing impacts by *limiting* the degree or magnitude of the action and its implementation,
3. *Rectifying* the impact by repairing, rehabilitating, or restoring the affected environment;
4. *Reducing* or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
5 *Compensating* for the impact by replacing or providing substitute resources or environments

In the design of alternatives in Chapter II and throughout the discussion of environmental consequences by resource component in this chapter, mitigations have been thoroughly incorporated and evaluated. For the actions analyzed in this programmatic EIS, both the means to resolving the issues (Planning Problems) and mitigations are primarily addressed through **land allocations, standards and guidelines**, and **capital investments.**

Mitigations are easily found in this chapter if the concept is understood. Some examples may help to highlight their use Where a sensitive nest site of a falcon is known to exist, a land allocation (such as Special Wildlife Site) or guideline requiring that any proposed management activity remain at several hundred yards distance can be applied to *avoid* the potential disturbance of that site and its occupants However, if the falcons only use the site for rearing of young, then a standard which requires a seasonal closure to activities in the vicinity of the nest may be most appropriate for *limiting* or minimizing the impacts during the occupancy period

Quite often soil and water improvements through capital investments are utilized in *rectifying* prior impacts (as in restoration of an old, badly eroding road) or in preventing erosion (such as grass seeding, mulching, or paving a newly constructed road) Programmed road maintenance for the level and type of use and other resource considerations is valuable in *reducing* many resource impacts while providing protection to the capital investment (the road itself) over the life of that facility.

Numerous examples of mitigations can be listed However, if the use of land allocations, capital investments, and standards and guidelines are tracked closely, the various forms of mitigation should be readily apparent.

Table IV-1. Important Interactions between Agency Activities, Public Consumption, and Components of the Environment

Agency Action/ Activity (A) Public Consumption (P)	Environmental Components 1/															
	Land Status	Cultrl Resrce	Energy	Mineral Deposits	Improve-ments	Wldrns & Rdless Areas	Wild & Scenic Rivers	Soil and Water	Fire	Vege-tation	Air Quality	Fish	Wild-life	Vis-uals	Recrn Set'gs	Econ. & Social Para-meters
LAND ALLOCATION																
Wilderness (A)	D		D	D		D					D				D	
Wild River (A)	D		D	D			D							D	D	
Research Nat.Area (A)	D		D	D						D						
Botanical (A)	D		D	D						D						
Unique Interest (A)	D	D	D	D												
Backcountry Rec.	D		D	D		D	D							D	D	
Supplemental Res. (A)	D		D	D			D	D				I	D		I	
Designated Wildlife Habitat (A)	D									D			D			
Special Wildl.Hab.(A)	D		D	D						D			D			
Scenic/Recreation River (A)	D		D	D			D							D	D	
Riparian (A)	D							D,C		D		I,C	I		I	
Retention Visual (A)	D					D	D			I			I	D	D	
Partial Retention Visual (A)	D					I	D			I			I	D	D	
General Forest (A)										D			I	D	D	
RECREATION																
Construction (A) -Sites -Trails		D		D	D	D	D		I					D	D	D,C
Use (P) -People -Vehicles -ORV's	D	D	I		D	I,C			I,C				I	D	D	I,C
W&S RIVERS																
Use (P)									I						D	I,C

Table IV-1. Important Interactions between Agency Activities, Public Consumption, and Components of the Environment (Continued)

Agency Action/ Activity (A) Public Consumption (P)	Environmental Components 1/															
	Land Status	Cultrl Resrce	Energy	Mineral Deposits	Improve-ments	Wldrns & Rdless Areas	Wild & Scenic Rivers	Soil and Water	Fire	Vege-tation	Air Quality	Fish	Wild-life	Vis-uals	Recrn Set'gs	Econ. & Social Para-meters
CULTURAL																
Survey (A)																D,C
WILDERNESS																
Construction (A) -Trails		D			D	D									D	D,I,C
Use (P) -People -Stock travel		D			D	D			I						D	I,C
WILDLIFE																
Habitat Improv. (A)									I	D			D,I,C			D,I,C
Harvest (Use) (P) -Hunting -Trapping -Nongame									I				D			I,C
FISH																
Habitat Improv. (A)												I,C				D,I,C
Harvest (Use) (P)			I						I			D,I,C				I,C
RANGE																
Use (AUM's) (P)										D			I			I,C
TIMBER																
Harvest (P) -Silv methods -Harvest systems		D	D,I					D,I,C	D,I	D,I,C		I,C	D,I,C	D,C	D,I,C	D,I,C
Haul (P)			I		D								D			
Site Prep (A) -Prescribed burns -Scarification -Hardwood conversion		D	I					D,C	D	D	D,I,C	I	D,I	D,I	D	D,C
Reforestation (A) -Planting										D			I	I		D,C
Tbr Stand Improv (A) -Thinning (Precom)									D	D			I	D		D,C

Table IV-1. Important Interactions between Agency Activities, Public Consumption, and Components of the Environment (Continued)

Agency Action/ Activity (A) Public Consumption (P)	Environmental Components 1/															
	Land Status	Cultrl Resrce	Energy	Mineral Deposits	Improve-ments	Wldrns & Rdless Areas	Wild & Scenic Rivers	Soil and Water	Fire	Vege-tation	Air Quality	Fish	Wild-life	Vis-uals	Recrn Set'gs	Econ. & Social Para-meters
SOIL & WATER																
Watershed Improvements					I			D		I		I				D
MINRLS,GEOL,&ENRGY																
Permitted Use (P)	D	D	D	D	D,I	D	D	D	I	D		I	I	D	D	
LANDS																
Boundaries (A)	D									D			I	D		D
Exchanges & Acquisitions (A)	D				I		D						I		I	D
FACILITIES																
Construction (A) -Roads		D	D,I	D,I	D	D	D	D,I,C	D,I	D,I		I,C	D	D	D	D,C
Reconstruction (A)			I	D	D			D,I				I,C		D	D	D,C
Maintenance (A)					D,I					D			I	D		D,C
Mgmt/Operations (A) -Road closures -Rds Open to PC/HC		I			D				D	D,I			D	D	D	D,C
PROTECTION																
Fire Prevention (A) -Hazard Reduction						D	D		D	D	D					D,C
Suppression (A) -Equipment, Chemicals					D	D	D	I	D	D	D					D,C
Fuels Treatment (A) -Activity -Natural						D	D	D	D,I	D	D,I	I	D	D		D,C
Insect & Disease Control (A) -POC root rot control										D						
Noxious Weed Control (A)										D						

1/ D - Direct Effect
I - Indirect Effect
C - Cumulative Effect

CHANGES BETWEEN DRAFT AND FINAL

Several areas of change have occurred since the DEIS These changes are noted in previous chapters and in the formulation of Alternative S, in particular The changes primarily resulted from the Omnibus Wild and Scenic Rivers Act of 1988 (which added the Chetco, Elk, and North Fork Smith Rivers to the National System), the 1987 fires, roadless area inventory adjustments, and public and other agency input relative to many of the resource components The greatest concerns revolved around environmental impacts associated with biological diversity and old growth, overall forest productivity, water quality, and fisheries

In evaluation of alternatives, only Alternative S fully represents the existing and newly designated Wild and Scenic Rivers. Other alternatives presented different management options to assess Wild River and Scenic/Recreation River allocations. The very recent legislation has negated the need for disclosing these potential effects and has effectively altered Planning Problem #4 (see Chapter I) Alternatives (other than Alternative S) which disclose environmental consequences associated with the Chetco, Elk, and North Fork Smith Rivers should be viewed in light of their recent change in status

The 1987 fires did affect the environmental setting for portions of the Forest (see Chapter III). In this Chapter, components which would change by alternative have been evaluated and the consequences provided under **1987 FIRES** Adjustment in the inventory resulting from the fires has not been applied to the alternatives evaluated in the FEIS. However, any alternative selected would be updated for these changes in the Forest Plan.

Considerable public input centered around the roadless area issue Comments focused on the "Custodial (Roadless)" Management Area which emphasized protection of these areas in an essentially preserved state. Management Area 6 goals and prescription have been changed to emphasize a greater array of recreational opportunities, and lesser restrictions on mineral entry and development (see Chapter II). The Management Area "Backcountry Recreation" replaces Custodial (Roadless). Backcountry Recreation better represents the intent and focus of management direction. For Alternative S, individual allocations to Backcountry Recreation are assigned to either motorized or non-motorized use

As noted in Chapter III, acres of inventoried roadless areas have changed since 1984 The effects on the new inventory of 284,000 acres are disclosed in **WILDERNESS AND ROADLESS AREAS** The decision for the Silver Fire Recovery Project created the largest adjustment in the inventory. Analysis of the affected wilderness characteristics for this site-specific project are provided in the Silver Fire Recovery Project FEIS and Record of Decision (USDA 1988). Specific changes in inventory and a analysis of each alternative by inventoried roadless area are provided in Appendix C.

The environmental consequences associated with the alternatives as addressed by resource component have been re-evaluated and changed, where necessary, to represent or respond to public and other agency input. One component, **BIOLOGICAL DIVERSITY**, has been added. Treatment of biological diversity, however, is addressed within several resource components in other sections of Chapter IV

Parts of the **SOIL AND WATER** and **FISH** sections have been combined to better disclose their interactions and potential effects. In addition, the process and application of Best Management Practices (BMP's) that accompany the Standards and Guidelines common to all alternatives have been further described and developed (see Forest Plan, Appendix F).

LAND ALLOCATIONS

SIGNIFICANT INTERACTIONS

The allocation (assignment) of land to various Management Areas may change existing land status because it establishes the permissible activities and uses that can occur on an acre of land, as described in Chapter III. Taken collectively, the land allocation "decision," with its associated activities and uses, provides the primary mechanism for creating environmental effects. Agency activities permitted within each Management Area are treated as the causative agent for all direct environmental impacts presented in this chapter Agency activities also produce, or make available, the goods and services necessary to resolve most planning problems The public's consumption of those opportunities creates, in turn, indirect environmental effects, removed in time and space from most initial agency actions.

Relative to the General Forest Management Area, lands assigned to other Management Areas limit site-disturbing activities by varying degrees. Depending upon the objective of each Management Area, Standards and Guidelines establish the acceptable degree of site disturbance and the kinds of uses permitted on lands within its perimeter Standards and Guidelines governing Wilderness, for example, greatly limit site disturbance Even activities such as trail construction are restricted to primarily the use of hand tools. General Forest Standards and Guidelines, on the other hand, permit a considerable degree of site disturbance to accommodate a broad range of multiple uses, subject to the provisions included in Forest-wide Standards and Guidelines.

ENVIRONMENTAL EFFECTS AND MITIGATION

Environmental consequences on land status, as defined in Chapter III, are presented in this section. *DIRECT EFFECTS* on land status are characterized by the number of acres represented by each Management Area (Table IV-2) and the Standards and Guidelines that define acceptable practices and permissible uses The amount of use anticipated, such as timber harvest and recreation, is presented in Chapter II, and reflects the number of acres allocated to each Management Area. The significance of use, or public consumption, of the opportunities provided in each Management Area is evaluated as indirect environmental consequences, and is presented in the subsequent sections of this chapter.

Because each alternative generally has some land represented by all Management Areas, the organization of this section differs from the format in the remainder of Chapter IV Direct effects of the alternatives on land status are presented by Management Area Following a statement of the objective for each Management Area, a summary of the Standards and Guidelines that define the permissible degree of site disturbance, access restrictions, and acceptable uses and activities is presented. The number of acres allocated to each Management Area (displayed in Table IV-2) indicates the direct effect of each alternative

Land allocations to the first nine Management Areas are designed to limit site-disturbing activity that can occur. Motorized access is generally restrained to one degree or another, and mineral and energy operating plans contain strict requirements and mitigative measures to protect the features and primary values of the Management Area. On occasion, withdrawal from mineral entry is requested. Lands in these Management Areas are rarely offered in land adjustments or exchanges. Agency activities are designed to provide basic resource protection (e.g , fire suppression and insect and disease control) and facilitate recreational use Land assigned to Management Areas 1-9 ranges from 280,863 acres (28 percent of the Forest) in Alternative NC to 670,117 acres (61 percent) in Alternative M.

Table IV-2. Acreage in Management Areas by Alternative

Management Area No.-Name	ALTERNATIVE										
	No Change	A and A-Departure	B	C	D	D1	E	G	K	M	S
1-Wilderness	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495	232,495
2-Wild River	3,120	3,120	2,043	2,043	2,043	2,043	3,120	3,120	2,043	3,120	5,029
3-Research Natural Area	3,249	3,249	3,349	3,349	3,349	3,349	4,693	4,693	4,704	4,693	4,608
4-Botanical	1,067	1,067	5,648	5,648	5,648	5,648	24,267	35,658	7,296	35,658	16,275
5-Unique Interest	0	0	395	395	395	395	1,568	1,333	1,595	1,333	2,015
6-Backcountry Recreation	0	0	0	0	0	0	301,737	150,431	13,691	296,520	108,092
7-Supplemental Resource	29,589	29,589	13,739	1,285	13,739	13,739	27,680	50,453	39,498	36,144	21,412
8-Designated Wildlife Habitat	5,082	52,053	52,885	55,109	52,885	52,885	39,242	70,858	59,477	53,125	47,354
9-Special Wildlife Site	6,261	5,883	9,195	9,477	9,195	9,195	7,547	8,640	14,581	7,029	27,450
10-Scenic/Recreation River	15,248	13,642	9,526	9,526	9,526	9,526	6,192	5,963	3,557	5,850	10,317
11-Riparian	122,279	110,465	111,749	115,743	111,749	111,749	62,337	72,483	102,944	56,139	89,206
Prescription B	(84,517)	(81,318)	(48,747)	(83,528)	(48,770)	(44,664)	(0)	(0)	(69,895)	(0)	(39,836)
Prescription C	(0)	(0)	(33,044)	(0)	(33,059)	(30,276)	(0)	(45,212)	(6,161)	(0)	(27,130)
Prescription M	(37,762)	(29,147)	(29,958)	(32,215)	(29,920)	(36,809)	(62,337)	(27,271)	(26,888)	(56,139)	(22,240)
12-Retention Visual	50,715	46,050	7,678	0	7,678	7,678	19,622	23,060	10,280	17,479	9,717
13-Partial Retention Visual	229,802	218,545	94,282	86,551	94,282	94,282	116,281	149,830	129,323	109,448	131,822
14-General Forest 1/	393,395	376,144	549,318	570,681	549,318	549,318	245,521	283,285	470,818	233,269	386,510
TOTAL NATIONAL FOREST LAND	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302	1,092,302

1/ Alternative M includes 97,661 acres not accessible from existing roads [illegible]

Land assigned to the last five Management Areas provides a much broader range of uses. A greater degree of site disturbance is allowed. The visual emphasis in three of the five areas, however, does limit the methods, scheduling, and locations of some site disturbing activities. Motorized access is prevalent in these Management Areas in support of the timber harvest program, some forms of recreation, and hunting use. Overall, energy and mineral development opportunities are not encumbered by overly-restrictive requirements and mitigations for access and development. Land assigned to Management Areas 10-14 ranges from 422,185 acres (39 percent of the Forest) in Alternative M to 811,439 acres (72 percent) in Alternative NC.

No indirect or cumulative effects on land status have been identified.

Wilderness Management Area (1)

These areas were established by Congress to provide opportunities for solitude and recreation in a natural state. Standards and Guidelines for Wilderness limit site disturbance to that which can be accomplished with hand tools *With the exception of mining activity on valid claims established prior to December* 31, 1984, no motorized access is permitted. Land within the Wildernesses is not available for energy and mineral development, except as previously noted. Total acreage within the Wilderness Management Area (232,495 acres) remains fixed by alternative Where two or more Management Area allocations overlap (e.g , Big Craggies Botanical Area in the Kalmiopsis Wilderness), the Wilderness effects and constraints on land status take precedence.

Levels of agency activity that vary by alternative are generally limited to trail construction/reconstruction and activities related to resource protection. Natural fuels treatment within Wilderness is permitted to varying degrees in all alternatives, except Alternatives NC, A, and A-Departure.

Wild River Management Area (2)

With the exception of permits, structures, and practices that were established prior to legislative designation, site disturbance within the Wild River Management Area is generally limited to that which would preserve the river in a natural, wild, and primitive condition. No motorized access is permitted unless provided for in the legislation (e g., Rogue River as cited in P L. 90-542). Subject to valid existing claims, lands in Wild River are withdrawn from mineral and energy development

Trail development, fish and wildlife habitat improvement projects, and primitive campsites illustrate the extent of agency activities permitted in the Wild River Management Area Treatment of natural fuels through prescribed burning is also permitted in all alternatives except NC, A, and A-Departure.

Research Natural Area Management Area (3)

RNA's are established (or recommended to be established) to represent typical and distinctive natural ecosystems and habitats for scientific or educational use in an unmodified condition. Standards and Guidelines for RNA's generally prohibit site disturbance unless consistent with the objectives of the area. Site-disturbing activities beyond trail development and maintenance are not permitted in this Management Area. Special use permits may be approved by the Pacific Northwest Experiment Station when directly related to the objective of the RNA Lands within this Management Area would have high levels of access restrictions for mineral and energy development However, withdrawals from mineral and energy development can only be considered through the NEPA process.

Three existing RNA's total 1,957 acres. Recommended additions to this Management Area of approximately 1,300 acres occur under Alternatives E, G, K, M, and S.

Botanical Management Area (4)

Similar to RNA's, these areas provide educational or recreational opportunities to observe exceptional plants and plant communities in a natural setting. A limited amount of site disturbance is permitted when it will not adversely affect endangered, threatened, or sensitive plants, and is consistent with the area's management objectives. Both motorized and trailed access are permitted to facilitate recreational opportunities. Withdrawal from energy and mineral entry may be considered through the NEPA process if development would jeopardize plant values emphasized in the area. Lands classified (36 CFR 294 1) as Botanical Area are unavailable for land adjustments or exchanges.

Three established areas total 4,475 acres Recommended additions to this Management Area range from 4,581 acres in Alternatives B, C, D, and D1, to 34,591 acres in Alternatives G and M

Unique Interest Management Area (5)

Lands allocated to this area provide recreation and education opportunities for observing unique or exceptional geologic features and cultural sites with historical significance Site disturbance that does not jeopardize the particular feature for which the area was recommended is generally permitted Access to the Management Area may be by road or trail. Where unique features are jeopardized, withdrawals from energy and mineral entry would be requested, if justified, and evaluated through the NEPA process Special-use permits may be granted that are consistent with the objectives of the individual areas. Lands classified (36 CFR 294.1) in this Management Area are generally not available for land adjustments or exchanges.

Allocations to these areas range from no acres in Alternatives NC, A, and A-Departure to 2,015 acres in Alternative S.

Backcountry Recreation Management Area (6)

Other than mineral activities, land allocated to this Management Area is managed to provide motorized and/or non-motorized recreation opportunities in an undeveloped setting. Other than mineral activities as noted, site-disturbing activities are not planned except for those activities described below. Unless associated with approved operating plans for mineral activity, motorized public access is restricted to designated travelways. Mineral access and site impact restrictions may be considered if they exceed the inventoried Visual Quality Objectives (VQO's) for the specific area, and mitigative measures are deemed ineffective

Fire prevention, presuppression, and suppression activities, trail construction and maintenance, treatment of major catastrophic losses, and control of insect and disease problems are the extent of agency activity in this Management Area. Motorized uses will generally occur where such use currently exists

Allocations to Backcountry Recreation range from no acres in Alternatives NC, A, A-Departure, B, C, D, and D1, to 301,737 acres in Alternative E.

Supplemental Resource Management Area (7)

Lands allocated to this Management Area possess inherently high watershed, recreation, fish, and wildlife values Site disturbance is limited to those activities which can be completed without adverse effects on the emphasized resources. As necessary, road access is occasionally permitted using techniques and locations that have the least impact on the watershed. Special requirements or mitigative measures may be necessary for energy and minerals development to comply with watershed objectives Lands in this Management Area are not available for land adjustment or exchange.

Agency activities within the Supplemental Resource area include development and maintenance of trails, watershed restoration, fish and wildlife habitat improvements, and developed recreation sites when compatible with primary resource objectives No timber harvest is programmed and firewood cutting is generally prohibited. Roads that comply with the Standards and Guidelines for this management area may be built and maintained.

Allocations to Supplemental Resource Management Area range from 1,285 acres in Alternative C, to 50,453 acres in Alternative G

Designated Wildlife Habitat Management Area (8)

Supporting plants and animals dependent upon mature and old-growth habitat, these areas are distributed throughout the Forest in a manner that facilitates population dynamics and long-term viability. Site-disturbing activities are limited to those that do not significantly alter existing old-growth characteristics, or occur beyond 1,000 feet of spotted owl nests or roost trees. Motorized and trailed access *is located to minimize impacts on indicator species, especially in the vicinity of nest trees Requirements* will be included in mineral and energy operating plans to minimize impacts on old-growth vegetation and nest sites.

Fire prevention, presuppression, and suppression activities, treatment of catastrophic losses, and control of insect and disease problems are examples of management activities typical to this area Most road and trail construction would occur to access other destinations. There is no programmed timber harvest and firewood cutting is prohibited

For alternatives which meet Management Requirements (MR's), land assigned to the Designated Wildlife Habitat Management Area ranges from 39,242 acres in Alternative E to 70,858 acres in Alternative G Alternative NC, which does not carry the current MR array, contains 5,082 acres of designated habitat; these acres are allocated in conformance with a memorandum (April 20, 1981) from the Regional Forester which establishes interim direction for management of spotted owl habitat (32 pairs; 300 acres per pair).

Special Wildlife Site Management Area (9)

Representing an array of unique plant and animal conditions that contributes to overall habitat diversity, these lands include meadows, water-dominated habitat, hardwood stands, rock cliffs, and small blocks and stringers of old-growth forest used as travel corridors by many animal species. The degree of site disturbance in this Management Area varies depending upon the specific area objective and condition. While no timber harvest is programmed in these areas, some activity is permitted as noted below. Motorized and trailed access is generally permitted, but discouraged in meadows Mineral activity is generally not encouraged as these sites are normally quite limited in size. Operating plans for mineral and energy development would be designed to minimize impacts on special site values.

A variety of agency activities designed to improve or enhance wildlife habitat may occur depending upon the characteristics and objectives of the individual site Road and trail construction is usually designed to access other destinations. Prescribed burns and removal of tree encroachments in meadows are typical of the activities oriented to enhancement of the resource.

Allocations to Special Wildlife Sites range from 5,883 acres in Alternatives A and A-Departure, to 27,450 acres in Alternative S.

Scenic/Recreation River Management Area (10)

Established to provide river-oriented recreation in an area of high scenic quality and largely undeveloped shorelines, lands allocated to this Management Area are limited in degree of site disturbance by VQO's of Retention as seen from the river itself, and/or Partial Retention within the 1/4 mile corridor on either side

of the river Scenic segments limit activity to that which will maintain visual quality and undeveloped shorelines, while development activity in Recreation segments may result in a substantially modified appearance.

Motorized and trailed access is permitted in both sections, but VQO's are generally more restrictive in the Scenic sections. High access restrictions may be imposed where necessary to protect river values.

A wide range of management activities, including construction and maintenance of trails and campsites, fish and wildlife habitat improvements, and timber harvest may occur in this Management Area. The amount of timber harvest activity and associated road construction varies by alternative Recreation use of the river may be controlled to maintain the character of each river.

Allocations to Scenic/Recreation River range from 3,557 acres in Alternative K, to 15,248 acres in Alternative NC

Riparian Management Area (11)

Bordering all perennial streams, rivers, and other bodies of water, lands occurring in the Riparian area are allocated to one of three different management regimes depending upon the emphasis in the alternative. Riparian vegetation in a particular basin is managed as an entire system over space and time. Planning Basins are allocated to one of three management prescriptions· Riparian Prescription B, Riparian Prescription C, or Minimum Level.

For the Minimum Level, there is no programmed harvest; little disturbance is permitted within the Riparian area. Basins managed with Prescription B permit some site disturbance and removal of trees where other riparian objectives can be concurrently met. Prescription B is designed to maintain existing water temperatures over the whole planning basin Site disturbance under Prescription C is limited to that activity which, over time, results in an improvement in summer water temperature.

A wide range of management activities, including construction and maintenance of trails, roads, and campgrounds, fish and wildlife habitat improvement projects, watershed restoration, and timber harvest may occur in areas allocated to Prescriptions B and C. The intensity of harvest activity will vary with Prescriptions B and C; site-specific environmental analysis is accomplished during implementation at the project level.

Allocations to Prescription B range from no acres in Alternatives E, G, and M, to 84,517 acres in Alternative NC. No land is allocated to Prescription C in Alternatives NC, A, A-Departure, C, E, and M, while Alternative G has 45,212 acres allocated to Prescription C The Minimum Level prescription applies to the Upper Chetco Planning Basin in all alternatives because it is entirely in the Kalmiopsis Wilderness. Over 56,000 acres are allocated to the Minimum Level prescription in Alternative E and M.

Retention Visual Management Area (12)

The maintenance of natural or near natural scenic quality during timber harvest, road construction, and other activities in areas of high recreational value is the objective of lands allocated to this Management Area Site disturbance is limited to those activities which result in visual impacts that are subordinate to the characteristic landscape Special mitigative measures may be necessary in energy and mineral operating plans to comply with the visual quality emphasis of this Management Area

No restrictions on agency activities apply to lands in this Management Area as long as techniques and locations that meet the VQO are utilized. Timber harvest opportunities are generally adjusted at the project level by area of activity, specific boundary adjustments, and condition of the viewshed relative to past management practices.

Allocations to the Retention Visual Management Area range from no acres in Alternative C, to 50,715 acres in Alternative NC

Partial Retention Visual Management Area (13)

Lands allocated to this Management Area are visible from major and secondary travel routes, rivers, and other high-use recreation areas Site-disturbing activities utilize techniques and locations that result in a visual impact that is subordinate to the characteristic landscape. Special measures may be necessary in energy and mineral operating plans to comply with the visual quality emphasis of this Management Area.

No restrictions on agency activities apply to lands in this Management Area as long as techniques and locations that meet the visual quality objective are utilized. Timber harvest activity is designed at the project level to meet the applicable guidelines.

Allocations to Partial Retention Visual areas range from 86,551 acres in Alternative C, to 229,802 acres in Alternative NC

General Forest Management Area (14)

Remaining Forest Service lands, following the allocations discussed above, are retained in this Management Area Other than Standards and Guidelines governing the Forest as a whole, no other restraints on site disturbance affect land in this Management Area. The basin-specific harvest constraint does apply, however, to the total area that can be disturbed in any one decade. This constraint occurs on six basins in Alternatives B, D, and D1, and on all basins in Alternatives E, G, K, M, and S. An extensive road system provides access for harvest, haul, timber stand management, other administrative needs, and public uses.

No special measures for mineral and energy operating plans are generally necessary in this Management Area. The entire range of management activities and practices that meet Forest-wide Standards and Guidelines are permitted in this Management Area.

General Forest Management Area acreage ranges from 233,269 acres in Alternative M, to 570,681 acres in Alternative C.



CULTURAL RESOURCES

SIGNIFICANT INTERACTIONS

Land management decisions which significantly affect the cultural resources component are those under the General Forest, Scenic/Recreation River, Riparian, Retention Visual, and Partial Retention Visual Management Area allocations. The factors considered in determining the nature of resource interactions are: the level of significance of the cultural resource, its suitability for scientific research or interpretive opportunities, its value to a community or ethnic group, its accessibility, and the level of compatibility with other management activities. Specifically, the ground-disturbing activity and increased access to remote areas are what generate potential effects to historic and prehistoric sites. In Table IV-3, the relationships between the causative agents and cultural resources are summarized.

Table IV-3. Relationship Between Activities and Affected Cultural Resources

Activity	Affected Cultural Resources (Site Types)
Recreation Development (Direct) Recreation Use (Indirect)	Prehistoric village sites, campsites, and food-procurement sites, historic trails, mining features, and homesteads occur in areas common to this activity. Sites are being affected by users of Forest recreation, particularly along the Rogue River corridor.
Trail Construction (Direct)	Same as above with the addition of potential quarry sites and Vision Quest sites. Sites may be affected by trail construction, particularly in identified high probability areas.
Road Construction (Direct) Timber Harvest (Indirect)	When road construction and harvest occur in areas of high probability, historic trails and prehistoric campsites are the most likely sites affected.
Minerals, Geology and Energy Use (Indirect)	Historic mining sites and prehistoric village sites, hunting camps and toolmaking sites are those most likely affected by this activity.
Fire - Wildfire and Prescribed (Direct)	Potential to destroy above-ground cultural resources, such as log cabins or other historic structures. May also reveal cultural sites previously overgrown with dense vegetation.

As initial development activity takes place in these Management Areas, the probability of adverse impacts on cultural resources may occur. Secondly, as alternatives allocate higher proportions of land to these Management Areas, the potential for adverse impacts correspondingly increases.

Studies on the Forest indicate certain locations which have the greatest probability for cultural resources. These include flat or gently rolling terrain, river terraces, meadows, ridgetops, saddles, springs, and southerly aspects (West and Steinfeld 1983). Table IV-4 indicates, by alternative, how many acres of ground-disturbing activities are permitted and how many acres possess a high, moderate, or low probability of containing cultural resources.

Table IV-4 Acres of Cultural Resource Probability by Alternative

Alternative	Total Acres 1/	High	Moderate	Low
NC/A/A-Dep	751,000	7,000	82,000	662,000
B	763,000	7,000	82,000	674,000
C	773,000	8,000	85,000	680,000
D/D1	763,000	7,000	82,000	674,000
E	443,000	4,000	42,000	397,000
G	529,000	3,000	51,000	475,000
K	713,000	6,000	76,000	629,000
M	416,000	4,000	50,000	362,000
S	617,000	5,000	56,000	557,000

1/ Acreage for Management Areas 11-14

ENVIRONMENTAL EFFECTS AND MITIGATION

Ground-disturbing activities, such as road construction, timber harvest, and recreation developments are permitted in Management Areas 10 through 14 and may have an effect on cultural resources. The degree of modification to the environment created by such management activities and the potential effect these activities have on cultural resources vary by alternative

Effects to cultural resources range from disturbance, destruction, or loss of part or all of the resource, to modification of the environmental setting around a site such that its basic sense of feeling or place is altered or destroyed. The greater the number of known or potential cultural sites or use areas that fall within the areas where ground disturbance is permitted, the greater the risk of adversely affecting cultural resources

Standards and Guidelines provide a means to minimize or mitigate adverse effects on cultural resources incurred by Forest management activities, vandalism or natural deterioration. However, situations may arise where site damage occurs without knowledge or discovery by the Agency.

Approximately 25,000 acres (2 5 percent) of the Forest are inventoried annually These acres are usually selected in conjunction with ground-disturbing activities During the past six years, an average of 25 new sites have been recorded annually, principally in proposed project areas.

For all alternatives, mining activity and forest fires may result in either discovery or disturbance of cultural resources. For fire, the risk of discovery for accessed areas is similar to those in remote areas For accessed areas, the ability to control wildfire is better, thereby reducing the degree of exposure. Simply the distance from people will reduce the probability of finds in remote, unroaded terrain.

Alternatives NC, A, A-Departure, B, C, D, and D1

DIRECT EFFECTS These alternatives have a high probability for identifying new cultural resource sites, and also present a likelihood for affecting existing cultural properties. Between 751,000 to 773,000 acres are potentially subject to ground-disturbing activities under these alternatives; 7,000 to 8,000 acres of which are characterized as high probability acres for containing cultural resources. Based on past inventory data, approximately 35 to 40 new sites will be identified annually and four or five sites will require mitigation, as prescribed in the Standards and Guidelines, to offset project impacts.

INDIRECT EFFECTS. With the area of ground-disturbing activity allowed under these alternatives, there is a high potential for destroying or altering sites during a given undertaking Furthermore, the increased access to sites in once-remote areas may promote an increase in site theft and vandalism Four or five sites may be adversely affected due to the indirect effects.

Alternatives K and S

DIRECT EFFECTS. Potential ground-disturbing activities under these alternatives could total 713,000 acres (Alternative K) and 617,000 acres (Alternative S), of which 6,000 acres (K) and 5,000 acres (S) are classified as high probability for containing cultural resources. Based on previous findings, 30 new sites will be recorded annually and three sites will require mitigation work to offset project impacts

INDIRECT EFFECTS. The same discussion applies from the above alternatives However, the potential for these effects to occur is moderate Some increased access may increase site vandalism and theft. Three sites may be adversely affected due to the indirect effects

Alternatives E and G

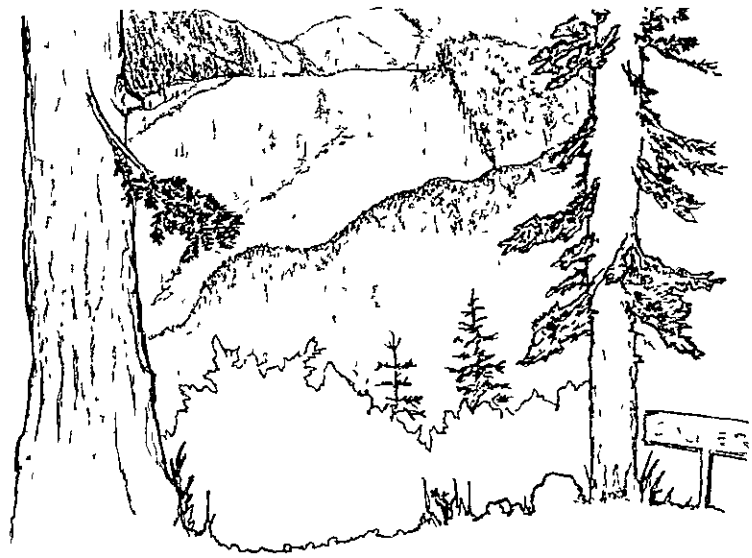
DIRECT EFFECTS. The potential to locate new cultural resources and conduct data recovery efforts or other mitigation measures is low for these alternatives because only 443,000 to 529,000 acres are subject to ground-disturbing activities over time Based on previous findings, 20 new sites will be recorded annually and two sites will require mitigation work to offset project impacts

INDIRECT EFFECTS The likelihood of altering or destroying sites due to ground-disturbing activities is low Vandalism and theft will occur; however, a low increase in access to presently remote areas is expected Two sites may be adversely affected due to the indirect effects of activities and vandalism.

Alternative M

DIRECT EFFECTS. Potential disturbances total 319,000 acres, 3,000 of which are classified as high-probability acres for containing cultural resources. The 250-year rotation provided in this alternative results in fewer acres harvested per decade and thus a low potential impact to cultural resource sites. Furthermore, no new roads are constructed Therefore, the potential to locate new sites and conduct data recovery projects or other mitigation work is very low. Based on previous findings, 15 new sites will be recorded annually and one site will require mitigation work

INDIRECT EFFECTS. The likelihood of altering or destroying sites due to activities is very low. Vandalism and theft may occur; however, no increase in access to presently remote areas is expected. One site may be adversely affected due to the indirect effects of ground-disturbing activities, vandalism, or modification to the environmental setting of a cultural resource.



ENERGY

SIGNIFICANT INTERACTIONS

The significant effects on nonmineral energy are a result of: (1) the different harvest levels of the alternatives which affect the amount of fuelwood generated as well as the energy required to implement the alternative; and (2) land allocation and associated Standards and Guidelines changes by alternative that affect hydropower development potential.

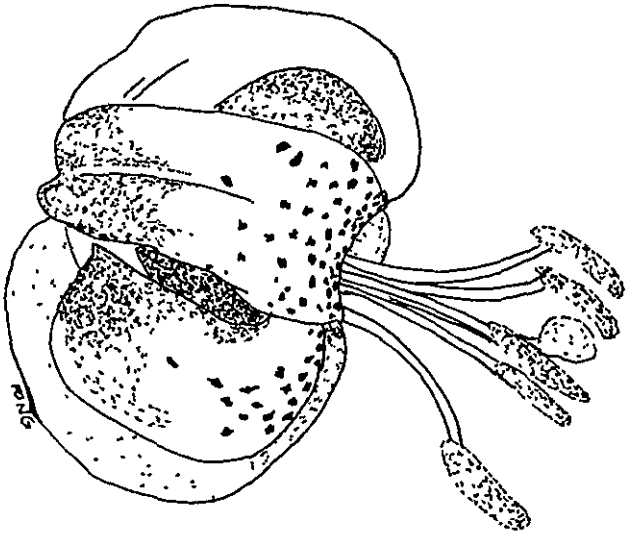
Energy required to implement the alternatives is discussed in the **SPECIFICALLY REQUIRED DISCLOSURES** section at the end of this chapter. Significant interactions and effects on energy minerals are discussed in the **MINERAL DEPOSITS** section of this chapter.

ENVIRONMENTAL EFFECTS AND MITIGATION

DIRECT EFFECTS There are no direct effects on fuelwood Direct effects on hydropower result from the changing of land allocations by alternative and the Standards and Guidelines associated with those allocations. These Standards and Guidelines have the effect of restricting access. The access (direct effect) is displayed by alternative in Table IV-5.

INDIRECT EFFECTS. The indirect effects on fuelwood result from residue of timber harvest and, as harvest levels fluctuate, cords of fuelwood change Cords of wood per year resulting from the harvest residue in the first decade range from a high of 60 cords in Alternative B to a low of 11 in Alternative M. Volumes of fuelwood by Alternative are listed in Table II-5.

CUMULATIVE EFFECTS. No significant effects are expected for fuelwood.



MINERAL DEPOSITS

Exploration and development of mineral resources on the Forest have varying effects on the environment. The potential environmental effects are dependent upon methods, duration, and extent of operations. Ground disturbance associated with mineral and energy activities can have important direct and indirect interactions with most of the environmental components described in this chapter (see Table IV-1) Conversely, land allocations designed to protect various resources from adverse effects of ground-disturbing activities can exclude or constrain mineral exploration and development, limiting mineral resource use.

SIGNIFICANT INTERACTIONS

Proposals for mineral exploration and development are negotiated on a case-by-case basis It would be impossible to describe all the potential significant interactions that could take place without knowing the actual plans of operation for mineral or energy proposals. However, one way the Forest can deal with such proposals is by allocating specific lands for protection of important resources. When a proposal is then received, the Forest Service can work with the proponent and other agencies to minimize or mitigate adverse impacts on those resources requiring some degree of protection Only reasonable restrictions to mining can be legally imposed on areas not withdrawn

Examples of possible significant interactions might include proposals to test drill for ore in Wilderness, Wild River, or Backcountry Recreation areas. If roads were needed to transport the drilling equipment and a site needed to be leveled and cleared in order to operate, the integrity of these areas could be compromised To mitigate these impacts, the operator may be required to build roads with costlier standards or in less-than-optimum locations. Or, drilling equipment and personnel may need to be flown in at a much greater cost The economic viability of the operation may be reduced

Another example might be a proposal to test drill for oil and gas in a Research Natural Area, Botanical Area, or Unique Interest Area. Sensitive plants are known to inhabit such areas. In order to protect the plants, the operator may be required to slant drill from an off-site location. Slant drilling is a much more time-consuming and costly method

Another significant interaction could result from a prospector that discovers valuable ore in a Special Wildlife Habitat area. Suppose the initial proposal threatens to drive the protected species from the site and jeopardize the site for future use To mitigate this impact, the proposal must be scaled down, reducing economic efficiency In addition, no operations can take place during the mating, birthing, and rearing seasons for the species. The economic viability of the operation would likely decrease.

Finally, a mining company decides to capitalize on a long-standing claim which is now located within a Scenic/Recreation River. Processing facilities are located a long distance from the claim and the company needs a site to mill the ore prior to transport. The mine and most feasible mill site are within the 1/4 mile river corridor which seriously threatens the visual qualities which brought about the Scenic designation To mitigate this impact, the mill site must be located elsewhere; the nearest suitable location being several miles away. New road construction will be required as well as significant upgrading of existing roads Considerations of water transmission, use, and treatment, mill waste disposal; and particulars of mine rehabilitation may become more complex. Mitigation costs coupled with the added transportation costs could jeopardize the operation's profitability

RESPONSE TO PLANNING PROBLEMS

Concerns with respect to mineral development are focused on Planning Problem #9, "How should mineral resources of the Forest be developed in coordination with management of other resources?" The key

indicator in resolution of this problem is the area remaining available for development with limited (low and moderate) restrictions imposed by various land allocations

ENVIRONMENTAL EFFECTS AND MITIGATION

The primary adverse effects on mineral and energy exploration and development relate to land allocations that either severely limit access and/or ground-disturbing activities or withdraw lands entirely from mineral entry.

The discussion of environmental effects on minerals is presented in two sections The first section, **ENVIRONMENTAL EFFECTS BY LAND ALLOCATION**, describes the impacts of the various land allocations on accessibility of Forest lands to mineral and energy exploration and development. The second section, **ENVIRONMENTAL EFFECTS BY ALTERNATIVE**, summarizes the direct and indirect effects of the Alternatives with respect to Forest land accessibility. Cumulative effects were considered, but were not found to be significant with respect to mineral and energy activities.

ENVIRONMENTAL EFFECTS BY LAND ALLOCATION

Restrictions imposed by various land allocations differ in severity depending on applicable laws and regulations Sensitivity of the resource being protected and the magnitude of the proposed ground-disturbing activity also influence the degree of restriction needed. For analysis in this document, the various land allocations were placed in one of four access restriction categories· *Withdrawn*, *High*, *Moderate*, or *Low* These access restriction categories are defined below.

Restriction	General Characteristics of the Restriction
Withdrawn	Lands withdrawn from mineral entry Includes statutory and administrative withdrawals In comparing land management alternatives, this category will also include areas where preservation of other resource values require subsequent withdrawal from mineral entry
High	Lands where mineral activities are permitted, but administrative designations preclude or highly restrict access and/or ground-disturbing activities This category includes statutory or regulatory designations where mineral development is permitted, but access is highly restricted due to resource constraints. Also included are lands where, through changes in landownership status, some or all of the mineral rights were retained by a prior landowner Leases usually would contain no surface occupancy stipulations
Moderate	Lands where management designations or other resource considerations require special mitigative measures Special lease stipulations or plan of operation considerations are needed to accomplish resource coordination
Low	Lands where management designations would not require special mitigative measures over extended areas Restrictive lease stipulations or operating conditions may be required to mitigate site-specific resource coordination needs For the most part, however, standard field practices for mining and mineral lease activities can be utilized

The effects of Management Area allocations on mineral and energy exploration and development are as follows.

Wilderness

Designated Wilderness has both direct and indirect effects on minerals However, there is no change from present as no additional Wilderness is proposed in any alternative. Direct effects are mandated by law; designated Wilderness has been withdrawn from new prospecting and mineral entry and location since December 31, 1984. However, pre-existing claims are still valid, but subject to restrictions on mining operations. Indirect effects are likely to grow, over time, in the form of increasing restrictions on mining

activities that conflict with wilderness values Public demand for removal of the activity from Wilderness could result

Wild and Scenic/Recreation Rivers

Allocations to or designations of Wild, Scenic, or Recreation Rivers could have significant direct effects on mineral activities due to high or withdrawn access restrictions The Illinois and Rogue River are partially withdrawn from mineral entry under the current situation Allocations to Wild segments will generally result in the withdrawal of land from mineral activities within 1/4 mile either side of the river In some cases, withdrawal may be recommended in Scenic segments Access restrictions on Recreation segments are generally high. Protection of visuals on lands adjacent to the 1/4 mile corridor (i e , within the viewshed) may impact mineral activities on a much larger area due to public demand for protection of those areas. Development of reservoirs and powerlines, and other types of intensive use, are generally not permitted on Wild and Scenic Rivers Removal of sand and gravel will usually be prohibited

Botanical, Unique Interest, and Research Natural Areas

The potential for major direct effects on minerals can occur in these areas Because of the potential conflict with sensitive plants and unique plant communities, all three allocations impose high restrictions relative to access and development. If protection cannot be assured during mining, the need for withdrawal will be considered through environmental analysis of specific operating plans Known deposits of strategic minerals such as nickel, laterites, and chromite could be significantly affected.

Existing Research Natural Areas (RNA's) and Botanical Areas are withdrawn (or are in the process of being withdrawn) from mineral entry. Impact will vary by alternative and by individual area depending on the mineral potential (see Appendix F for site specific information for RNA's and Botanical Areas). Unique Interest Areas are quite limited in number and area

Backcountry Recreation

This Management Area assignment could lead to significant direct effects on mineral activities. The level of access restrictions is low to moderate, depending on whether the individual area is motorized or non-motorized In general, though, areas of higher mineral potential have existing primitive jeep roads and motorized trails. Where these occur, the established use would likely continue under either the Management Area prescription or an approved operating plan.

Designated Wildlife Habitat and Special Wildlife Habitat Areas

Allocations to Wildlife Management Areas could have moderate or high restrictions on mineral access and development depending on the sensitivity of the species affected While not prohibitive, some of the more sensitive wildlife habitats and species may carry restrictions on mineral activities that could make mining uneconomical.

Riparian and Supplemental Resource Management Areas

Assignments to these areas could have a significant direct effect on mineral activities. A moderate access restriction has been applied to the acreage of Riparian areas A high restriction will apply to Supplemental Resource areas, depending largely on the proposal and sensitivity of the area and its related resource values The potential for major conflict exists between placer mining and fish habitat, water quality, recreation use, and other values and uses This could lead to more severe access restrictions, however, to date, this has not been the Forest's experience

Retention and Partial Retention Visual Management Areas

Allocations to these Management areas generally require moderate restrictions on mineral activities Retention will usually produce a moderate restraint on activities. Partial Retention provides more than the normal restrictions, but not overly so when compared to General Forest (the least restrictive).

General Forest

The General Forest allocation is the least restrictive to mineral access However, there are some circumstances where visual concerns may require moderate restrictions. Lands allocated to General Forest have the least effect on mineral and energy exploration and development.

ENVIRONMENTAL EFFECTS BY ALTERNATIVE

Table IV-5 displays the estimated mineral potential and accessibility restrictions by alternative. When considered together, these two factors (potential and restrictions) tend to indicate the potential for development of mineral resources. The combination of high or moderate potential for locating minerals with low or moderate access restrictions is the most favorable for mineral development



Table IV-5. Estimated Mineral Potential and Accessibility Limitations by Alternative

	Mineral Potential (M Acres)			
Access Restrictions	High	Moderate	Low	Total
Alternative NC:				
Withdrawn	34	83	149	266
High	3	10	27	40
Moderate	22	44	108	174
Low	86	163	363	612
Alternatives A and A-Departure:				
Withdrawn	34	83	150	267
High	3	10	26	39
Moderate	25	52	126	203
Low	83	154	347	584
Alternatives B, D, and D1:				
Withdrawn	34	83	149	266
High	4	4	20	28
Moderate	23	45	100	168
Low	84	167	379	630
Alternative C:				
Withdrawn	33	83	149	265
High	4	3	10	17
Moderate	21	44	103	168
Low	87	170	385	642
Alternative E:				
Withdrawn	35	83	150	268
High	10	15	34	59
Moderate	58	120	233	411
Low	42	80	232	354
Alternative G:				
Withdrawn	35	83	150	268
High	17	21	54	92
Moderate	46	90	171	307
Low	49	104	272	425
Alternative K.				
Withdrawn	34	83	149	266
High	7	10	41	58
Moderate	25	50	104	179
Low	80	156	354	590
Alternative M:				
Withdrawn	35	83	150	268
High	15	19	44	78
Moderate	58	121	232	411
Low	37	76	222	335
Alternative S:				
Withdrawn	34	83	152	269
High	9	14	45	68
Moderate	16	49	118	183
Low	85	152	334	571

In the following discussion, Alternatives were grouped in terms of similar direct and indirect effects. *DIRECT EFFECTS* are simply the access restrictions imposed by the various land allocations In general, Alternatives with more acres allocated to Management Areas 10 through 14 are the most favorable and have the least potential for adverse impacts on mineral and energy activities *INDIRECT EFFECTS* are simply the amount of roads proposed by the various alternatives. Increased roading is assumed to benefit *mineral and energy interests since roads facilitate exploration and prospecting opportunities.*

Alternatives NC, A, A-Departure, K, and S

The area with low or moderate access restrictions varies from 754,000 acres in Alternative S to 786,000 acres in Alternatives A and A-Departure The percentage of these acres with low access restrictions ranges from 74 to 78 percent. These figures represent a moderately adverse direct effect on potential mineral and *energy activities All five of these alternatives provide for development of an extensive road system* with a good start being made in the first decade. This provides a favorable indirect effect on mineral and energy exploration and prospecting.

Alternatives B, D, D1, and C

The area with low or moderate access restrictions varies from 798,000 acres in Alternatves B, D, and D1 *to 810,000 acres in Alternative C. The percentage of these acres with low access restriction is 79 percent* for all four alternatives. These figures represent a minimally adverse direct effect on potential mineral and energy activities. All alternatives provide development of a very extensive road system with an aggressive start being made in the first decade. This provides a highly favorable indirect effect on mineral and energy exploration and prospecting

Alternatives E and G

Low to moderate access restrictions range from 732,000 acres in Alternative G to 765,000 acres in Alternative E. However, the percentage of these acres with low access restrictions is 58 percent for Alternative G and 46 percent for Alternative E. These figures represent a highly adverse direct effect on potential mineral and energy activities Both alternatives provide for development of a moderate transportation system with a modest start being made in the first decade. This provides a slightly favorable indirect effect on mineral and energy exploration and prospecting

Alternative M

Low to Moderate access restrictions amount to 746,000 acres with 45 percent of these acres in the low access restriction category These figures amount to a severely adverse direct effect on potential mineral and energy activities Alternative M provides for no new road development with numerous road closures and thus a limited transportation system. This provides a negative indirect effect on mineral and energy exploration and prospecting

IMPROVEMENTS

SIGNIFICANT INTERACTIONS

Effects on improvements from the implementation of land management alternatives are described in this section. Improvements are an important part of the human environment, these include such facilities as roads, trails, developed recreation sites, administrative sites, utility and transportation corridors, water storage developments, and miscellaneous improvements. These are described in the **IMPROVEMENTS** section of Chapter III.

Roads, in particular new construction and reconstruction, have significant interactions with nearly all environmental components discussed in this chapter A multitude of direct, indirect, and cumulative effects on various resources are associated with roads, and these are discussed at length under respective environmental components in this chapter Significant interactions and their associated environmental effects in this discussion are limited to those that affect the improvements themselves and their management

Public use of Forest resources along with Forest Service use and protection activities have significant direct and indirect effects on man-made improvements on the Siskiyou National Forest Land allocations which attract people can cause traffic on existing roads and trails. Vehicles, pack animals, and people cause wear on these facilities and, along with vegetative encroachments into the traveled way, require recurring maintenance to protect the initial investment. When excessive traffic wear resulting from deferred maintenance or storm damage has occurred, reconstruction may be required to provide a suitable facility Where people will have limited access to a resource use opportunity, a new road or trail could be constructed to satisfy the identified transportation need, e g., access for recreation, mining, fire suppression, or timber harvesting.

Some roads are closed to meet resource management objectives. Closures are used to discourage or eliminate all use by motorized vehicles over 40 inches in width. And, a few road closures may altogether eliminate traffic where resource sensitivity is of particular concern. The purposes for closures include providing for water quality, erosion control, public safety, reduction of road user conflicts, reduction of maintenance costs, legal mandates, managing recreation opportunity, and protection/management of wildlife and wildlife habitat. Road closures can result in reduced disturbance to big game and help meet demand for increased "quality" hunting experiences Changes made to accommodate recreation demand could cause closure of existing developed recreation sites or construction of new ones. Closures may be permanent or periodic Road closures are authorized in the Code of Federal Regulations, *Title 36 Part 261.*

ENVIRONMENTAL EFFECTS AND MITIGATION

The alternatives and their associated land allocations have varying effects on the improvements found on the Forest While road construction can have important cumulative effects on a number of resources including soil and water, no significant adverse cumulative effects were found to impact improvements Forest-wide Standards and Guidelines, as they apply to location, design, operation, and maintenance of facilities, assure that improvements will accommodate their intended use over time As demand and use changes with time, capital investments can be used to mitigate those changes An example might be paving a road to accommodate increased winter traffic In cases where capital investments are not justified, improvements such as roads or campgrounds might be closed to prevent degradation

A number of effects common to all alternatives are described at the end of this chapter under the section titled **ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVES.** The remainder of the discussion is focused on direct and indirect effects, both in general terms and by alternative.

New road construction within the first decade offered by the alternatives range from none (Alternative M) to 308 miles (Alternative C). The long-term road system will require from zero to 1,577 additional miles. The final road system varies from the present 2,645 miles (Alternative M) to 4,222 miles (Alternative C) Completion of the system could take up to eight decades. Alternative M, however, utilizes the existing road system only.

Road closures under the alternatives during the first decade would vary from 89 to 475 additional miles of road for wildlife, recreation, watershed, or road management purposes. As the final road system is attained, the alternatives provide for a proportionate increase in road closures This varies from a maximum of 1,127 more miles of road closures to 271 additional miles. This information can be found by comparing Tables II-11 and II-12 with Table III-5.

Road reconstruction varies from 23 miles (Alternative M) to 172 miles (Alternative C) per year during the first decade. In subsequent decades, there is a general upward trend in miles per year in road reconstruction. Table II-10 shows these variations.

Trail construction in Wilderness areas during the first decade varies from zero (Alternative E) to 47 miles (Alternative C). Trail construction in non-Wilderness areas during the first decade varies from zero to 44 miles (Alternative S). The long-term trail system could add between 32 miles (all outside Wilderness) to 130 miles (nearly equally divided between Wilderness and non-Wilderness) to the existing 450 trail miles. Trail construction and reconstruction data is found in Table II-14. The potential trail improvements by alternative are in Table II-4.

The number of recreation sites provided varies from 47 sites (Alternatives NC and A) to 65 sites (Alternative M). Most of the 21 existing developed recreation sites are retained for public use in all alternatives. In several of the alternatives, closure of some existing minimum developed sites is proposed. Four currently closed sites would be reopened under four alternatives. A summary of recreation site status is found in Table II-18. Detailed alternative assignments are found in Table II-4.

For all alternatives, the *INDIRECT EFFECTS* are primarily those related to road and trail maintenance. While these effects are essentially the same by alternative, they vary by the amount of construction, reconstruction, and total system at a specific point in time. Various levels of maintenance will be performed on existing and added miles of road during the first decade, and will continue for all miles under the final road system. Likewise, maintenance would be programmed for all trails on the system.

The following are the *DIRECT EFFECTS* of each alternative:

Alternatives NC, A, and A-Departure

During the first decade, 230 miles of road will be added. Almost all (218 miles) will be constructed in support of timber sale needs. Ultimately, 1,545 miles will have to be built to satisfy this need. It will take until the seventh decade to attain 95 percent of the long-term (4,190 miles) road system. During the first decade, there will be 89 additional miles of road closure; ultimately, 613 additional miles over present will be closed During the first decade, 1,460 miles of road reconstruction will be required to satisfy user needs and road management objectives.

Within the first decade, less than a half mile of trail access will be constructed in Wilderness; none will be built in non-Wilderness areas. Ultimately, 57 miles of trail construction will be completed before the end of the third decade; less than half (24 miles) will be in Wilderness.

All 46 existing developed and minimum developed recreation sites are retained for public use at their present capacity. The four existing closed sites will remain closed. A visitor information center will be constructed at Agness during the first decade.

Alternatives B, D, and D1

During the first decade 277 miles of road will be added to the road system Almost all (252 miles) will be constructed in support of timber sale needs. Ultimately, 1,553 miles will have to be built to satisfy this need. It will take until the sixth decade to attain 95 percent of the long-term (4,198 miles) road system During the first decade, there will be 110 additional miles of road closure; in the long-run, 620 additional miles over present will be closed. During the first decade 1,670 miles of road reconstruction will be required to satisfy user needs and road management objectives.

Within the first decade, 21 miles of trail access will be constructed in Wilderness, and five miles in non-Wilderness Ultimately, 88 miles of construction will be completed before the end of the fourth decade, almost all (81 miles) in Wilderness.

Forty-two of the existing recreation sites are retained for public use at their present development scale. In addition to the existing four closed sites, three of the low use sites will be closed. As the demand for developed recreation facilities increases over the first four decades, seven new recreation sites will be constructed where concentrations of recreation use are expected. One existing site will be reconstructed to a higher standard this will be done in the first decade. One additional site will also be constructed during the first decade.

The description and effects are essentially the same as those of Alternative B, except 1,560 (Alternative D) and 1,720 (Alternative D1) miles of road reconstruction will be required during the first decade.

Alternative C

During the first decade 308 miles of road will be added Almost all (288 miles) will be constructed in support of timber sale needs Ultimately, 1,577 miles will have to be built to satisfy this need. It will take until the fifth decade to attain 95 percent of the long-term (4,222 miles) road system During the first decade, 119 additional miles of road closure, ultimately, 627 additional miles over present will be closed During the first decade, 1,720 miles of road reconstruction will be required to satisfy user needs and road management objectives

Within the first decade, 47 miles of trail access will be constructed in Wilderness; and five miles constructed in non-Wilderness. Ultimately, 99 miles will be constructed before the end of the second decade, almost all (92 miles) in Wilderness.

All 46 existing developed and minimum developed recreation sites are retained for public use at their present development scale. The four existing closed sites will be reopened as demand for these facilities increases

Alternative E

During the first decade, 110 miles of road will be added to the road system Almost all (107 miles) will be constructed in support of timber sale needs. Ultimately, 665 miles will have to be built to satisfy this need. It will take until the fifth decade to attain 95 percent of the long-term (3,310 miles) road system During the first decade, there will be 475 additional miles of road closure; ultimately, 834 additional miles over present will be closed. During the first decade, 820 miles of road reconstruction will be required to satisfy user needs and road management objectives

Within the first decade, no new trail access will be constructed in Wilderness, 14 miles will be constructed in non-Wilderness Ultimately, 32 miles will be constructed by the end of the fifth decade, all outside Wilderness.

Forty-five of the existing recreation sites are retained for public use at their present development scale. As the demand for developed recreation facilities increases over the first four decades, all four of the existing closed sites would be reopened and seven new sites constructed where concentrations of recreation use are expected. Also, one existing site will be reconstructed to a higher standard in the first decade. One additional site will also be constructed during the first decade

Alternative G

During the first decade 142 miles of road will be added to the road system. Almost all (136 miles) will be constructed in support of timber sale needs. Ultimately, 963 miles will have to be built to satisfy this need. It will take until the seventh decade to attain 95 percent of the long-term (3,608 miles) road system. During the first decade, there will be 225 additional miles of road closure, ultimately, 719 additional miles over present will be closed. During the first decade, 1,010 miles of road reconstruction will be required.

Within the first decade, 22 miles of trail access will be constructed in Wilderness and six miles in non-Wilderness. Ultimately, 85 miles will be constructed before the end of the fourth decade, over half (45 miles) being in non-Wilderness.

Forty-three of the existing recreation sites are retained for public use at their present development scale. As the demand increases over the first four decades, all four of the existing closed sites will be reopened and 15 new recreation sites will be constructed where concentrations of recreation use are expected. Also, three existing sites will be reconstructed to a higher standard, one being completed in the first decade. One additional site (a visitor information center at Agness) will also be constructed during the first decade.

Alternative K

During the first decade, 206 miles of road will be added to the road system. Almost all (190 miles) will be constructed in support of timber sale needs. Ultimately, 1,433 miles will have to be built to satisfy this need. It will take until the eighth decade to attain 95 percent of the long-term (4,078 miles) road system. During the first decade, there will be 391 additional miles of road closure; ultimately, 1,127 additional miles over present will be closed During the first decade, 1,311 miles of road reconstruction will be required.

Within the first decade, 15 miles of trail access will be constructed in Wilderness and five miles in non-Wilderness. Ultimately, 95 miles will be constructed before the end of the third decade, over half (50 miles) being in Wilderness.

Forty-three of the existing recreation sites are retained The four existing closed sites will remain closed As the demand increases over the first five decades, seven new sites will be constructed where concentrations of use are expected. Also, three existing sites will be reconstructed to a higher standard, one of which will be done in the first decade.

Alternative M

No roads will be constructed during any decade. The existing system will be the ultimate road system During the first decade, there will be 271 additional miles of road closure, there will be no subsequent road closure. During the first decade 230 miles of road reconstruction will be required to satisfy user needs and road management objectives

Within the first decade, 22 miles of trail access will be constructed in Wilderness and six miles in non-Wilderness Ultimately, 85 miles will be constructed before the end of the fourth decade, less than half (40 miles) in non-Wilderness.

Forty-three of the existing recreation sites are retained. As the demand increases over the first four decades, all four of the existing closed sites will be reopened and 15 new recreation sites will be

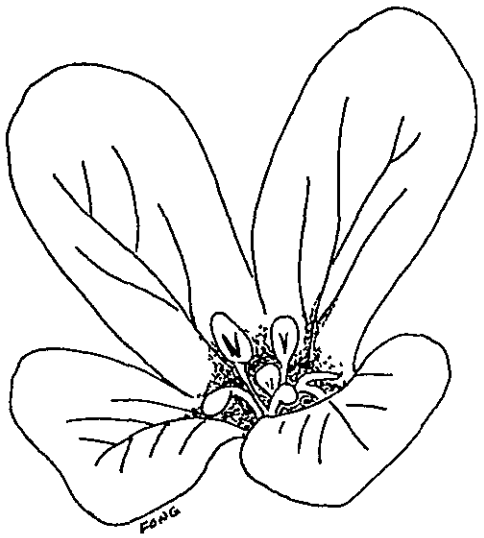
constructed where concentrations of recreation use are expected. Also, three existing sites will be reconstructed to a higher standard, one of being done in the first decade. One additional site (a visitor information center at Agness) will also be constructed during the first decade

Alternative S

During the first decade, 228 miles of road will be added to the road system Almost all (212 miles) will be constructed in support of timber sale needs. Ultimately, 1,343 miles will have to be built to satisfy this need. It will take until the seventh decade to attain 95 percent of the long-term (3,988 miles) road system. During the first decade, there will be 404 additional miles of road closure; ultimately, 1,072 additional miles over present will be closed. During the first decade, 1,353 miles of road reconstruction will be required to satisfy user needs and road management objectives

Within the first decade, 42 miles of trail will be constructed in Wilderness and another 44 miles in non-Wilderness. Ultimately, 130 miles will be constructed before the end of the third decade, slightly more than half (68 miles) being in non-Wilderness.

Forty-three of the existing recreation sites are retained for public use at their present development scale. The four existing closed sites will remain closed. As the demand for developed recreation facilities increases over the first five decades, nine new sites will be constructed where concentrations of recreation use are expected. Also, four existing sites will be reconstructed to a higher standard, three being in the first decade A visitor information center at Agness will also be constructed during the first decade.



WILDERNESS AND ROADLESS AREAS

SIGNIFICANT INTERACTIONS

Impacts to the Wilderness resource and the potential for Wilderness on the Forest will vary through the range of alternatives The agent that will affect Wilderness most is the alternative prescriptions with varying degrees of management in the Wildernesses

For those unroaded areas with undeveloped characteristics (i e , Wilderness potential), the most significant impact would be development. With development, the existing values, attributes, or inherent characteristics that provided the option for wilderness opportunities would be foregone if an unroaded area was roaded and management activities, such as timber harvest, took place

There are no additions to the Forest's existing Wilderness System proposed within any of the management alternatives considered.

RESPONSE TO PLANNING PROBLEMS

Planning Problem #8, "How will management direction affect recreation opportunities in the Wilderness and Unroaded Areas?" This is one of the most polarized issues identified during scoping Analysis of the alternatives in response to the problem deals with both management of existing Wildernesses, and allocation and management of the remaining unroaded areas.

ENVIRONMENTAL EFFECTS AND MITIGATION

WILDERNESS MANAGEMENT

Management activities that are proposed within the Wildernesses under any alternative will be implemented using the Wilderness Management Guidelines. Management activities within any of the alternatives that would affect the Wilderness are primarily those associated with trail construction and fire, most activities are highly restricted as specified in the Standards and Guidelines.

Other potential effects relative to the quality of a wilderness recreation experience are management activities planned in areas adjacent to designated Wilderness that may be seen or heard by recreationists in the Wilderness. Proposed activities adjacent to a Wilderness are evaluated at the site-specific project level and appropriate measures taken to mitigate the potential effects.

Alternatives NC, A, A-Departure, and E would continue the existing management policy for the Wildernesses and implement a modest program of trail construction in the Kalmiopsis Wilderness There would be no new trail construction programmed for the Wild Rogue or Grassy Knob Wildernesses

Alternatives B, C, D, and D1 would implement an aggressive program of trail construction in the Kalmiopsis and Wild Rogue Wildernesses. Alternatives G and K would implement a moderate level of trail construction in these Wildernesses Alternative S would implement a more aggressive trail construction program in the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses.

Alternative M would maintain all Wildernesses in their existing condition No additional activity is proposed.

The Red Buttes and Siskiyou Wildernesses will not be significantly affected by any alternative. These two areas are essentially developed.

Wilderness Management Plans will be developed for each area Plans for the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses are included in the Forest Plan, Appendix A The Siskiyou National Forest will

implement management plans developed by the lead Forests for both the Red Buttes and Siskiyou Wildernesses.

ROADLESS AREAS

Alternatives NC, A, A-Departure, B, C, D, and D1 would assign all, or nearly all, of the roadless areas to Management Areas which allow for some level of development. Except for the large blocks of unsuitable land in the South Kalmiopsis, any undeveloped characteristics (Wilderness potential) within these areas would be permanently lost by the end of the first or second decades. The inventoried Siskiyou and Kangaroo Roadless Areas, and the lower Illinois River viewshed within the Wild segment are the exceptions They are managed in whole or part as Supplemental Resource Management Areas in Alternatives NC, A, and A-Departure.

Alternatives E, G, K, S, and M would allocate varying amounts of the inventoried roadless areas to Backcountry Recreation and other Management Areas which have very limited activity and no programmed harvest. Wilderness potential would be maintained in those areas allocated

Determination of demonstrable Wilderness potential is subject to varying interpretations For the purposes of this document, Wilderness potential (or "undeveloped characteristics") is based on the criteria identified in the Wilderness Management Act These are areas in which the natural integrity of the ecosystems are intact and uninterrupted, and offer the opportunities for solitude and primitive experiences.

For site-specific descriptions of the environment, opportunities, and environmental consequences by alternative for each of the 18 inventoried roadless areas, refer to Appendix C.

Table IV-6 (Table C-4 in Appendix C) provides a summary of the 18 inventoried roadless area attributes. The wilderness characteristics and key resource values are identified by area The primary characteristics evaluated for Wilderness potential were (1) manageability, (2) natural integrity, (3) opportunity for solitude, (4) primitive experience, and (5) special factors. Accessibility, resource use conflicts, and relevance of need were also appraised. From these, the potential for Wilderness has been used to make an objective separation of those roadless areas which have strong wilderness attributes from areas with lesser qualities. Those with strong wilderness attributes are discussed here; the remaining are included in Appendix C.



Table IV-6. Summary of Roadless Area Attributes - Description, Capability, Availability, and Need

		EXISTING CONDITIONS AND POTENTIALS							
				Key Resource Values - Potentials					
Name of Area	RARE II Number	Accessibility	Use Conflicts	Mining	Grazing	Fish	Wildlife	Timber	Recreation
Grassy Knob	N/A	Mod	Mod	L	0	HIGH	Mod	HIGH	L
Copper Mountain	6171	HIGH	Mod	L	0	HIGH	Mod	Mod	L
Mule Creek	6172	HIGH	Mod	Mod	0	L	Mod	Mod	L
Rogue	6173	Mod	Mod	L	L	L	Mod	HIGH	L
Potato Mountain	6174	HIGH	HIGH	0	Mod	L	HIGH	HIGH	Mod
Shasta Costa	6175	HIGH	Mod	L	L	HIGH	Mod	HIGH	L
North Kalmiopsis	6176	Mod	Mod	Mod	L	HIGH	Mod	HIGH	Mod
Quosatana	6177	Mod	HIGH	0	0	HIGH	HIGH	HIGH	Mod
Briggs	6178	HIGH	HIGH	HIGH	L	HIGH	Mod	Mod	Mod
Squaw Mountain	6179	HIGH	Mod	Mod	0	0	Mod	L	0
Windy Valley	6180	HIGH	Mod	Mod	HIGH	Mod	HIGH	HIGH	Mod
Kalmiopsis Addition	6183	Mod	HIGH	L	0	Mod	L	Mod	0
Mount Emily	6184	HIGH	HIGH	L	0	HIGH	Mod	Mod	L
Siskiyou	6701	HIGH	Mod	Mod	Mod	L	Mod	L	Mod
Kangaroo	6703	HIGH	Mod	L	Mod	0	Mod	Mod	HIGH
North Fork Smith	6707	Mod	Mod	Mod	0	0	L	Mod	0
Packsaddle	6708	Mod	Mod	Mod	0	Mod	L	L	L
South Kalmipsis	6709	L	HIGH	HIGH	L	L	L	L	Mod

		PRESENCE OF WILDERNESS CHARACTERISTICS					RELEVANCE			
								Need		
Name of Area	RARE II Number	Manageability	Natural Integrity	Opportunities for Solitude	Primitive Experience	Special Features	Other Areas	Public Use	Ecosystem Represent.	Public Interest
Grassy Knob	N/A	Mod	Mod	Mod	L	Mod	0	0	0	Mod
Copper Mountain	6171	Mod	Mod	L	L	L	L	0	L	Mod
Mule Creek	6172	L	0	L	0	0	0	0	0	0
Rogue	6173	L	Mod	Mod	L	L	0	L	0	0
Potato Mountain	6174	L	Mod	L	0	Mod	L	Mod	Mod	0
Shasta Costa	6175	Mod	Mod	Mod	L	Mod	0	L	L	L
North Kalmiopsis	6176	Mod	HIGH	Mod	HIGH	Mod	0	L	L	HIGH
Quosatana	6177	L	L	L	0	0	0	Mod	Mod	0
Briggs	6178	Mod	Mod	Mod	L	L	L	L	L	0
Squaw Mountain	6179	L	Mod	L	0	0	L	0	L	0
Windy Valley	6180	L	Mod	Mod	L	L	Mod	Mod	Mod	L
Kalmiopsis Addition	6183	L	0	0	0	0	0	0	0	0
Mount Emily	6184	L	L	L	L	Mod	Mod	L	Mod	0
Siskiyou	6701	Mod	Mod	Mod	L	Mod	0	Mod	0	Mod
Kangaroo	6703	Mod	Mod	Mod	L	HIGH	0	HIGH	L	HIGH
North Fork Smith	6707	Mod	Mod	0	0	L	0	0	0	L
Packsaddle	6708	L	Mod	Mod	Mod	Mod	0	0	L	L
South Kalmiopsis	6709	Mod	Mod	HIGH	HIGH	Mod	0	Mod	0	Mod

KEY to Attributes:
HIGH - High
Mod - Moderate
L - Low
0 - None, or negligible

Grassy Knob Unroaded Area

This area has a moderate level of manageability due to size, location, and potential for conflict with management activities on adjacent land The area has a moderate level of natural integrity due to some evidence of human activity (westside of the North Fork Dry Creek and Butler Creek). The area demonstrates a low level for Semi-primitive recreation experiences with the opportunity for only localized solitude due to the influences of the sights and sounds of motorized activities and harvest units on adjacent lands. However, the western (Anvil and Rock Creeks) and eastern (Bee Creek) portions of the unroaded area provide a good opportunity to further separate the interior of the designated Grassy Knob Wilderness from sights and sounds of activities on adjacent lands.

North Kalmiopsis Roadless Area

This roadless area demonstrates a moderate level of manageability due to its irregular boundaries The area's large size inherently protects the character and values of the interior environment, especially where contiguous with the Kalmiopsis Wilderness. The area demonstrates a high level of natural integrity due to lack of human influences on natural appearance or long-term ecological processes A moderate level of solitude is demonstrated throughout much of the area, but is occasionally limited by the sights and sounds of activities on adjacent lands However, there is ample opportunity for both solitude and Primitive and Semi-primitive recreation experiences on approximately 30,000 acres in the Silver and Horse Sign Creek drainages

The area demonstrates a moderate level of special features, the most notable being the Kalmiopsis Wilderness to the south and the Illinois Wild and Scenic River which runs through the northwestern portion There is a very high level of public interest in the disposition of the North Kalmiopsis.

Approximately 42,000 acres in the north central part of the inventoried roadless area was impacted by the 1987 Silver Fire. The salvage of fire-killed trees and other resource activities planned under the subsequent Silver Fire Recovery Project FEIS and Record of Decision in 1988 will result in a 19,000-acre reduction in the inventoried roadless area The inherent wilderness attributes have been changed to varying degrees by nonconforming features of new roads (13 miles) and numerous helicopter and skyline timber salvage units proposed and being implemented. Even with this reduction in inventory, nearly 88,000 acres of unroaded condition remains For further discussions, see sections covering **1987 FIRES** and **RECREATION SETTINGS**, and Appendix C

Siskiyou Roadless Area

This roadless area demonstrates a moderate level of manageability due to it's location adjacent to the newly created Siskiyou Wilderness Maintaining the roadless characteristics would aid in the retention of the Siskiyou Wilderness character. There is a potential for conflict with management activities on lands in lower areas to the west. The natural integrity of the area within the roadless boundary is intact. The area demonstrates the opportunity for localized solitude and Semi-primitive experiences that would be influenced by the sights and sounds of management activities The area demonstrates a moderate level of special features, although the high elevation and the character of the landscape offer vistas that are quite limited on other areas of the Forest The area demonstrates the most Wilderness potential through the moderate level of public use and interest.

Kangaroo Roadless Area

This roadless area demonstrates a moderate level of manageability. Boundaries are well defined, but the presence of activities on adjacent lands to the east and west would affect the ability to manage the area in a natural state. A significant portion of this roadless area lies to the east of the divide on the Rogue River National Forest The natural integrity is nearly intact although there are human influences within the area due to old campsites and grazing The area provides opportunities for localized solitude and Semi-primitive

experiences, though both would be influenced by the sights and sounds of activities on adjacent lands. The area demonstrates a high level of special features that include wildlife, several mountain peaks, subalpine vegetation, and a scenic character that is unusual for the Forest

South Kalmiopsis Roadless Area

This area demonstrates a moderate level of manageability Boundaries are irregular and, in some places, abut private land Numerous access points are located on private land and would be difficult to control. There are numerous roads within the area being used to access active mining claims. The area's large size inherently protects the natural character of the area in the eastern interior portions adjacent to the Kalmiopsis Wilderness The natural integrity and appearance of the area is near natural.

Mining development (both past and present) and other miscellaneous activities have relatively little impact on the area's natural characteristics. Significant portions of the area exhibit an undisturbed landscape character. The potential for solitude and Semi-primitive recreation experiences is high, particularly for those portions adjacent to the Kalmiopsis Wilderness. Moderate levels of special features are exhibited, including the adjacent Kalmiopsis Wilderness, the Illinois Wild and Scenic River, abundant plant species, and unusual rock formations Perhaps the greatest attribute for Wilderness potential is the area's ability to further separate the interior of the Kalmiopsis Wilderness from sights and sounds of management activities on adjacent lands.

Table IV-7 delineates the disposition of the five areas cited above through the range of the alternatives.

Table IV-7. Backcountry Recreation Allocations by Alternative, in Roadless Areas with Demonstrable Wilderness Potential (Thousands of Acres)

	M Acres								
Roadless Area Name	NC/A/ A-Dep/ B	C	D/D1		E	G	K	M	S
Grassy Knob	-	-	-	-	6	1	-	6	2
North Kalmiopsis	-	-	-	-	110	88	11	110	42
Siskiyou	-	-	-	-	3	3	-	3	1
Kangaroo	-	-	-	-	7	7	-	7	3
South Kalmiopsis	-	-	-	-	105	52	2	105	57

A few other roadless areas (notably Shasta Costa and Copper Mountain) demonstrate attributes that are similar to the five areas cited above. However, they are isolated from other unroaded areas and Wildernesses. All are heavily influenced by the sights and sounds of activities on adjacent lands which would detract from desired wilderness qualities.

ENVIRONMENTAL EFFECTS BY ALTERNATIVE

The following evaluation deals primarily with *DIRECT EFFECTS* of management direction and activities on the character of Wildernesses For roadless areas, direct effects are associated with the Management Area allocations by alternative, and accompanying activities related to the development or non-development of the unroaded area. *INDIRECT EFFECTS* of management activities associated with these alternatives include the effects of adjacent land allocations, Wilderness use (people), mineral exploration and development, and road closures on adjacent lands The range of effects is not expected to vary by

alternative although the degree of the effects will For *CUMULATIVE EFFECTS*, see **ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVES.**

Alternatives NC, A, and A-Departure

The current management direction for recreation would continue to be implemented under these alternatives, resulting in construction or reconstruction of 38 miles of trail in Wilderness. The construction of these trails is not expected to materially alter the existing character of the Wilderness

The potential for Wilderness that exists in the Forest's roadless areas would not be maintained under these alternatives. These areas would be allocated to varying degrees of development. Road construction and related harvest activities would significantly alter the character of the area and result in the loss of Wilderness potential. The Siskiyou and Kangaroo Roadless Areas and lower Illinois River viewshed are managed as Supplemental Resource Management Areas under these alternatives. Only 3,000 acres of the Kangaroo area, however, is managed as Supplemental Resource (called "Craggy Mountain" in this Management Area assignment). The undisturbed character of these areas would be retained

The quality of recreation experiences within existing Wilderness is likely to be affected by the management activities in adjacent areas. Development of the Silver Creek drainage will affect approximately 4,000 acres of area currently inventoried as Primitive (ROS) in the Kalmiopsis Wilderness. Although additional impacts may occur, the Forest expects to be able to provide approximately 110,000 acres of Primitive or Pristine recreation opportunities within the Kalmiopsis Wilderness over the course of the planning period.

The direct effects of management activities within the Wildernesses associated with these alternatives include trail construction and fire management The range of these effects is not expected to vary by alternative. The impacts, accompanied by their respective Standards and Guidelines, are deemed minor

The direct effects of management activities within the roadless areas identified as having Wilderness potential include road and trail construction, timber harvest, and other facility construction The range of effects is not expected to vary by alternative, although the degree (miles of trail, miles of road, acres harvested, etc.) of the effects will.

For these alternatives, the area remaining unroaded (non-Wilderness) at the end of the first decade would be 102,000 acres; at the end of the fifth decade and beyond, approximately 85,000 acres These figures are estimates of the remaining undeveloped areas in blocks generally (a) greater than 5,000 acres, and/or (b) contiguous to designated Wilderness. The largest residual is attributable to the South Kalmiopsis Roadless Area where the large block of land unsuitable for the production of timber exists, this is assumed to remain unroaded over time

A different scenario exists if the land allocated to Management Areas 2 through 9 within the inventoried unroaded areas is added. For Alternatives A and A-Departure, 47,000 acres has been assigned to Management Areas which have no programmed timber harvest and whose management goals are strongly oriented to little or no roading Approximately 28,000 acres are allocated in Alternative NC to Management Areas 2-9.

Alternatives B, C, D, and D1.

Approximately 97 miles of trail would be constructed or reconstructed in the Kalmiopsis and Wild Rogue Wildernesses. No trail construction is programmed in the Grassy Knob Wilderness The character of portions of these Wildernesses without trails would be altered by the construction of the trails, however, these effects are not expected to be significant. Primitive and Semi-primitive capacities will be expanded under these alternatives (see Table IV-10 in **RECREATION SETTINGS** section) Within the Wildernesses,

the quality of recreation experiences are expected to be influenced heavily by the sights and sounds of management activities on adjacent lands

None of the Forest's roadless areas would be allocated to the Backcountry Recreation under these alternatives The Wilderness potential of these areas would be permanently lost as described in Alternative A above

For these alternatives, the area remaining unroaded (non-Wilderness) at the end of the first decade would be 86,000 acres; at the end of the fifth decade, approximately 68,000 acres. Again, these figures are estimates of the remaining undeveloped areas in blocks generally (a) greater than 5,000 acres, and/or (b) contiguous to designated Wilderness.

Alternatives B, D, and D1 has 36,000 acres and Alternative C has 28,000 acres if land allocated to Management Areas 2 through 9 within the inventoried unroaded areas is added These Management Areas have no programmed timber harvest and management goals are strongly oriented to little or no roading

Alternative G

Approximately 50 miles of trail would be constructed or reconstructed There would be no trails programmed in the Grassy Knob Wilderness. The character of the Pristine portions of the Kalmiopsis Wilderness would be altered by construction of trails, however, these effects are not expected to be significant. Primitive and Semi-primitive recreation capacities would be expanded as a result of the trail construction Recreation experiences within the Kalmiopsis Wilderness are expected to be moderately influenced by a reduction in sights and sounds of adjacent activities due to Backcountry Recreation allocations on contiguous lands.

Alternative G would assign all or portions of eight roadless areas (Grassy Knob, Copper Mountain, North Kalmiopsis, Siskiyou, Kangaroo, North Fork Smith, Packsaddle, and South Kalmiopsis) to Management Areas with no programmed development. Maintenance of viable wilderness character is achieved due to the size of the allocations and the location (this alternative would allocate significant portions of the roadless areas in the viewshed adjacent to the Wild and Scenic sections of the Illinois River) The Primitive and Semi-primitive opportunities available in the Silver Creek drainage would be maintained

For Alternative G, the area remaining unroaded (non-Wilderness) at the end of the first decade would be 185,000 acres At the end of the fifth decade and beyond, approximately 173,000 acres would remain These figures do not include over 25,000 acres allocated to Backcountry Management under this alternative which would require restoration to a nonroaded, undeveloped setting.

If land allocated to Management Areas 2 through 9 within the inventoried unroaded areas is added, Alternative G has 178,000 acres. These areas have no programmed timber harvest and remain essentially unroaded

Alternatives E and M

All of the Wildernesses would be maintained in their present condition. No trails would be programmed for construction or reconstruction other than those on the current capital investment program (approximately 50 miles). Naturally occurring ecosystems in all of the Wildernesses would be uninterrupted by further development The integrity of the recreation experiences within the Wildernesses is expected to be minimally influenced by the sights and sounds of activities on adjacent lands due to the large Backcountry Recreation Management Area assignments

The Wilderness potential in all of the roadless areas would be maintained under these alternatives, since all would be allocated to Backcountry Recreation. For these alternatives, the area remaining unroaded

(non-Wilderness) at the end of the first decade and beyond would be 284,000 acres Again, these figures are estimates of the remaining undeveloped areas in blocks generally (a) greater than 5,000 acres, and/or (b) contiguous to designated Wilderness. An additional 30,000 acres that is included under the Backcountry Recreation allocation would require restoration to a nonroaded, undeveloped setting. These acres are not included in the above 284,000 acre figure.

Alternatives B, D, and D1 have 36,000 acres and Alternative C has 28,000 acres if land allocated to Management Areas 2 through 9 within the inventoried unroaded areas is added These Management Areas have no programmed timber harvest and management goals are strongly oriented to little or no roading.

Alternative K

A moderate increase in trails (66 miles) in the Kalmiopsis and Wild Rogue Wildernesses would occur under this alternative No new trail construction is proposed within the Grassy Knob Wilderness Primitive and Semi-primitive recreation capacities would be expanded as a result The recreation experiences within the designated Wilderness are expected to be moderately influenced by the sights and sounds of activities on adjacent lands. Some of the influences will be offset by the Backcountry Recreation Management Area allocations in these alternatives.

Portions of the Briggs and North Kalmiopsis Roadless Areas (approximately 16,000 acres) would be allocated to the Backcountry Recreation. Some Primitive recreation opportunities would be maintained in areas outside of the Kalmiopsis Wilderness. The allocated portion of the North Kalmiopsis would offer positive benefits to the Kalmiopsis Wilderness since the area is contiguous. The most significant effect of these allocations is the maintenance of the viewshed (approximately 5,400 acres) adjacent to the last six miles of the Wild section of the Illinois River.

For Alternative K, the area remaining unroaded (non-Wilderness) at the end of the first decade would be 109,000 acres. At the end of the fifth decade, the residual unroaded area would be maintained at approximately 91,000 acres.

If land allocated to Management Areas 2 through 9 within the inventoried unroaded areas is added, Alternatives K has 70,000 acres. These Management Areas have no programmed timber harvest and management goals are strongly oriented to little or no roading.

Alternative S

There would be a substantial increase in trails (128 miles) in the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses under this alternative. Primitive and Semi-primitive recreation capacities would be expanded as a result. The recreation experiences within the designated Wildernesses are expected to be moderately influenced by the sights and sounds of activities on adjacent lands Much of this influence, however, will be offset by the Backcountry Recreation Management Area allocations adjacent to the Kalmiopsis Wilderness.

Portions of eight roadless areas (Grassy Knob, Copper Mountain, North Kalmiopsis, Windy Valley, Siskiyou, Kangaroo, Packsaddle, and South Kalmiopsis) would be allocated to Backcountry Recreation. As a result, the Forest will maintain opportunities for Primitive, Semi-primitive Non-motorized, and Semi-primitive Motorized opportunities in these areas. Portions of the North and South Kalmiopsis would offer positive benefits to the contiguous Kalmiopsis Wilderness The most significant effect of these allocations is the maintenance of the unroaded recreation opportunities (both motorized and non-motorized) in a natural/near-natural forest setting, and the maintenance of the undisturbed viewshed (approximately 5,400 acres) adjacent to the last six miles of the Wild section of the Illinois River.

The area remaining unroaded (non-Wilderness) at the end of the first decade in Alternative S would be nearly 135,000 acres; at the end of the fifth decade and beyond, approximately 126,000 acres. These figures are estimates of the remaining undeveloped areas in blocks generally (a) greater than 5,000 acres, and/or (b) contiguous to designated Wilderness

Alternative S has 146,000 acres if lands allocated to Management Areas 2 through 9 within the inventoried unroaded areas are added These Management Areas have no programmed timber harvest and management goals are strongly oriented to little or no roading.



WILD AND SCENIC RIVER

SIGNIFICANT INTERACTIONS

Management plans for the Rogue and Illinois Wild and Scenic Rivers will not be affected through the range of the alternatives Land allocation decisions and activities on the periphery of Wild and Scenic Rivers corridors, however, have a potentially significant impact on the Wild and Scenic River attributes. Depending on the specific land allocations within the alternatives, the potential for adverse effects varies greatly The allocations can affect the quality of the recreation experiences available (Clark and others 1984) Timber harvest and related road construction, and other facility construction are the management activities within any of the alternatives that would have the greatest affect on the quality of the river experience and the inherent attributes The degree of visual resource protection offered in the viewsheds adjacent to the rivers becomes the means to evaluate acceptable levels of activity. Resource activities are mitigated through the use of Standards and Guidelines applicable to the visual resource.

RESPONSE TO PLANNING PROBLEMS

Planning Problem #4, "How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild and Scenic River attributes?" is addressed by alternative in this section The problem has two parts.

The first part deals with establishing or reaffirming management direction for the five designated rivers Management Plans exist for both the Rogue and Illinois Rivers. However, as a result of the Omnibus Oregon Wild and Scenic Rivers Act of 1988, management plans are required for the Chetco, Elk, and North Fork Smith River. Development of the three new plans and review of the two existing River Management Plans will not occur under the analysis and documentation provided herein These plans will be prepared within the next three years under separate documents.

Also as a consequence of the new legislation, the Planning Problem was basically reduced to the question dealing with management of lands adjacent to the corridors The alternatives presented are evaluated based on the visual management objectives assigned to lands within and adjacent to the river corridors which indirectly affect recreational experiences

Wild and Scenic River designations have an immediate effect on water quality standards too, through change to the more restrictive antidegradation policy applied by the State of Oregon As the impacts are already in place by virtue of the 1988 Act, there is little need to dwell on the beneficial or adverse effects of the river designations on other resources. Refer to the **SOIL AND WATER** section for treatment of water quality and application of Standards and Guidelines, including BMP's, to proposed management activities

The DEIS treatment of inventoried and eligible rivers for inclusion into the National Wild and Scenic Rivers System is moot. The Chetco, Elk, and North Fork Smith Rivers were intentionally assigned differing designs in the array of alternatives so that a full range of management options could be offered to adequately analyze the environmental impacts and tradeoffs. In the FEIS analysis, the rivers still are allocated as originally designed (per alternatives presented in the DEIS), however, discussion will be brief The new Alternative S carries the five rivers as they are Congressionally designated. If another alternative is recommended as the Preferred, then the changes per recent status would have to be incorporated From a Forest-wide perspective, the changes are relatively minor as to acres and effects

ENVIRONMENTAL EFFECTS AND MITIGATION

DIRECT EFFECTS. The direct effects of management activities associated with these alternatives include land allocations, road construction, construction of developed recreation sites, and trail construction

These effects are common to all alternatives, except Alternative M (no new road construction), and are not expected to vary, though the intensity of the effects may

INDIRECT EFFECTS The indirect effects of management activities associated with these alternatives include timber harvest and related activities, the effects of recreation users, and mineral development These effects are common to all alternatives and are not expected to vary except by intensity of the effects.

CUMULATIVE EFFECTS See **ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVE** at the end of this chapter.

Alternative NC, A, and A-Departure

Current conditions would be maintained in the Rogue and Illinois River corridors. The current visual inventory would be allocated in all viewsheds resulting in maintenance of natural/near-natural landscape character. A limited reduction in the natural character of the landscape within the Rogue corridor would result from allocation of parts of the Quosatana, Potato Mountain, and Rogue Roadless Areas to development. These areas are inventoried for Retention and Partial Retention, thereby the potential visual impacts of activities as seen from the Rogue River would be largely mitigated. It is noted, however, that the majority of these areas are located within the Recreation sections of the river where open extended views are offered recreationists traveling on the river, the Agness Road, and on portions of the Upper and Lower Rogue River Trails

Past analysis (available in Planning Records; Rogue River Corridor Visual Study 1982) indicates that unroaded areas in viewsheds bordering the Rogue present problems related to color contrast that would make it difficult to achieve the inventoried VQO's on a site-specific basis. Coupled with the topography, the potential for impacts to the visual resource from management activities would neither benefit the recreation setting for the river corridor nor the attendant experiences offered

Similar effects could result from the allocation of Squaw Mountain and the eastern portion of the North Kalmiopsis roadless areas in the Upper Illinois viewshed to General Forest The susceptibility of portions of these areas to adverse visual impacts has not been verified And, the viewshed adjacent to the last six miles of the Wild section of the Illinois could be impacted to a limited degree as a result of being assigned to Supplemental Resource.

Both the Illinois and Rogue corridors are expected to remain in a natural/near-natural condition as a result of their Wild and Scenic designation, the large area of Wilderness through which both rivers flow, visual resource allocations in viewsheds of both corridors, and other assignments to Management Areas 1-9.

The inventoried Chetco and North Fork Smith Rivers would be managed to maintain Wild and Scenic River attributes The character of both river corridors is expected to remain in a natural/near-natural condition resulting from the maintenance of the corridor and assignment to Supplemental Resource. The upper reaches of both rivers are bounded by Wilderness. The natural/near-natural character of the Elk River will be maintained largely through the inventoried VQO's within the viewshed.

Alternatives B, C, D, and D1

Outside of the river corridors within the Kalmiopsis and Wild Rogue Wildernesses, there would be a reduction in the existing character of the landscape in both designated Wild and Scenic River corridors and in the two inventoried river corridors The Elk River would be allocated to a combination of Supplemental Resource and Riparian Prescription C in Alternatives B, D, and D1. The river would be managed under only Riparian Prescription B in Alternative D. Visual resource assignments would be reduced in viewsheds adjacent to the designated and potential river corridors, resulting in a near-natural/modified landscape character. Under Alternative C, 38,000 acres of inventoried Retention in

the five viewsheds adjacent to the rivers would be managed to achieve the Partial Retention objective. Under Alternatives B, D, and D1, approximately 26,000 acres inventoried for Retention would be managed to achieve Partial Retention.

The effects on the quality of the recreation settings and attendant experiences are expected to be similar to those described in Alternative A. Reductions to the character of the landscape result from a combination of the allocation of adjacent viewsheds to management for Partial Retention and Modification, and the allocation of unroaded areas to General Forest Allocations that benefit the two designated rivers include Supplemental Resource, Partial Retention Visual, and other allocations that have no programmed timber harvest

None of the rivers eligible for inclusion into the Wild and Scenic River System would be recommended for designation or further study. The character of the river corridors would be somewhat reduced The viewshed adjacent to the Chetco would be managed to achieve the Partial Retention. The character of the landscape would vary between near-natural appearing and modified. The viewshed adjacent to the North Fork Smith is expected to be modified as a result of allocation to General Forest Alternative C would result in a significant impact to the potential rivers since they are managed only under the Riparian Prescription.

Alternatives E, G, and M

Recreation settings in all five river corridors would be maintained in a natural/near-natural condition. Alternatives E, G, and M would meet or exceed the inventoried VQO's, and allocate all unroaded areas to Backcountry Recreation. No changes to the character of the landscape are expected.

The viewshed adjacent to the last six miles of the Wild section of the Illinois River would be allocated to the Backcountry Recreation. Alternative M would enhance the character (i.e , create a natural appearance) within all river corridors since timber management would be subject to a 250-year harvest rotation. Additional allocations that benefit the Wild and Scenic River resource include visual resource assignments in viewsheds along both river corridors and allocations to Management Areas 1-9.

The Chetco and North Fork Smith Rivers would be recommended for designation in all of these alternatives resulting in effects similar to those identified in Alternative A. The Elk River would be managed under Riparian Prescription Minimum Level and allocated to Supplemental Resource in Alternatives E and M. Riparian Prescription C would be applied in Alternative G. The Wild and Scenic attributes of the rivers are expected to be fully protected under these three alternatives

Alternative K

The existing character of the landscape within the designated Wild and Scenic River corridors would be maintained in its current condition Recreation settings in the Rogue and Illinois River corridors would be maintained in a natural/near-natural condition due to assignments of their viewsheds to inventoried VQO's. The three roadless areas would be allocated to General Forest; effects would be similar to those described in Alternative A In addition, the inventoried foreground Retention along the Scenic and Recreation sections of the Rogue River would be removed from the lands suitable for timber production in order to protect or maintain the old-growth character in view of the river. The land within the viewshed adjacent to the last six miles of the Wild section of the Illinois River (approximately 5,400 acres) would be allocated to Backcountry Recreation, resulting in maintenance of the landscapes natural character.

None of the potential rivers would be recommended for designation or further study in this alternative. Both the Chetco and the North Fork Smith Rivers would be allocated to management as Supplemental Resource areas, providing protection to a 1/8 mile strip on either side of the river. In addition, visual resource allocations in the immediate viewsheds would be reduced (the foreground being managed to achieve Partial Retention objectives), resulting in near-natural/modified Forest settings which may effect the quality

of the recreation experiences available. However, the upper reaches that extend into the Kalmiopsis Wilderness would remain unchanged. Elk River would be managed under Riparian Prescription C. The viewshed adjacent to the Elk River would be assigned Partial Retention so that the river corridor retains its natural/near-natural character.

Alternative S

The existing character of the landscape within all five designated Wild and Scenic River corridors would be maintained in their current condition. Recreation settings in the Rogue and Illinois river corridors would be maintained in a natural/near-natural condition due to the allocation of these viewsheds to their inventoried VQO's. Portions of the three roadless areas adjacent to the rivers would be allocated to General Forest; effects similar to those described in Alternative A would occur. In addition, the inventoried foreground Retention (nearly 10,000 acres) along the Scenic and Recreation sections of the Rogue River would be removed from the land base suitable for the production of timber in order to protect the old-growth character as seen from the river. The land within the viewshed adjacent to the last six miles of the Wild section of the Illinois River (approximately 5,400 acres) would be allocated to the Backcountry Recreation, maintaining the undisturbed character of this area.



SOIL AND WATER

SIGNIFICANT INTERACTIONS

The interaction between components of the hydrologic cycle and erosion is very complex, with resource management activities adding further complexity (Brown 1980) Significant interactions with the soil and water resource are possible from any resource management activity that disturbs the soil, reduces root strength on steep slopes, reduces organic matter, disrupts watershed drainage, or reduces riparian vegetation. Road construction, timber harvest, fuels treatment, and the development of energy or mineral deposits are the principal resource management activities with potential for significant interactions with the soil and water resource.

Water quality, soil erosion, mass-wasting (landslides), and long-term productivity are the forest components that would most likely be affected by interactions of both management activities and natural conditions. Stream temperature and stream sedimentation are the two water quality parameters most sensitive to management activities. Water temperature is affected primarily by loss of stream canopy cover, while sediment is delivered to streams by surface erosion, channel erosion, and mass wasting

Erosion of surface soils is a natural process on steep lands of the Forest Exposure of mineral soil on steep slopes, however, allows direct raindrop impact, causing erosion and puddling of the soil which reduces infiltration and increases runoff. Mass wasting occurs when the shear strength of rock or soil is exceeded by the shear stress imposed by gravity Slope failure of soil and rock involves a reduction in strength or an increase in stress in those earthen materials. Responsible factors usually include increased water loading (pore pressure), weathering of soil and rock, oversteepened slopes, and delay or absence of root replacement Increases in groundwater during storms contributes to reduced strength and increased stress.

All of these processes occur naturally, however, ground disturbance, removal of soil-anchoring vegetation, and concentration of water caused by management activities, would tend to accelerate the interactive processes Increases in water temperature and sediment can reduce the quality of anadromous fish habitat Excessive turbidity can affect the quality of angling in the Forest's streams and rivers, as well as water utility for domestic uses.

Long-term productivity of forest ecosystems is highly dependent on the interactions of management activities with natural variables including soil, bedrock, plant community, and climate.

Considering the above factors, the potential risk of adverse cumulative watershed effects from resource management activities, irrigation, and domestic water use definitely exists The interaction of Forest Service activities that create soil disturbance or remove stream shading, alone, or in combination with those of other agencies and landowners, may result in cumulative watershed effects

SEDIMENTATION

Each alternative produces a different amount of sediment Road construction is a major source of sediment (Fredriksen 1972), while activities related to timber harvest produce a much smaller amount of sediment per acre of disturbance. Increased sediment delivery to streams resulting from soil erosion and mass wasting is a potential consequence of timber harvest and road construction in steep terrain. Large inputs of sediment can aggrade stream channels if stream power is insufficient to transport the material downstream The limited areal extent of mining activity and the resultant impacts, while numerous, are neither major nor significant

Erosion

Soil erosion is often accelerated by road construction, timber harvest, site preparation, and fuels treatments on steep slopes and slopes adjacent to streams. Road construction may divert and concentrate surface water, increasing erosion of ditches, slopes, stream banks, and channels Prescribed burning to prepare a site for reforestation may produce a significant loss of soil cover on steep slopes where litter and duff layers are naturally thin Mineral soil exposure on steep slopes can greatly increase erosion, with corresponding effects on soil productivity and stream sedimentation. Off-site effects can include channel scour and streambed aggradation Streambank failures are secondary downstream effects.

Mass Wasting

Many slopes on the Siskiyou National Forest, especially those near streams, are oversteepened (i e., greater than 70 percent) and, as a result, most major landslide activity occurs along the inner gorges of major streams

The removal of vegetation by timber harvest, site preparation, or fuels treatment increases the potential for landslides. Accelerated rates of mass wasting are a potential consequence of building roads and harvesting timber in steep, rugged terrain. All alternatives that contain road building and timber harvesting will accelerate the occurrence of landslides above the background level Best Management Practices will be implemented to minimize the amount of management-related mass wasting and protect the beneficial uses of water The consequences of slope failures may include.

Increased sediment to streams and reservoirs;
Decreased water and fish habitat quality;
Potential impacts on structures and facilities;
Loss of growing sites and decreased site productivity;
Visual impacts of landslide scars, and
Potential loss of life.

Sediment from slope failures associated with road construction are directly related to.

The area of land dedicated to roads;
The types of rock and soil through which the road passes,
The frequency of high intensity and large storms;
Distance of the failure to an active stream,
Length of time since road construction; and
Road design and construction techniques.

Debris slides of noncohesive soil and rock fragments have potential for rapid, but temporary, increases in stream sedimentation. Thick slow-moving earthflows of cohesive soil provide low initial amounts of sediment, but contribute sediment for long periods. Earthflows commonly grade into debris slides at the toe of the failure, and periodically produce large amounts of sediment

Geology, topography, and soils directly affect the location and cost of roads, rock quarries, and timber harvest units Conversely, timber harvest and road construction can cause significant changes in slope stability causing damage and increasing the costs of structures Buildings, bridges, culverts, fences, etc. are subject to impacts from slope failures

Slope failures on the Forest do not normally result in the loss of human life. Safety is, however, of prime importance when constructing roads through steep, rocky terrain, or land particularly susceptible to slope failure Failures on Forest have occurred with sufficient intensity that Forest workers or visitors could have

been killed or injured had they been in the path of these rapid landslides Population centers and residences located outside the Forest boundary have a low probability of risk to mass wasting

WATER QUALITY

Water Temperature

Water temperature can be affected by removing the vegetation that shades streams, or by summer water withdrawals for irrigation, domestic consumption, or other uses For many Siskiyou streams, summer water temperatures are at critical levels for the survival of cold water game fish This condition exists due to both natural and activity-induced impacts. Natural conditions can range from very low summer stream flows, to a geology-related lack of stream shading A combination of streamside conditions resulting from past activity, from activity of others, or indirectly through upstream diversions (water withdrawals), blend to create a potential impact on instream uses The **FISH** section of this chapter provides a discussion of water temperature for each alternative

Water Clarity

As described above, primary sources of sediment are natural and management-related surface erosion, channel erosion, and mass wasting An increase in the amount of delivered sediment to streams can affect the clarity or turbidity of the water Turbidity (cloudiness) is a measure of the capacity a given volume of water to transmit light. When sediment rates increase, turbidity will increase. The amount of turbidity produced per unit of suspended sediment concentration depends on the size, shape, and refractive index of the sediment particles (Lloyd 1987). Whereas a strong relationship between sediment and turbidity can be developed within a watershed, this relationship can vary significantly between drainages (Beschta 1980).

Turbidity usually drops off rapidly after the triggering storm events; however, reservoirs and lakes may experience increased turbidity for an extended period of time Earthflows are often major contributors to turbidity because of high clay contents.

WATER YIELD AND PEAK FLOWS

The harvest of mature timber increases water yield up to 20 inches per year per unit area harvested. This additional water yield results in small increases in summer flows and modest increases in fall peak flows. The additional water yield gradually diminishes over the first 20 years following timber harvest due to regrowth of trees and brush. The total amount of additional water yield produced by timber harvesting is not significant when compared to the total water yield from a large river basin, and is estimated to be smaller than the five percent accuracy of stream flow measurement (Harr 1976; Harr and others 1979).

When soils are saturated, the magnitude of larger peak flows will normally be similar with or without timber harvest and roads (Wright 1985) However, in the less frequent "rain on snow" events, harvested areas may contribute to increased peaks. Some of the Forest is within the "transient" snow zone, i.e., snowpacks being generally less in depth, but lower in elevation and warmer. A major storm event, coupled with a heavy snowpack in the transient zone, may produce higher peak flows which increase the potential for both hillslope and channel erosion. The drainage size will normally influence and normalize the peak flows to the extent that downstream values and structures are not placed at risk. A more thorough discussion of water yield and peak flows is provided at the end of this chapter and entitled **ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVES**

SITE PRODUCTIVITY

Forest productivity is dependent on continual gains and losses of organic materials and nutrients from roots, dead and down trees, and other organic material. Nitrogen, the most limiting soil nutrient in the

forests of southwestern Oregon, is mineralized or made available by biological decomposition of organic matter Organic material supply the habitat and energy for these processes It also aids in moisture retention, soil aggregate stability, and surface protection. Levels and distribution of phosphorus, a second critical element, is also affected by loss and redistribution of organic residues, duff, and litter during timber harvest, site preparation, and fuels treatment

Site productivity can also be affected by loss of organic matter due to harvest of logs, site preparation, and fuels treatments, all of which transport nutrients off-site Low intensity prescribed burns preserve more on-site nutrients, duff, litter, and large woody material than high intensity burns Woody residues, duff, and litter concentrated close to the ground that act as moisture storage reservoirs are preserved following low intensity burns. High intensity burns expose more mineral soil than low intensity burns. Nutrient availability following fuels treatment is high in the short term, and low in the long term with high demand by a fast growing new forest.

Site productivity can further be affected by soil compaction during timber harvest and site preparation Moderate and severe compaction has the potential to reduce soil porosity, water storage and release, and plant root growth. Further, it has potential to reduce infiltration of precipitation and to increase storm runoff.

Site productivity is affected by mass wasting, soil erosion, and by losses of organic matter in timber harvest units. Failures that occur within harvest units, above the top of road cuts, or below the toe of the fill slopes, may directly impact productivity of forest land Most soil nutrients and moisture storage are found in the surface soil horizons, and any loss of topsoil impacts site productivity.

Best Management Practices are implemented to reduce the impact to site quality. Soil compaction by heavy equipment during timber harvest or site preparation may also be minimized by limiting the area of tractor use

MANAGEMENT AREA ALLOCATIONS

Land allocations have a direct bearing on soil and water resources Management Areas 1-9 have no programmed harvest, as such, a higher percentage of land allocated to these Management Areas result in less impact on soils and water. By contrast, Management Areas 13 and 14 allow for development, principally through timber harvest and road construction, and therefore present the greatest risk to soil and water. Management Areas 10-12, while allowing for limited harvest and associated roading, spread impacts over space and time Guidelines for management of these areas provide for smaller unit size and other requirements which, in effect, substantially reduce the risk to the soil and water resource

Management Areas 7 and 11 are especially important to maintaining critical soil and water resources. Management Area 7 (Supplemental Resource) generally restricts activity from the inner river gorge environment where the risk of mass slope instability is high. Management Area 11 (Riparian) similarly restricts or limits activities adjacent to streams and rivers (see the **FISH** section in this chapter). Impacts on soil and water values are further mitigated through the Riparian Standards and Guidelines which provide for area constraints (an average of 11 percent activity per decade), limited harvest to no harvest depending on prescription, an initial suitability determination, and Best Management Practices (BMP's) described in the Siskiyou National Forest's policy for riparian ecosystem management and Appendix F of the Forest Plan.

On areas designated Management Area 14 (General Forest), all timber harvest activity is governed by Standards and Guidelines and associated BMP's. Some of the more important Standards and Guidelines deal with the first step, that of the suitability determination Here, areas susceptible to adverse impacts due to high risk soil, water, and geologic conditions are removed from the land base In the second step, specific requirements are applied to numerous practices within all phases of planning, location, design, implementation, and post-treatment activity Surveillance and monitoring before, during, and after helps

to assure that the effects are those that were anticipated, or that changes in practices are required to meet the soil and water quality standards incorporated into the site-specific projects.

RESPONSE TO THE PLANNING PROBLEMS

Planning Problem #3, "How can the Forest's fish habitat, water quality and soil productivity be maintained or improved?," is addressed here Changes, by alternative and by basin, are addressed for selected measures most relevant to soil productivity and the beneficial uses of water throughout the Forest's 19 Planning Basins Stream temperature and sediment, as related to fish habitat, is addressed under the **FISH** section of this chapter.

ENVIRONMENTAL EFFECTS AND MITIGATION

The discussion of environmental effects is divided into three sections The first section, **ANALYSIS CONSIDERATIONS**, explains several factors that influence how effects were determined These include Short- and Long-Term Effects, Cumulative Effects Analysis, Standards and Guidelines, and Mitigations The second section, **ENVIRONMENTAL EFFECTS BY ALTERNATIVE**, describes the direct, indirect and cumulative effects with respect to each alternative. The last section, **SEDIMENT INCREASE BY BASIN AND ALTERNATIVE**, provides a series of bar charts illustrating the increase in sediment predicted for each alternative. The section **ENVIRONMENTAL EFFECTS BY PLANNING BASIN** describes the risks to watersheds in each Planning Basin posed by management activities prescribed for each alternative, and is located under the **FISH** section of this chapter. Since anadromous fisheries are a major beneficial use in nearly all Planning Basins and the only use which occurs in all basins, the analysis and discussions for water quality and fish were combined.

ANALYSIS CONSIDERATIONS

Short- and Long-Term Effects

The relationship between short- and long-term effects is complex. Short-term effects range from increases in water yield which gradually diminish over a twenty-year period as vegetation grows, to long-term cumulative effects such as the potential for soil productivity loss over multiple rotations of harvests and fuels treatments Both the short-term and long-term effects are discussed in more detail below.

Cumulative Effects

Interactions of land management activities with soil and water resources contribute to soil erosion, mass wasting, nutrient losses, and stream sedimentation They may also contribute to cumulative impacts to fisheries, site productivity, and water quality Considering these direct and indirect effects, there is a potential risk of cumulative effects from resource management activities such as timber harvest and road construction, or from consumptive uses of water such as irrigation and domestic uses For example, channel sedimentation and aggradation may be tied directly and indirectly to landslide size and frequency and, in turn, to timber harvest and road building

The analysis of cumulative effects takes into consideration past, present, and future impacts on National Forest and adjacent lands Cumulative impacts are reviewed in terms of timing, location, and significance Analysis of cumulative effects often requires a threshold value above which the cumulative effects may be significant, and below which the effects are judged to be insignificant The accepted methods or models to establish threshold values for determining the significance of cumulative impacts from sediment delivered to streams from surface erosion, channel erosion, and mass wasting are not highly reliable relative to accuracy (absolutes) This is particularly true when applied to differing physiographic and climatic conditions in which the model was neither designed to replicate particular natural processes (systems) nor based on local, empirical information

Second, and just as important, the relationship of the activity to the direct effect may be good, but the secondary (indirect or cumulative) effects may not be as strong From extensive literature review, coupled with on-site measurements and field knowledge gained over time, a good quantative estimate may closely represent actual processes, outputs and effects Quantitative estimates may not be absolute, but may be appropriately used in comparing relative differences between alternatives wherein a good assessment of effects can be made In many cases, a model may assist simply through providing the means in which immense data can be processed and outputs generated in a consistent manner. Furthermore, because mass failures cannot be predicted from storm magnitudes or frequencies with a high degree of reliability, the estimate of when threshold values might be exceeded is mostly professional judgment Only the probability may be calculated.

A model that relates stream power and the percent increase in sediment over natural conditions to fish habitat was developed on the Siskiyou National Forest in 1988 by the Silver Fire Recovery Project's "Cumulative Effects Assessment Team" (Vanderheyden and others 1988). The model holds considerable promise for Forest-wide use in making cumulative effects assessments at the project-level; monitoring data is currently being gathered in the Silver Fire area to help validate and improve the model.

Concentrating timber harvest and road-building activities may result in an increase in landslide frequency. The concentration of intensive management (roads and timber harvest) in very steep or marginally stable terrain can cause greater impacts than in flatter or more stable terrain. These effects become important when, as a result of management activities, storms of lesser intensity cause equivalent damages that were previously sustained only under major storms and/or natural conditions. The accumulation of numerous failures may become important after an extended period of time For example, many small failures can result in the loss of growing sites, eventually adding to a substantial loss of timber production

Applying restrictive basin-specific timber harvest constraints will result in a greater dispersion of activity. Consequently, as harvest acres are constrained, total sediment yield is reduced And, more importantly, sediment is more evenly distributed over both space and time. This distribution diminishes the potential risk for cumulative effects on stream morphology and degradation of established beneficial uses of water.

The sum of all soil and stream disturbances in a watershed has the potential to produce adverse cumulative impacts due to increased frequency of landslides, altered stream channels, and increased stream temperature. The alternatives provide for various levels of dispersion of timber harvest and roading by application of "basin constraints" (basin-specific timber harvest dispersion constraints) and "Watershed Analysis Areas" (Standards and Guidelines 7-15). Riparian Prescriptions B, C, and Minimum Level for Management Area 11 are designed to either maintain or, in selected watersheds, reduce water temperatures to prevent adverse cumulative impacts to the downstream aquatic environment

For selected alternatives, the basin timber harvest dispersion constraints on acres suitable for timber production range from 9 to 13 percent per decade in Planning Basins ranging in size from 34,600 to 93,800 acres. Several alternatives contain a 20 percent per-decade basin constraint on timber harvest, while one alternative contains a 7 to 17 percent constraint. To prevent concentrating too much harvest in smaller watersheds, projects proposing to harvest 20 percent or more in a Watershed Analysis Area of up to 2,500 acres in area require a more indepth analysis of watershed condition, past and proposed activities, and the potential for significant cumulative effects.

The reduction in variation of sediment yield over time also results in lower peaks of sediment production. For the Planning Basin analyses, a lower sediment yield variance results in a reduced potential risk for adverse effects. Higher mean decade sediment increases indicate greater risk for on-site impacts due to soil loss, and off-site impacts related to beneficial uses of water as affected by both sediment and turbidity.

Similarly, increasing the magnitude of the "pulse" or peak sediment output will require that the watershed absorb this impact over a short time The risks of cumulative effects are measurably increased Use of the

basin-specific harvest dispersion constraint has a tremendous bearing on averting potentially significant direct, indirect, and cumulative impacts on soil, water, and other associated resource values within a Planning Basin

When sediment rates are discussed, it should be kept in mind that these figures are not absolutes, but are estimates based on the best tools and professional inputs available. However, they are reasonably good estimates of the values anticipated for the resource conditions and activities found on the Forest. For relative differences and comparative purposes, they are excellent For project level application, sediment values would need to be developed from existing data, monitoring, site-specific conditions, and proposed activity

The application of basin constraints is evaluated below (Forest-wide) by alternative. A comparison of the relative differences in risk for cumulative effects between alternatives is made under the **SOIL AND WATER** section of Chapter II The potential risk for cumulative effects by Planning Basin is analyzed under the **FISH** section of this chapter.

Standards and Guidelines

The Standards and Guidelines and BMP's contained in the accompanying Forest Plan (Chapter IV and Appendix F) have been designed to minimize the impacts to the soil and water resource, and thereby provide a strong degree of protection to the established beneficial uses of water. A discussion of the requirements in accordance with the Clean Water Act for the protection of waters of the State of Oregon and State of California is contained in the **SOIL AND WATER** section of **POTENTIAL CONFLICTS WITH PLANS AND POLICIES OF OTHER JURISDICTIONS** near the end of this chapter.

Mitigations

Mitigation measures are used in preventing or restoring those direct, indirect, and cumulative effects previously discussed The applicable Standards and Guidelines designed to mitigate these effects contain requirements for maintaining soil cover, classifying land for suitability, maintaining riparian vegetation and minimizing disturbance for both stream temperature and stability, avoiding or restricting activity in areas of potential mass instability, and qualifying type, degree, and timing of soil disturbance

Best Management Practices (Appendix F of the Forest Plan) will be implemented on National Forest lands to comply with State requirements for protection of waters of the State of Oregon and California. Sullivan and others (1987) suggest that adopting BMP's provides the needed basis for reducing effects of forest management activities The monitoring and evaluation plan in Chapter V and Appendix D (Forest Plan) describes the BMP's implementation and effectiveness monitoring

For private lands in watersheds with multiple ownerships, the BMP's for timber harvest are contained in the Oregon Forest Practice regulations These are designed to protect water quality and beneficial uses following timber harvest on private lands

Capital investments, applied through watershed improvement projects, vary primarily by acres harvested These resource improvement activities are oriented to preventing, mitigating, or enhancing the soil and water resources

Approaches to evaluating non-point source impacts from silvicultural activities on water and soil are discussed in the WRENS document (EPA 1980) Other overviews of erosion, sedimentation, and water quality relationships are covered in *Forestry and Water Quality* (Brown 1980), *Forest and Water. Effects of Forest Management on Floods, Sedimentation, and Water Supply* (H.W. Anderson and others 1976), and *Logging Roads and Protection of Water Quality* (EPA 1975)

ENVIRONMENTAL EFFECTS BY ALTERNATIVE

Potential effects on soil and water vary between alternatives due to differences in Management Area allocations (development and nondevelopment areas), basin timber harvest dispersion constraints, and Riparian prescriptions. Differences are also strongly correlated to activity acres (timber harvest and associated road construction), timing of the activity, and soil and slope sensitivity within the basins

All alternatives have been evaluated utilizing the full set of mitigation measures provided in the Standards and Guidelines and associated BMP's.

The alternatives provide for a range of first-decade annual timber sale volume of 6.1 to 36 8 million cubic feet (MMCF). For road construction, the alternatives range from no new construction to 308 miles within the first decade Acres of timber harvest by alternative varies from 754 to 6,713 acres each year in the first decade.

The intensity and extent of activities are primary determinants of potential risks to soil, water, and geologic resources. A more complete discussion of potential risk can be found in the subsection titled **ENVIRONMENTAL EFFECTS BY PLANNING BASIN**, located in the **FISH** section of this chapter. The beneficial uses of water considered below may include the anadromous fishery, public and domestic water supplies, irrigation, wildlife, fishing, boating, water-contact recreation, visual quality, and navigation where applicable. The following terms for rating the potential risks to the beneficial uses of water are used in the analysis·

> **negligible** -- the existing beneficial uses of water are expected to be maintained or improved; water quality standards are expected to be met.
>
> **minor adverse** -- the predicted change in sediment or turbidity results in increased risk to a beneficial use without significant impacts. There is a slight risk of exceeding water quality standards on a short-duration, localized basis
>
> **moderate adverse** -- the predicted change in sediment or turbidity results in increased risk, with potential for localized impacts to beneficial uses. Water quality standards for an identified use may be exceeded.

Under alternatives where risks are defined as **negligible,** water quality and instream conditions for beneficial uses are expected to be maintained or improved. Where the potential for improvement over current condition exists, the ratings are enclosed by parentheses, e.g., **(minor improvement)** or **(moderate improvement)**; this rating applies to the long term potential for improvement of existing conditions For current conditions, refer to Chapter III, **FISH** and **SOIL AND WATER** sections

For each alternative, under the *CUMULATIVE EFFECTS* heading, the average variation in potential accelerated sediment over the first five decades is used as an indicator of the potential for cumulative effects A combination of the variation in both the basin timber harvest constraint and the total amount of accelerated sediment for each alternative results in a smaller or larger value for this coefficient. A smaller value for the average variation in potential accelerated sediment results in a correspondingly reduced potential risk of adverse cumulative effects, such as channel aggradation and occurrence of landslides.

Besides the average variation in potential accelerated sediment over the first five decades, the potential risk from sediment and turbidity identified for each Planning Basin under the **FISH** section of this chapter is another indicator of the potential risk of cumulative effects Planning Basins with either a minor or moderate potential risk from sediment and turbidity are listed below for each alternative under the *CUMULATIVE EFFECTS* heading The potential risk associated with increased stream temperature for all alternatives and Planning Basins is negligible (see **FISH** section of this chapter)

The environmental consequences to soil and water for each alternative are described below The overall assessment by alternative is a composite rating of the 19 Planning Basins.

Alternative NC

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary to produce 31.0 MMCF per year of wood for decades 1-5 would result in a 964,000 tons per decade mean increase in potential accelerated sediment to streams and rivers.

All Planning Basins would be managed with Riparian Prescription B which is designed to maintain stream water temperature Fourteen rivers and streams allocated to Supplemental Resource areas provide soil and water protection to the high-risk inner-gorge areas

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies moderately by Planning Basin, ranging from below five percent for the Upper Illinois (5 percent) and Rough/Josephine (4 percent) to over 30 percent for the Indigo (33 percent) and Winchuck (34 percent)

The estimated risk of a potential increase in accelerated sediment and turbidity to the beneficial uses of water for all Planning Basins ranges from **negligible** to **minor adverse** The majority of the estimated risks are **negligible**; existing conditions are maintained (see **ENVIRONMENTAL EFFECTS BY PLANNING BASIN** in the **FISH** section of this chapter)

CUMULATIVE EFFECTS. For Alternative NC, the 20 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 35 percent average variation in potential accelerated sediment over the first five decades For this alternative, the Indigo, Silver, Briggs, Rough/Josephine, and Winchuck Planning Basins would have an estimated **minor adverse** risk from sediment and turbidity.

Alternative A

DIRECT AND INDIRECT EFFECTS The level of timber harvest and road construction necessary to produce 30 1 MMCF per year of wood for decades 1-5 would result in a 944,000 ton per decade mean increase in potential accelerated sediment to streams and rivers.

All Planning Basins would be managed with Riparian Prescription B, designed to maintain stream water temperature. Twelve rivers and streams allocated to Supplemental Resource areas to provide soil and water protection to the high-risk inner-gorge areas.

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies moderately by Planning Basin, ranging from below five percent for the Upper Illinois (5 percent) and Rough/Josephine (3 percent) to over 30 percent for the Indigo (33 percent) and Winchuck (31 percent)

The estimated risk of a potential increase in accelerated sediment and turbidity to the beneficial uses of water for all Planning Basins ranges from **negligible** to **minor adverse**. The majority of the estimated risks are **negligible**; existing conditions are maintained

CUMULATIVE EFFECTS For Alternative A, the 20 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 34 percent average variation in potential accelerated sediment over the first five decades. For this Alternative, the Briggs, Indigo, and Silver Planning Basins would have a **minor adverse** risk from sediment and turbidity.

Alternative A-Departure

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary to produce 31 2 MMCF per year of wood in the first decade and 29 4 MMCF per year in the fifth decade would result in a 962,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers.

All Management Area allocations, Riparian prescriptions, and basin dispersion constraints are the same as Alternative A The mean 1-5 decade percent increase in potential accelerated sediment is essentially the same as Alternative A, for the minor differences, see Figures IV-2 and IV-3.

The estimated risk of a potential increase in accelerated sediment and turbidity to the beneficial uses of water for all Planning Basins ranges from **negligible** to **minor adverse.** The majority of the estimated risks are **negligible**, existing conditions are maintained.

CUMULATIVE EFFECTS For Alternative A-Departure, the 20 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 28 percent average variation in potential accelerated sediment over the first five decades For this Alternative, the Briggs, Indigo, and Silver Planning Basins would have an estimated **minor adverse** risk from sediment and turbidity.

Alternative B

DIRECT AND INDIRECT EFFECTS The level of timber harvest and road construction necessary for harvesting the average annual wood output of 36 8 MMCF per year in the first decade and 25.0 MMCF per year in the fifth decade would result in a 990,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers

Riparian Prescription B (12 Planning Basins) will maintain stream temperature, and Prescription C (6 Planning Basins) will improve stream temperature. Fourteen Supplemental Resource areas are allocated to provide soil and water protection to the high-risk inner-gorge areas.

The mean increase for decades 1-5 in potential accelerated sediment ranges by Planning Basin from below five percent for the Upper Illinois (5 percent) to over 30 percent for Indigo (39 percent).

The estimated risk of a potential increase in accelerated sediment and turbidity to the beneficial uses of water for all Planning Basins ranges from **moderate adverse** to **negligible (minor improvement).** Half of the estimated risks are **negligible**, existing conditions are maintained

CUMULATIVE EFFECTS For Alternative B, the 9-12 percent per-decade limit on disturbed acreage due to timber harvesting and road construction in six Planning Basins and 20 percent per decade in the remaining 12 Planning Basins results in a 35 percent average of variation in potential accelerated sediment over the first five decades. For this alternative, the East and West Forks Illinois, Rough/Josephine, Indigo, Lower Illinois, Galice/Slate, Silver, and Briggs Planning Basins would have an estimated **minor adverse** risk from sediment and turbidity. Indigo Planning Basin would have an estimated **moderate adverse** risk.

Alternative C

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 31.8 MMCF per year for decades 1-5 would result in a 1,076,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers.

Riparian Prescription B would be implemented in all Planning Basins to maintain stream temperature Two Supplemental Resource areas are allocated to provide soil and water protection to the high-risk inner-gorge areas

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies greatly by Planning Basin, ranging from below five percent for the Upper Illinois (5 percent) and Rough/Josephine (5 percent) to over 30 percent for the Indigo (39 percent) and Winchuck (34 percent)

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **moderate adverse** to **negligible** Half of the estimated risks are **negligible,** existing conditions would be maintained

CUMULATIVE EFFECTS. For Alternative C, the 20 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 44 percent average variation in potential accelerated sediment over the first five decades. For this Alternative, the Upper Rogue, Indigo, Galice/Slate, Lower Illinois, Briggs, Rough/Josephine, Winchuck, and East and West Forks Illinois Planning Basins would have an estimated **minor adverse** risk from sediment and turbidity. Indigo and Silver Planning Basins would have an estimated **moderate adverse** risk.

Alternative D

DIRECT AND INDIRECT EFFECTS The level of timber harvest and road construction necessary for harvesting the average annual wood output of 30 4 MMCF per year for decades 1-5 would result in a 970,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers

All Management Area allocations, Riparian prescriptions, and basin constraints are the same as Alternative B. The mean 1-5 decade percent increase in potential accelerated sediment is essentially the same as Alternative B; for the differences, see Figures IV-4 and IV-6

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **moderate adverse** to **negligible (minor improvement).** The majority of the estimated risks are about equally distributed between **minor adverse** and **negligible**

CUMULATIVE EFFECTS For Alternative D, the 9-12 percent per-decade limit on disturbed acreage due to timber harvesting and road construction in six Planning Basins and 20 percent per decade in the remaining 12 Planning Basins results in a 41 percent average variation in potential accelerated sediment over the first five decades For this alternative, the East and West Forks Illinois, Silver, Rough/Josephine, Lower Illinois, Galice/Slate, Briggs, and Pistol Planning Basins would have an estimated **minor adverse** risk from sediment and turbidity. Indigo Planning Basin would have an estimated **moderate adverse** risk.

Alternative D1

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 33 2 MMCF per year in decades 1-5 would result in a 942,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers

All Management Area allocations, Riparian prescriptions, and basin constraints are the same as Alternatives B and D. The mean 1-5 decade percent increase in potential accelerated sediment is essentially the same as Alternative B and D, for the differences, see Figures IV-4, IV-6, and IV-7

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **moderate adverse** to **negligible (minor improvement).** The majority of the estimated risks are about equally distributed between **minor adverse** and **negligible.**

CUMULATIVE EFFECTS The same description applies from Alternative B and D, except the average variation is 42 percent For this alternative, the Lobster, East and West Forks Illinois, Silver, Rough/Josephine, Lower Illinois, Galice/Slate, Briggs, and Pistol Planning Basins would have an estimated

minor adverse risk from sediment and turbidity Indigo Planning Basin would have an estimated **moderate adverse** risk

Alternative E

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 16 2 MMCF per year for decades 1-5 would result in a 510,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers.

Riparian areas (Minimum Level Prescription) and all 30 Supplemental Resource areas would be allocated to a level of management which precludes programmed timber harvest in stream and inner-gorge river areas The risk of potential adverse impacts on the water resource and values would be greatly minimized adjacent to most waterways.

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies by Planning Basin, ranging from below five percent for the Silver (1 percent), Upper Illinois (2 percent), Rough/Josephine (1 percent), and North Fork Smith (3 percent), to less than 30 percent for all other basins

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **negligible** to **negligible (moderate improvement)**. The majority of the estimated risks are **negligible (minor improvement)**.

CUMULATIVE EFFECTS. For Alternative E, the 9-13 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 17 percent average variation in potential accelerated sediment over the first five decades. The potential risk from sediment and turbidity for all Planning Basins is **negligible.**

Alternative G

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 20.5 MMCF per year in decades 1-5 would result in a 614,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers.

Riparian areas and 31 Supplemental Resource areas would be allocated to a level of management which precludes programmed timber harvest in stream and inner-river gorge areas. The risk of potential adverse impacts on the water resource and values would be greatly minimized adjacent to most waterways.

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies by Planning Basin, ranging from below five percent for the Silver (2 percent), Upper Illinois (2 percent), North Fork Smith (4 percent), and Rough/Josephine (2 percent), to less than 30 percent for all other basins.

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **negligible** to **negligible (moderate improvement)**. The majority of estimated risks are **negligible (minor improvement)**.

CUMULATIVE EFFECTS. For Alternative G, the 9-13 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 14 percent average variation in potential accelerated sediment over the first five decades. The potential risk from sediment and turbidity for all Planning Basins is **negligible**

Alternative K

DIRECT AND INDIRECT EFFECTS The level of timber harvest and road construction necessary for harvesting the average annual wood output of 27 8 MMCF per year for decades 1-5 would result in a 800,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers.

All Planning Basins, with the exception of the Elk-Sixes (Prescription C), would be managed with Riparian Prescription B Twenty-three Supplemental Resource areas that are of particular benefit to fish also reduce the potential risks of adverse impacts to soil and water values in the inner-river gorges

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies by Planning Basin, ranging from below five percent for the Silver (5 percent), Upper Illinois (4 percent), Rough/Josephine (3 percent), and North Fork Smith (5 percent), to less than 30 percent for all other basins.

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **minor adverse** to **negligible (minor improvement)** The majority of estimated risk is **negligible**, existing conditions maintained.

CUMULATIVE EFFECTS. For Alternative K, the 9-13 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 16 percent average variation in potential accelerated sediment over the first five decades The potential risk from sediment and turbidity for Indigo and Silver Planning Basins is **minor adverse**; all other Planning Basins are **negligible.**

Alternative M

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 6.1 MMCF per year for decades 1-5 would result in a 174,000 ton per-decade mean increase in potential accelerated sediment to streams and river.

Riparian areas (Minimum Level Prescription) and all Supplemental Resource areas would be allocated to a level of management which precludes programmed timber harvest. Potential impacts to soil and water values from risk of mass failures would be minimized.

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity is below 10 percent for all Planning Basins

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **negligible (minor improvement)** to **negligible (moderate improvement)** The majority of estimated risks are **negligible (moderate improvement)**

CUMULATIVE EFFECTS For Alternative M, the 9-13 percent per-decade basin limit on disturbed acreage due to timber harvesting and road construction would result in a 96 percent average variation in potential accelerated sediment over the first five decades. A smaller average variation in potential accelerated sediment could result in a reduced potential for adverse cumulative effects; however, the total acres impacted under this alternative for all basins are insignificant. The potential risk from sediment and turbidity for all Planning Basins is **negligible**

Alternative S

DIRECT AND INDIRECT EFFECTS. The level of timber harvest and road construction necessary for harvesting the average annual wood output of 29.0 MMCF per year for decades 1-5 would result in a 828,000 ton per-decade mean increase in potential accelerated sediment to streams and rivers. Fertilizer would be applied to increase commercial forest growth

Eleven Planning Basins would be managed with Riparian Prescription B, seven would be managed with a Prescription C. Twenty of the most productive Supplemental Resource areas for fish would be allocated to provide soil and water protection to the high-risk inner-gorge areas. Five other key streams and rivers are given additional protection through other land allocations with no programmed harvest

The mean increase for decades 1-5 in potential accelerated sediment for this level of activity varies by Planning Basin, ranging from below five percent for the Silver (4 percent), Upper Illinois (4 percent) and Rough/Josephine (3 percent), to less than 30 percent for all other basins.

The estimated risk of a potential increase in accelerated sediment to the beneficial uses of water for all Planning Basins ranges from **minor adverse** to **negligible (minor improvement)**. The majority of estimated risks are **negligible**; existing conditions maintained.

In a summary of six fertilization studies in the Douglas-fir region, Fredriksen and others (1975) concluded that peak concentrations of nitrogen never reached toxic levels. The observed peak concentrations were associated with direct application to water. No effect from fertilizer application is anticipated since precautionary project-level Standards and Guidelines will be taken to prevent direct application or fertilizer to streams, as well as buffer zones between treated areas and the streams.

CUMULATIVE EFFECTS. For Alternative S, the 7-17 percent per-decade basin limit on disturbed acreage due to timber harvest and road construction would result in a 16 percent average variation in potential accelerated sediment over the first five decades. The potential risk from sediment and turbidity for Indigo and Silver Planning Basins is **minor adverse**; all other Planning Basins are **negligible.**

SEDIMENT INCREASE BY BASIN AND ALTERNATIVE

Figures IV-1 through IV-12 show the mean decade percent increase (decades 1-5) in potential accelerated sediment, and the maximum percent decade increase (decades 1-5) for each alternative by basin The mean and peak decade percent increase in sediment shown in Figures IV-1 through IV-12 was used to help estimate the potential risk from increased sediment and turbidity by alternative for each Planning Basin. See **ENVIRONMENTAL EFFECTS BY PLANNING BASIN** located in the **FISH** section for these ratings.

The percent increase in the figures is computed based on an estimate of current sediment production on the Forest Current sediment production consists of natural erosion and human-induced erosion from existing road systems. Of the 20 original Planning Basins, only 19 remain. Basin 18 was combined with two other Planning Basins. Basin 14, the Upper Chetco, is entirely within the Kalmiopsis Wilderness. The Planning Basins are shown in Figure III-8

The sediment yield estimates should not be considered as absolute amounts, but rather as an **index** for comparing the relative risk to water quality and beneficial uses between alternatives. Sediment yield estimates were made based on geomorphic indices for natural surface and channel erosion, an aerial photograph inventory of landslides on the Forest between 1956 and 1976 for estimating the natural and management-related rate of landslides, and literature to estimate potential surface erosion for management activities. Considering the fact that several major floods, including the 1964 flood (a 100-year runoff event), occurred within the aerial photograph landslide inventory period, the estimate of mass movement-related sediment for management activities is probably greater than would be expected under a normal long-term average. Additionally, the sediment calculations do not totally account for current BMP's for road construction and timber harvesting in use today.

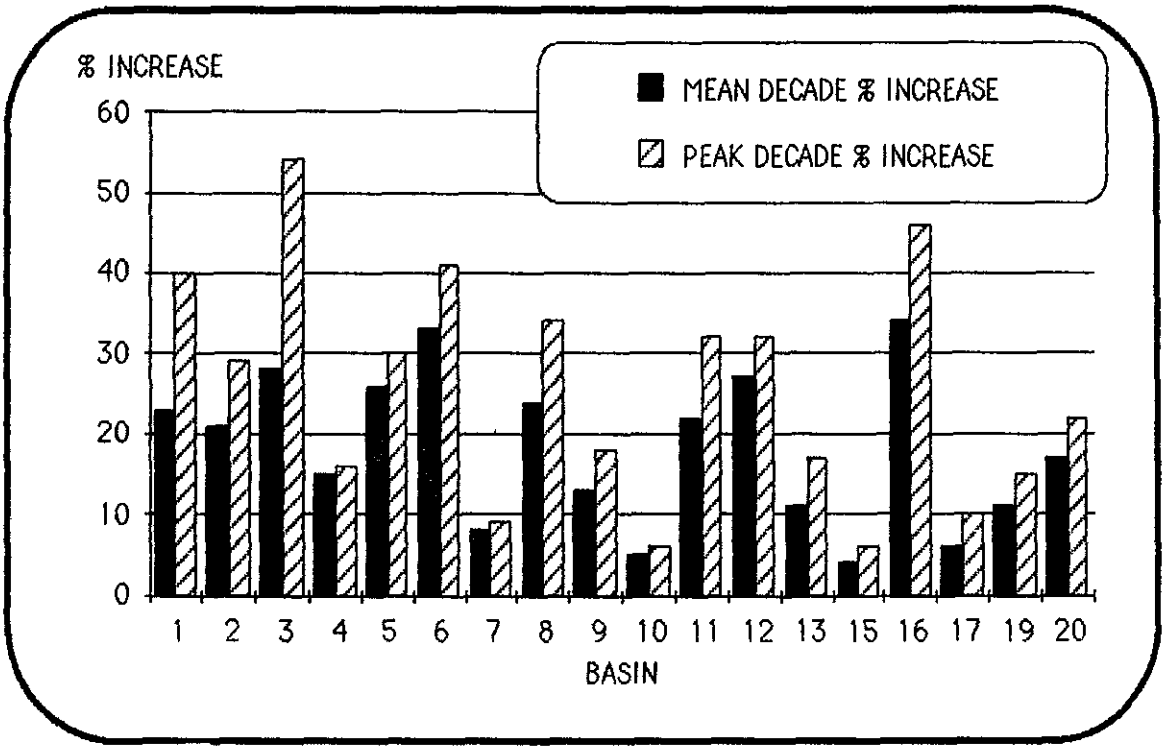


Figure IV-1. Alternative NC Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

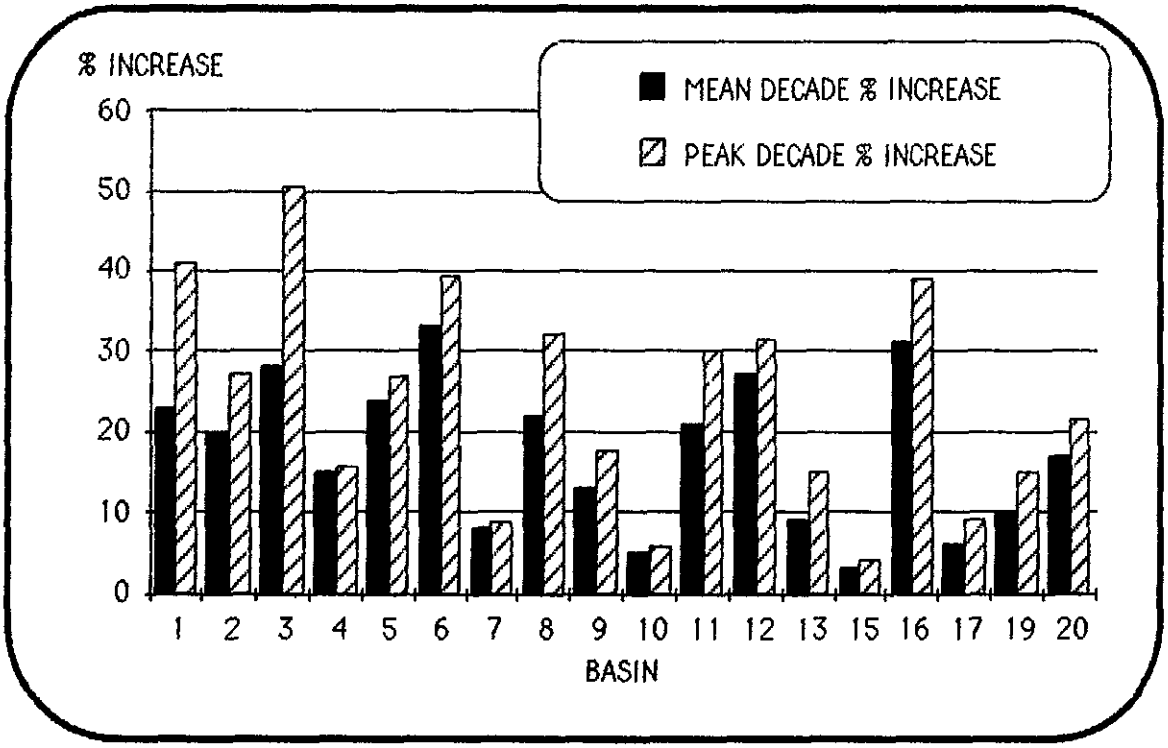


Figure IV-2. Alternative A Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

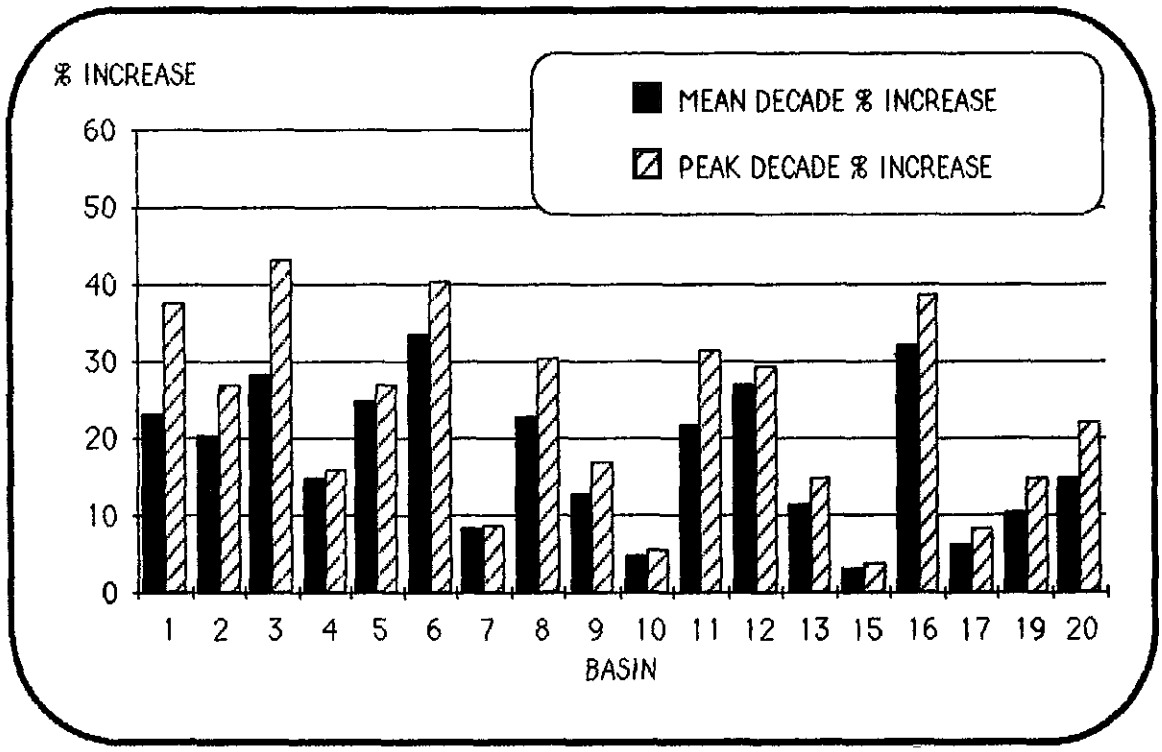


Figure IV-3. Alternative A-Dep Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

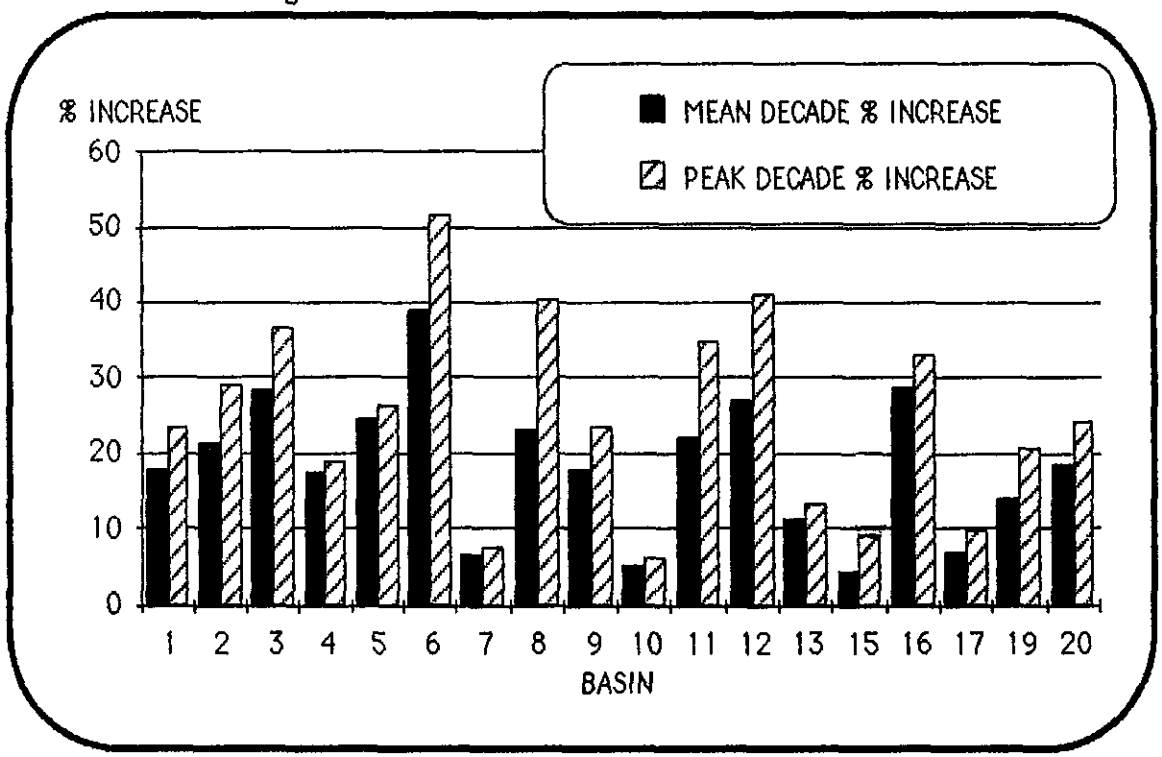


Figure IV-4. Alternative B Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

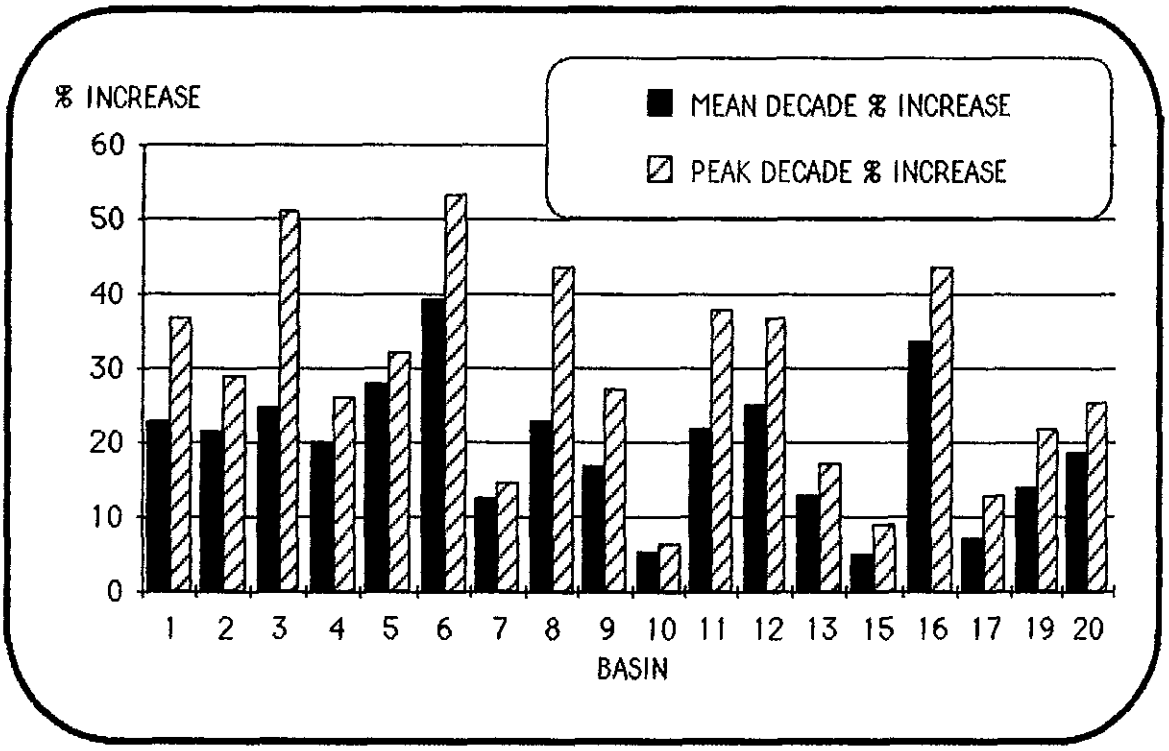


Figure IV-5. Alternative C Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

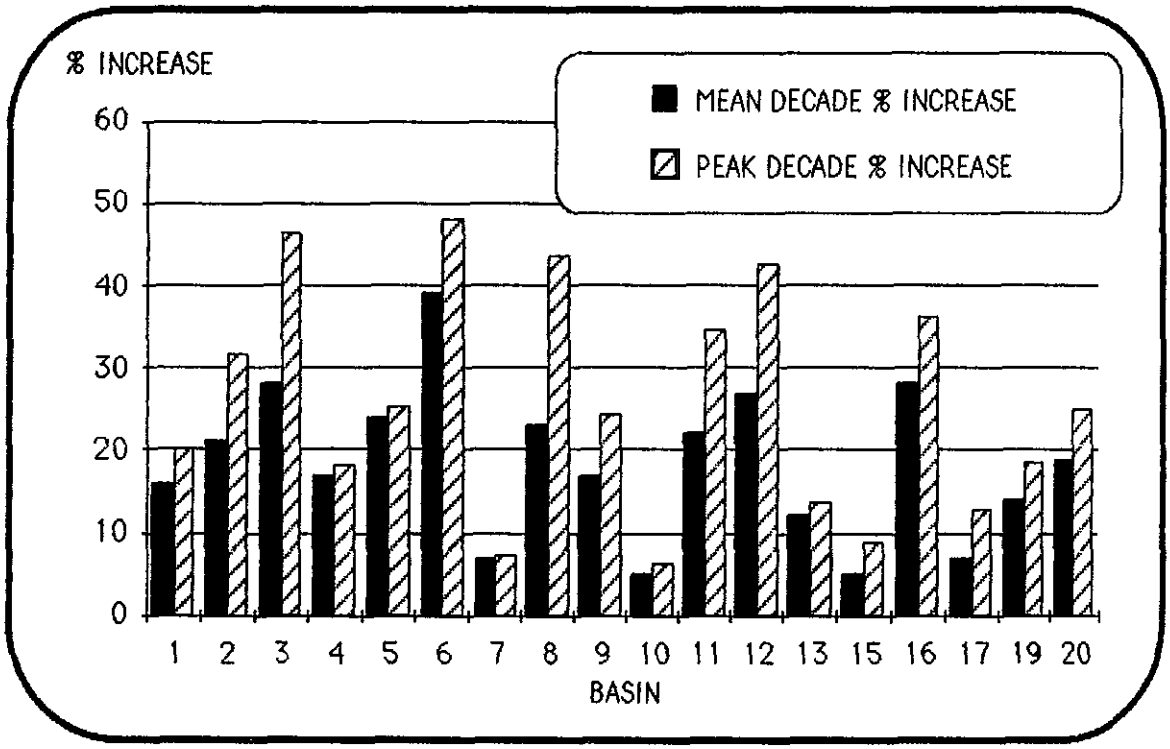


Figure IV-6. Alternative D Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

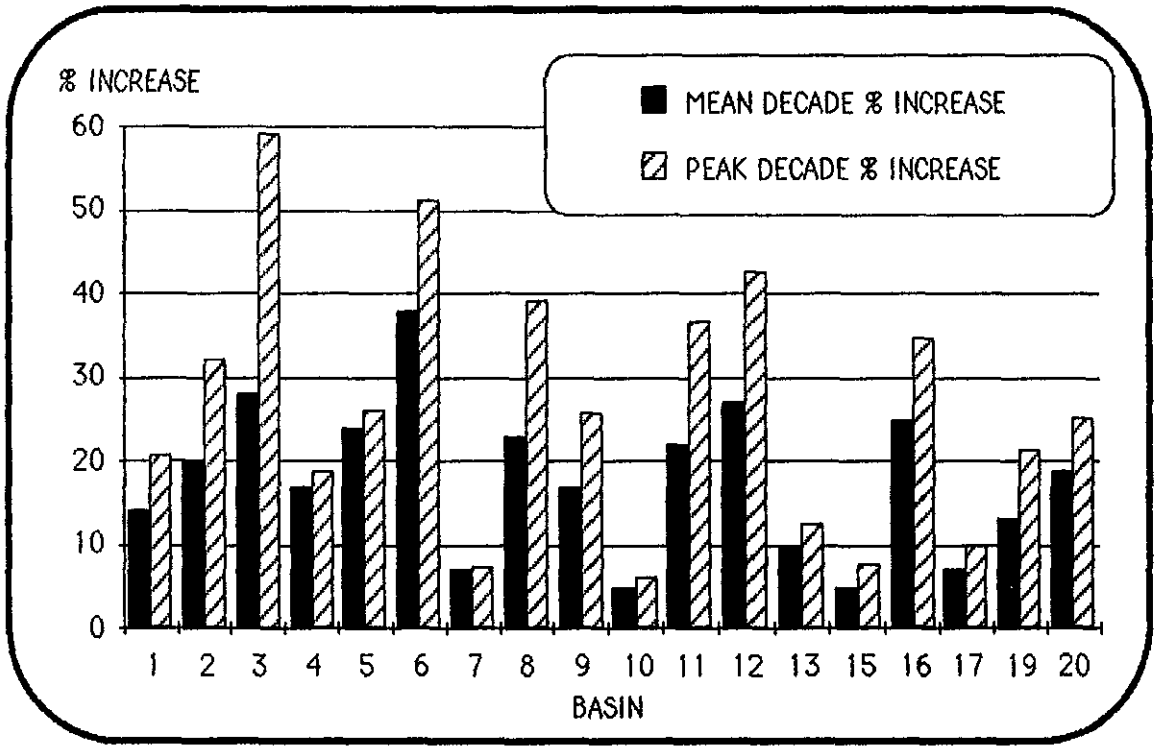


Figure IV-7. Alternative D1 Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

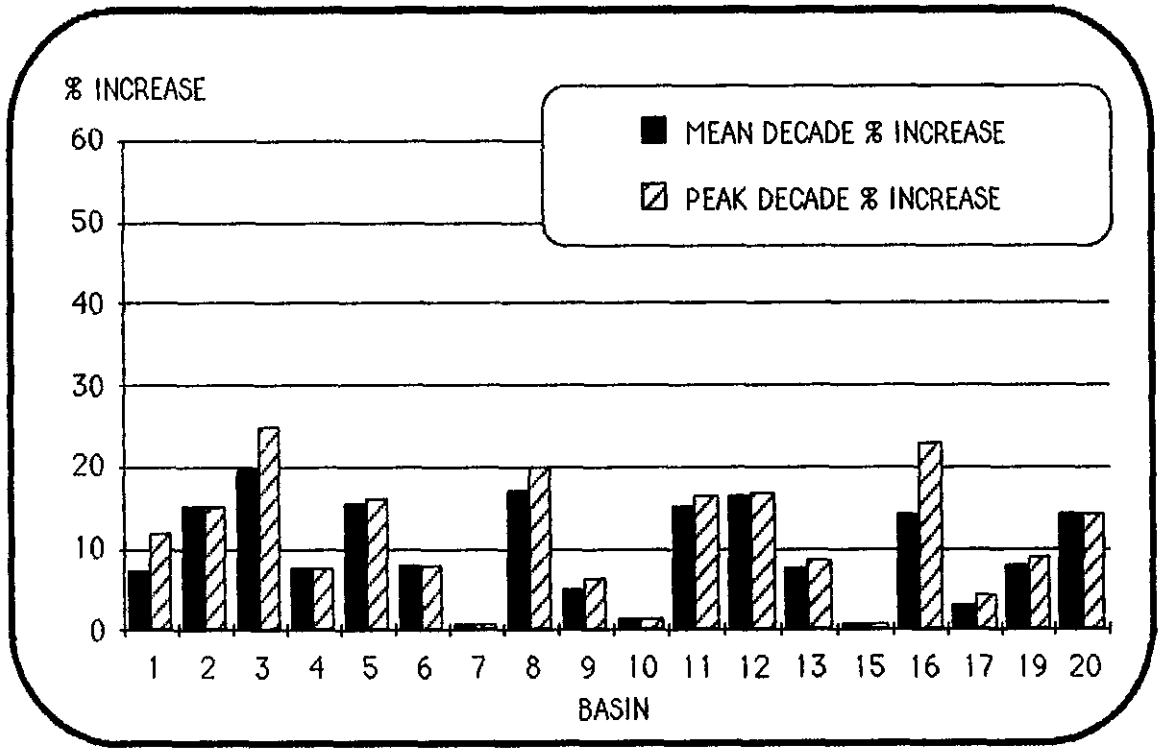


Figure IV-8. Alternative E Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

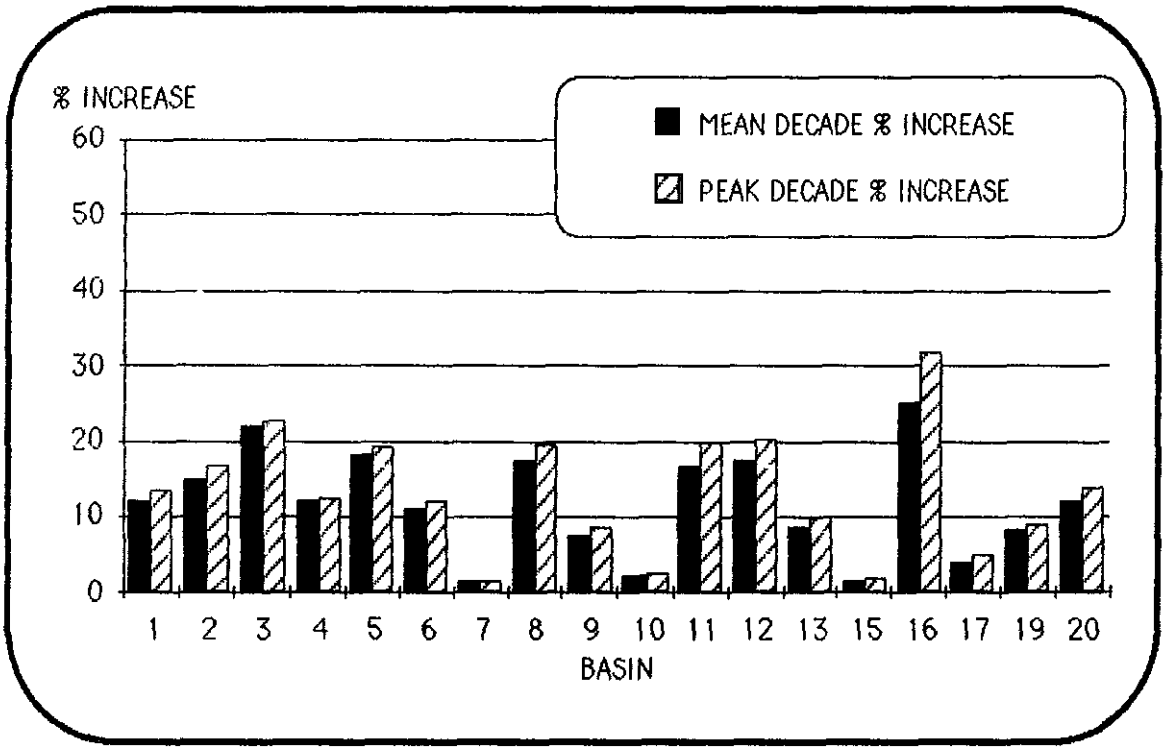


Figure IV-9. Alternative G Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

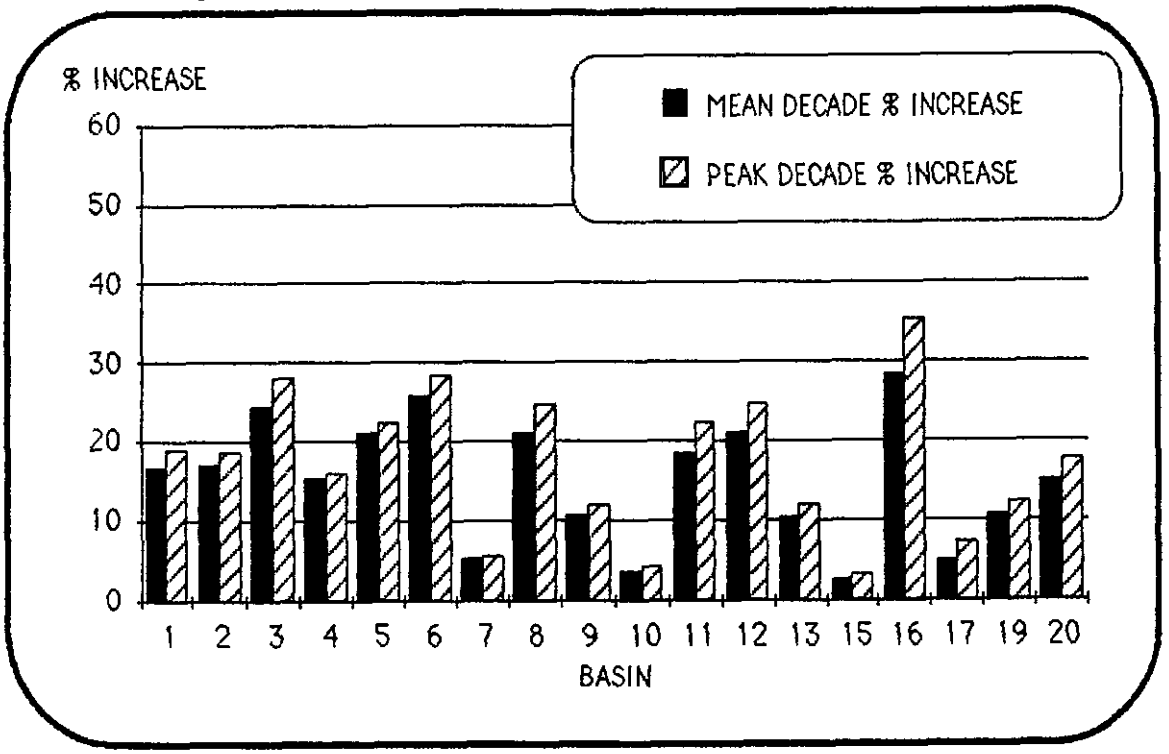


Figure IV-10 Alternative K Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

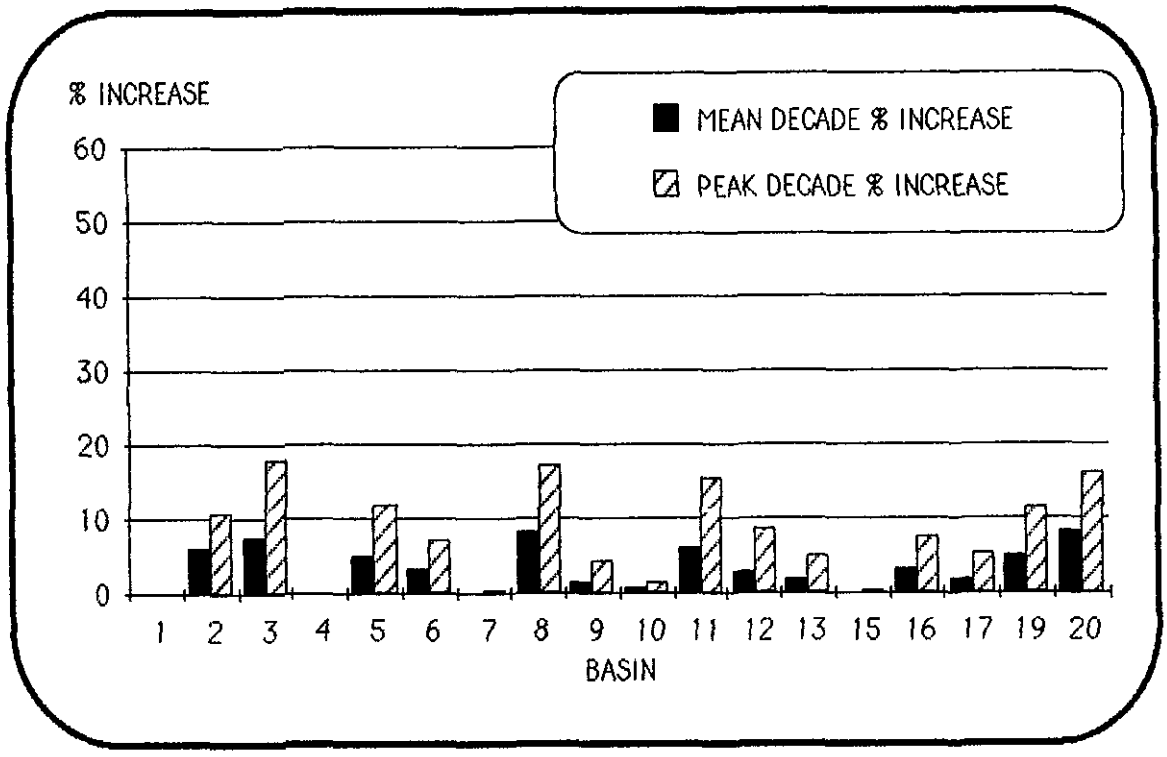


Figure IV-11 Alternative M Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

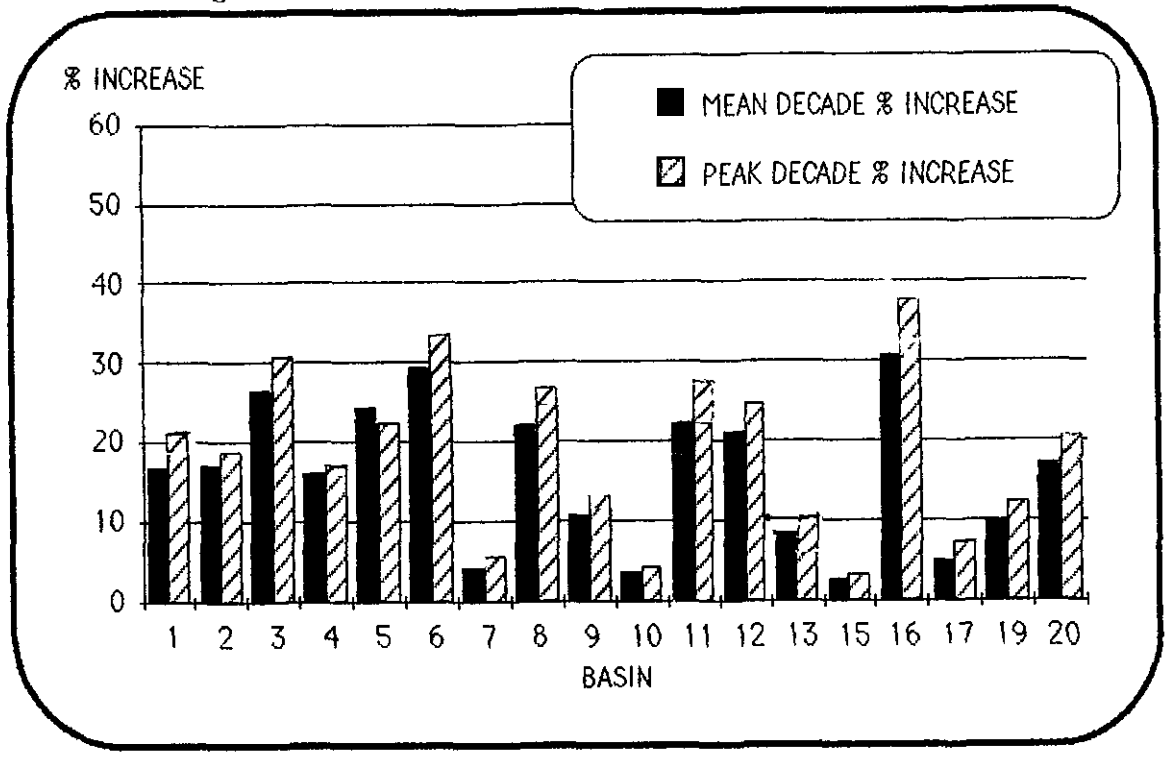


Figure IV-12 Alternative S Mean Decade Percentage Increase in Accelerated Sediment by Basin with Peak Decade Percentage Increase

FIRE

SIGNIFICANT INTERACTIONS

The various land allocations and the associated agency activities and public consumption will interact with the Fire environmental component by increasing or decreasing the "risk" and "hazard" associated with the fuels component of the fire environment Microclimate, an element of the weather component of the fire environment, will also be affected The interactions are complex and range from short-term to long-term and may produce positive or negative impacts on the Forest's resources and the ability to protect those resources.

For example, General Forest, Partial Retention Visual, Retention Visual, Riparian, and Scenic and Recreation River allocations (Management Areas 10-14), allow timber harvest operations In the short term, these operations present a significant risk and generate large amounts of slash which contribute to the development and rapid spread of high intensity wildfires The harvest operations also open up the vegetative canopy, creating a hotter and drier microclimate which affects fire behavior In the long term, however, timber harvest activities and the associated fuels treatment will create a mosaic pattern in the vegetation (diversity) which will serve to reduce the potential development and spread of large fire, its intensity, and the potential for resource damage and high suppression costs

Even-aged management is the predominant silvicultural system utilized in General Forest. Good spatial distribution of the units will, over time, develop a mosaic of age classes and non-uniform fuel profiles that will be more resistant to the spread of a major wildfire than will a homogeneous stand condition. The large tracts of existing even-aged timber with interlocking crowns, large accumulations of surface fuels, and understory vegetation which provide an excellent fire ladder, would be broken up by an array of areas with relatively low flammability ranging in size from 2 to 60 acres, with an anticipated average of 20 to 30 acres. The post-treatment fuel loadings left on these sites would be less than 30 tons per acre. The effectiveness of a fire suppression organization would be increased as a result of the discontinuous fuel profiles.

The units would remain relatively fire resistant until silvicultural activities, such as chemical or manual release, and precommercial thinning begin to contribute to the buildup of fuels in the 0 to 3 inch size classes within the first decade in the stand rotation. Harvest clearcuts will eventually develop into even-aged, dense conifer plantations with a potential for high rates of spread. The plantations create a more hazardous fuels complex when these dense stands cover old logging slash. The potential rate of spread will drop sharply and then start to increase again after each commercial thinning operation and accompanying fuels treatment

Silvicultural systems, such as shelterwood, seed tree, single-tree selection, and group selection, will also serve to modify the vegetation. This in turn will serve to reduce the spread of a major fire, but to a lesser degree than clearcutting These systems will be more predominant in the Retention Visual, Partial Retention Visual, Riparian, and Scenic/Recreation River Management Area allocations

Site-specific microclimates will be modified as a result of the activities associated with land allocations. Road construction, timber harvest, and thinning will open up the forest canopy and increase the amount of sunlight and wind at ground level. Countryman (1955) estimated that opening a virgin mixed-conifer stand could increase the rate of fire spread up to 4.5 times. This considers only the changes due to microclimate and not any additional rate of spread increase due to the additional fuels on the site. Morris (1941) reports that the fire weather in harvest clearcut Douglas-fir units in western Oregon will be seven times more severe than in adjacent, uncut timber under similar conditions. The potential for an ignition source (lightning strike, spark, etc) causing a detectable fire is increased in the hotter and drier microclimates

One of the paradoxes of modern fire exclusion and over-protection practices is that those areas most protected become the most susceptible, and dangerous for fires. Numerous small fires create both diversity and protection against the worst ravages of fire storms which devastate more uniform, climax forests (Lewis 1982).

Fuels complexes are dynamic and based on the cyclic nature of vegetative types and stages in the area (Martin and Brackebusch 1974) Continued suppression of wildfires frequently leads to the development of timber stands dominated by shade-tolerant species (Spurr and Barnes 1973). Species composition of the stand and fire suppression result in fuel accumulations above natural levels A climatic pattern of warm, dry summers and wet, cool or cold winters leads to maximum accumulations of dead fuels (Dodge 1972) Past suppression activities and inadequate fuel management programs, too, have enhanced the threat of wildfires by allowing fuel loads in the forest to accumulate to unnaturally high levels (Davis and Cooper 1963; Vogl 1971; Hall 1977).

The treatment or reduction of natural fuels accumulations goes a long way toward reducing the intensity and potential spread of wildfire Selected fuels complexes can be treated to reduce the fuel continuity and protect resources in critical areas Large areas can be treated with prescribed fire which would result in a mosaic of fuels complexes.

Recreation opportunities, timber harvest, and harvest-related activities affect the risk of human-caused fires. No specific numbers are available to correlate the relationship between activities and use, and the number of human-caused fires, but it is generally accepted that as activities and uses increase, the risk of an ignition also increases. Industrial operations present a high risk of ignition. This high risk is compounded by the high fuel hazard that concurrently exists on the site

Prescribed fire, as an agency activity, also constitutes a legitimate risk of ignition. The risk is twofold. First, there is the risk of fire escaping at the time of fire application. Later, there is the risk of ignition due to holdover embers

The risk associated with motorized recreation is related to the miles of road maintained for public use. Areas not presently available become so as timber harvest activities expand the road network. This improved access would then increase the risk of a human-caused fire in areas where this previously has not been a problem. The risk is compounded by motorcycle and all-terrain-vehicle (ATV) users who would still make use of the many miles of nonmaintained roads.

Dispersed recreation facilitates a broader distribution of risk than developed recreation. With dispersed recreation, the Forest visitor will be using natural or otherwise-unimproved areas Forest-wide. Developed recreation will focus risk in specific locations such as campgrounds or day-use areas

ENVIRONMENTAL EFFECTS AND MITIGATION

The effects of the distribution of land allocations across the alternatives on fire is best approached through an analysis of risk and hazard Risk and hazard are terms that are not easily quantified. The analysis is broad scale and the effects are based on the "best professional judgement" of fire management professionals. The analysis also assumes that fire management direction spelled out in the Standards and Guidelines are followed, especially those relating to fuels treatment. More detailed assessments are possible, however, for site-specific areas The reference point for the analysis of effects is the existing condition discussed in Chapter III.

Alternatives NC, A and A-Departure

DIRECT EFFECTS. About 35 percent of the Forest will be allocated to General Forest. Harvest activities will develop a mosaic of nonuniform fuel complexes by the end of the eighth decade. An additional 36 to 38 percent of the Forest will be modified to a lesser degree in the Management Areas 10-13.

The acres of fuels mosaic generated through the land allocations will be supplemented by 60 acres annually of natural fuels treatment in General Forest beginning in the first decade and up to 750 acres annually of hardwood conversion Prescribed fire will be utilized to treat approximately 3,400 acres of activity fuels annually in the first decade.

INDIRECT EFFECTS. The risk of a human-caused ignition will be affected by the 2,528 miles of road open to the public. Industrial operations will distribute the risk of an operations-related fire over 70 percent of the Forest

CUMULATIVE EFFECTS The expected annual loss to wildfire (based on 1970-1979 data) will be 215 acres The potential for large fires (fires of several thousand acres) will be reduced in allocations having timber harvest activities Fuels accumulations and the potential for a major fire will continue to increase in Wildernesses due to fire exclusion. The hazard presented by fuels accumulations in the Wild Rogue Wilderness will be compounded by recreation use in the river corridor.

Alternatives B, D and D1

DIRECT EFFECTS. About 50 percent of the Forest will be allocated to General Forest Harvest activities will complete a mosaic of nonuniform fuel complexes by the end of the ninth decade An additional 20 percent of the Forest will be modified to a lesser degree in Management Areas 10-13.

The acres of fuels mosaic generated through the land allocations will be supplemented by 400 acres annually (250 acres for Alternative B) of natural fuels treatment. This program will emphasize treatment of Wilderness, particularly the Kalmiopsis and Wild Rogue Planned ignitions and limited use of unplanned ignitions (lightning) will play a role Hardwood conversions up to 1,400 acres annually may also make a contribution to the vegetation or fuels mosaic on General Forest lands

Prescribed fire will be utilized to treat approximately 4,000 to 4,200 acres of activities fuels annually in the first decade.

INDIRECT EFFECTS The risk of a human-caused ignition will be affected by 2,554 miles of road open to the public. Industrial operations will distribute risk over 72 percent of the Forest.

CUMULATIVE EFFECTS The expected annual loss to wildfire will be 171 acres The potential for large fires will be reduced in allocations dominated by timber harvest activities The potential for large damaging fires in the Wilderness, or the potential for a fire escaping from the Wilderness and causing extensive resource damage to surrounding General Forest lands, will also be reduced

Alternative C

DIRECT EFFECTS. About 52 percent of the Forest will be allocated to General Forest. Harvest activities will complete a mosaic of nonuniform fuel complexes by the end of the eighth decade. Another 19 percent of the Forest will be modified to a lesser degree in Management Areas 10-13.

The acres of fuels mosaic generated through the land allocations and hardwood conversions are the same as described in Alternatives D and D1. Prescribed fire will be utilized to treat approximately 5,000 acres of activity fuels annually in the first decade.

INDIRECT EFFECTS. The risk of a human-caused ignition will be affected by 2,578 miles of road open to the public Industrial operations will distribute risk over 72 percent of the Forest.

CUMULATIVE EFFECTS. The expected annual loss to wildfire will be 171 acres The potential for large fires will be reduced in allocations dominated by timber harvest activities The potential for large damaging fires in the Wildernesses, or the potential for a fire escaping from Wilderness and causing extensive resource damage to surrounding General Forest, will also be reduced.

Alternative E

DIRECT EFFECTS. About 22 percent of the Forest will be allocated to General Forest Harvest activities will develop a mosaic of nonuniform fuel complexes by the end of the seventh decade Another 19 percent of the Forest will be modified to a lesser degree in Management Areas 10-13.

Almost 49 percent of the Forest would be assigned to Wilderness and Backcountry Recreation Much of this area would be considered old growth by the end of the fifteenth decade. Fuel accumulations will be heavy and continuous, and the vegetative canopy will be closed and continuous over large acreages. The old-growth stands will be vulnerable to a large, high intensity wildfire

The acres of fuels mosaic generated through allocations will be supplemented by 400 acres annually of natural fuels treatment. This program will emphasize treatment of lands under Backcountry Recreation and fuels in other high risk areas outside of Wilderness Prescribed fire will be utilized to treat nearly 2,200 acres of activity fuels annually in the first decade.

INDIRECT EFFECTS The risk of a human-caused ignition will be affected by the 2,022 miles of road open to the public. Industrial operations will distribute risk over only 41 percent of the Forest as all existing unroaded and undeveloped areas will remain in a roadless condition.

CUMULATIVE EFFECTS. The expected annual loss to wildfire in the first decade will be 171 acres The potential for large fires will be reduced in allocations dominated by timber harvest activities. The potential for large damaging fires in Wildernesses will increase due to the combination of fire exclusion and the lack of natural fuels treatment

Alternative G

DIRECT EFFECTS. About 26 percent of the Forest will be allocated to General Forest. Harvest activities will develop a mosaic of nonuniform fuel complexes by the end of the seventh decade. Another 23 percent of the Forest will be modified to a lesser degree in Management Areas 10-13

Another 35 percent of the Forest would fall under Wilderness and Backcountry Recreation management. Most of these acres would be considered old growth by the end of the fifteenth decade. Fuel accumulations will be heavy and continuous; vegetative canopy will be closed and continuous over large acreages. The old-growth stand will be vulnerable to a large, high intensity wildfire.

The acres of fuels mosaic generated through allocations will be supplemented by 400 acres annually of natural fuels treatment. Fuels treatment will be emphasized in Wilderness and other high risk areas outside of Wilderness Planned ignitions, as well as unplanned ignitions (lightning) will play a role in Wilderness. High intensity prescribed fires ignited by lightning would be acceptable in those portions of the Kalmiopsis with a Primitive ROS classification. Only low-intensity lightning fires would be managed as prescribed fires in the Wild Rogue Wilderness. Hardwood conversions up to 400 acres per year could contribute to the vegetation or fuels mosaic on General Forest lands Prescribed fire would be utilized to treat approximately 2,600 acres of activity fuels annually in the first decade

INDIRECT EFFECTS The risk of a human-caused ignition will be affected by 2,304 miles of road open to the public. Industrial operations will distribute risk over 49 percent of the Forest.

CUMULATIVE EFFECTS. The expected annual loss to wildfire in the first decade will be 171 acres. The potential for large fires will be reduced in allocations with timber harvest activities The potential for large damaging fires in Wilderness will decrease as will the resource impacts of fires in the areas receiving treatment The potential exists for damage to forest resources (primarily the soil resources) in Wilderness where high intensity prescribed fire is permitted.

Alternative K

DIRECT EFFECTS. About 43 percent of the Forest will be allocated to General Forest. Harvest activities will develop a mosaic of nonuniform fuel complexes by the end of the seventh decade. An additional 23 percent of the Forest will be modified to a lesser degree in Management Areas 10-13.

Another 23 percent of the Forest would be allocated to Wilderness and Backcountry Recreation. Most of these acres would be considered old growth by the end of the fifteenth decade. The fuels accumulations will be heavy and continuous; the vegetative canopy will be closed and continuous over large acreages. The old growth will be vulnerable to a large, high intensity wildfire.

The acres of fuels mosaic generated through allocations will be supplemented by 400 acres annually of natural fuels treatment This program will emphasize fuels treatment on lands in Wilderness and other high risk areas outside of Wilderness. Planned ignitions, as well as unplanned ignitions (lightning), will play a role in the Wildernesses. High intensity prescribed fires ignited by lightning would be acceptable in those portions of the Kalmiopsis with a Primitive ROS classification Only low-intensity lightning fires would be managed as prescribed fires in the Wild Rogue Wilderness. Limited amounts of hardwood conversions up to 750 acres annually would also contribute to the fuels mosaic on General Forest lands. Prescribed fire will be utilized to treat approximately 3,600 acres of activity fuels annually in the first decade.

INDIRECT EFFECTS. The risk of a human-caused ignition will be affected by the 2,202 miles of road open to the public Industrial operations will distribute risk over 66 percent of the Forest.

CUMULATIVE EFFECTS. The expected annual loss to wildfire in the first decade will be 171 acres. The potential for large fires will be reduced in allocations having timber harvest activities. The potential for large damaging fires in Wilderness will decrease as will the resource impacts of fires in the areas receiving treatment. The potential exists for damage to forest resources (primarily the soil resources) in the Wildernesses where high intensity prescribed fire is permitted.

Alternative M

DIRECT EFFECTS Approximately 21 percent of the Forest will be allocated to General Forest Harvest activities will complete a mosaic of nonuniform fuel complexes in some future decade. The rate of conversion as old-growth stands and areas accessed by existing roads would not be managed the same as the other alternatives. An additional 17 percent of the Forest will be modified to a lesser degree Management Areas 10-13.

About 48 percent of the Forest would be allocated to Wilderness and Backcountry Recreation. Most of these acres would be considered old growth by the end of the fifteenth decade The fuels accumulations will be heavy and continuous, the vegetative canopy will be closed and continuous over large acreages. The old growth will be vulnerable to a large, high intensity wildfire

The annual 400 acres of natural fuels treatment will not contribute significantly to the overall reduction in the potential of a major wildfire, but the treatments will enhance the ability to protect sensitive resources

and improvements from fire damage. Prescribed fire will be utilized to treat approximately 600 acres of activity fuels annually in the first decade.

INDIRECT EFFECTS. The overall risk of a human-caused ignition should not increase. No new roads, accompanied by road closures, will limit access to many areas, thereby concentrating the risk in general areas. Only 2,116 miles of road will be open. The risk associated with dispersed recreation may increase Risk associated with industrial operations will be limited to 39 percent of the Forest.

CUMULATIVE EFFECTS The expected annual loss to wildfire in the first decade will be 171 acres. This objective will become harder to sustain in future decades as the amount of old growth increases and becomes more vulnerable to a stand replacement type of fire. Fuels accumulation and the potential for a major fire will continue to increase in Wilderness with fire exclusion. The hazard presented by fuels accumulations in the Wild Rogue Wilderness will be compounded by recreation use in the corridor.

Alternative S

DIRECT EFFECTS. About 35 percent of the Forest will be allocated to General Forest. Harvest activities will develop a mosaic of nonuniform fuel complexes by the end of the seventh decade An additional 22 percent of the Forest will be modified to a lesser degree in Management Areas 10-13.

Another 31 percent of the Forest would in Wilderness and Backcountry Recreation Most of these acres would be considered old growth by the end of the fifteenth decade. The fuels accumulations will be heavy and continuous; the vegetative canopy will be closed and continuous over large acreages The old-growth stand will be vulnerable to a large, high intensity wildfire.

The acres of fuels mosaic generated through allocations will be supplemented by 400 acres annually of natural fuels treatment This program will emphasize fuels treatment on lands in Wilderness and other high risk areas outside of Wilderness. Planned ignitions, as well as unplanned ignitions (lightning), will play a role in Wilderness High intensity prescribed fires ignited by lightning would be acceptable in portions of the Kalmiopsis with a Primitive ROS classification Only low intensity lightning fires would be managed as prescribed fires in the Wild Rogue Wilderness. Limited hardwood conversion, up to 750 acres annually, would also contribute to the fuels mosaic on General Forest Prescribed fire will be utilized to treat approximately 3,600 acres of activity fuels annually in the first decade

INDIRECT EFFECTS. The risk of a human-caused ignition will be affected by 2,211 miles of road open to the public. Industrial operations will distribute risk over 66 percent of the Forest

CUMULATIVE EFFECTS. The expected annual loss to wildfire in the first decade will be 171 acres. The potential for large fires will be reduced in land allocations having timber harvest activities The potential for large damaging fires in Wilderness will decrease as will the resource impacts of fires in the areas receiving treatment. The potential exists for damage to forest resources (primarily the soil resources) in the Wildernesses where high intensity prescribed fire is permitted

VEGETATION

SIGNIFICANT INTERACTIONS

Almost all land allocations and their ensuing activities have a direct or indirect effect on the vegetation For example, the General Forest allocation indirectly affects the age-class distribution of tree species. The actual harvest activity, in turn, directly affects the amount and distribution of old-growth stands only as consumption of the stand is realized. Such an interaction is significant because the amount, and the rate, of liquidation of old-growth stands is an important planning issue that affects southwestern Oregon.

Hardwood Conversion

Conversion of hardwood stands to conifer stands will affect species abundance, forest structure, and overall diversity Species composition is only slightly affected since most hardwoods will resprout after treatment The major change is relative cover or dominance Conifers, not hardwoods, will dominate the site. In coastal sites where tanoak is climax, manzanita and ceanothus will be part of the preconversion complement of shrub species. Most of the herbs will still exist in the area, but in isolated patches where disturbance was minimal. Normally, pioneer species are introduced and overall diversity is higher immediately following conversion However, the pioneers are usually short lived and quickly rot while the preconversion species begin to reach previous levels after approximately ten years It is in this period that vegetation management activities are most needed on General Forest acres. Heavy competition from resprouting hardwoods would otherwise affect survival and growth of the crop trees. Twenty-five years following burning, the invading pioneer species are significantly reduced (Kraemer 1977) This immediate effect is of local significance.

Effects on biological diversity depend on the amount and location of land converted and scale Viewed as a local basin effect, the impacts may be significant; but viewed as a Forest-wide process, the effects may be insignificant. Of importance is the juxtaposition of areas converted Silvicultural considerations as well as the number of acres converted should follow the Standards and Guidelines in order to minimize cumulative impact. If areas converted are distributed such that the remaining uncut hardwood stands remain well connected either to each other or via riparian areas, impacts are likely to be insignificant. Managers should be looking for the most productive sites for conversion (tanoak series). Under those alternatives that provide for hardwood conversion, the overall effect on diversity is insignificant.

Land Allocation

The most significant interaction is brought about by the activities related to the land allocations. The status of vegetation relative to old growth, diversity, timber, and sensitive plants are indirectly, but significantly, affected by the land allocation process and the site-disturbing activities permitted Management Areas 1-9 allow natural processes to shape forest composition and structure more so than Management Areas 12-14 For a full discussion of the alternatives as they relate to sensitive plants, Botanical Areas and Research Natural Areas, refer to the **SENSITIVE PLANTS** section of this chapter.

RESPONSE TO PLANNING PROBLEMS

Several Planning Problems relate to vegetation; however, Planning Problem #1, "How much timber should the Forest produce?," and #2, "How much old-growth forest should be preserved?" have the greatest impact on vegetation This analysis takes a holistic approach to vegetative management and diversity in response

ENVIRONMENTAL EFFECTS AND MITIGATION

The effects of alternatives and consequent management activities on the vegetative component of the environment are directly related to the intensity of consumption set by the particular alternative. Timber

harvest activities are significant, direct and cumulative. Alternative M, the least consumptive relative to timber, has the least direct effect on the vegetation, but the greatest indirect effect Indirectly, the existing vegetative character is at risk of high intensity wildfire and/or epidemics It will be difficult to prolong the character of older age classes without an active program of fuel and stand maintenance. Another option is to accept the effects of natural disturbances, such as fire and epidemics, on the vegetation in these areas, and their influence on adjacent areas with different land allocations Alternatives C and D1 have the greatest direct effect on age-class distribution.

Harvest levels are the highest among Alternatives NC, B, C, D, and D1 and the rate of conversion of older, less productive age classes to managed status is the fastest. Streamside vegetation is managed in all the alternatives except E and M. The intensity of activity in riparian areas is governed by the Standards and Guidelines, but the option to remove volume and manage for structure and disturbances exists Harvesting requires roads. The alternatives that have the highest level of harvest have the highest level of road construction Road and trail construction have a direct effect on the vegetation, but are concentrated and usually of only local significance to the vegetation composition and structure

IMPACTS COMMON TO ALL ALTERNATIVES

Although harvest levels differ by alternative, the direct effects of timber management activities are basically the same for each. Only the spatial extent to which they are applied and the rate of harvest differ. Harvest rates by alternative are dealt with in detail in Chapter II. The major cumulative effect is the change in age-class distribution as the old growth is harvested. The composition of those areas allocated to management that include harvest (Management Areas 10-14) would continue to shift from mature and old-growth stands toward more seedling, sapling, and pole stands. Continuing this management for several decades would result in a dispersion of stands from newly regenerated seedlings to mature stands at harvest age

The absolute amount of younger age classes will not have significant effects on the vegetation or site potential. Only local effects, such as minor changes in microclimate, will be experienced. Such changes will have indirect effects on the growth and survival of both planted and natural vegetation. The placement of harvest units, for example, affects the flow of heat or cold. Cold air pockets and exposed southern slopes can be difficult to reforest.

Arrangement of harvest units may also be used to facilitate animal travel and associated seed dispersal. Where patches of old growth are being saved to provide habitat for sensitive plants, consideration of the size, amount, and quality of edge is important Generally, the smaller the patch and the greater the amount of edge, the less the total patch will climatically resemble old-growth environment. In many cases, managers can use harvest unit arrangement to modify microclimate in favor of sensitive species. In all cases, application of the Standards and Guidelines related to basin-cutting levels will assure species viability.

Wildfires have been a key process in creating a diversity in composition and structure. Low intensity fires are common in nature and often effect composition and structure of the vegetation. High intensity fires, on the other hand, do not often totally destroy vegetation over a great extent. Islands of trees or individual trees are often left in the wake of such fires. Patches are usually left, particularly in riparian zones and on north slopes. These stands or individuals usually provide natural seed for regeneration. Over the first rotation, potential effects of wildfire on vegetation differs through the alternatives High preservation alternatives greatly increase the risk of large intense fires, whereas alternatives that create more roaded areas provide more opportunity for fuel management.

SPECIAL MANAGEMENT CONSIDERATIONS

Port-Orford-cedar

Management of Port-Orford-cedar is consistent through all the alternatives. Application of Standards and Guidelines is intended to minimize or negate any artificial increase in the rate of root disease spread Appropriate practices identified from experience and research will be applied on a site or drainage-specific basis to prevent or reduce the spread and severity of Port-Orford-cedar root disease

Port-Orford-cedar management is based on a Forest Service manual supplement and standards developed from work by Harvey, Hadfield, and Greenup (1985); "Ecology, Pathology, and Management of Port-Orford-cedar (*Chamaecyparis lawsoniana*)" by Zobel, Roth, and Hawk (1985); and by the Port-Orford-cedar consensus group, whose membership included industry, agency, and university personnel as well as conservation-minded citizens.

Of special significance to the management of Port-Orford-cedar is the Region Five-Region Six Port-Orford-cedar Root Disease Action Plan dated June 29, 1988. In short, this document provides the support and the direction to manage for the viability and continued presence of Port-Orford-cedar in the ecosystem throughout its native range on Forest Service lands.

For Port-Orford-cedar, the major differences between alternatives are related to the harvest and recreation level, because it is suspected that the rate of root rot spread is related to road construction, road travel, and harvest activities. Thus, Alternatives NC, A, A-Departure, B, C, D, D1, K, and S have the highest potential for spreading the rot; Alternatives E, G, and M have the lowest potential

Redwood

The management of redwood is consistent through the alternatives. The effects of the present management regime will be to slightly increase its present range and possibly increase genetic variability. The Wheeler Creek RNA is an important part of the system because it represents a tenable redwood stand at the species' northern environmental limits. However, Alternatives E, G, K, M and S include the Snake Tooth Redwood Botanical Area (21 acres), an isolated stand of old-growth redwood approximately 5 miles north of the Wheeler Creek RNA. It is possible that this stand represents diversity not included in the Wheeler Creek RNA Alternative S also includes an additional Botanical Area called Redwood Groves, this area preserves prime examples of old-growth redwood stands which are otherwise unprotected.

Meadows

There are few true meadows on the Forest; most are denuded forest land that will eventually return to forest composition and structure if the natural process is not interrupted. However, the Forest-wide Siskiyou Standards and Guidelines dictate the maintenance and enhancement of meadow habitat. In areas where "meadows" are being reclaimed by trees, efforts will be made to prevent forest encroachment There are no differences in effects among the alternatives

Forage

Big game and livestock forage areas are constantly changing The vast majority of sites on the Forest are categorized as "transitory." That is, grasses and forbs present in the early stages of succession following harvest are the source of forage As harvested areas mature and potential forage production wanes, animals shift to other newly harvested areas. Alternatives NC, B, C, D, K, and S have the highest potential for producing transitory forage areas, Alternative A is moderate; and Alternatives E, G, and M have the lowest potential

Riparian Areas

Riparian areas will be managed to maintain their health and integrity, adding to the diversity of the Forest. No significant differences occur between alternatives with respect to riparian areas. Approximately one-third of the riparian acres in Class I and II streams have old-growth characteristics.

Alternative NC

DIRECT AND INDIRECT EFFECTS. Approximately 26 percent of the Forest land is allocated to nonconsumptive management where site-disturbing activities are generally prohibited. The remainder is under Management Areas 10-14 and is available for harvest.

Existing Research Natural Areas (RNA's) and the proposed Hoover Gulch RNA (3,247 acres) are allocated under this alternative. No new Botanical Areas are established

The conversion of hardwood sites to conifer production could eventually increase timber output when the stands mature. All hardwood stands planned for conversion represent less than 7 percent of the suitable timber acres and the maximum rate of conversion is less than 2 percent per year of the suitable hardwood acres (approximately 48,000 acres per year).

All of the existing unroaded areas will be roaded and open for motorized travel. The direct effect on vegetation by construction is insignificant. The indirect effect of the forest visitor on the vegetation is also insignificant.

CUMULATIVE EFFECTS. Generally, Alternative NC does not allocate lands for special habitats or sensitive species. The potential for maintaining Forest-wide diversity may be slightly affected However, the viability of the populations of sensitive species may not be affected. More specific information is provided in the **SENSITIVE PLANTS** section of this chapter

By the tenth decade (the length of an average rotation), approximately 10 percent of the Forest would remain as mature or old growth This appears to be more than enough to meet Management Requirements (MR's) for wildlife species dependent on mature or old-growth forest. However, there are no wildlife MR's in the alternative; habitat dispersion requirements for mature/old growth Management Indicator Species will not be met.

Alternatives A and A-Departure

DIRECT AND INDIRECT EFFECTS. Approximately 30 percent of Forest land is allocated to nonconsumptive management where site-disturbing activities are generally prohibited The remainder is under Management Areas 10-14 and is available for harvest.

Existing RNA's and proposed Hoover Gulch RNA (3,247 acres) are allocated under this alternative. No new Botanical Areas are established

The conversion of hardwood sites to conifer production (up to 750 acres per year) will eventually increase timber output when the stands mature. Hardwood stands converted annually represent less than 7 percent of the suitable timber acres and the maximum rate of conversion is less than 2 percent per year of the suitable hardwood acres (approximately 48,000 acres per year).

All of the existing unroaded areas will be roaded and open for motorized travel. The direct effect on vegetation by construction is insignificant. The indirect effect of the forest visitor on the vegetation is also insignificant.

CUMULATIVE EFFECTS. Generally, Alternative A does not allocate lands for special habitats or sensitive species. The potential for maintaining Forest-wide diversity may be slightly affected. However, the viability of the populations of sensitive species should not be affected More specific information is provided in the **SENSITIVE PLANTS** section of this chapter

By the tenth decade (the length of an average rotation), approximately 12 percent of the Forest would remain as mature or old growth The Forest would more than meet MR's for wildlife species dependent on mature or old-growth forest.

Alternative B

DIRECT AND INDIRECT EFFECTS. Approximately 29 percent of the Forest (about 319,000 acres) is allocated to nonconsumptive management. As in Alternative A, the remainder of the land is available for full or partial harvest.

Seven new Botanical Areas totalling 4,581 acres would be added Hoover Gulch and Craggy Peak RNA's would also be added.

The conversion of hardwood sites to conifer production, up to 1,400 acres annually, will eventually increase timber output when the stands mature. Hardwood stands converted annually represent less than 7 percent of the suitable timber acres and the maximum rate of conversion is about 3 percent per year of the suitable hardwood acres.

All of the existing unroaded areas will be roaded and open for motorized travel. The direct effect on vegetation by construction is insignificant The indirect effect of the forest visitor on the vegetation is also insignificant.

CUMULATIVE EFFECTS. Generally Alternative B does not fully allocate lands for special habitats or sensitive species. The potential for enhancing Forest-wide diversity is relatively low. However, the viability of the populations of sensitive species should not be affected

The amount of mature and old growth remaining after tenth decade is 11 percent of the current total, similar to Alternatives A, C, D, K and S.

Alternatives C, D, and D1

DIRECT AND INDIRECT EFFECTS. Approximately 28 percent (29 percent in Alternatives D and D1) of the Forest land (about 319,000 acres) is allocated to nonconsumptive management. As in Alternatives A and B, the remainder of the land is available for full or partial harvest

The same Botanical Areas and RNA's allocated under Alternative B would be allocated under alternatives C, D, and D1.

The conversion (up to 1,400 acres per year) of hardwood sites to conifer production will eventually increase timber output when the stands mature Hardwood stands converted annually represent less than one-fifth of one percent (0 2 percent) of the suitable timber area and the maximum rate of conversion is about 3 percent per year of the suitable hardwood acres

All of the existing unroaded areas will be roaded and open for motorized travel The direct effect on vegetation by construction is insignificant. The indirect effect of the Forest visitor on the vegetation is also insignificant

CUMULATIVE EFFECTS. Generally, Alternatives C, D, and D1 do not fully allocate lands for special habitats or sensitive species The potential for incorporating Forest-wide diversity is relatively low. However, the viability of the populations of sensitive species should not be affected

The amount of mature and old growth remaining after decade 10 is 11 percent of the Forest total, similar to Alternatives A, B, K, and S.

Alternative E

DIRECT AND INDIRECT EFFECTS. Approximately 59 percent of Forest land is allocated to non-consumptive management. The remainder is under Management Areas 10-14 and is available for partial or full harvest.

All or part of 15 potential Botanical Areas would be established in addition to establishment of all four proposed RNA's

There is no conversion of hardwood dominated sites to conifers.

Thirty-two percent of the Forest (approximately 352,000 acres) will remain unroaded in addition to Wilderness. Without access to these areas, opportunity to manage fuel and stand structure is limited. *Ability to suppress wildfire is poor. There is an extreme risk of wildfire damaging or altering the composition* and structure of large tracts of vegetation within the first rotation. As such, the potential for indirect but significant effects on vegetation is high

CUMULATIVE EFFECTS. Alternative E allows for setting aside many diverse habitats for sensitive species. The potential for maintaining Forest-wide diversity is high. The viability of the populations of sensitive species should not be affected.

At decade 10 (the length of an average rotation), approximately 25 percent of the Forest would remain as mature or old growth, approximately three times the amount needed to meet MR's for wildlife species dependent on mature or old-growth forest.

The character of existing old-growth stands is dependent on the trees' ability to ward off insect attacks and pathogens. Stand health depends on tree density, the site's ability to provide resources, and it's ability to withstand wildfire. Access facilitates the use of prescribed fire to safely reduce fuel loads and manipulate vegetation in favor of tree longevity. The lack of access provided by Alternative E will make it increasingly difficult to maintain the health of old-growth stands over succeeding rotations.

Alternative G

DIRECT AND INDIRECT EFFECTS. Approximately 51 percent (558,000 acres) of the Forest land is allocated to nonconsumptive management. The remainder is under Management Areas 10-14 and is available for partial or full harvest

Twenty-two Botanical Areas would be established in addition to all four proposed RNA's.

The conversion (up to 400 acres per year) of hardwood sites to conifer production will eventually increase timber output when the stands mature. Hardwood stands converted annually represent less than one-fifth of one percent of the suitable timber area and the maximum rate of conversion is about one percent per year of the suitable hardwood acres.

Thirty-two percent of the Forest (approximately 344,000 acres) will remain unroaded in addition to Wilderness. Without access to these areas, opportunity to manage fuel and stand structure is limited and

potential for large intense wildfires and subsequent indirect but significant effects on the vegetation is high (see Alternative E)

CUMULATIVE EFFECTS. Alternative G allows for setting aside many diverse habitats for sensitive species. The potential for maintaining Forest-wide diversity is high. The viability of the populations of sensitive species should not be affected

At decade 10 (the length of an average rotation), approximately 20 percent of the Forest would remain as mature or old growth, well above the the amount needed to meet MR's for wildlife species dependent on mature or old-growth forest

Lack of access will make the character of existing old growth stands increasingly difficult to maintain over succeeding rotations (see Alternative E).

Alternative K

DIRECT AND INDIRECT EFFECTS Approximately 34 percent of the Forest land (approximately 375,000 acres) is allocated to nonconsumptive management The remainder is under Management Areas 10-14 and is available for partial or full harvest.

Eight Botanical Areas would be established in addition to all four proposed RNA's.

The conversion of hardwood sites to conifer production (up to 750 acres per year) will eventually increase timber output when the stands mature Hardwood stands converted annually represent less than one-fifth of one percent of the suitable timber area and the maximum rate of conversion is less than two percent per year (750 acres) of the suitable hardwood acres.

Approximately three percent of the Forest (about 29,517 acres) will remain as unroaded in addition to Wilderness. Because increased access allows more effective fire control and fuels management, the risk of wildfire damaging or completely altering the composition and structure of the vegetation within the first rotation is low.

CUMULATIVE EFFECTS. In Alternative K, the potential for maintaining Forest-wide diversity is moderate. The viability of the populations of sensitive species should not be affected.

At decade 10 (the length of an average rotation), approximately 13 percent of the Forest would remain as mature or old growth, which more than meets MR's for wildlife species dependent on mature or old-growth forest.

Alternative M

DIRECT AND INDIRECT EFFECTS. Approximately 61 percent (670,000 acres) of the Forest is allocated to nonconsumptive management The remainder is under Management Areas 10-14 and is available for partial or full harvest There is no conversion of hardwood-dominated sites to conifers.

Twenty-seven percent of the Forest (approximately 297,000 acres) will remain unroaded in addition to Wilderness. There would also be another nine percent (98,000 acres) in General Forest not accessible by existing roads that would not have programmed timber harvest. Without access to these areas, opportunity to manage fuel and stand structure is limited and potential for indirect but significant effects on the vegetation is high (see Alternative E).

CUMULATIVE EFFECTS. Alternative M allows for setting aside many diverse habitats for sensitive species. The potential for maintaining Forest-wide diversity is high The viability of the populations of sensitive species should not be affected

At decade 10, approximately 31 percent of the Forest would remain as mature or old growth, well over the amount needed to meet MR's for wildlife species dependent on mature or old-growth forest. Today's mature and old growth is approximately 36 percent of the Forest.

Lack of access will make the character of existing old-growth stands increasingly difficult to maintain over succeeding rotations (see Alternative E).

Alternative S

DIRECT AND INDIRECT EFFECTS. Approximately 43 percent of the Forest land (approximately 465,000 acres) is allocated to nonconsumptive management. The remainder is under Management Areas 10-14 and is available for partial or full harvest

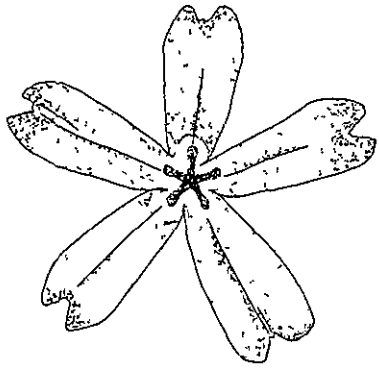
Nineteen Botanical Areas are established in addition to the four proposed RNA's.

The conversion of hardwood sites to conifer production (up to 750 acres per year) will eventually increase timber output when the stands mature. Hardwood stands converted annually represent less than one-fifth of one percent of the suitable timber area and the maximum rate of conversion is less than two percent per year (750 acres) of the suitable hardwood acres

In addition to Wilderness, approximately 12 percent of the Forest (about 136,000 acres) will remain essentially unroaded Because increased access allows more effective fire control and fuels management, the risk of wildfire damaging or completely altering the composition and structure of the vegetation within the first rotation is low.

CUMULATIVE EFFECTS. In Alternative S, the potential for maintaining Forest-wide diversity is moderate The viability of the populations of sensitive species should not be affected.

At decade 10 (the length of an average rotation), approximately 14 percent of the Forest would remain as old growth, which more than meets MR's for wildlife species dependent on mature or old-growth Forest.



SENSITIVE PLANTS

SIGNIFICANT INTERACTIONS

Timber harvesting, road building, and mining are all land-disturbing activities that affect sensitive plants Road building and logging can severely impact small populations of sensitive species. Surface mining activities present the potential for elimination of localized concentrations of some sensitive plant communities Economically important metals such as nickel and chromium are found associated with 44 sensitive species (Webb 1988). Land-disturbing activities may also disrupt site conditions which sustain sensitive plant communities (such as changes in water flow or introduction of disease organisms) For example, water flow into Darlingtonia bogs can be altered by road building However, in such cases, roads have been relocated and the effects mitigated The Elk Wallow Road with *Bensoniella oregana* and Bald Mountain Road with *Kalmiopsis leachiana* are examples of road relocation which avoid such impacts.

Livestock grazing can detrimentally affect populations of sensitive plants. Specific sites may be over-used by people

Conversely, some sensitive plants rely on the habitat provided by early seral stages Timber harvesting can be beneficial to some sensitive plants, although the vegetative changes may have to be designed to benefit the intended plant species Natural and prescribed fire can be detrimental, neutral, or beneficial, as with Kalmiopsis.

Land allocations affect sensitive plant communities; designations such as RNA, Botanical, or Supplemental Resource Management Areas can provide protection to sensitive plant sites and help maintain genetic viability In all cases, Standards and Guidelines can be established to mitigate detrimental effects of other environmental components on sensitive plants.

RESPONSE TO PLANNING PROBLEMS

The following alternative descriptions relate directly to Planning Problem #5. "How should sensitive plant resources be addressed?" Two additional planning problems are addressed indirectly. #2, "How much old-growth forest should be preserved?"; and #9, "How should mineral resources of the Forest be developed in coordination with management of other resources?"

ENVIRONMENTAL EFFECTS AND MITIGATION

There are two methods of managing sensitive plant resources: designation and standards. Designation involves allocation of specific sites as Botanical areas. Important concentration areas of sensitive or rare plants are logical candidates for designation Certain areas on the Forest, such as Eight Dollar Mountain, are more unique than others. In concentration areas of lesser importance, or where sensitive/rare plants are more widely dispersed, management standards will guide timber management, road building, mining activities, and livestock grazing.

The management objective for botanical resources is to provide habitat capable of indefinitely supporting all native plants and plant communities. All alternatives are designed to meet this objective in at least a minimally adequate fashion Alternatives that allocate relatively large amounts of land for preservation of sensitive plants or specific plant communities (RNA's) result in the best long-term protection for these resources, although this results in a somewhat lower annual allowable timber harvest Alternatives that allocate the most land to categories other than General Forest also result in the best level of protection for sensitive plants and plant communities (potential RNA's) Alternatives with lower timber harvests also have fewer roads, and this means less potential impact on sensitive plants/plant communities

Potential Botanical areas and RNA's described in this FEIS represent an incomplete inventory Although major concentration areas for sensitive plants have been identified, additional potential Botanical areas will

undoubtedly be found on the Forest. Also, much remains to be discovered about the range and abundance of individual plant species Known plant communities needing representation in the RNA system are included in the proposed RNA's. Research in progress on the plant associations of the Siskiyou Mountain Province (Atzet and Wheeler 1984) will undoubtedly result in the identification of additional plant communities needing representation in RNA's

Over the short term, there is a low risk that sites not designated will be precluded from receiving future consideration as RNA's or Botanical areas For most sites, a decision to withhold RNA or Botanical status can be reversed at the end of the first planning period (10-15 years) This would not be true of the old-growth sites, which might be harvested (at least partially) before the Forest Plan is revised Over the long term (by the fifth decade), grazing, road building, timber harvesting, and mining activities will have taken their toll and many sites will no longer retain the qualities necessary to meet the criteria for designation as RNA or Botanical areas The Forest's rare plant resources would be best managed by assigning Botanical areas status to high priority sites Plant resources in sites with lower priorities would be intensively inventoried before this Forest Plan is revised in 10-15 years. For a description of the RNA's and Botanical areas (existing and proposed) refer to Appendix F (FEIS).

Alternatives NC, A, and A-Departure

DIRECT EFFECTS. No potential Botanical areas are established with these alternatives. In areas with a significant amount of land allocated to General Forest (see Table II-3), site conditions will change from natural to managed over the long term as road building and logging take place This means most of these sites will eventually be unsuitable for designation as Botanical areas. This is especially true for old-growth sites; all of these sites are allocated in whole or in part to General Forest Individual sensitive plant populations within potential Botanical areas (and elsewhere) will be managed through application of Standards and Guidelines; however, the natural features of individual areas may not be protected in the long term.

Existing RNA's and the proposed Hoover Gulch RNA (3,249 acres) are allocated (14 plant communities protected) Present cell needs (Dyrness and others 1975) will not be met. Thus, future needs will have to be found in Wilderness or in other compatible management areas If they are not found, cells will not be *represented and baseline information will be unavailable.*

Lemmingsworth Gulch and Cedar Log Flat contain both mineral resources and land allocated to General Forest. Up until the next revision of the Forest Plan in 10-15 years, these two sites may not be heavily impacted by mining, road building, and timber harvesting activities In the long term, logging and road building will inevitably make the sites unsuitable for designation as RNA's The portion of the proposed Craggy Peak RNA on the Siskiyou National Forest has no known mineral resources and no timber available for harvesting; the option to designate this site as an RNA would probably be available indefinitely.

Many sensitive species are present in existing Wilderness, RNA's, and Riparian areas. Without specific information on environmental requirements of sensitive species, the effects of this alternative on specific sensitive plants is unknown over the long term. Refer to Appendix F (FEIS) for additional information.

Alternative A-Departure is the same as Alternative NC and A, except that accelerated timber harvest activities may change the character of individual areas sooner.

INDIRECT EFFECTS The public will still be able to visit potential Botanical and RNA's; however, at some sites inherent natural values may be lost over time because of grazing, road building, timber harvesting, and mining activities Although few allocations were made in this alternative for Botanical or RNA's, some of the areas will still be relatively unchanged and available for designation during the next one or two decades.

CUMULATIVE EFFECTS Over time, the range of options for allocating lands for Botanical areas diminishes.

Alternatives B, C, D, and D1

DIRECT EFFECTS Seven new Botanical areas totaling 4,581 acres are established in this alternative; most were selected not on a priority basis, but because they exist on serpentine sites or otherwise have little harvestable timber (see Table II-3 for list of specific sites) Important sensitive plant areas such as Iron Mountain and Bigelow Lakes were not selected. Even so, the seven selected sites contain at least 25 sensitive species and candidates for the Regional Forester's sensitive list, out of 73 known to exist on the Forest. Eight Dollar Mountain, probably the site best known to the general public, is selected

All nonselected areas contain a significant number of acres tentatively suitable for timber production (see Table II-3). Site conditions in these areas will change from natural to managed over the long term as road building and timber harvest occur. This means most of these sites will eventually be unsuitable for designation as Botanical areas This is especially true for the old-growth sites, all of these areas except the Page Mountain Grove are allocated in whole or in part to General Forest Individual sensitive plant populations within potential Botanical areas (and elsewhere) will be managed through the application of Standards and Guidelines; however, the natural features of individual areas may not be protected in the long term.

Existing RNA's, Hoover Gulch, and Craggy Mountain are allocated as RNA's in this alternative (16 plant communities protected; 3,349 acres). Present or projected cell needs will not be covered. Non-representation of a cell may result in loss of baseline areas as reference points to monitor and compare Forest activities

The two other potential RNA's are not designated, and their natural ecosystems are not protected; Lemmingsworth Gulch and Cedar Log Flat contain both mineral resources and land allocated to General Forest. Up until the next revision of the Forest Plan in 10-15 years, these two sites may not be heavily impacted by mining, road building, and timber harvesting activities. In the long term, logging and road building will inevitably make the sites unsuitable for designation as RNA's

INDIRECT EFFECTS. The public will still be able to visit potential Botanical and RNA's not selected in these alternatives; however, at some sites inherent natural values may be lost over time because of grazing, road building, timber harvesting, and mining activities Some of the areas not selected in these alternatives will still be relatively unchanged and available for designation during the next one or two decades. However, the accelerated harvest programmed for these alternatives in the first two decades will eliminate this option relatively sooner

Alternative D is slightly different in that timber harvest is not accelerated in the first two decades. The character of individual areas will not change as quickly and thus the option to apply Botanical or RNA status may be available for a longer period of time. Alternative D1 has an average rotation age of 80 years instead of 100 This means that 25 percent more acres will be harvested every year, which in turn means that the character of individual areas will change more rapidly. The option to apply Botanical or RNA status will dissipate more rapidly than in Alternative D (about the same as B for the first two decades).

Alternative C is the same as Alternative B, except that timber harvest is not accelerated in the first two decades The character of individual areas will not change as quickly and thus the option to apply Botanical or RNA status may be available for a longer period of time

CUMULATIVE EFFECTS Over time, the range of options for allocating lands for Botanical areas diminishes

Alternative E

DIRECT EFFECTS Fifteen new Botanical areas totaling 23,251 acres are established in this alternative (see Table II-3 for a list of specific sites). This is nearly 70 percent of the land identified within potential Botanical areas A minimum of 37 sensitive plants and candidates for the Regional Forester's sensitive list, are present in allocated Botanical areas, out of 73 known to be present on the Siskiyou Eight Dollar Mountain is selected in this alternative areas selected represent a good cross-section of the Forest's different plant habitats. The range of plant diversity, both coastal and inland, will be quite well covered. Bear Camp, Bigelow Lakes, Chrome Ridge, Iron Mountain, Oregon Mountain, and Snow Camp are other noteworthy areas selected Sensitive plant resources are well protected in this alternative. Three of the old-growth sites are selected, including Lobster Grove and Page Mountain Grove.

A few non-selected areas contain a significant number of acres tentatively suitable for timber production (see Table II-3). Site conditions in these areas will change from natural to managed over the long term as road building and timber harvest take place, most of these sites will eventually be unsuitable for designation as Botanical areas. This is especially true for the old-growth sites not selected. Although sensitive plant populations within non-selected Botanical areas (and elsewhere) will be managed through application of Standards and Guidelines, natural features of individual areas may not be protected in the long term.

Existing RNA's and all four potential RNA's identified on the Siskiyou by the Pacific Northwest Experiment Station are designated (4,756 acres; 25 plant communities protected). They, along with existing RNA's, account for present needs; the distribution of the Botanical areas allows for future needs. Lemmingsworth Gulch and Cedar Log Flat contain both mineral resources and land allocated to General Forest. These sites are thus protected from potential mining impacts, road building, and timber harvest which might have taken place before the next revision of the Forest Plan.

INDIRECT EFFECTS The public will be drawn to visit sites designated as RNA and Botanical areas; there could eventually be problems with over use in some areas. The public will still be able to visit non-selected potential Botanical; however, at some sites inherent natural values may be lost over time because of grazing, road building, timber harvesting, and mining activities. Some of the areas not selected in this alternative will still be relatively unchanged and available for designation during the next one or two decades

CUMULATIVE EFFECTS. Over time, the range of options for allocating lands for Botanical areas diminishes.

Alternative G

DIRECT EFFECTS. Twenty-two new Botanical areas, including three old-growth sites, totaling 34,526 acres are established (see Table II-3 for a list of specific sites). A minimum of 41 out of 73 known sensitive plants and candidates for the Regional Forester's sensitive list are present in allocated Botanical areas. Eight Dollar Mountain is selected, along with other well-known sensitive plant areas such as Bear Camp, Bigelow Lakes, Chrome Ridge, Iron Mountain, Oregon Mountain, Snow Camp, and Vulcan Peak. areas selected represent a good cross-section of the Forest's diverse plant habitats. All potential sensitive plant Botanical areas identified to date are protected. Three of the five old-growth Botanical areas are protected including Lobster Grove, Page Mountain Grove, and Snaketooth Redwood. Forest-wide Standards and Guidelines are used to manage sensitive plant resources located outside of Botanical areas

All four potential RNA's identified on the Siskiyou National Forest by the Pacific Northwest Experiment Station are designated in this alternative. See DIRECT EFFECTS, Alternative E

INDIRECT EFFECTS. The public will be drawn to visit sites designated as RNA and Botanical areas; there could eventually be problems with over-use in some areas

CUMULATIVE EFFECTS. None

Alternative K

DIRECT EFFECTS. Eight new Botanical areas, totaling 6,214 acres, are established in this alternative (see Table II-3 for a list of specific sites), this is 18 percent of the land identified within potential Botanical areas. A minimum of 31 sensitive plants and candidates for the Regional Forester's sensitive list are present in allocated Botanical areas, out of 73 known to be present on the Siskiyou. The areas selected are the most important botanical sites on the Forest, and represent a cross section of the habitats which support sensitive plants on the Siskiyou Eight Dollar Mountain is selected in this alternative, along with Bear Camp (two parts), Bigelow Lakes, Days Gulch, and Iron Mountain (two parts). Three of the old-growth sites are selected, and include Lobster Grove, Page Mountain Grove, and Snaketooth Redwood. This alternative provides good protection of botanical resources The Forest's unique plants are managed through a blending of two courses of action. Forest-wide Standards and Guidelines and designated Botanical areas.

Some nonselected areas contain a significant number of acres tentatively suitable for timber production (see Table II-3). Site conditions in these areas will change from natural to managed over the long term as road building and timber harvest take place; most of these sites will eventually be unsuitable for designation as Botanical areas This is especially true for the old-growth sites not selected Although sensitive plant populations within potential Botanical areas (and elsewhere) will be managed through application of Standards and Guidelines, the natural features of individual areas may not be protected in the long term.

All four potential RNA's identified on the Siskiyou National Forest by the Pacific Northwest Experiment Station are designated in this alternative. See Alternative E.

INDIRECT EFFECTS. Same as Alternative E

CUMULATIVE EFFECTS Same as Alternative E.

Alternative M

DIRECT EFFECTS. Same as Alternative G. Also, given the relatively low amount of land devoted to timber management, most sensitive plants not in Botanical areas are inherently well protected. Some plants which live in habitats maintained by periodic fires may be at a disadvantage.

INDIRECT EFFECTS. Same as Alternative G. Also, given the very low amount of land tentatively available and suitable for timber production, there will be opportunities to designate additional Botanical areas (there would be no more timber harvested from areas of the Forest not already roaded)

CUMULATIVE EFFECTS None.

Alternative S

DIRECT EFFECTS Nineteen new Botanical areas, totaling 15,157 acres, are established in Alternative S This is approximately 43 percent of land identified within potential Botanical areas (see Table II-3 for list of specific sites). Fourteen of the selected areas are Sensitive Plant sites; five are old-growth sites.

Out of 73 known sensitive plants and candidates for the Regional Forester's sensitive list on the Forest, at least 40 are present in Botanical areas recommended in Alternative S The areas selected include the most important concentrations of sensitive plants on the Forest.

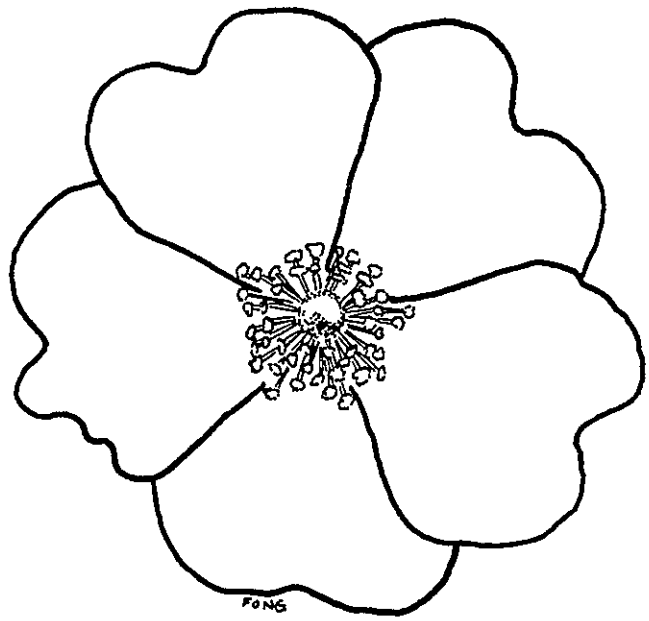
Many of the sensitive species present in nonselected sites are represented in the selected Botanical areas. One area (Cleopatra) was not selected because the species of concern was far more abundant on the adjacent Six Rivers National Forest. In some cases, boundaries of potential Botanical areas have excluded some sensitive plant populations, but the most important populations have been retained

Some nonselected areas contain a significant number of acres tentatively suitable for timber production (see Table II-3). Site conditions in these areas will change from natural to managed over the long term as road building and logging take place; most of these sites will eventually be unsuitable for designation as Botanical areas. Although individual sensitive plant populations within the Forest will be managed through application of Standards and Guidelines, the natural features of individual areas may not be protected over the long term

Existing RNA's and all four potential RNA's identified on the Siskiyou National Forest by the Pacific Northwest Experiment Station are designated (4,608 acres, 25 plant communities protected) See Alternative E.

INDIRECT EFFECTS Same as Alternative E.

CUMULATIVE EFFECTS. Same as Alternative E.



AIR QUALITY

SIGNIFICANT INTERACTIONS

The principal impact to air quality on the Forest and the surrounding area generated by the various land allocations and associated activities will be the temporary visibility impairment caused by smoke from prescribed fires and wildfires

An important impact on air quality in some areas adjacent to the Forest is that caused by the residential use of firewood produced on the Forest. Butcher and Sorenson (1979) suggest that the particulate emissions from a total community may contribute to particulate levels as high as 100 micrograms per cubic meter of air in a worst-case 24-hour average ambient concentration Data from various research shows an emission range for particulates from 15 to 75 pounds per cord of firewood burned with an average of 28 1 pounds per cord (Duncan and others 1979)

No emissions from forestry burning have yet been identified by the Environmental Protection Agency (EPA) as hazardous (Cook and others 1978), and no threshold limit values have been set for compounds in forest smoke (Sandberg and others 1979). Breysse (1984) does, however, outline health hazards associated with the inhalation of smoke. Emissions of polycyclic organic matter (POM) have been reported from burning pine needles (Ryan and McMahon 1976) and from agricultural burning (Darley and Lerman 1974). POM is of special interest in smoke management because it is a class of compounds containing many physiologically active substances. Benzo(a)pyrene (BaP) and other implicated carcinogens are usually found in POM (Tangren and others 1976).

Cook and others (1978) report that emissions from prescribed burning are highly complex, consisting of hundreds of gaseous chemical compounds and particulates, which vary greatly in composition and physical properties. They also report that a number of the compounds emitted are photochemically reactive and thus the physical and chemical properties of smoke change with increasing residence time in the atmosphere

Sandberg and others (1979) report that there are few studies on the effects of smoke on forest ecosystems in the vicinity of fire or upon long-range smoke transport and transformation. There is also little information on the effects of smoke on forest animals

The effect of reduced visibility on the amenity-related resources, e.g., recreation, visual resource, Wild and Scenic Rivers, and Wilderness will be to detract from the experience provided by those resources Vistas and panoramas normally enjoyed by Forest users could be temporarily obscured by smoke and haze. Rural communities and human resources could be inconvenienced by smoky conditions for relatively short periods of time.

Emission factors, relating quantity of effluent released to mass of fuel consumed, have been derived through laboratory burning studies and a limited number of field measurements. However, emission factors for burning forest fuels are anything but precise because of the great variation in fuels, fuel arrangement, moisture, ventilation, and type of burning--flaming versus glowing, and head fire versus backing fire (Cramer 1974)

The following emission ranges for the major effluents have been suggested by leading experts in prescribed fire and represent the best general estimate of expected normal field emissions based on current data (Cook and others 1978)

Carbon dioxide	-	2,000 to 3,500 lbs per ton of fuel consumed
Water	-	500 to 1,500 lbs. per ton of fuel consumed
Carbon monoxide	-	20 to 500 lbs. per ton of fuel consumed
Particulates	-	17 to 67 lbs. per ton of fuel consumed
Hydrocarbons	-	10 to 40 lbs. per ton of fuel consumed
Nitrogen oxides	-	2 to 6 lbs per ton of fuel consumed

Particulates are the major contributor to visibility reduction The suspended particles 0.3 to 1 microns in diameter are the principle factor in visibility impairment. Experimental data developed by Sandberg and Martin (1975) shows that more than 80 percent of the smoke mass is contained in particles 1 micron in diameter or less. Deeming (1980) reports that only two micrograms of these small particulates per cubic meter of air is enough to produce a change in the clarity of clear air to be perceivable to the human eye. The small size of the particles also compounds the visibility problem because of their very slow fall velocity Because of this tendency to stay aloft, the particles can be transported great distances by even relatively light winds creating vast areas of uniform haze

The largest contribution to TSP (total suspended particulates) production will come from the broadcast burning of final harvest units and the burning associated with the hazard reduction efforts in commercial thinning operations The hardwood conversion program, which is not included in all of the alternatives, will be the second largest contributor to TSP, followed by the burning of landing piles and road right-of-way piles The TSP production associated with the treatment of natural fuels will not be a major factor in annual TSP production

The particulate emission problem is less severe with prescribed fire than with wildfire Prescribed fires consume less fuel per unit area and therefore produce less particulates per unit of fuel, than wildfire (Cooper 1976) The ratio of wildfire to prescribed fire particulate production of roughly 3·1 has been suggested by Ward and others (1976).

Wildfire smoke will also affect air quality and air quality-related values throughout the array of alternatives Since the occurrence of wildfires is a random event in both time and space, the severity of the air quality impact will vary, depending upon fire intensity, fuel type and conditions, size of the fire, and meteorological conditions. Wildfires, and lightning fires in Wilderness that are managed as prescribed fires, are not considered in TSP production estimates.

ENVIRONMENTAL EFFECTS AND MITIGATION

Air quality will be affected by the array of forest resource management activities proposed through the range of alternatives Smoke from prescribed fire operations and wildfires will create a significant, but temporary, impact on the forest environment Mitigation measures designed to maintain air quality at a level adequate for the protection and use of National Forest resources, and meet or exceed applicable Federal and State standards and regulations are detailed in the Air Quality section of the Forest-wide Standards and Guidelines (Chapter IV, Forest Plan)

The direct effect of the alternatives will be measured by the amount of TSP produced on an annual basis. Indirect effects on air quality will be the impacts created in local urban areas from the burning of firewood obtained from the Forest Cumulative effects common to all alternatives include the downwind increases in TSP, in particular fine particulates, when the smoke from prescribed burning operations on the Forest combines with the smoke from prescribed fire operations on adjacent downwind ownerships. Other effects common to all alternatives are described in the **ENVIRONMENTAL EFFECTS UNCHANGED BY**

ALTERNATIVES section at the end of this chapter. Specific outputs by alternative are presented in Chapter II

Alternatives NC, A and A-Departure

DIRECT EFFECTS. Prescribed burning operations will produce a moderate amount of TSP annually in the first decade, ranging from 4,280 to 4,445 tons. This will increase to between 7,500 and 7,631 tons annually in the fifth decade

INDIRECT EFFECTS. Between 688 and 878 tons of particulates could be added annually to local urban airsheds from burning of firewood produced as a by-product of timber harvest on the Forest

Alternatives B and D1

DIRECT EFFECTS Prescribed burning operations under Alternatives B and D1 will produce a moderately high amount of TSP annually in the first decade (5,804 and 5,386 tons, respectively) This will increase to 7,649 (Alternative B) and 7,554 (Alternative D1) tons annually in the fifth decade

INDIRECT EFFECTS. An estimated 843 (Alternative B) and 773 (Alternative D1) tons of particulates could be added to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations on the Forest

Alternative C

DIRECT EFFECTS Prescribed burning operations will produce a very high amount of TSP annually in the first decade (9,159 tons). This will decrease to approximately 6,703 tons annually in the fifth decade.

INDIRECT EFFECTS An estimated 745 tons of particulates could be added annually to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations

Alternative D

DIRECT EFFECTS Prescribed burning will produce a high amount of TSP annually in the first decade (7,265 tons), decreasing to approximately 5,892 tons annually in the fifth decade.

INDIRECT EFFECTS. An estimated 717 tons of particulates could be added annually to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations

Alternatives E and G

DIRECT EFFECTS. Prescribed burning operations under Alternatives E and G will produce a low amount of TSP annually in the first decade (2,700 and 3,344 tons, respectively) This will increase to 3,330 (Alternative E) and 3,913 (Alternative G) tons annually in the fifth decade

INDIRECT EFFECTS An estimated 393 (Alternative E) and 491 (Alternative G) tons of particulates could be added to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations on the Forest

Alternatives K and S

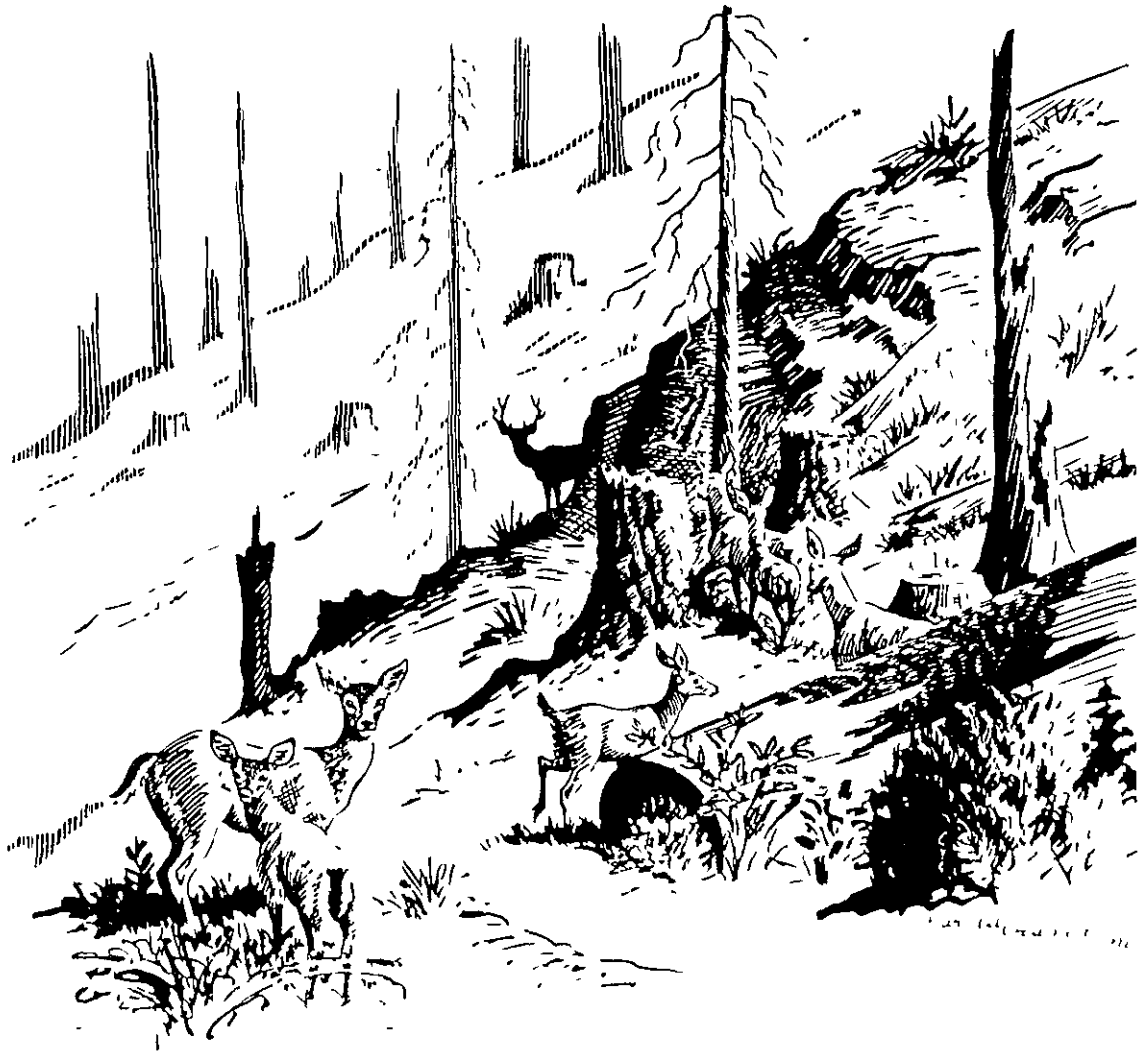
DIRECT EFFECTS Prescribed burning operations for Alternatives K and S will produce a moderate amount of TSP annually in the first decade (4,430 and 4,579 tons, respectively) This will increase to 5,663 (Alternative K) and 5,218 (Alternative S) tons annually in the fifth decade

INDIRECT EFFECTS An estimated 618 (Alternative K) and 759 (Alternative S) tons of particulates could be added annually to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations on the Forest

Alternative M

DIRECT EFFECTS Prescribed burning operations for this alternative will produce a negligible amount of TSP annually in the first decade (748 tons). This will increase to approximately 1,093 tons annually in the fifth decade.

INDIRECT EFFECTS An estimated 155 tons of particulates could be added annually to local urban airsheds from the burning of firewood produced as a by-product of timber harvest operations on the Forest.



FISH

The success of the Forest fish habitat is directly dependent upon maintaining or improving water quality, instream cover, pool quality, streambed stability, quality of spawning gravel, and riparian zone integrity. Impacts upon these resources affect Forest habitat capability to rear juvenile anadromous salmonids to the smolt stage and resident salmonids through juvenile and adult stages. However, the anadromous salmonid life cycle involves both on- and off-Forest habitats, from headwater streams to the ocean. Any weak link within the cycle can have major influence upon population. Excess harvesting of fish, poor ocean food conditions, competition from hatchery stock, and off-Forest water withdrawals are factors beyond Forest control.

SIGNIFICANT INTERACTIONS

Management of salmonid fish habitat interacts significantly with nearly all other Forest resources By improving or maintaining salmonid habitat capability and production, fish habitat objectives complement water quality goals and the desires of recreational and commercial fishermen Increasing numbers of people enjoy fishing and the aesthetic values of observing fish in streams However, fisheries objectives can directly interfere with the maximization of timber production capability, and options for road and mineral development. The ability to rear resident trout and juvenile anadromous salmonids, attributable to the Forest, is a direct reflection of how well both aquatic and terrestrial habitat is managed.

Land management activities which have the highest probability of affecting Forest fish habitat capability include a mix of land allocations, Standards and Guidelines, and capital investments. Relationships between these activities and their influence over Forest salmonid habitat capability are shown below·

Activity	Affected Prime Fish Habitat
Riparian Area Management	Water quality (temperature, turbidity), streambed and bank, slope stability; nutrient source; instream cover, interspecies competition
Supplemental Resource Areas	Water quality (temperature, turbidity); streambed and bank, slope stability, nutrient source, instream cover
Timber Management and Road Construction	Water quality (turbidity), streambed and bank stability; nutrient source, instream cover, streambed sedimentation; interspecies competition
Off-Forest Water Use	Water quality (temperature), instream cover, water availability (flow), riparian area stability, interspecies competition.
Capital Investments	Instream cover, pool depth, water quality (temperature), streambed and bank stability, stream shade canopy, habitat availability

RIPARIAN MANAGEMENT AREA

Streamside areas (riparian areas), contain some of the most valuable Forest resources in terms of human needs for high quality water, recreation, and economic gain Many harvested riparian areas on private lands are now recovering, with overhead canopy cover improving along many streams Benefits from this recovery would exist in all alternatives.

There are three options for management of riparian vegetation on Forest lands suitable for the production of timber These are provided for under Riparian Management Area allocations, and are referred to as Riparian Prescription B, Prescription C, and Prescription M (see FEIS, Chapter II, "Management Area 11") These prescriptions restrict the amount of vegetation that can be removed from riparian areas within a given Planning Basin Prescription B is the least restrictive and Prescription M (Minimum Level) is the most

restrictive Alternatives with Prescription C or Prescription M riparian management would allow more long-term stream shade retention and recovery than Prescription B

Application of any of the prescription options will provide flexibility to retain sufficient old-growth conifer species in the riparian areas for long-term input of large organic material to stream systems For modeling purposes, these prescriptions represent an average for conditions and application throughout the Forest. During project implementation, however, the variability of trees removed from the riparian areas (from no harvest to a specified amount) will largely depend on site-specific conditions and resource protection objectives for the given stream. Maintenance or expected decrease in stream temperatures over time, too, is a function of past, present, and future activity. Where Planning Basins are largely undeveloped, the goal is to maintain existing stream temperatures Where entry and timber harvest has been heavy in the past, the goal will be to reduce stream temperature within two to three decades.

Prescription B

Prescription B allows a light to moderate level of commercial-sized conifer tree removal from the riparian area It is designed to maintain existing water temperatures within the Planning Basin as regrowth of shade in past activity units balances removal associated with new projects It must be remembered that these prescriptions are applied to an entire Basin; the expected results are viewed as a net change over time. Prescription B is considered the Management Requirement (MR's) for riparian areas. Removing more conifers from the riparian area would lead to net increases in water temperature during the critical summer period resulting in unacceptable adverse impacts to the fisheries resource.

Prescription C

Prescription C allows minor removal of the vegetation that provides stream shading. The net effect is estimated to produce up to a two degree Fahrenheit reduction in the summer water temperature by the end of the third decade. A decrease in water temperature would improve salmonid habitat quality Prescription C reduces risk slightly from Prescription B for activity-related impacts on all perennial streams (Class I, II, and III), adding some increase in protection to the riparian ecosystem. The long-term availability of large woody material input to streams and the densities of overhead shade canopies would be maintained or increased above current levels. On-the-ground implementation of Prescription C will result in very limited or no harvest of trees within 25-50 feet of stream edges.

Prescription M (Minimum Level)

Prescription M does not allow for removal of vegetation that provides stream shade. There is no programmed timber harvest Reductions in stream temperatures beyond those predicted by Prescription C have not been projected. This option provides little risk to fish habitat by further minimizing the potential for activity-related impacts on riparian areas.

SUPPLEMENTAL RESOURCE MANAGEMENT AREA

Supplemental Resource areas were designated on some larger streams and rivers to address concerns for fish habitat and other high values and uses associated with the riparian ecosystem. Some of the factors influencing the choice of these areas were: (1) water quality, (2) salmonid rearing capability, (3) geologic risk, and (4) other high value riparian resources. The Supplemental Resource area designation provides important protection of fish habitat in inner-gorge areas (refer to FEIS, Chapter II, "Management Area 7").

TIMBER MANAGEMENT AND ROAD CONSTRUCTION

Past timber harvest, road construction, and early mining practices, both on- and off-Forest, were responsible for considerable localized degradation of salmonid fish habitat. Today, for all alternatives,

activities in the General Forest, Partial Retention and Retention Visual Management Areas have the most significant influence on the potential for erosion and sedimentation of streams Without question, the greatest source of sediment comes from road construction and, to a lesser degree, landslides associated with tree removal (timber harvest). Coupled with the Standards and Guidelines and associated (BMP's), the basin-specific timber harvest constraints are designed to decrease management-related erosion and sediment by dispersing activities in both space and time over the Planning Basin Alternatives which are reasonably constraining to site disturbances, particularly on the higher risk landforms, generally offer the most protection to water quality and fish habitat Refer to the **SOIL AND WATER** section for additional discussion of basin timber harvest constraints

OFF-FOREST WATER USE

Off-Forest water uses present either a current or potential threat to Forest-derived salmonids in several Planning Basins Human water needs are expected to increase due to population growth projected for the region. Water withdrawal currently presents a serious threat to salmonid populations in the Illinois River drainage (Refer to Chapter III, **FISH**). Since salmonids spend critical life stages in habitats both on- and off-Forest, gains in anadromous salmonid habitat capability on-Forest can be offset by losses off-Forest. State water appropriation laws do not assure that adequate summer flows will be maintained for rearing salmonids This problem is common to all proposed alternatives for the Siskiyou.

Background water temperatures, both for natural and human-affected conditions, are near threshold limits for salmonid survival and growth in several rivers. Temperature problems are particularly severe in the mainstem Illinois River and several of its tributary streams. This problem is common to all alternatives. Possible measures that might mitigate this condition and increase fish production include: water storage impoundments, purchase of water rights, and riparian management practices that increase streamside shade

CAPITAL INVESTMENTS

Some streams that lack suitable salmonid habitats or contain habitat which has been degraded as a result of past activity, will benefit from in-stream projects that improve these conditions. The stream habitat enhancement activity may reduce competition among juveniles and adults, and prevent them from being forced downstream to less desirable areas off-Forest. Habitat enhancement opportunities are limited in some basins due to poor access, low flows, high water temperatures, or existing conditions already near maximum capability. Improvement of salmonid rearing habitat capability will be conducted under basin priority selection (see Planning Records for 2630 Fish Habitat memorandum by D. King 1983) This method for choosing priority areas will be used with all alternatives. Instream habitat enhancement work is only beneficial if land management practices are complementary in not seriously impacting water quality and stream channel conditions

RESPONSE TO PLANNING PROBLEMS

Planning Problem #3, "How can the Forest's fish habitat, water quality and soil productivity be maintained or improved?," is addressed here for response to fish habitat concerns. Changes by alternative and by basin are addressed for selected measures most relevant to fish habitat and beneficial uses of the fisheries resource.

ENVIRONMENTAL EFFECTS AND MITIGATION

All alternatives are designed to maintain or improve existing fish habitat capability. However, some alternatives can place individual Planning Basins at risk of minor adverse impact (moderate for one basin for one alternative) Where this occurs, water quality standards could be exceeded on a short duration, localized basis The Standards and Guidelines and accompanying BMP's, which are found in Chapter IV of the Forest Plan, include many mitigating measures and/or enhancements that would be applied to future

activities. These are considered an integral part of all alternatives and their implementation (the planning, location, design, construction, and subsequent monitoring and evaluation for project-level activity). Criteria used for evaluation include: timber harvest (acres), Riparian prescriptions, Supplemental Resource area allocations, basin timber harvest constraints, and capital investments

CUMULATIVE EFFECTS associated with Forest Service, private land, and other ownerships relative to past, current, and reasonably foreseeable future activities have been considered in the following discussions. However, the most specific evaluation of cumulative effects appears in the section titled **ENVIRONMENTAL EFFECTS BY PLANNING BASIN.** For additional discussion of the interrelated watershed cumulative effects, refer to the **SOIL AND WATER** section of this chapter.

Anticipated effects on fish habitat and production capability are presented in four parts:

1. **CHANGES IN YEARLY FISHERIES OUTPUTS.**
2. **DIRECT AND INDIRECT EFFECTS BY ALTERNATIVE.**
3. **ENVIRONMENTAL EFFECTS BY PLANNING BASIN.**
4. **SUMMARY OF FOREST-WIDE EFFECTS ON FISH HABITAT BY ALTERNATIVE**

CHANGES IN YEARLY FISHERIES OUTPUTS

Table IV-8 shows the differences between alternatives in relation to predicted fisheries outputs.

Table IV-8. Anticipated Changes in Yearly Fisheries Output Based on Fisheries Habitat Management and Capital Investment by Alternative.

Alternative	Riparian Management		Investment 3/ (M $)	Yearly Fisheries Output	
	Prescription B 1/ (No of Basins)	Prescription C 2/ (No of Basins)		Pounds	(WFUD's)
NC	19	0	227	978,000	67,050
A	19	0	227	978,000	67,050
A-Dep	19	0	227	978,000	67,050
B	13	6	350	1,047,915	72,546
C	19	0	260	992,000	68,231
D, D1	13	6	250	1,004,951	68,973
E	1	18	250	1,011,533	69,578
G	1	18	260	1,014,533	69,816
K	18	1	350	1,028,143	71,295
M	1	18	260	1,014,533	69,816
S	12	7	350	1,044,000	72,300

1/ Continuation of existing riparian management practices
2/ Minimal timber harvest from riparian areas, combined with gains in overhead canopy shade in areas which were previously harvested, results in decreased temperatures
3/ Includes spawning, rearing, and migration habitat improvements Does not include projects planned for the soil and water recovery program (Refer to FEIS, Chapter II, Table II-21)

DIRECT AND INDIRECT EFFECTS BY ALTERNATIVE

Alternatives NC, A, and A-Departure

DIRECT EFFECTS. These alternatives represent today's management situation and existing salmonid habitat condition as shown in Tables III-24 and III-26. Alternative A-Departure has slightly greater risks associated with accelerated timber harvest activities

Timing of timber harvest and road construction in Alternative A-Departure will be accelerated over the base level for the first two decades, resulting in a predicted sediment increase of two percent The increased sediment level presents a slight increase in risk to salmonid habitat capability, but is not considered significantly different than current direction nor detrimental to overall salmonid production There are no specific timber harvest basin constraints applied to these alternatives; however, the watershed dispersion constraint of 20 percent does apply as a Management Requirement (MR)

Riparian habitat is managed under Prescription B within 18 planning basins, and Minimum Level for the Upper Chetco (that basin being entirely within Wilderness) This array will result in maintenance of current water temperatures, long-term organic material input to streams, and instream habitat stability

Alternatives NC and A include 14 Supplemental Resource areas which favorably influence salmonid habitat

Capital investments of $227,000 per year are programmed to increase salmonid habitat capability.

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 8,100 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 98,000 pounds per year in the offshore commercial salmon fishery.

Alternative B

DIRECT EFFECTS. Alternative B offers moderate salmonid capability in terms of smolt and fisheries output potentials. The application of Riparian Prescription C on the Elk/Sixes, Upper Rogue, Lower Rogue, Silver, Lower Chetco, and Winchuck Planning Basins is expected to decrease water temperatures in these basins. Water temperatures will be maintained in other basins with application of Riparian Prescription B.

Alternative B has predicted sediment outputs at five percent above the current level (Alternative A) This increase in sediment level presents slightly higher risk to salmonid habitat capability, but is not expected to significantly decrease overall salmonid production Timber harvest basin constraints have been applied to five Planning Basins; the watershed dispersion constraint applies to the remainder.

Fourteen Supplemental Resource areas of special importance to fish habitat were selected from the candidate areas.

Capital investments of $350,000 per year are programmed. This high investment option is the primary reason for the high potential fisheries outputs.

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 13,600 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 167,000 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the increase attributed to the application of Riparian Prescription C alone would be 1,100 WFUD's and 17,900 pounds

Alternative C

DIRECT EFFECTS Alternative C represents an option for high timber outputs. Riparian Prescription B is utilized for all basins available for timber management Current water temperatures will be maintained in all basins

Sediment is predicted to increase by 14 percent over the current level (Alternative A). This increased sediment poses a greater risk to salmonid habitat capability than any of the other alternatives The potential

for localized aggradation and adverse impacts on fish habitat and production exists Only the watershed dispersion constraints (MR's) apply to this alternative

Two Supplemental Resource areas are allocated. This low number limits protection of many key streams.

Capital investments of $260,000 per year for Alternative C represents a moderate investment option. Improvement of salmonid rearing habitat capability, as shown in Table IV-8, was predicted based on these investments For Alternative C, capital investment offers the only identified opportunity for improving salmonid habitat capability

INDIRECT EFFECTS During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 9,300 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 112,000 pounds per year in the offshore commercial salmon fishery.

Alternative D and D1

DIRECT EFFECTS. Alternative D offers moderate salmonid capability in terms of smolt and fisheries output potentials. The application of Prescription C is expected to improve habitat in the Elk/Sixes, Upper Rogue, Lower Rogue, Silver, Lower Chetco, and Winchuck Planning Basins. Current water temperatures will be maintained in 12 basins with application of Prescription B. Sediment increases in some basins approach levels predicted for Alternative C.

Alternative D1 is essentially the same as Alternative D with the exception of shorter timber-harvest rotation. Impacts on the fishery are not substantially different from those discussed under Alternative D. Alternative D has predicted sediment outputs of three percent above the current level (Alternative A), while Alternative D1 is essentially the same as current outputs. The increase in sediment level for Alternative D presents slightly higher risk to salmonid habitat capability, but is not expected to significantly decrease overall salmonid production. Timber harvest basin constraints have been applied to five Planning Basins; the watershed dispersion constraint (MR's) applies to the remainder.

Fourteen Supplemental Resource areas of special importance to fish habitat were selected from the candidate areas.

Capital investments of $250,000 per year for Alternative D represent a moderate investment option

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 10,000 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 125,000 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the potential increase would be 1,100 WFUD's and 17,900 pounds (attributable to application of Riparian Prescription C only).

Alternative E

DIRECT EFFECTS. Alternative E offers high salmonid capability in terms of smolt and fisheries output potentials. Through application of the Minimum Level Prescription to Riparian Management Areas in all 19 basins, habitat capability will increase in 18 basins.

Sediment production is predicted to decline by 46 percent below current levels This significantly reduces the risk of sediment effects on streams (from current levels of activity) Timber harvest basin constraints have been applied to all Planning Basins.

Supplemental Resource area designation is prescribed for 30 key streams.

Capital investments of $250,000 per year for Alternative E represent a moderate investment option.

INDIRECT EFFECTS During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 11,600 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 131,500 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the expected increase would be 1,500 WFUD's and 19,000 pounds (attributable to application of Minimum Level standards).

Alternative G

Alternative G is similar to Alternative E, with the exception of differences in scheduled timber harvest, the additional of Supplemental Resource areas, and a special category of Fisheries-Watershed Areas as described below.

DIRECT EFFECTS Alternative G offers high salmonid capability in terms of smolt and fisheries output potentials. The application of Riparian Prescription C to 18 basins would reduce stream temperatures below current levels in these basins.

Sediment production is predicted to decline by 35 percent below current levels. Timber harvest basin constraints ranging from 9-13 percent have been applied to all Planning Basins. These constraints distribute harvest among the basin and reduce risks to fisheries habitat. The effects are similar to Alternative E.

Thirty-one Supplemental Resource areas are allocated. A number of major streams are protected by 1/8 mile corridors in Fisheries-Watershed areas These corridors measurably reduce the potential for risks associated with activity in the inner-gorge areas. The 1/8 mile corridors, which are twice the width of Riparian Management Areas for Class I and II streams, reduce the probability of activity-induced landslides, but add little improvement in stream temperature over Riparian Prescription C It is again noted that stream temperature is the most limiting factor for salmonids in the majority of Siskiyou National Forest streams.

Basin-specific timber-harvest constraints ranging from 9-13 percent are applied to the 18 planning basins.

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 10,900 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 134,500 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the potential increase would be 1,400 WFUD's and 19,500 pounds (attributable to application of Prescription C)

Alternative K

DIRECT EFFECTS Alternative K offers high salmonid capability in terms of smolt and fisheries output potentials. Application of Riparian Prescription C, which will aid in salmonid habitat capability recovery, applies only to the Elk/Sixes Basin. Water temperature will be maintained in 17 basins with application of Riparian Prescription B.

Sediment production is predicted to decline by 15 percent below current levels. Timber-harvest basin constraints ranging from 9-13 percent have been applied to all Planning Basins. These constraints distribute harvest among the basin and reduce risks to fisheries habitat.

Capital investment of $350,000 per year for Alternatives B, K, and S represent the highest investment option

Twenty-three Supplemental Resource areas with no programmed timber harvest are allocated

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 12,400 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 148,000 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the potential increase attributable to application of Riparian Prescription C would be 79 WFUD's and 1,100 pounds.

Alternative M

Anticipated fishery outputs are the same as Alternative G. There is considerably less risk, however, due to measurably reduced timber harvest and no new road construction. Sediment production is predicted to decline by 81 percent from current levels, representing a significant decrease in potential impacts to salmonid habitat capability.

Alternative S

DIRECT EFFECTS Alternative S offers high salmonid capability in terms of smolt and fisheries output potentials. Water temperatures would gradually decrease and salmonid fish habitat capability would increase over present levels in the seven planning Basins with Riparian Prescription C. These basins include: Elk/Sixes, Lobster, Lower Rogue, Indigo, Silver, Pistol, and Lower Chetco. The temperature in the 12 basins with Riparian Prescription B would remain at current levels

Sediment production is predicted to decrease by 12 percent from current levels (Alternative A) for decades 1-5 This will have effects similar to those described for Alternative K Basin-specific timber-harvest basin constraints of 7 to 17 percent have been applied.

Salmonid capability is expected to increase through fish habitat improvement projects. Capital Investments of $350,000 represent the high investment option.

Twenty key streams are allocated to Supplemental Resource Management Areas. Five other key streams are given additional protection through other land allocations with no programmed harvest.

INDIRECT EFFECTS. During the first decade, potential fish harvests are expected to gradually increase from current levels, providing an additional 13,400 wildlife/fish user days (WFUD's) per year in the inland and offshore sport fishery and an additional 164,000 pounds per year in the offshore commercial salmon fishery. If improvement projects are not funded, the expected increase attributable to application of Prescription C would be approximately 1,000 WFUD's and 15,000 pounds

ENVIRONMENTAL EFFECTS BY PLANNING BASIN

The potential for sediment and water temperature impacts on anadromous salmonid fish are also key indicators for the **SOIL AND WATER** section of this chapter. The recognized environmental effects for both fish and water are combined herein. For each Planning Basin, an estimate is made of the risk of the proposed management activities on salmonid habitat capability and other selected beneficial uses of water. The beneficial uses selected were those considered most sensitive to forest management activities, and/or at least those with the status of a minor beneficial use for the Planning Basin, as shown on Table III-11.

For Siskiyou National Forest streams, the most critical potential sources of risk from management activities are related to:

1. Sediment and turbidity increases, above background levels, by timber harvest and road construction (refer to the **SOIL AND WATER** section in this chapter), and

2. Temperature increases due to removal of streamside shade canopies

The water quality standards established by the Oregon Department of Environmental Quality and the California Water Resources Control Board are intended to provide for water quality sufficient to maintain existing levels of beneficial uses.

The intensity and extent of activities are the primary determinants of potential risks to the water and fisheries resource The following terms for rating the potential risks to salmonid habitat capability and selected beneficial uses of water are used in this analysis. The beneficial uses of water considered below always include the anadromous fishery, and may include public and domestic water supplies, irrigation, wildlife, fishing, boating, water-contact recreation, visual quality, and navigation where applicable.

negligible -- the existing salmonid habitat capability and beneficial uses of water are expected to be maintained or improved; water quality standards are expected to be met.

minor adverse -- the predicted change in temperature, sediment, and turbidity results in increased risk to salmonid habitat capability and beneficial uses without significant impacts. There is a slight risk of exceeding water quality standards on a short-duration, localized basis.

moderate adverse -- the predicted change in temperature, sediment, and turbidity results in increased risk, with potential for localized impacts to salmonid habitat capability and beneficial uses. Water quality standards for an identified use may be exceeded.

Under alternatives where risks are defined as **negligible**, water quality and instream conditions for salmonid capability and beneficial uses are expected to be maintained or improved. Where the potential for improvement over current condition exists, the ratings are enclosed by parentheses, e.g , either **(minor Improvement)** or **(moderate Improvement)**. This rating applies to long-term potential for improvement over existing conditions. For current conditions, refer to the **FISH** and **SOIL AND WATER** sections of Chapter III.

The potential for on-site and downstream cumulative effects resulting from all (National Forest and other) proposed management activities in the basin is shown by the relative rating of potential risk from increased sediment, turbidity, and temperature identified below for each Planning Basin. The estimates of potential risk from increased sediment and turbidity were made considering the estimated mean and peak decade percent increase in sediment shown in Figures IV-1 through IV-12, land allocations, the beneficial uses of water, current watershed condition and water quality, and past, present, and future (anticipated) levels of management activity on National Forest and other lands The estimates of potential risk from increased temperature were made considering current and future water temperatures and trends, land allocations, as well as the Riparian Prescriptions (B, C, or M) identified by alternative for each Planning Basin. The estimates of potential risk for Indigo, Silver, Galice/Slate, and East and West Fork Illinois Planning Basins considered the impacts associated with the 1987 fires on both watershed condition and water quality.

In order to track the following discussions, two tables in previous chapters will be particularly helpful. Table II-3 (Special Area Assignments) should aid in tracking specific land allocations by alternative. Table III-10 (Descriptive Indices by Planning Basin) covers the Planning Basin acreages and percentages; references to prior harvest by decades are taken from this source.

Further, to partially mitigate potential significant cumulative impacts within a given basin, various levels of timber harvest constraints have been applied to selected alternatives. These constraints apply to the tentatively suitable lands within the basin over the decade. Where alternative constraints are not specified in the following analysis, the Management Requirement of 20 percent is used The constraints only apply to Siskiyou National Forest System lands; the analysis of basin impacts on the fish and water resource,

however, include the probable management activity of private and other land ownerships in these Planning Basin assessments

Basin 01 - Elk/Sixes

In addition to salmonid habitat capability, the following includes estimated risk to domestic water supplies and fishing in terms of potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity.

Alternatives NC, A, A-Departure, and C are **negligible**
Alternatives B, D, D1, K, and S are **negligible (minor improvement).**
Alternatives E, G, and M are **negligible (moderate improvement)**

Estimated risk from increased temperature·

Alternatives NC, A, A-Departure, and C are **negligible** (Prescription B)
All other Alternatives are **negligible (moderate improvement)**(Prescription C or M).

The Elk/Sixes Planning Basin is shared between two separate coastal rivers, the Elk and the Sixes The basin is characterized by it's high-value anadromous fisheries, including the Oregon Department of Fish and Wildlife's Elk River Hatchery. The north side of the Elk River, plus the Dry Creek basin on the Sixes, is in the Grassy Knob Wilderness. Two-thirds of the basin under National Forest management is tentatively suitable for the production of timber. Of this, 18 percent was harvested from 1950-70, and 20 percent from 1970-80 Management activity in the 1980's on the Siskiyou National Forest lands has continued at about the same level

As a result of past timber harvest and roading activities on both Forest and private lands, this basin is presently in a recovery mode The rate of recovery varies greatly by small watershed In several instances, the type and extent of older activity has created some adverse, long-term impacts to tributary drainages Other watersheds have either been more resilient or did not experience the level of poor practices or heavy, *cumulative impacts within a relatively short period This past activity has been accounted for in the above* ratings.

While the Elk and Sixes Rivers are contiguous and contain high-valued anadromous fisheries, this is where much of their similarity ends. The Elk River is a very steep, rugged drainage largely within the Siskiyou National Forest Private land within and outside this watershed has been harvested in the past, road systems are complete and the lands are revegetated. Very little harvesting on private land occurred during the 1980's, little is expected in the 1990's

The Sixes River, different in geology, responses to activity, and history of development, presents another scenario. However, the trend in water quality is again expected to improve over the next few decades Most of the watershed is in private ownership. The Forest's portion has access and much of it was harvested within the last 20 years Harvesting of the private land was heaviest in the 1950's and 1960's. Harvesting since has been scattered and limited The road system is in place Activity levels for private lands in the entire drainage are low and expected to remain so for a few decades until the new stands reach merchantable size. Impacts of past activities still remain, but much reduced from the likely levels that occurred in 1950's and 1960's.

Under Alternatives E, G, and M, management activities and resulting sediment would be concentrated in the headwaters of South Fork Sixes River and the south side of Elk River. All other alternatives would distribute activities and associated sediment outputs to the South Fork Sixes River and throughout the Elk River watershed. Improvement of existing conditions under Alternatives E, G, K, M, and S will be due

primarily to allocations of Management Areas 1-9 in selected portions of these two watersheds. Complementing these allocations, the Elk River was designated Wild and Scenic for nearly 20 miles upstream from the Forest boundary as a result of the Oregon Omnibus Wild and Scenic River Act of 1988

Alternatives B, D, D1, E, G, K, and M have a 10 percent per-decade basin timber harvest dispersion constraint Alternative S applies a 12 percent basin harvest constraint.

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects, both on- and off-Forest, considering anticipated levels of new activity on both National Forest and other lands for at least the next two decades. The risk of cumulative effects is further reduced in alternatives with either basin harvest constraints. Water quality is expected to be maintained or improved for rivers and streams, including the Wild and Scenic Elk River No cumulative effects in the Wild and Scenic Elk River are anticipated

Basin 02 - South Fork Coquille

In addition to salmonid habitat capability, the following includes the estimated risk to the Powers municipal water supply (low-flow period), domestic water supplies, and fishing in terms of potential increase in accelerated sediment and turbidity.

Potential risk from sediment and turbidity increases.

Alternative NC, A, A-Departure, B, C, D, and D1 are **negligible.**
Alternatives E, G, K, and S are **negligible (minor improvement).**
Alternative M is negligible (**moderate improvement**).

Estimated risk from increased temperature:

All alternatives other than E, G, and M are **negligible** (Prescription B).
Alternatives E, G, and M are **negligible (minor improvement)**(Prescription C or M).

Salmonid habitat and water quality in the South Fork Coquille Basin is a reflection of both Forest and private management, past and present. Early timber harvest operations on private lands in the Coquille River watershed involved use of large steam yarders and railroads. These operations, plus extensive burning of logging slash on oversteepened slopes and riparian areas, resulted in many water quality problems in the 1920's through the 1950's.

By the early 1980's, much of the mature timber on private lands in the South Fork Coquille River watershed had been harvested, leaving about 18 percent of the private lands in the basin available for harvest Ninety percent of the basin under National Forest management is tentatively suitable for the production of timber Of this, 16 percent was harvested from 1950-69, and 20 percent from 1970-79. Timber harvest activity on Siskiyou National Forest lands in the 1980's has continued at about the same level. While some harvest on private lands occurred during the 1980's, streamside and upslope areas are generally in a recovery phase Stands of 10-30 foot high Douglas-fir dominate much of both private and National Forest lands today.

The summer water withdrawal from the South Fork Coquille River for the Powers municipal use is largely unaffected by sediment and turbidity due to the water quality conditions at this time of year. During winter and high-flow periods, the water source is switched to a small watershed (Bingham Creek) outside the National Forest boundary.

All alternatives have selected Management Area 1-9 allocations coupled with visual management objectives and Riparian areas which provide added benefits above the Standards and Guidelines to the

mainstem river corridor. Alternatives G and M, however, have Supplemental Resource areas of one-eighth mile corridors along Coal, Johnson, Sucker, and Rock Creeks, and along the upper mainstem of the South Fork Coquille. An extensive road system already exists, so few additional roads will be needed.

Alternatives E, G, K, and M have a 11 percent per-decade basin timber harvest dispersion constraint Alternative S applies a 12 percent constraint

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects This considers both existing conditions and anticipated levels of activity on both National Forest and other lands for at least the next two decades. The risk of cumulative effects is further reduced in alternatives with either basin timber harvest constraint Water quality is expected to be maintained or improved

Basin 03 - Lobster.

In addition to salmonid habitat capability, the following includes the estimated risk to the public water supply and fishing in terms of potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity.

Alternatives D1 is **minor adverse**
Alternatives NC, A, A-Departure, C, and D are **negligible.**
Alternatives B, E, G, K, and S are **negligible (minor improvement).**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature.

Alternatives other than E, G, M, and S are **negligible** (Prescription B).
Alternatives E, G, M and S are **negligible (minor improvement)** (Prescription C or M)

National Forest lands, located in the upper watershed area of Lobster Creek, comprise approximately 44 percent of the Planning Basin. The majority of the private lands in the lower watershed were harvested and burned between 1960 and 1980, leaving about five percent of the private lands to be harvested This harvest activity and associated practices in the lower watershed lead to both temperature and sediment cumulative impacts on the fishery habitat downstream from National Forest lands. Of land within the basin under National Forest management, 93 percent is tentatively suitable for the production of timber Of this, eight percent was harvested from 1950-70, and 18 percent from 1970-80 Some additional harvest of the remaining commercial-sized stands on private land and moderate harvest levels (similar to the prior decade) on the Siskiyou National Forest has occurred through the 1980's, however at a much reduced rate for the basin. As a result, the Lobster Creek watershed is currently in a recovery period.

Portions of the Euchre Creek watershed are located in the Lobster Creek Planning Basin Removal of timber from private lands within the basin occurred over a relatively short time period during the 1960's and 1970's The type and extent of these harvest practices, coupled with even older livestock grazing in the lower reach, resulted in extensive damage to the low-gradient stream system in the form of aggraded channels and bank instability. Timber harvesting and associated roading on National Forest lands has been moderate and mostly within the last two decades The Euchre Creek watershed is currently slowly recovering, but poor salmonid fish habitat characteristics are expected to remain for at least the next two decades.

Alternatives E, G, K, and M have a 11 percent per-decade basin timber harvest dispersion constraint; Alternative S applies a 12 percent constraint These alternatives also allocate Lobster Creek and South Fork Lobster Creek to Supplemental Resource Management Areas.

For all alternatives except D1, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on National Forest, BLM, and other lands for at least the next three decades. The risk of cumulative effects is further reduced in alternatives with the basin timber harvest constraints. For alternatives other than Alternative D1, water quality is expected to be maintained or improved No cumulative effects downstream in either the Rogue River or the estuary are anticipated.

Basin 04 - Upper Rogue

In addition to salmonid habitat capability, the following includes the estimated risk to public and domestic water supplies, fishing, boating, and visual quality in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity:

Alternative C is **minor adverse**
Alternatives NC, A, A-Departure, B, D, D1, K, and S are **negligible.**
Alternatives E and G are **negligible (minor improvement)**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature·

Alternatives NC, A, A-Departure, C, K, and S are **negligible** (Prescription B).
Alternatives B, D, D1, E, G, and M are **negligible (minor improvement)**(Prescription C or M)

The Upper Rogue Planning Basin contains the designated Wild Rogue Wilderness and the Wild and Scenic Rogue River. Nearly all (97 percent) of the basin is National Forest Much of the basin lies within the Wild Rogue Wilderness. Shasta Costa and Foster Creek are major fish-producing tributaries Approximately 60 percent of the total basin is tentatively suitable for timber production Of this, six percent was harvested from 1950-70, and six percent from 1970-80 Timber harvest activity on National Forest lands in the 1980's has continued at about the same level

The basin has been heavily harvested on the west and essentially undeveloped on the east (Shasta Costa and Stair Creeks, and the Wild Rogue Wilderness). In the upper reach of the Rogue River in this basin, summer water quality and fish habitat conditions have improved since the completion of Lost Creek Reservoir in 1977 and Applegate Reservoir in 1980.

Under Alternatives E and M, management activities and associated sediment output would be concentrated in the headwaters of Stair Creek and to the west side of the Rogue River. All other alternatives would distribute the accelerated sediment levels throughout the non-Wilderness portion of the basin. All Alternatives except C include the Shasta Costa Supplemental Resource Management Area(s). Within the Rogue River corridor, visual management constraints are applied in Alternatives E, G, K, M, and S which further reduce potential impacts. A 12 percent basin timber harvest dispersion constraint applies to Alternatives B, D, D1, E, G, K, and M, a 16 percent constraint applies to Alternative S

For all alternatives except Alternative C, there is an estimated negligible potential risk for timber management/road-related cumulative effects This considers both existing conditions and anticipated levels of activity on predominately National Forest lands Alternative C is anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with basin timber harvest constraints of either 12 or 16 percent For other than Alternative C, water quality is expected to be maintained or improved in rivers and streams, including the Wild and Scenic Rogue River. No cumulative effects downstream in either the Rogue River or estuary are anticipated

Basin 05 - Lower Rogue

In addition to salmonid habitat capability, the following includes the estimated risk to public and domestic water supplies, fishing, boating, navigation, and visual quality in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity:

Alternatives NC, A, A-Departure, B, C, D, D1, K, and S are **negligible.**
Alternatives E and G are **negligible (minor improvement)**
Alternative M is **negligible (moderate improvement)**

Estimated risk from increased temperature:

Alternatives NC, A, A-Departure, C, and K are **negligible** (Prescription B).
Alternatives B, D, D1, E, G, M, and S are **negligible (moderate improvement)** (Prescription C or M)

The Rogue River watershed is one of the top salmonid fish producers in the United Stated in terms of species diversity, angler success, and opportunity. Salmonid habitat capability of the Lower Rogue Planning Basin is strongly influenced by the designated Wild and Scenic Rogue River and other complementary land allocations within the river corridor High concern for the fisheries also centers on the quality of tributary streams such as Quosatana Creek

Nearly 90 percent of the National Forest portion of the basin is tentatively suitable for timber production. Six percent of this was harvested from 1950-70, and 12 percent from 1970-80. A moderate level of harvest has continued through the 1980's on the Siskiyou National Forest About six percent of the private land is still available for harvest.

Alternatives E and M would spatially distribute sediment impacts to the south and western portions of the basin; the east side of Quosatana Creek would not be developed. All other alternatives would distribute higher sediment levels throughout the basin. Alternatives B, D, D1, E, G, K, and M have a 12 percent per-decade basin timber harvest dispersion constraint; a harvest constraint of 15 percent applies to Alternative S. Alternatives E, G, K, M, and S have a high level of visual management applied along the Rogue River and Quosatana Creek allocated to Supplemental Resource areas

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects This considers both existing conditions and anticipated levels of activity on both National Forest and other lands. The risk of cumulative effects is further reduced in alternatives with basin timber harvest constraints of either 12 or 15 percent. Water quality is expected to be maintained or improved in rivers and streams, including the Wild and Scenic Rogue River. No cumulative effects downstream in either the Rogue River or estuary are anticipated.

Basin 06 - Indigo

In addition to salmonid habitat capability, the following includes the estimated risk to fishing and wildlife in terms of a potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity:

Alternatives B, C, D, and D1 are **moderate adverse.**
Alternatives NC, A, A-Departure, K, and S are **minor adverse.**
Alternatives E and G are **negligible.**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature

All Alternatives except E, G, M, and S are **negligible** (Prescription B).
Alternatives E, G, M, and S are **negligible (moderate improvement)** (Prescription C or M)

By providing cool water to the Illinois River during the time of low summer flows, this Planning Basin strongly influences salmonid habitat off-site All of the basin is National Forest lands Much of the headwaters of Indigo Creek have been roaded Most of the south side of Indigo Creek, though, remains unroaded.

Nearly 80 percent of the basin under National Forest management is tentatively available for the production of timber. Of this, three percent was harvested from 1950-70, and five percent from 1970-80 Timber harvest activity on National Forest lands in the 1980's has continued at about the same limited rate.

Under Alternatives E and M, potential sediment production would occur on lands in the northwest and extreme eastern (headwaters) portions of the basin All other alternatives with higher sediment yields would distribute the effects throughout the basin.

Alternatives E, G, M, and S have allocated both Indigo Creek and the East and West Forks of Indigo Creek to Supplemental Resource areas, all alternatives except C allocate Indigo Creek. For these alternatives and Alternative K, a basin timber harvest dispersion constraint of 11 percent per decade applies For further analysis of potential cumulative effects, refer to Silver Fire Recovery Project FEIS (USDA 1988d).

For all alternatives other than E, G, and M, there is either an estimated minor or moderate adverse risk for wildfire and timber management/road-related cumulative effects This analysis considers both existing conditions, including 1987 fire impacts, and anticipated levels of activity on National Forest lands Alternatives B, C, D, and D1 are anticipated to result in a moderate adverse risk for cumulative effects from wildfire, timber management, and road-related sedimentation. Alternatives NC, A, A-Departure, K, and A are anticipated to result in a minor adverse risk for cumulative effects The risk of cumulative effects is reduced in alternatives with a basin timber harvest constraint For other than Alternatives B, C, D, and D1, water quality is expected to be maintained or improved. No cumulative effects downstream in either the Wild and Scenic Illinois or Rogue River are anticipated.

Basin 07 - Silver.

In addition to salmonid habitat capability, the following includes the estimated risk to fishing and wildlife in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity

Alternative C is **moderate adverse**
Alternatives NC, A, A-Departure, B, D, D1, K, and S are **minor adverse.**
Alternatives E and G are **negligible.**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature

Alternatives NC, A, A-Departure, C, and K are **negligible** (Prescription B)
All other alternatives are **negligible (minor improvement)** (Prescription C or M).

Silver Creek continues to be an important source of cooler water for the Illinois River, and is an important influence on fish habitats both on- and off-site

The headwaters of Silver Creek were harvested in localized areas by the Forest Service and BLM in the 1960's and early 1970's. Most (one percent of the tentatively suitable land) of the past National Forest harvesting occurred in the headwaters of Silver and South Fork Silver Creeks in the 1960's The Bureau of Land Management harvests are located in the North Fork Silver Creek headwaters from the 1960's to date. Less than one percent of the suitable Siskiyou National Forest lands were harvested in the decade of 1970-80. Approximately 60 percent of the basin under National Forest management is tentatively suitable for the production of timber

With the exception of the Silver Fire Recovery Project, little harvest activity has occurred in the 1980's. Salvage logging using helicopter and long-span skyline systems in the Silver Fire area is presently underway. Very few miles of new road construction accompanied the fire salvage activities. Whereas the area covered by harvest is relatively large, the associated impacts are minor due to the type of logging systems utilized, the limited roading, and other mitigation measures applied. For further discussion of potential effects, including the cumulative effects analysis, refer to Silver Fire Recovery Project FEIS (USDA 1988d).

Some recovery is still occurring within riparian areas as a result of the older harvest practices. However, the residual impact today is not significant on the downstream fishery resources.

Alternatives E, G, M, and S would hold the minor sediment impacts to predominately the eastern fringes of the basin. All other alternatives would distribute higher sediment levels throughout the basin. Most activity, however, would occur away from the inner gorge areas due to allocations to Supplemental Resource and other Management Areas with no programmed harvest, and the prevalence of unsuitable land in the lower slope areas

A nine percent per-decade basin timber harvest constraint would apply to Alternatives B, D, D1, E, G, K, and M. A seven percent constraint is applied to Alternative S to mitigate some of the Silver Fire Recovery Project impacts. In addition, Alternatives E, G, M, and S have very limited harvest within the Silver Planning Basin as a result of the large area allocated to Backcountry Recreation.

For all alternatives other than E, G, and M, there is either an estimated minor or moderate adverse risk for wildfire and timber management/road-related cumulative effects. This analysis considers both existing conditions and anticipated levels of activity on predominately National Forest and BLM lands. Alternatives NC, A, A-Departure, B, D, D1, K, and S are anticipated to result in a minor adverse potential risk for cumulative effects from wildfire, timber management, and road-related sedimentation, while Alternative C would result in a moderate adverse potential risk. The risk of cumulative effects is reduced in alternatives with basin harvest constraints. For other than Alternative C, water quality is expected to be maintained or improved. No cumulative effects downstream in either the Wild and Scenic Illinois or Rogue River are anticipated

Basin 08 - Galice/Slate.

In addition to salmonid habitat capability, the following includes the estimated risk to domestic water supplies and irrigation in terms of potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity.

Alternatives B, C, D, and D1 are **minor adverse.**
Alternatives NC, A, A-Departure, E, G, K, and S are **negligible.**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature:

All Alternatives except E, G, and M are **negligible** (Prescription B)
Alternatives E, G, and M are **negligible (minor improvement)** (Prescription C or M).

The Planning Basin contains tributaries of both the Rogue and Applegate Rivers. This basin contains some of the prime summer steelhead spawning and rearing habitat on the Forest. Salmonid production in the basin is affected by naturally low flows and water withdrawals for irrigation and domestic uses mostly below the Forest boundary.

About one half of the basin is National Forest land. Of this, three-quarters is tentatively suitable for the production of timber. While only four percent of the suitable National Forest lands were harvested between 1950-70 and two percent between 1970-80, private lands were heavily logged in the 1960's. This resulted in localized impacts on water quality. The watershed condition as a result of this past harvesting, along with that of older mining and present activities, were considered in making the above estimates of effects. Harvest activity in the 1980's has largely been on National Forest lands, the extent of activity has varied by stream tributary from light to moderate.

Mining within riparian areas, road erosion, water withdrawal, and localized landslides triggered (in part) by timber harvest activities, have all contributed to the present salmonid habitat conditions in the basin. Coupled with these, a major fish habitat problem occurs because of water withdrawals on private land in the lower eight miles of Slate Creek and it's tributaries. Poor ground water conditions and a relatively high demand for domestic water will continue to impact salmonid habitat throughout the this drainage.

Alternatives E, G, K, and M have a 12 percent per-decade basin harvest constraint, Alternative S has a 14 percent constraint. These five alternatives have Management Areas with either no programmed harvest or constrained harvest along Taylor, Galice, and Slate Creeks.

For all alternatives except B, C, D, and D1, there is an estimated negligible risk for wildfire and timber management/road-related cumulative effects. This analysis considers both existing conditions, including the Galice Fire of 1987, and anticipated levels of activity on National Forest, BLM, and other lands. Alternatives B, C, D, and D1 are anticipated to result in a minor adverse potential risk for cumulative effects from wildfire, timber management, and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraints. For other than Alternatives B, C, D, and D1, water quality is expected to be maintained or improved. No cumulative effects downstream in either the Wild and Scenic Rogue River or Applegate River are anticipated.

Basin 09 - Lower Illinois

In addition to salmonid habitat capability, the following includes the estimated risk to the fishing, boating, and visual quality in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity:

Alternatives B, C, D, and D1 are **minor adverse.**
Alternatives NC, A, A-Departure, K, and S are **negligible**
Alternatives E and G are **negligible (minor improvement).**
Alternatives M is **negligible (moderate improvement).**

Estimated risk from increased temperature

All alternatives except E, G, and M are **negligible** (Prescription B).
Alternatives E, G, and M are **negligible (minor improvement)**(Prescription C or M).

The Lower Illinois Planning Basin is considered to be of primary importance to rearing adult and juvenile salmon and steelhead. Habitat capability is heavily influenced by off-Forest consumptive water uses in the Illinois Valley and Deer Creek. This influence presently reduces salmonid habitat capability of the mainstem Illinois River Tributary streams managed by the Forest are extremely important for maintaining viability of salmonid populations in the Lower Illinois Planning Basin Inner gorge areas along the two principal tributaries, Lawson and Collier Creeks, are extremely unstable and have been classed as unsuitable for the production of timber.

Nearly all of the basin is National Forest land. Stability problems have contributed to the reduction of tentatively suitable land to about one half of the total basin area. The 1950-1970 harvest of five percent of the suitable land was followed by eight percent for the 1970-1980 period. Most activity in the 1980's has been concentrated on the north and west portions of the Lawson Creek watershed; the extent of activity has been limited for the Planning Basin.

In Alternatives E, G, M, and S, considerable portions of Lawson Creek watershed are allocated to Backcountry Recreation. Alternatives E and M shift development activities to the western boundaries of Lawson Creek; activities under Alternatives G and S occur west of Lawson Creek and Game Lake. In alternatives without Lawson Creek allocated to the Backcountry Recreation, sediment impacts would be distributed throughout the suitable land base. Activity acres would occur to the west and north of the Kalmiopsis Wilderness, and outside the large block of unsuitable land within Lawson Creek.

All alternatives include the Wild and Scenic Illinois River corridor. The Collier Creek drainage is largely within the Kalmiopsis Wilderness. All alternatives, except C, include Lawson Creek Supplemental Resource Management Area Alternatives E, G, K, M, and S also include Horse Sign and Collier Creek Supplemental Resource areas Alternatives E, G, K, and M set basin harvest constraints at 11 percent per decade; *Alternative S has a 14 percent harvest constraint.*

For all alternatives except B, C, D, and D1, there is an estimated negligible potential risk for timber management/road-related cumulative effects This considers both existing conditions and anticipated levels of activity on mostly National Forest land Alternatives B, C, D, and D1 are anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 11 or 14 percent. For other than Alternatives B, C, D, and D1, water quality is expected to be maintained or improved. This evaluation also considers the cumulative influence of the Upper Illinois, Silver, and Briggs Planning Basins on the Lower Illinois River. No cumulative effects downstream in either the Wild and Scenic Illinois or Rogue River are anticipated.

Basin 10 - Upper Illinois.

In addition to salmonid habitat capability, the following includes the estimated risk to fishing, boating, water contact recreation, and visual quality in terms of a potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity

Alternatives NC, A, A-Departure, B, C, D, D1, K, and S are **negligible**
Alternatives E, G, and M are **negligible (minor improvement)**

Estimated risk from increased temperature.

All alternatives are **negligible.**

Salmonid habitat capability of the Upper Illinois Planning Basin is highly related to water supply. Geology and low elevations are prime reasons for natural low flows in the Upper Illinois River drainage A cumulative effect to fish habitat condition and water quality exists because of water withdrawals outside the Forest. Salmonid habitat located on Forest Service administered tributary streams are in the best condition for the basin. One-half of the basin within the Siskiyou National Forest boundary is in the Kalmiopsis Wilderness. Outside the Wilderness, the mainstem of the Illinois River is designated Wild and Scenic River.

Private timber lands in the Upper Illinois Planning Basin were almost entirely harvested on first entry by 1980. The majority of private timber lands are now in a recovery and regrowth state, timber harvest on these lands will not occur for at least two decades Forest timber harvest activity per decade has remained relatively low at two to three percent of the suitable land since 1950 Most National Forest harvest has occurred in area north of the Illinois River and east of Briggs Creek basin.

Significant opportunities exist for improving tributary stream habitat capability through capital investments on selected Forest streams having favorable habitat opportunity. For the mainstem Illinois River, unless supplemental water supplies are developed to meet off-Forest irrigation and domestic needs and assure adequate releases for minimum flows downstream, there is little doubt that the increasing demand for water will further exasperate the existing fish habitat problems on the Forest.

Potential sediment producing activities for Alternatives E and M, and to a lesser degree G, are concentrated in localized areas along the south side and to a limited area north of the Illinois River. For all other alternatives, sediment impacts occur over the half of the basin which is outside the Wilderness.

Alternatives E, G, K, M, and S have significant areas set aside in Management Areas with no programmed harvest or with visual constraints. Alternatives E, G, K, and M have a 12 percent per-decade basin harvest constraint; Alternative S has a 17 percent harvest constraint.

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on National Forest, BLM, and other lands The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 12 or 17 percent Water quality is expected to be maintained or improved. No cumulative effects downstream in either the Wild and Scenic Illinois or Rogue River are anticipated.

Basin 11 - Briggs

In addition to salmonid habitat capability, the following includes the estimated risk to fishing and wildlife in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity.

Alternatives NC, A, A-Departure, B, C, D, and D1 are **minor adverse.**
Alternatives E, G, K, and S are **negligible**
Alternative M is **negligible (minor improvement)**

Estimated risk from increased temperature

All Alternatives except E, G, and M are **negligible** (Prescription B)
Alternatives E, G, and M are **negligible (minor improvement)** (Prescription C or M).

The Briggs Creek Planning Basin is considered to be more manageable for timber because of gentler slopes adjacent to riparian areas and greater slope stability Seventy-eight percent of the basin is tentatively suitable for timber production. Approximately five percent of the basin is in private ownership

From 1950 to date, less than 20 percent of the suitable National Forest land was harvested. Private lands in the upper Briggs Creek drainage received extensive harvest activity of mature pine timber in the 1920's through the 1960's. Road development in the watershed is nearly complete on both National Forest and private lands. New access development will be concentrated on upgrading existing systems and short local roads to harvest units.

Alternatives NC, A, E, G, and M have Briggs Creek allocated to Supplemental Resource Alternatives E and M place the majority of the Briggs Creek drainage under roadless management. Alternatives E, G, K, and M have a 12 percent per-decade basin timber harvest dispersion constraint; Alternative S applies a 16 percent basin harvest constraint.

For all alternatives except NC, A, A-Departure, B, C, D, and D1, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on mostly National Forest land and limited private ownerships Alternatives NC, A, A-Departure, B, C, D, and D1 are anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 12 or 16 percent. For other than Alternatives NC, A, A-Departure, B, C, D, and D1, water quality is expected to be maintained or improved. No cumulative effects downstream in either the Wild and Scenic Illinois or Rogue River are anticipated.

Basin 12 - Pistol.

In addition to salmonid habitat capability, the following includes the estimated risk to domestic water supplies and fishing in terms of a potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity:

Alternatives D and D1 are **minor adverse.**
Alternatives NC, A, A-Departure, B, and C are **negligible.**
Alternatives E, G, K, and S are **negligible (minor improvement).**
Alternative M is **negligible (moderate improvement).**

Estimated risk from increased temperature:

Alternatives NC, A, A-Departure, B, C, D, D1, and K are **negligible** (Prescription B).
Alternatives E, G, M, and S are **negligible (minor improvement)** (Prescription C or M)

Forest administration in this basin is interspersed with private lands. Quality of fish habitat is a combined result of both private and Forest influences. In general, the upper half of the basin is National Forest

Over 85 percent of the basin under National Forest management is tentatively suitable for the production of timber While approximately 20 percent of the suitable National Forest lands were harvested since 1950, harvesting on private lands in the 1960's and early 1970's was extensive in the western half of the basin. The type and extent of harvest and roading contributed significantly to off-Forest direct and cumulative

effects This past activity and current recovery trend, particularly sediment rates, was considered in making the above assessments

Road development within the Pistol Planning Basin is currently extensive On National Forest lands, upgrading and developing short, local roads to access harvest units is expected to be the prime engineering activity. Most of the road system is also in place on private lands. The commercial timber volume has been nearly depleted, harvest in the next few decades is expected to be very light

Due to the private land ownership being distributed along the much of the mainstem of Pistol River, benefits potentially attributable to Supplemental Resource areas is limited. Alternatives E and M provide some protection to the East Fork Pistol River by allocation to Backcountry Recreation, the other alternatives provide lesser amounts of area with no programmed harvest. Alternatives E, G, K, M, and S have a 12 percent basin harvest constraint per decade

For all alternatives except D and D1, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on both National Forest and other lands. Alternatives D and D1 are anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint. For other than Alternatives D and D1, water quality is expected to be maintained or improved.

Basin 13 - Lower Chetco

In addition to salmonid habitat capability, the following includes the estimated risk to public and domestic water supplies, wildlife, fishing, boating, water contact recreation, visual quality, and navigation in terms of a potential increase in accelerated sediment and turbidity.

Estimated risk from increased sediment and turbidity.

Alternatives NC, A, A-Departure, B, C, D, D1, K, and S are **negligible.**
Alternatives E and G are **negligible (minor improvement)**
Alternative M is **negligible (moderate improvement)**

Estimated risk from increased temperature.

Alternatives NC, A, A-Departure, C, and K are **negligible** (Prescription B).
Alternatives B, D, D1, E, G, and S are **negligible (minor improvement)**(Prescription C or M).

Salmonid capability of this basin is strongly influenced by the Upper Chetco Planning Basin, which is in the Kalmiopsis Wilderness. Even though close to the ocean, low summer flows are an inherent problem in the basin (due primarily to the geology in the upper reaches). Steep, highly erodible slopes also affect the recovery of fish habitats in the basin from past activities.

About 61 percent of the Lower Chetco Planning Basin is National Forest System lands. Nearly three-quarters of the basin under National Forest management is tentatively suitable for the production of timber

The majority of private timber in the lower Chetco River drainage was logged during the latter 1950's through the early 1970's Over 30 percent of the suitable land within the National Forest has also been harvested between 1950 and 1980. The level of harvest activity in the 1980's has continued at about the same rate. Erodible soils, heavy rainfall, and older timber harvest and roading practices resulted in extensive erosion and loss of riparian vegetation on much of the private and Forest lands during the latter 1950's and 1960's Vegetative recovery since that time has resulted in mixed stands of young alder (20-40

ft high), tanoak, and second growth conifers on the majority of cut-over lands. On smaller tributary streams, many of the second-growth riparian stands are sufficient to offer good stream shade cover on both National Forest and private lands

Forest transportation systems within the Chetco watershed are extensive. Future transportation work will be limited to short roads to harvest units and upgrading of the existing system.

Seventy-four percent of the basin is tentatively suitable for timber harvest Potential sediment impacts are fairly well distributed throughout the basin in all alternatives However, Alternatives E and M reduce the spatial impacts to the suitable lands outside of the four Backcountry Recreation Management Areas.

All Alternatives include the Emily Creek Supplemental Resource Management Area. Alternatives E, G, K, M, and S have allocated the Mislatnah and South Fork Chetco Supplemental Resource areas And, as a result of the Oregon Omnibus Wild and Scenic River Act of 1988, the entire mainstem of the Chetco River within the National Forest boundary is now designated Wild and Scenic. Alternatives B, D, D1, E, G, K, M, and S have applied a basin timber harvest constraint of 10 percent per decade or less, to both disperse activity over time and space, and to allow for some recovery from prior decade activities.

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on National Forest, BLM, and other lands. The risk of cumulative effects is further reduced in alternatives with the basin harvest constraint Water quality is expected to be maintained or improved.

Basin 14 - Upper Chetco

Essentially unchanged under all alternatives, this Planning Basin offers few opportunities for enhancement of fish habitat beyond current conditions As it is entirely within the Kalmiopsis Wilderness, risks (cumulative or otherwise) to beneficial uses of anadromous fishery, wildlife, fishing, and visual quality in terms of potential increases in sediment, turbidity, or temperature under all alternatives is negligible.

Basin 15 - Rough/Josephine.

In addition to salmonid habitat capability, the following includes the estimated risk to fishing and water contact recreation in terms of potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity.

Alternatives NC, B, C, D, and D1 are **minor adverse.**
Alternatives A, A-Departure, K, and S are **negligible.**
Alternatives E, G, and M are **negligible (minor improvement).**

Potential risk from increased temperature.

All alternatives are **negligible**

The Rough/Josephine Planning Basin has very low potential for cumulative effects and other impacts from timber harvest since very few acres (10 percent) are tentatively suitable for timber production As a result, the potential for sediment outputs is also very low Nearly three-fourths of the basin is National Forest Far less than 10 percent of the suitable National Forest lands have been harvested from 1950 to date. This basin is characterized by very sparse riparian vegetation and poor soil conditions for conifer tree growth over much of the area. There are few opportunities for improvement of riparian areas Much of the basin is in an unroaded condition

Mineral exploration and development activity for both gold and chromium ore has resulted in past heavy sediment loads to tributary streams. Similarly, the riparian vegetation along many streams was removed during these operations This situation persisted up to the 1960's

The potential sediment impacts are generally along the Babyfoot Lake access corridor, or are very localized in areas suitable for the production of timber. In Alternatives E, G, M, and S, activities are almost exclusively concentrated along the Babyfoot Lake access corridor.

Opportunities for effective Supplemental Resource Management Areas are limited Alternatives E, G, K, and M have an 11 percent per-decade basin timber harvest constraint, while Alternative S has a 17 percent harvest constraint.

For all alternatives except NC, B, C, D, and D1, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on mostly National Forest land and to a limited extent lands of others. Alternatives NC, B, C, D, and D1 are anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 11 or 17 percent. For other than Alternatives NC, B, C, D, and D1, water quality is expected to be maintained or improved.

Basin 16 - Winchuck

In addition to salmonid habitat capability, the following includes the estimated risk to domestic water supplies, wildlife, fishing, boating, water contact recreation, and visual quality in terms of an increase in potential sediment

Estimated risk from increased sediment and turbidity·

Alternatives NC and C are **minor adverse.**
Alternatives A, A-Departure, B, and S are **negligible.**
Alternatives D, D1, G, and K are **negligible (minor improvement)**
Alternatives E and M are **negligible (moderate improvement).**

Estimated risk from increased temperature:

Alternatives NC, A, A-Departure, C, K, and S are **negligible** (Prescription B).
Alternatives B, D, D1, E, G, and M are **negligible (minor improvement)**(Prescription C and M).

This Planning Basin has high fish and timber production capabilities Nearly 90 percent of the basin is National Forest Ninety-two percent of the total land base is classified as tentatively suitable for timber production.

About 15 percent of the suitable National Forest lands were harvested in the decade of 1970-80 A similar level of activity has continued since 1980 Extensive timber harvest occurred on privately owned portions of the lower Winchuck watershed during the 1950's and 1960's Transportation systems in the Winchuck Planning Basin are extensive Future road development is anticipated to be limited to short roads to access harvest units, plus improvement of the existing system Although the trend should be favorable for recovery, the riparian areas have not reforested sufficiently from previous timber harvest activities to measurably improve conditions over the past impacts

Many of the private timber lands and farms in the lower river reach have since been divided into home sites With continued development of off-Forest home sites, the demand for domestic water and irrigation has

greatly increased in recent years. This trend is expected to continue to the detriment of fish life in the lower Winchuck River.

All alternatives, except C, contain the Winchuck River Supplemental Resource Management Area Alternatives B, D, D1, E, G, and M have a 12 percent per-decade harvest constraint; Alternative S includes a 15 percent basin timber harvest constraint.

For all alternatives except NC and C, there is an estimated negligible potential risk for timber management/road-related cumulative effects This considers both existing conditions and anticipated levels of activity on largely National Forest lands and limited other ownerships; however, this analysis does not consider any cumulative effects associated with the South Fork Winchuck Alternatives NC and C are anticipated to result in a minor adverse potential risk for cumulative effects from timber management and road-related sedimentation The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 12 or 15 percent. For other than Alternatives NC and C, water quality is expected to be maintained or improved

Basin 17 - North Fork Smith River.

In addition to salmonid habitat capability, the following includes the estimated risk to fishing and visual quality in terms of an increase in potential sediment.

Estimated risk from increased sediment

All alternatives except E, G, and M are **negligible**
Alternatives E, G, and M are **negligible (minor improvement)**

Estimated risk from increased temperatures.

All Alternatives are **negligible.**

The entire North Fork Smith Planning Basin is administered by the National Forest. From 1950 to date, less than one-quarter of the National Forest lands suitable for the production of timber have been harvested This basin is characterized by rough, rugged terrain with sparse timber resources. Mineral development is a major potential activity in this area. Twenty-two percent of the land is tentatively suitable for timber production. Considerable area is within the Kalmiopsis Wilderness Only the extreme western edge of the basin (west of North Fork Smith River) is currently affected by accelerated sediment from management activities. Thirteen miles of the North Fork Smith River was included in the Omnibus Oregon Wild and Scenic Rivers Act of 1988.

Alternatives E, G, M, and S concentrate activities to the northwest, but their low sediment yield has little impact on water quality due to the limited activity area However, due to the large percentage of unsuitable land within the areas allocated to Management Areas 1-9, the difference between these alternatives and others is insignificant Alternatives except E, G, K, and M have applied an 12 percent per-decade basin timber harvest constraint Alternative S has a 17 percent harvest constraint.

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on National Forest lands. The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 12 or 17 percent. Water quality is expected to be maintained or improved. No cumulative effects downstream in the Wild and Scenic North Fork Smith River are anticipated.

Basin 19 - East and West Forks Illinois River.

In addition to salmonid habitat capability, the following includes the estimated risk to public and domestic water supplies, fishing, water contact recreation, and visual quality in terms of a potential increase in accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity.

Alternatives B, C, D, and D1 are **minor adverse**
Alternatives NC, A, A-Departure, K, and S are **negligible.**
Alternatives E, G, and M are **negligible (minor improvement).**

Estimated risk from increased temperature:

All Alternatives except E, G, and M are **negligible** (Prescription B)
Alternatives E, G, and M are **negligible (minor improvement)**(Prescription C or M)

The East and West Forks of the Illinois River and many of the tributaries are critical to on-site salmonid production and immediate off-Forest domestic and salmonid water needs. Elk Creek, a tributary of the West Fork Illinois River, contains one of the few remaining native coho populations in California

National Forest System lands made up less than 60 percent of this Planning Basin. Sixty percent of the National Forest portion is tentatively suitable for the production of timber Of this, 14 percent was harvested from 1950-70, and 10 percent from 1970-80. Timber harvest activity on National Forest lands in the 1980's has continued at about the same level. Some harvest on private and BLM lands also occurred during the 1980's, but was rather limited For a more indepth evaluation of cumulative effects in this Planning Basin, refer to the Planning Records (Forest Service document titled, "Cumulative Effects Analysis for the East Fork Illinois River basin"; September 15, 1986).

The largest single activity in the basin, much being timber salvage on prior managed lands, occurred as a result of the Longwood Fire in 1987 Several Environmental Assessments or Revisions were prepared for the salvage of the fire-killed trees; these documents are in the Planning Records of the Illinois Valley Ranger District and the Supervisor's Office. Impacts on the fish, soil, and water resources were analyzed, along with the cumulative effects, of the fire salvage projects.

Extensive timber harvest activity, with little regard for fish habitat or water quality, occurred on private lands of the Elk Creek and East Fork Illinois River drainages during the 1950's and 1960's. Compounding this, the demand for the limited water supply during the late summer results in lower Elk Creek and the East Fork having no surface flow in many areas. This dewatering also affects salmonid fish capability of the National Forest portion of this watershed since many juvenile fish produced on the Forest attempt to rear in the lower portions of the watershed The demand for good quality water has had a cumulative effect on the other beneficial uses of water within the basin

Due to the relative stability of adjacent slopes of many riparian in this basin that are also suitable for timber management, the potentially significant impact on water quality and fish habitat is directed to adequacy of streamside shade. Therefore, Riparian prescriptions are highly oriented to shade maintenance; use of more restrictive land allocations provide little additional reduction in risk Alternatives E, G, K, M, and S have a 12 percent per-decade basin harvest constraint

For all alternatives except B, C, D, and D1, there is an estimated negligible potential risk for wildfire and timber management/road-related cumulative effects. This analysis considers both existing conditions, including the Longwood Fire of 1987, and anticipated levels of activity on National Forest, BLM, and other lands. Alternatives B, C, D, and D1 are anticipated to result in a minor adverse potential risk for cumulative

effects from wildfire, timber management, and road-related sedimentation The risk of cumulative effects is reduced in alternatives with the basin harvest constraint For other than Alternatives B, C, D, and D1, water quality is expected to be maintained or improved

Basin 20 - Sucker.

In addition to salmonid habitat capability, the following includes the estimated risk to public and domestic water supplies, irrigation, fishing, and visual quality in terms of potential accelerated sediment and turbidity

Estimated risk from increased sediment and turbidity·

All alternatives except E, G, and M are **negligible**
Alternatives E and G are ***negligible (minor improvement)***
Alternative M is **negligible (moderate improvement)**

Estimated risk from increased temperature

All Alternatives except E, G, and M are **negligible** (Prescription B).
Alternatives E, G, and M are **negligible (minor improvement)**(Prescription C and M).

This basin has had extensive past and current mining and timber harvest activities. Seventy-one percent of total basin acreage is tentatively suitable for timber production. Landforms and effects of management activities are very similar to the East and West Fork Illinois Planning Basin

Sixty percent of the basin in National Forest System land. Of this, about 70 percent is tentatively suitable for the production of timber. Between 1950-1970, 11 percent of the National Forest timber lands were harvested; 11 percent was also harvested for the decade 1970-1980. About the same level of activity has continued through the 1980's.

Currently, irrigation and domestic demands for water in off-Forest portions of Sucker Creek essentially dry up the stream by late summer. The effects of water withdrawal in these private land reaches of Sucker Creek and for miles downstream in the Illinois River system is significant relative to both the instream habitat for fisheries, and recreational and esthetic values along the Wild and Scenic River

As with the East and West Fork Illinois Planning Basin, Riparian prescriptions are aligned to maintenance of stream canopy shade The use of Supplemental Resource areas provide little extra in reducing sediment or stream temperature risks Alternative E, G, K, and M have a 13 percent per-decade basin timber harvest constraint; Alternative S provides a 17 percent constraint. This assessment of effects also considered the cumulative effects of past mining activities

For all alternatives, there is an estimated negligible potential risk for timber management/road-related cumulative effects. This considers both existing conditions and anticipated levels of activity on National Forest, BLM, and other lands The risk of cumulative effects is further reduced in alternatives with a basin harvest constraint of either 13 or 17 percent. Water quality is expected to be maintained or improved

SUMMARY OF FOREST-WIDE EFFECTS ON FISH HABITAT BY ALTERNATIVE

The following discussion summarizes the analysis of each alternative for effects on fish habitat from the composite of the 19 Planning Basins. The currently most important basins in terms of opportunities for instream fish habitat improvements are the· East and West Forks Illinois, Lower Chetco, Galice/Slate, Winchuck, Briggs, and Lower Rogue. Capital investments are not included in this evaluation

Alternatives NC, A, and A-Departure

These alternatives would be expected to result in an estimated potential risk to salmonid fish habitat capability ranging from negligible to minor adverse. The Indigo, Silver, Briggs, Rough/Josephine, and Winchuck Planning Basins, if managed under Alternative NC, would have a minor adverse risk to salmonid habitat from timber management/road-related sedimentation Briggs, Indigo, and Silver Planning Basins, if managed under Alternatives A or A-Departure, would have a minor adverse risk to salmonid habitat from timber management/road-related sedimentation. The potential increase in risks from either sediment or temperature is negligible in all other basins

Alternative B

Alternative B would be expected to result in an estimated risk to salmonid fish habitat capability ranging from negligible (minor improvement) to moderate adverse. A potential risk of minor adverse impacts to salmonid habitat from timber management/road-related sedimentation is predicted in the Galice/Slate, Lower Illinois, Briggs, Silver, Rough/Josephine, and East and West Forks Illinois Planning Basins A potential risk of moderate adverse impacts is predicted for Indigo Planning Basin A potential for minor improvement in salmonid habitat is predicted for the Elk/Sixes and Lobster Planning Basins. All other basins would have negligible increases in risk from sediment or temperature changes.

Alternative C

Alternative C would be expected to result in an estimated risk to salmonid fish habitat capability ranging from negligible to moderate adverse A potential risk of minor adverse impacts to salmonid habitat is predicted in the Upper Rogue, Galice/Slate, Lower Illinois, Briggs, Rough/Josephine, Winchuck, and East and West Forks Illinois Planning Basins from timber management/road-related sedimentation, and a potential risk of moderate adverse impacts for the Indigo and Silver Planning Basins. All other basins would have negligible predicted increases in risk from sediment or temperature changes

Alternatives D and D1

Alternatives D and D1 would be expected to result in an estimated risk to salmonid fish habitat capability ranging from negligible (minor improvement) to moderate adverse. A potential risk of minor adverse impacts to salmonid habitat is predicted in the Lobster (Alternative D1 only), Galice/Slate, Lower Illinois, Briggs, Pistol, Silver, Rough/Josephine, and East and West Forks Illinois Planning Basins from timber management/road-related sedimentation A potential risk of moderate adverse impacts is predicted for Indigo Planning Basin. A potential for minor improvement in salmonid habitat is predicted for the Elk/Sixes and Winchuck Planning Basins All other basins would have negligible increases in predicted risk from sediment or temperature changes.

Alternatives E and G

Alternatives E and G would be expected to result in an estimated risk to salmonid fish habitat capability ranging from negligible to negligible (moderate improvement). For the Galice/Slate, Briggs, Indigo, and Silver Planning Basins, the risk to salmonid habitat is negligible. For the Elk/Sixes and Winchuck (Alternative E only) Planning Basins, there is the potential for moderate improvement in salmonid habitat For all remaining basins there is the potential for minor improvement in salmonid habitat capability.

Alternative K

Alternative K would be expected to result in either an estimated negligible to minor adverse risks to salmonid fish habitat capability, or minor improvement in current salmonid habitat conditions For the Elk/Sixes, Winchuck, South Fork Coquille, Lobster, and Pistol Planning Basins, there is the potential for

minor improvement in salmonid habitat. A potential risk of minor adverse impacts is predicted for Silver and Indigo Planning Basins All other basins would have negligible increases in predicted risk from sediment or temperature changes.

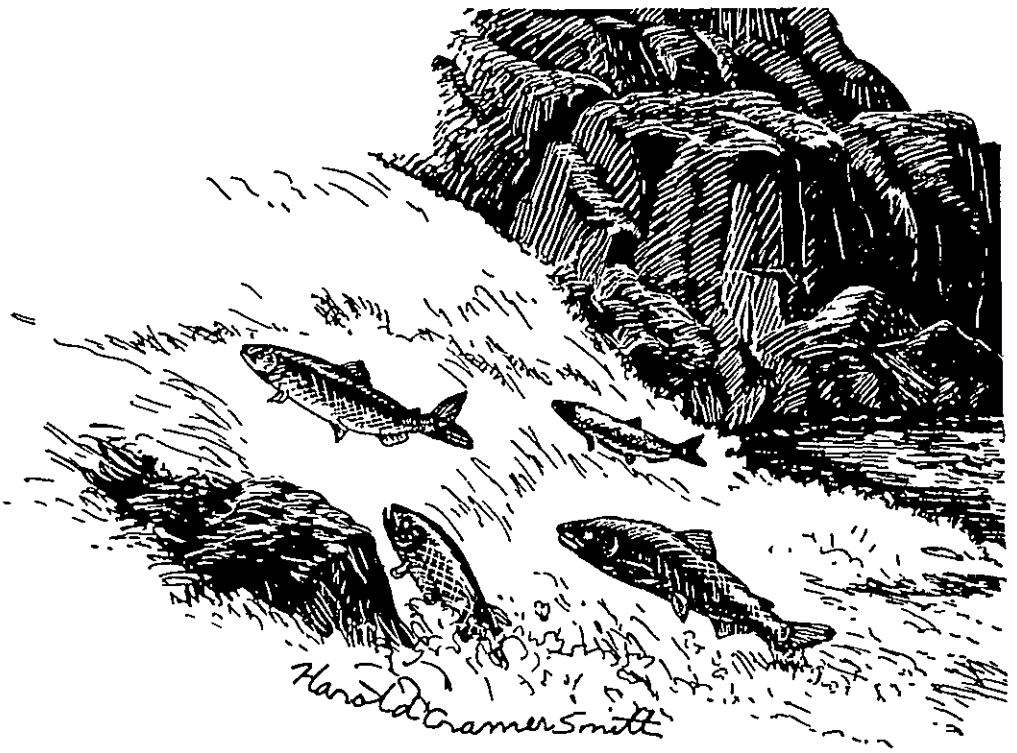
Alternative M

Alternative M would be expected to result in an estimated moderate improvement in salmonid fish habitat capability in all but five of the basins analyzed Current salmonid habitat conditions have potential for only minor improvement in the East and West Fork Illinois, Upper Illinois, Briggs, Rough/Josephine, and the North Fork Smith Planning Basins

Alternative S

Alternative S would be expected to result in either an estimated negligible to minor adverse risk to salmonid fish habitat capability, or minor improvement in current salmonid habitat conditions. For the Elk/Sixes, South Fork Coquille, Lobster, and Pistol Planning Basins, there is the potential for minor improvement in salmonid habitat. All other basins would have negligible increases in predicted risk from sediment or temperature changes.

Minor improvements of salmonid fish habitat are also predicted for all priority basins for instream fish habitat improvements due to the application of Riparian Prescription C, or the inclusion of selected land allocations in Management Areas 1-9.



WILDLIFE

SIGNIFICANT INTERACTIONS

Recreation does not generally have a major adverse effect on wildlife resources However, site-specific impacts, due to developed recreation sites, trail construction, or dispersed activities, such as ORV use or hunting, will have adverse effects on localized wildlife communities Many wildlife species benefit from small, dispersed openings which are characteristic of areas managed to achieve the VQO's of Retention and Partial Retention

Timber management activities generally improve the quantity of food resources for black-tail deer, Roosevelt elk, and many other game and nongame species Early successional stages resulting from timber harvest provide cover for a variety of wildlife Timber management activities can generally improve food resources for mountain quail, most other game birds, and a variety of nongame species Timber management activities may also limit many animals which frequent mature or old-growth forest, including such birds as the goshawk, saw-whet owl, and Hammond's flycatcher.

Snag levels in unmanaged forest support 100 percent population levels of all woodpecker species. In managed timber stands, Wildlife Tree Guidelines are employed to ensure that affected species will be maintained at either 20 or 60 percent of their maximum population potential The percent level depends on which Forest Plan alternative is employed; current Forest policy is 60 percent. The 20 percent level is the MR and the 60 percent level provides a highly viable population (Thomas 1979).

Roads needed for access to timber harvest areas allow the public greater access to wildlife habitat. Although roads provide travelways for many species, roads which remain open may result in increased road mortality Road building results in a direct loss of wildlife habitat. Increased vehicle access results in increased vulnerability of animals to both legal and illegal harvest.

Wildlife habitat is disturbed by new road construction This activity displaces one population segment into the territory of another, resulting in increased competition for space and forage (Brown 1985). Increased access has a short-term detrimental effect on species that adjust to road traffic (such as songbirds and squirrels), but will negatively affect other species which avoid the activities of humans (such as elk, bear, and cougar).

The suitability of vegetative cover for wildlife is modified by the amount of roads open to the public. The effectiveness of wildlife hiding cover is reduced by an increase in roads Often it is the use of roads, rather than the roads themselves, that negatively affect local wildlife. Specific roads can be closed to protect wildlife travel corridors or hiding cover. Closed roads can be seeded to provide additional forage. Seeded cut and fill slopes provide some forage for wildlife Deer and elk use of otherwise suitable feeding and resting areas is reduced adjacent to open primary and secondary roads (Brown 1985:241)

Mining activities may adversely affect wildlife needs Wildlife habitats may be modified and species distribution influenced Wildlife may be exposed to toxic substances used or uncovered during mining activities Vehicle use and other mining activities produce noise, which may affect calving, feeding, migration, and other activities of wildlife. Reclamation may create additional forage areas and wildlife sighting opportunities

Direct interactions between fire and wildlife populations vary widely While some evidence of vertebrate mortality has been reported, the most commonly held opinion is that vertebrates are rarely killed in fires, instances of mortality are usually negligible. Interactions with invertebrate populations may be short-term or long-lasting Population levels may decrease because the individuals or their eggs are killed, or their food supply or shelter are diminished. In some instances, populations of some species which are attracted to heat, smoke, or damaged trees may increase during and after the fire.

The immediate post-fire environment presents all terrestrial wildlife with a sudden and drastic modification of habitat structure and local microclimates This may have positive or negative influences depending on the species involved Long-term influence of post-fire vegetation succession on wildlife populations cannot be generalized Vegetation growth and change provide the driving force for a dynamic system in which some species are favored, while others are not (Lyon and others 1978).

Land allocations affect wildlife populations. Designated Wildlife Habitat and Special Wildlife Site Management Areas maintain animal populations dependent on habitats which are scarce or diminishing as more of the Forest is brought into a managed rotation The description and size of each wildlife management area is included in the description of alternatives (Chapter II). Permitted activities and mitigation measures for each Management Area are included in Standards and Guidelines (Forest Plan, Chapter IV).

RESPONSE TO THE PLANNING PROBLEMS

In the following discussions on environmental effects of the alternatives, Planning Problem #7, is addressed in depth This Planning Problem asks, "How should wildlife habitats on the Forest be managed?" Two other Planning Problems are addressed indirectly: #1, "How much timber should the Forest produce?"; #2, "How much old-growth forest should be preserved?"

ENVIRONMENTAL EFFECTS AND MITIGATION

The management objective for wildlife resources is to provide habitat capable of indefinitely supporting all native and desirable nonnative wildlife species All alternatives are designed to meet this objective in at least a minimally adequate fashion. Alternatives that allocate relatively large amounts of land for preservation of specific wildlife resources result in the best long-term protection Alternatives that allocate the most land to categories other than General Forest, especially Backcountry Recreation, also result *(de facto)* in the best level of protection for species requiring older forest successional stages Alternatives with lower timber harvests also have fewer roads; this generally means less potential disturbance to wildlife in general, and especially big game.

All alternatives except NC provide a mix of habitats capable of sustaining all species at viable population levels or higher over the long term Refer to the **WILDLIFE** section of Chapter II for discussion of Management Requirements (MR's) for spotted owls. MR's for wildlife ensure that viable populations of all species will be well-distributed throughout the Siskiyou. All alternatives except NC are bound by MR's. The major difference between other alternatives and NC relates to management of habitat for species dependent on mature or old-growth forest This alternative makes no provisions for habitat enclaves devoted to pileated woodpeckers, pine marten, and the species they represent.

Some alternatives provide for significantly more old-growth habitat; this habitat type will gradually diminish and by the fifth decade will be greatly reduced in commodity-oriented alternatives. Various alternatives provide for woodpecker populations at the 60 percent level, other alternatives provide snags for 20 percent of the woodpecker population (MR level)

Various alternatives provide significantly more foraging habitat for deer and elk (although less thermal cover) Eagle and osprey habitat is protected in all alternatives

All alternatives contain land allocations for special wildlife habitats not represented by indicator species. Table II-3 describes these habitats. More riparian habitat, hardwood stands, meadows, and other special sites are allocated in some alternatives than in others

All alternatives provide for capital investment in wildlife habitat improvement projects through implementation of all or part of the Forest's Comprehensive Fish and Wildlife Plan (Sikes Act--Public Law

93-452), plus K-V (Knutson-Vandenberg) projects. If funding is made available to implement wildlife habitat improvement projects identified in Appendix B of the Forest Plan, total habitat capability would increase for many species (especially deer and elk)

In alternatives where a decrease in "hunting" WFUD's is associated with a decline in habitat capability for deer and elk (see **WILDLIFE** section of Chapter II), the falldown may not actually be as great as predicted. Hunters may accept lower success rates, in fact, hunter success has decreased markedly on the Siskiyou in the last 25 years, but hunter-days have increased substantially (see **WILDLIFE** section [Consumptive Use] of Chapter III)

There are two methods of managing wildlife resources protection and standards Protection involves designation of specific sites as Designated Wildlife Habitat, Special Wildlife Sites, and Supplemental Resource Management Areas In other areas, such as General Forest, Forest-wide Standards and Guidelines for wildlife resources will guide timber management, road building, mining, and livestock grazing.

MITIGATION. Standards and Guidelines provide the necessary provisions to ameliorate major adverse consequences of the alternatives. However, some habitat changes can only be partially mitigated The amount of mature and old-growth habitat will be reduced substantially under most alternatives. Habitat for cavity nesters will decline, as will optimal thermal cover.

The Forest can protect spotted owl nest and roost sites found outside of designated SOHA's (in areas managed for timber) Chapter IV (Forest-wide Standards and Guidelines) of the Forest Plan provides specific details. Designated SOHA's, as well as habitat in Wilderness and other reserved areas, can be monitored to determine pair occupancy and reproductive status within sites allocated for spotted owls. General population trends for spotted owls can be determined through random samples of suitable habitat Chapter V of the Forest Plan provides more detail on monitoring For at least the next decade, the Forest has the flexibility to modify the SOHA network to accommodate changes caused by fire or other catastrophic events For at least the next five to ten years, the Forest would also be able to expand the size of most SOHA's, if current research shows a need to do so

Alternative NC

DIRECT EFFECTS. Alternative NC continues the management regime responsible for the Forest's existing condition. This is the only alternative which will not provide for the long-term viability of populations of wildlife species that are dependent on mature or old-growth Forest; NFMA MR's are not incorporated Alternative NC would not supply enough mature or old-growth habitat within General Forest land, both in terms of block size (acres), and dispersion. The eastern portion of the Illinois Valley Ranger District would be particularly lacking in this habitat Populations of some species would ultimately be reduced to below-minimum levels

Pileated woodpeckers, pine martens, and spotted owls represent all wildlife species on the Forest that are dependent on mature or old-growth habitat No provisions for habitat for pileated woodpecker, pine marten, and the species they represent are made in this alternative. In addition, spotted owl enclaves are limited to 300 acres of old growth per pair, are not well dispersed, and provide for only 32 owl pairs Management Requirements are not met for this species

In the short term (first decade), some options are maintained to allocate specific habitat sites for wildlife Over the long term (by the third decade), some species may disappear from the Siskiyou because of Forest Service actions, and opportunities to allocate specific habitat sites for wildlife would diminish quickly as options are foregone.

A significant adverse effect results from the 20 percent basin constraint (up to 20 percent of the land tentatively suitable for timber production in an individual basin can be programmed for harvest per decade). Because the average harvest rotation on the Forest is 100 years, up to twice as much land could be harvested per decade in a given basin as could be sustained over the long term This could cause a maldistribution of successional stages over time which would have a detrimental effect on habitat diversity.

In Alternative NC, a small number of Special Wildlife Sites are allocated directly for wildlife, plus one of the four Supplemental Resource areas most important to wildlife (Windy Valley) Eighteen Supplemental Resource Management Areas are designated, providing significant habitat diversity for wildlife. Other new land allocations which would contribute to overall habitat diversity, such as Botanical or Unique Interest areas, are not selected in this alternative. Standards and Guidelines are used to govern management of specific wildlife resources

Just over 58,000 acres of prime habitat for bald eagle and osprey have been identified on the Forest; nearly 55,000 acres are safeguarded. Additional secondary habitat is available in the short term, but will eventually be altered by timber harvest.

At the beginning of the second decade, 113, 602, and 2,730 habitat areas will be available for spotted owls, pileated woodpeckers, and pine marten, respectively By the fifth decade the numbers will decrease to 32, 335, and 1,370. Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber

Fifty-three percent of the Forest (576,000 acres) is managed for timber harvest and, consequently, a sustained supply of forage for deer and elk will be provided During the first five decades, habitat capability for deer and elk will average nine percent over current levels, for an average herd size of 30,800 animals (down from 28,300 at present).

Riparian areas are managed through the application of Standards and Guidelines; 81,300 acres of riparian habitat are managed, in part, for timber under Prescription B Twelve major stream corridors are allocated to Supplemental Resource, and five of eleven types of wildlife sites are protected, including meadows and wildlife areas. Meadow edges receive no special protection

INDIRECT EFFECTS Wildlife will continue to supply significant recreation to the public. The first five decades average 85,300 WFUD's annually, a five percent increase from the present situation No capital investments are made for habitat improvement projects

Habitat allocations for Wildlife Special Sites and Designated Habitat will result in a slight reduction in the amount of land available for timber management; 6,450 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. However, habitat for species dependent on old-growth forest will undergo a 53 percent reduction during the next 50 years (73 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade, the Forest road system will total 3,884 miles, with 749 miles closed to vehicular traffic. First decade figures are 2,875 and 347, respectively

Alternative A

DIRECT EFFECTS. Alternative A continues the management regime responsible for the Forest's existing condition. In the short term (first decade), this alternative does a reasonable job of maintaining a diversity of wildlife habitats. Over the long term (by the fifth decade), no species would disappear from the Siskiyou

because of Forest Service actions, but opportunities to allocate specific habitat sites for wildlife would diminish significantly as options are foregone.

A significant adverse effect results from the 20 percent basin constraint (up to 20 percent of the land tentatively suitable for timber production in an individual basin can be programmed for harvest per decade). Because the average harvest rotation on the Forest is 100 years, up to twice as much land could be harvested each decade in a given basin as could be sustained over the long term. This could cause a maldistribution of successional stages over time which would have a detrimental effect on habitat diversity.

In Alternative A, a small number of Special Wildlife Sites are allocated directly for wildlife, plus one of the four Supplemental Resource areas most important to wildlife (Windy Valley). Eighteen Supplemental Resource Management Areas are designated, providing significant habitat diversity for wildlife. Designated Wildlife Habitat areas are allocated at MR levels. Other new land allocations which would contribute to overall habitat diversity, such as Botanical or Unique Interest areas, are not selected in this alternative. Standards and Guidelines are used to govern management of specific wildlife resources. Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas, $56,000 per year is programmed

Just over 58,000 acres of prime habitat for bald eagle and osprey has been identified on the Forest, nearly 55,000 acres are safeguarded Additional secondary habitat is available in the short term, but will eventually be altered by timber harvest.

At the beginning of the second decade, 137, 607, and 2,387 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively By the fifth decade the numbers will decrease to 90, 357, and 1,450. Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber

Fifty-one percent of the Forest (557,000 acres) is managed for timber harvest and, consequently, a sustained supply of forage for deer and elk will be provided. During the first five decades, habitat capability for deer and elk will average eight percent above current levels for an average herd size of 30,500 animals (up from 28,300 at present)

Riparian areas are managed through the application of Standards and Guidelines; 84,600 acres of riparian habitat are managed, in part, for timber under Prescription B Twelve major stream corridors are allocated to Supplemental Resource areas, and five of 11 types of wildlife sites are protected, including meadows and wildlife areas. Meadow edges receive no special protection

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 91,700 WFUD's annually, a 13 percent increase from the current situation; 7,400 WFUD's are derived from habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 84,300 annually, still an increase of four percent over the present situation

Habitat allocations for Wildlife Special Sites and Designated Habitat will result in a reduction in the amount of land available for timber management, 31,824 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. However, habitat for species dependent on old-growth forest will undergo a 51 percent reduction during the next 50 years (68 percent by the tenth decade) Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade, the Forest road system will total 3,884 miles, with 749 miles closed to vehicular traffic. First decade figures are 2,875 and 347, respectively.

Alternative A-Departure

The following effects are the same as Alternative A, except for the following differences due to increased timber harvest in the first two decades.

DIRECT EFFECTS. At the beginning of the second decade, 137, 605, and 2,381 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade the numbers will decrease to 90, 357, and 1,450. During the first five decades habitat capability for deer and elk will average nine percent above current levels, for an average herd size of 30,800 animals (up from 28,300 at present).

INDIRECT EFFECTS. The first five decades average 92,100 WFUD's annually, a 14 percent increase from the existing situation, but include 7,400 WFUD's attributed to habitat improvement projects If improvement projects are not funded, total WFUD's would be 84,700 annually, or a five percent increase from present.

CUMULATIVE EFFECTS. Habitat for species dependent on old-growth forest will undergo a 51 percent reduction during the next 50 years (68 percent by the tenth decade). Because the annual timber harvest will be based on a departure schedule in this alternative, the reduction in old-growth habitat will be more pronounced during the first two decades. Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,889 miles, with 752 miles closed to vehicular traffic (first decade figures are 2,876 and 348).

Alternative B

DIRECT EFFECTS In the short term (first decade) this alternative does a reasonable job of maintaining a diversity of wildlife habitats Over the long term (by the fifth decade), no species would disappear from the Siskiyou because of Forest Service actions, but opportunities to allocate specific habitat sites for wildlife would diminish significantly as options are relinquished. Because timber harvest is accelerated in the first two decades, options for reallocations would diminish with relative quickness.

A pair of 20 percent constraints are significant detriments of this alternative. First, habitat capability for woodpeckers will be sustained at 20 percent in areas managed for timber; this will maintain a minimally viable population which has little influence on its habitat. Second, a 20 percent basin constraint is applied to 12 of the Forest's 19 planning basins (in these basins up to 20 percent of the land tentatively suitable for timber production can be programmed for harvest per decade). Because the average harvest rotation on the Forest is 100 years, up to twice as much land could be harvested each decade in a given basin as could be sustained over the long term This could cause a maldistribution of successional stages over time and have a detrimental effect on habitat diversity. Another seven basins are constrained at 9-13 percent per decade; in these areas, successional stage distribution over time would be satisfactory The last basin is contained within the Kalmiopsis Wilderness and harvest constraints do not apply

None of the four Supplemental Resource Management Areas with high priority for wildlife are allocated, although 15 other designated Supplemental Resource areas provide habitat diversity for wildlife Designated Habitat areas are allocated at MR levels A few other new land allocations which contribute to overall habitat diversity, such as Botanical or Unique Interest areas, are selected, but the land sites represented are mostly serpentine areas and other relatively open vegetative types. Standards and Guidelines are used to govern management of specific wildlife resources

Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas, $109,800 per year is programmed to meet RPA targets of 4,549 acres of habitat improvement. This is nearly a seven-fold increase in improvements over the projects listed in the Forest's Fish and Wildlife Comprehensive Plan These additional projects would be accomplished, for example, by seeding edges of clearcuts.

Just over 58,000 acres of prime habitat for bald eagle and osprey have been identified on the Forest; slightly less than 49,000 acres are safeguarded Additional secondary habitat is available in the short-term, but will eventually be altered by timber harvest.

At the end of the first decade, 135, 583, and 2,300 Habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively By the fifth decade the numbers will decrease to 81, 327, and 1,337. Fifty-one percent of the Forest (558,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average 11 percent above current levels, for an average herd size of 31,300 animals (up from 28,300 at present)

Riparian areas are managed through the application of Standards and Guidelines; 84,300 acres of riparian habitat are managed, in part, for timber. Twelve basins are managed under Prescription B and six under Prescription C; the latter prescription provides less risk of adverse impacts to wildlife Thirteen major stream corridors are classed as Supplemental Resource areas, and five of 11 types of wildlife sites are protected, including all water-related sites and meadows (with their buffers).

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 99,900 WFUD's annually. This is a twenty-three percent increase from the current situation, and includes 14,500 WFUD's attributed to habitat improvement projects If improvement projects are not funded, total WFUD's would be reduced to 85,400 annually, or a six percent increase from the existing situation.

Habitat allocations for Special Wildlife Sites and Designated Wildlife Habitat will result in a reduction in the amount of land available for timber management; 34,507 acres falls in this category, although many sites contain overlapping land allocations installed to meet other resource objectives

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages However, habitat for species dependent on old-growth forest will undergo a 56 percent reduction during the next 50 years (69 percent by the tenth decade) Because the annual timber harvest on the Siskiyou will be based on a departure schedule in this alternative, the reduction in old-growth habitat will be more pronounced during the first two decades. Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,960 miles, with 783 miles closed to vehicular traffic (first decade figures are 2,922 and 368).

Alternative C

DIRECT EFFECTS. Same as Alternative B, except for the following differences. Land allocations which provide for a diversity of wildlife habitats are at a minimum. The Forest is managed to produce a nondeclining flow of timber throughout the next 150 years, rather than the accelerated harvest prescribed in Alternative B during the first two decades, thus options for reallocations would not diminish as quickly. The 20 percent per decade harvest constraint is applied to all basins

Only three Supplemental Resource Management Areas are designated, none of the four areas with high priority for wildlife are included At the beginning of the second decade, 136, 623, and 2,450 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade the numbers will decrease to 86, 343, and 1,400 Fifty-two percent of the Forest (566,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk. During the first five decades the deer herd will average 17 percent above current levels (28,300), for an average herd size of 33,000 animals.

Riparian areas are managed through the application of Standards and Guidelines; 86,000 acres of riparian habitat are managed, in part, for timber. Only one major stream corridor is classed as Supplemental Resource areas, and 5 of 11 types of wildlife sites are protected, including all water-related sites and meadows (with buffers).

INDIRECT EFFECTS. Same as Alternative B, except for the following differences. Wildlife will continue to supply significant recreation to the public The first five decades average 95,100 WFUD's annually This is an 18 percent increase from the existing situation, and includes 7,400 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 87,700 annually, still an eight percent increase over the present situation.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. However, habitat for species dependent on old-growth forest will undergo a 53 percent reduction during the next 50 years (70 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk By the fifth decade the Forest road system will total 4,072 miles, with 825 miles closed to vehicular traffic (first decade figures are 2,953 and 377).

Alternative D

DIRECT EFFECTS. Same as Alternative B, except for the following differences. Land allocations which provide for a diversity of wildlife habitats are at a minimum The Forest is managed to produce a nondeclining flow of timber throughout the next 150 years, rather than the accelerated harvest prescribed in Alternative B; thus options for reallocations would not diminish as quickly

Capital investments for wildlife habitat improvements are programmed at $28,000 per year

At the beginning of the second decade 137, 615, and 2,200 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade the numbers will decrease to 89, 355, and 1,444.

The 51 percent (558,000 acres) of the Forest managed for timber harvest will provide a sustained supply of forage for deer and elk. During the first five decades habitat capability for deer and elk will average 11 percent above current levels, for an average herd size of 31,400 animals (up from 28,300 at present).

INDIRECT EFFECTS. Same as Alternative B, except for the following differences. The first five decades average 89,500 WFUD's annually. This is an 11 percent increase from Alternative A, and includes 3,700 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 85,800 annually, or a six percent increase from the present situation.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages However, habitat for species dependent on old-growth forest will undergo a 51 percent reduction during the next 50 years (69 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,933 miles, with 768 miles closed to vehicular traffic (first decade figures are 2,916 and 362).

Alternative D1

DIRECT EFFECTS. Same as Alternative B, except for the following differences At the beginning of the second decade 135, 592, and 2,331 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade the numbers will decrease to 80, 323, and 1325 Fifty-one percent of the Forest (558,000 acres) is managed for timber harvest and consequently will provide a

sustained supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average 12 percent above current levels, for an average herd size of 31,700 animals (up from 28,300 at present). Rotation lengths are two decades shorter in Alternative D1; this means that a relatively high proportion of the area managed for timber will consist of forage habitat (25 percent versus 20 percent) However, this supplement is partially offset by the smaller land base devoted to timber management in this alternative Riparian areas are managed through the application of Standards and Guidelines, 77,400 acres of riparian habitat are managed, in part, for timber

INDIRECT EFFECTS. Same as Alternative B, except for the following differences. The first five decades average 93,900 WFUD's annually This is a 16 percent increase from the existing situation, and includes 7,400 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 86,500 annually, or a seven percent increase from the present situation

CUMULATIVE EFFECTS. The average 80-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages However, habitat for species dependent on old-growth forest will undergo a 56 percent reduction during the next 50 years (69 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,936 miles, with 770 miles closed to vehicular traffic (first decade figures are 2,915 and 362).

Alternative E

DIRECT EFFECTS. This alternative does a reasonably good job of providing a variety of habitats for Siskiyou wildlife In the short term (first decade) this alternative does well in maintaining a diversity of wildlife habitats. Over the long term (by the fifth decade), all species would be maintained above minimum viable levels, and most opportunities to allocate specific habitat sites for wildlife would still be available. All planning basins are constrained at 9-13 percent per decade, which results in a reasonable distribution of successional stages over time.

Overall, this alternative provides significant habitat diversity for wildlife Among the important land allocations are all Special Wildlife Sites, plus 48 Supplemental Resource areas, including the four with the highest priority for wildlife (Fishhook Peak, Morris Rodgers, Pebble Hill, and Windy Valley).
Designated Wildlife Habitat areas are allocated at 14,561 acres above MR levels This includes 18,086 acres of habitat (mostly small blocks of mature or old-growth forest unsuitable for timber management) incorporated into the MR network as "stepping stones" between some individual Designated Wildlife habitat areas. A variety of new land allocations which contribute to overall habitat diversity, such as Botanical, RNA, or Unique Interest areas, are selected, representing a variety of habitat types.

All roadless areas are designated Backcountry Recreation; this results in a relatively small proportion of the Forest managed for timber, and young successional stages Species needing early successional stages are provided with a less than optimum amount of habitat. Standards and Guidelines are used to govern management of specific wildlife resources. Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas; $56,000 per year is programmed.

Just over 58,000 acres of prime habitat for bald eagle and osprey have been identified on the Forest, all are safeguarded in this alternative. Additional secondary habitat is available in the short-term, but some will eventually be altered by timber harvest.

At the end of the first decade, 147, 643, and 2,525 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively By the fifth decade the numbers will decrease to 129, 528, and 2,094. Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber; this level provides for a highly viable population

Twenty-six percent of the Forest (287,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk. During the first five decades habitat capability for deer and elk will average 24 percent below current levels, for an average herd size of 21,600 animals (considerably down from 28,300 at present).

Riparian areas are managed through the application of Standards and Guidelines. All basins are managed at Minimum Level (no timber harvest), this prescription results in slightly improved cover for wildlife over Prescription C. All types of wildlife sites are protected, including general wildlife areas, all water-related sites, and meadows with their buffers.

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 79,800 WFUD's annually. This is a one percent decrease from the current situation, and includes 7,400 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 72,400 annually, or an 11 percent reduction from the present situation. Habitat allocations for Special Wildlife Sites, Designated Wildlife Habitat, and Supplemental Resource areas (the areas most important for wildlife) will result in a reduction in the amount of land available for timber management; 58,670 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. Habitat for species dependent on old-growth forest will undergo a 25 percent reduction during the next 50 years (29 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,153 miles, with 992 miles closed to vehicular traffic (first decade figures are 2,755 and 733).

Alternative G

DIRECT EFFECTS. In both the short term (first decade) and long term (by the fifth decade), this alternative does very well in maintaining a diversity of wildlife habitats. Over the long-term, all species would be maintained above minimum viable levels, and opportunities to allocate additional specific habitat sites for wildlife would still be available. All planning basins are constrained at 9-13 percent per decade, which results in a reasonable distribution of successional stages over time.

Overall, this alternative provides significant habitat diversity for wildlife. Among the important land allocations are all Special Wildlife Sites, plus 49 Supplemental Resource areas, including the four with the highest priority for wildlife (Fishhook Peak, Morris Rodgers, Pebble Hill, and Windy Valley). Designated Wildlife Habitat areas are allocated at the highest level, 37,574 acres above MR levels. This includes 18,086 acres of habitat (mostly small blocks of mature or old-growth forest unsuitable for timber management) incorporated into the MR network as "stepping stones" between some individual Designated Wildlife Habitat areas. A variety of land allocations which contribute to overall habitat diversity, such as Botanical, RNA, or Unique Interest areas, are allocated, representing a variety of habitat types.

Selected unroaded areas are designated Backcountry Recreation; this results in a reasonably good distribution of large blocks of land not managed for timber, which will benefit wildlife species needing mature and old-growth forest. Species needing early successional stages are provided with somewhat more than an optimum amount of habitat. Standards and Guidelines are used to govern management of specific wildlife resources. Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas; $56,000 per year is programmed.

Just over 58,000 acres of prime habitat for bald eagle and osprey have been identified on the Forest; all are safeguarded in this alternative. Additional secondary habitat is available in the short-term, but some will eventually be altered by timber harvest.

At the end of the first decade, 142, 632, and 2,481 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively By the fifth decade the numbers will decrease to 107, 450, and 2,362. Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber; this level provides for a highly viable population.

Thirty-seven percent of the Forest (406,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average 13 percent below current levels, for an average herd size of 24,500 animals (down from 28,300 at present)

Riparian areas are managed through the application of Standards and Guidelines; 46,400 acres of riparian habitat are managed in part for timber. All basins are managed under Prescription C, which provides less risk of adverse impact to wildlife than Prescription B. All types of wildlife sites are protected, including general wildlife areas, all water-related sites, and meadows with their buffers.

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 83,600 WFUD's annually. This is a three percent increase from the present situation, and includes 7,400 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 76,200 annually, or a six percent reduction from the present situation.

Habitat allocations for Special Wildlife Sites, Designated Habitat, and Supplemental Resource areas (four sites) will result in a reduction in the amount of land available for timber management; 80,355 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. Habitat for species dependent on old-growth forest will undergo a 37 percent reduction during the next 50 years (46 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk. By the fifth decade the Forest road system will total 3,333 miles, with 812 miles closed to vehicular traffic (first decade figures are 2,787 and 483).

Alternative K

DIRECT EFFECTS. This alternative does a reasonably good job of providing a variety of well-dispersed habitats for Siskiyou wildlife. In the short term (first decade) this alternative does well in maintaining a diversity of wildlife habitats. Over the long term (by the fifth decade), all species would be maintained at or above minimum viable levels, and some opportunities to allocate specific habitat sites for wildlife would still be available. All planning basins are constrained at 9-13 percent per decade, which results in a reasonable distribution of successional stages over time

Overall, significant habitat diversity for wildlife is provided Among the important land allocations are all Special Wildlife Sites, plus 31 Supplemental Resource areas, including three of the four with the highest priority for wildlife (Fishhook Peak, Morris Rodgers, and Windy Valley) Designated Wildlife Habitat areas are allocated at MR levels Additionally, 18,086 acres of habitat (mostly small blocks of mature or old-growth forest unsuitable for timber management) are incorporated into the MR network as "stepping stones" between some individual Designated Wildlife Habitat areas. A variety of new land allocations which contribute to overall habitat diversity, such as Botanical, RNA, or Unique Interest areas, are selected, representing a variety of habitat types. Standards and Guidelines are used to govern management of specific wildlife resources Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas; $56,000 per year is programmed

Just over 58,000 acres of prime habitat for bald eagle and osprey has been identified on the Forest; just over 52,000 acres are safeguarded in this alternative Additional secondary habitat is available in the short-term, but will eventually be altered by timber harvest

At the end of the first decade, 138, 607, and 2,387 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade, the numbers will decrease to 93, 368, and 1,494 Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber, this level provides for a highly viable population.

Forty-eight percent of the Forest (529,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average one percent below current levels, for an average herd size of 28,000 animals (down slightly from 28,300 at present).

Riparian areas are managed through the application of Standards and Guidelines, 76,900 acres of riparian habitat are managed in part for timber. Seventeen basins are managed under Prescription B and one under Prescription C; the latter prescription provides less risk of adverse impacts to wildlife. Nineteen major stream corridors are classified as Supplemental Resource areas, and all types of wildlife sites are protected, including general wildlife areas, all water-related sites, and meadows with their buffers.

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 88,300 WFUD's annually. This is a nine percent increase over the present situation, and includes 7,400 WFUD's attributed to habitat improvement projects. If improvement projects are not funded, total WFUD's would be reduced to 80,900 annually, or equal to the present situation.

Habitat allocations for Wildlife Special Sites, Designated Habitat, and Supplemental Resource areas (three of the four most important wildlife sites) will result in a reduction in the amount of land available for timber management; 42,919 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. However, habitat for species dependent on old-growth forest will undergo a 49 percent reduction during the next 50 years (64 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk; by the fifth decade the Forest road system will total 3,652 miles, with 1,128 miles closed to vehicular traffic (first decade figures are 2,851 and 649).

Alternative M

DIRECT EFFECTS. In the short term (first decade) this alternative does a reasonable job of maintaining a diversity of wildlife habitats. Over the long term (by the fifth decade), all species would be maintained above minimum viable levels, but populations of wildlife species dependent on early successional stages would be considerably reduced from present levels.

Alternative M favors wildlife species dependent on mature and old-growth forest Among the significant land allocations are all Special Wildlife Sites, and 51 Supplemental Resource areas, including those four with the highest priority for wildlife. Designated Wildlife Habitat areas are allocated at the highest level, 37,574 acres above MR levels. This includes 18,086 acres of habitat (mostly small blocks of mature or old-growth forest unsuitable for timber management) incorporated into the MR network as "stepping stones" between some individual Designated Wildlife Habitat areas.

A variety of new land allocations which contribute to overall habitat diversity, such as Botanical, RNA, or Unique Interest areas, are selected, representing a variety of habitat types. All roadless areas are

designated Backcountry Recreation, and all land tentatively suitable for timber production is managed on a 250-year rotation; this results in a relatively small proportion of the Forest managed for timber, and young successional stages Species needing early successional stages are provided with considerably less than an optimum amount of habitat. Standards and Guidelines are used to govern management of specific wildlife resources Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas; $56,000 per year is programmed.

Just over 58,000 acres of prime habitat for bald eagle and osprey have been identified on the Forest; all are safeguarded in this alternative. Additional secondary habitat is present, most of which will always be available for these species' use. At the beginning of the second decade, 150, 678, and 2,656 habitat areas will be available for spotted owl, pileated woodpecker,and pine marten, respectively By the fifth decade the numbers will decrease to 140, 628, and 2,469 Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber; this level provides for a highly viable population Nineteen percent of the Forest (207,000 acres) is managed for timber harvest and consequently will provide a sustained (although limited) supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average 41 percent below current levels, for an average herd size of 16,700 animals (down from 28,300 at present). This major reduction is due to both the small amount of area managed for timber harvest and the long rotation length (250 years)

Riparian areas are managed through the application of Standards and Guidelines. Riparian areas in all planning basins are managed at Minimum Level (no timber harvest); this prescription results in excellent cover for wildlife. In this alternative, all types of wildlife sites are protected, including general wildlife areas, all water-related sites, and meadows with their buffers.

INDIRECT EFFECTS. Wildlife will continue to supply recreation to the public, although use levels would be lower than at present. The first five decades average 71,500 WFUD's annually This is a 12 percent decrease from the present situation, and includes 7,400 WFUD's attributed to habitat improvement projects If improvement projects are not funded, total WFUD's would be reduced to 64,100 annually, or a 21 percent reduction from the present situation

Habitat allocations for Special Wildlife Sites, Designated Habitat, and Supplemental Resource areas (four sites) will result in a reduction in the amount of land available for timber management; 80,355 acres fall in this category, although many sites contain overlapping land allocations installed to meet other resource objectives.

CUMULATIVE EFFECTS. The average 250-year rotation applied to areas managed for timber will provide a continual, albeit small, rotating supply of habitat to those wildlife species dependent on early successional stages Habitat for species dependent on old-growth forest will undergo only a nine percent reduction during the next 50 years (13 percent by the tenth decade). By the fifteenth decade old-growth habitat will actually increase 40 percent over present levels because of the 250-year rotation schedule for timber harvest Open roads reduce habitat capability for some species of wildlife, especially elk Wildlife are least affected by this alternative because the Forest road system stays constant at 2,645 miles, with 529 miles closed

Alternative S

DIRECT EFFECTS. This alternative does a reasonably good job of providing a variety of well-dispersed habitats for Siskiyou wildlife In the short term (first decade) this alternative does well in maintaining a diversity of wildlife habitats Over the long term (by the fifth decade), all species would be maintained above viable levels, and some opportunities to allocate specific habitat sites for wildlife would still be available. All planning basins are constrained at 7-17 percent per decade, which results in a reasonable distribution of successional stages over time

Overall, significant habitat diversity for wildlife is provided Among the important land allocations are all Special Wildlife Sites, plus 22 Supplemental Resource areas The Special Wildlife Sites encompass 41,753 acres, including over 15,000 acres of dispersed old growth (scattered small patches of timber not suitable for timber management). Important wildlife sites protected include Fishhook Peak, Morris Rodgers, Windy Valley, Pebble Hill, Horse Creek, and Adams Prairie. Designated Wildlife Habitat areas are allocated at MR levels A variety of new land allocations which contribute to overall habitat diversity, such as Botanical, RNA, or Unique Interest areas, are selected, representing a variety of habitat types. Standards and Guidelines are used to govern management of specific wildlife resources. Capital investments for wildlife habitat improvements will result in increased habitat carrying capacity for many wildlife species in specific local areas, well over $100,000 per year is programmed.

Just over 58,000 acres of prime habitat for bald eagle and osprey has been identified on the Forest, just over 52,000 acres are safeguarded in this alternative. Additional secondary habitat is available in the short-term, but will eventually be altered by timber harvest

At the end of the first decade, 139, 604, and 2,380 habitat areas will be available for spotted owl, pileated woodpecker, and pine marten, respectively. By the fifth decade, the numbers will decrease to 97, 384, and 1,552 Habitat capability for woodpeckers will be sustained at 60 percent in areas managed for timber; this level provides for a highly viable population

Forty-six percent of the Forest (505,000 acres) is managed for timber harvest and consequently will provide a sustained supply of forage for deer and elk During the first five decades habitat capability for deer and elk will average one above below current levels, for an average herd size of 28,500 animals (slightly up from 28,300 at present)

Riparian areas are managed through the application of Standards and Guidelines; 66,396 acres of riparian habitat are managed in part for timber Eleven basins are managed under Prescription B and seven under Prescription C; the latter prescription provides less risk of adverse impacts to wildlife. Thirteen major stream corridors are classed as Supplemental Resource areas, and wildlife sites protected include general wildlife areas, all water-related sites, and meadows with their buffers.

INDIRECT EFFECTS. Wildlife will continue to supply significant recreation to the public. The first five decades average 102,300 WFUD's annually This is a 26 percent increase over the present situation, and includes 21,400 WFUD's attributed to habitat improvement projects If improvement projects are not funded, total WFUD's would be reduced to 80,900 annually, or equal to the present situation. Without investment in habitat improvement projects, there would be a significant Forest-wide reduction in average deer habitat capability during the first five decades.

Habitat allocations for Wildlife Special Sites, Designated Habitat, and Supplemental Resource areas will result in a reduction in the amount of land available for timber management; 66,745 acres fall in this category. However, many sites contain overlapping allocations installed to meet other resource objectives.

CUMULATIVE EFFECTS. The average 100-year rotation applied to areas managed for timber will provide a continual rotating supply of habitat to those wildlife species dependent on early successional stages. However, habitat for species dependent on old-growth forest will undergo a 47 percent reduction during the next 50 years (61 percent by the tenth decade). Open roads reduce habitat capability for some species of wildlife, especially elk; by the fifth decade the Forest road system will total 3,711 miles, with 1,163 miles closed to vehicular traffic (first decade figures are 2,873 and 662).

BIOLOGICAL DIVERSITY

The effects on biological diversity should not vary substantially by alternative. The National Forest Management Act (NFMA) requires forest diversity to be maintained or enhanced within a planning area The Forest strategy is to deal with diversity by allocating some lands to management areas with no programmed harvest, by applying Standards and Guidelines to areas under active management, and by carefully monitoring species and habitat throughout the Forest. This should either assure maintenance of "natural" diversity, or indicate need for direction change.

A definition acceptable to a variety of value systems would help to simplify evaluation of the effects of management alternatives on diversity. The law requires that the "natural forest" be used as the basis for evaluating the maintenance of diversity Yet, existing conditions have been so thoroughly influenced by man that "natural" references are difficult to find and apply

Ecosystems are resilient and adjust to impacts such as fire, flood, and other agents of change. Actively managed lands (Management Areas 10-14) are usually invaded by a rich mixture of early seral plant species, and frequented by animals that require open-structured habitat and shrub/forb dominated systems. Lands affected primarily by natural processes (Management Areas 1-9) can be species rich or poor depending on their successional history and age It is generally agreed, however, that biological diversity is at risk when a high percentage of the land base is actively managed for consumptive purposes such as timber management Indeed, many ownerships surrounding the Forest, particularly those to the north and west, are dominated by consumptive uses. As such, Forest lands allocated to non-consumptive uses act as refuges for those species that require later seral stages, such as spotted owl or western hemlock

It is debatable as to whether the more consumptive alternatives or the less consumptive alternatives provide the "best" diversity In most instances, lands allocated to non-consumptive uses are dominated by natural processes that shape forest composition and structure. Natural processes, when undisrupted by human activity, are generally good for diversity Furthermore, actively managed lands are not at risk of losing diversity as long as detrimental activities are curbed by effective Standards and Guidelines. Admittedly, some Standards and Guidelines are as yet untried and thereby carry a degree of uncertainty as to their effectiveness. Consequently, there is a greater *risk* to the maintenance of biological diversity in the more consumptive alternatives.

Selected suitable acreage ranges from 207,000 acres for Alternative M to 576,000 acres for Alternative NC. In other words, consumptive use ranges from 19 to 53 percent of the Forest acreage. Regardless of the allocation scheme, in every alternative all plant and animal species are managed at viable levels, and management indicator species are monitored. Monitoring is expected to point up any shortcomings in the Standards and Guidelines so that changes can be made. There is more to learn before we can conclusively and appropriately monitor and manage for biological diversity. But based on available information, we have set in motion our best effort. In summary, we do not expect the differences in land allocation between alternatives to significantly affect biological diversity.

VISUAL RESOURCE

SIGNIFICANT INTERACTIONS

Impacts to the visual resource will vary through the range of alternatives (see Figure III-20, Visual Quality Objective Map). Site-disturbing activities associated with Management Areas 10-14 will have the most significant effect on the visual resource. Management activities within any of the alternatives that would affect the resource are primarily those associated with timber harvest, related road construction, and other facility construction. Management activities that are designed to be in compliance with the inventoried Visual Quality Objective (VQO's) for a particular area are designed to blend with the character of the landscape so that the effects are within acceptable limits. Management activities that are evident to Forest visitors can affect the quality of recreation experiences (Clark and others 1984)

Alternative land allocations whose management activities are not designed to meet inventoried VQO's will have a noticeable impact on the character of the Forest landscape, and will be noticeable to the casual Forest visitor. The effects of the alternatives on the resource are summarized by Table IV-9 which displays the Expected Future Condition of the Forest's 44 viewsheds. The "Expected Future Condition" is a prediction of the effects of the management alternatives on the visual resource relative to the existing visual condition of the Forest. Alternative A depicts the existing condition. "Natural appearing" and "natural/near-natural" viewsheds are the 17 most sensitive viewsheds. The 13 "near-natural/modified" viewsheds are secondary viewsheds; the 14 "modified" viewsheds are those not visible from primary or secondary travel routes (see Figure III-20, Visual Quality Objective Map).

Table IV-9. Expected Future Viewshed Condition

	No of Viewsheds by Alternative								
Viewshed Condition	NC/A/A-Dep	B	C	D/D1	E	G	K	M	S
Natural Appearing	*6*	*5*	*5*	*5*	*11*	*10*	*5*	*11*	*6*
Natural/Near-natural	11	0	0	2	15	13	5	17	12
Near-natural/Modified	13	12	11	9	11	11	11	10	10
Modified	14	27	28	28	7	10	23	6	16

RESPONSE TO THE PLANNING PROBLEMS

This discussion is pertinent to Planning Problem #4, "How, and to what extent, should lands in and adjacent to river corridors be managed to protect, preserve, and enhance Wild and Scenic River attributes?" and Planning Problem #6, "How, and to what degree, should Forest scenic values be protected through visual resource management?" Response to these questions will primarily be tracked through changes in viewsheds from the inventoried VQO's For a full discussion of Planning Problem #4, please refer to the section on **WILD AND SCENIC RIVERS.**

ENVIRONMENTAL EFFECTS AND MITIGATION

Alternatives NC, A, and A-Departure meet the inventoried VQO's in all viewsheds. Alternatives B, C, D, D1, K, and S emphasize the production of goods and services requiring site disturbance, as well as varying degrees of protection to the visual resource. The VQO's will not be fully achieved in these alternatives Alternatives E and G emphasize the production of goods and services which generally value and maintain the current VQO's in those viewsheds located in the motorized portions of the Forest. Visual objectives would be upgraded to Preservation in areas allocated to unroaded uses. Alternative M would improve, in effect, the current VQO's by requiring timber to be managed under a 250-year harvest rotation which is analogous to the requirements for management under the Retention objective.

DIRECT EFFECTS of management activities associated with these alternatives include the construction of roads, developed recreation sites, and trails The *INDIRECT EFFECTS* of management activities associated with the alternatives include timber harvest and related activities, recreation users, and mineral development For the purposes of this document, these effects are combined and addressed in common during the discussion of effects of the various alternatives

NOTE: The percentages shown in the land allocations by VQO's represent the percent increase or decrease relative to the current inventory (shown in Alternative A).

NOTE: "Modification" is the term used to describe the amount of land managed to achieve the Modification/Maximum Modification VQO's

Alternative NC

The Forest would achieve the full range of inventoried VQO's under this alternative. There would be an increase in the acreage allocated to Retention and Partial Retention relative to current condition represented by Alternatives A The increase can be attributed to the decrease in area allocated to Designated Wildlife Habitat. Land Allocations by VQO are.

Visual Quality Objective	Acres	Percent
Preservation	318,625	- 11
Retention	72,323	+ 10
Partial Retention	258,622	+ 5
Modification	442,732	+ 4

Forest visitors may see some noticeable changes in the natural character of the Forest on a site-specific basis. In general, however, Forest visitors can expect to see a forest setting similar to that described for Alternatves A and A-Departure

Alternatives A and A-Departure

The Forest would achieve the full range of inventoried VQO's under these alternatives. Land allocations by VQO are

Visual Quality Objective	Acres	Percent
Preservation	356,603	0
Retention	65,536	0
Partial Retention	246,281	0
Modification	423,882	0

Forest visitors can expect to see an undisturbed Forest setting exhibiting mature and old-growth character in Wildernesses. Foreground views with managed stands of conifers and hardwoods exhibiting old-growth characteristics will be offered in the heavily used viewsheds and along major travel routes. Middle and background vistas feature younger managed stands of conifers and hardwoods with some noticeable interruptions in the vegetative character that vary in size and distribution, depending on the distance zone and applicable visual objective.

Alternatives B, D, and D1

The Forest would not achieve the full range of the visual inventory under these alternatives. Land allocations by VQO are:

Visual Quality Objective	Acres	Percent
Preservation	349,707	- 2
Retention	18,168	- 72
Partial Retention	106,123	- 57
Modification	618,304	+ 46

Natural/near-natural Forest settings will be maintained within five viewsheds (Rogue-Illinois, Upper Illinois, Chetco, Coquille, and Oregon Caves), and would offer vistas in the fore, middle, and background distance zones similar to those described in Alternative A above.

Areas currently inventoried for Retention in four viewsheds (Upper Illinois, Rogue-Illinois, Coquille, and Chetco) would be managed to achieve Partial Retention which would have some effect on the quality of the recreation settings within these viewsheds. Forest visitors can expect views in the foreground and middleground distance zones featuring managed young stands of conifers and hardwoods with some noticeable interruptions in the vegetative character that would resemble vegetative patterns occurring naturally in the landscape. Background vistas would feature obvious interruptions in the vegetative character that are larger in size and would resemble patterns occurring naturally.

In three viewsheds (Bob's Garden, Chetco, and Winchuck River), the Forest would not achieve the inventoried VQO's. Areas inventoried as Retention would be managed to achieve Partial Retention, and areas inventoried for Partial Retention would be managed to achieve Modification objectives. These reductions in the visual inventory may be appropriate for the Bob's Garden viewshed where the vistas offered consist of secondary middle and background views that are seen for only short periods of time. The situation differs in the lower river portions of the Chetco and Winchuck River viewsheds which receive consistently moderate to high levels of recreation use, indicating a greater level of viewer sensitivity than allocations made in this alternative

Alternative C

The Forest would not achieve the full range of VQO's under this alternative Land allocations by Visual Quality Objective are.

Visual Quality Objective	Acres	Percent
Preservation	342,016	- 4
Retention	9,526	- 85
Partial Retention	97,551	- 60
Modification	643,209	+ 52

Forest visitors can expect views in all distance zones that feature young managed stands consisting primarily of conifers with interruptions to the vegetative character that are obvious and occur frequently

Four viewsheds (Oregon Caves, Upper Illinois, Rogue-Illinois, and Chetco) would allocate areas inventoried for Retention to Partial Retention and would have an effect on the recreation setting within these viewsheds. Management activities would be evident in the near foreground and the middleground in areas previously managed to achieve the Retention objective.

In three viewsheds (Bob's Garden, Chetco, and Winchuck River), the same discussion of effects as described in Alternatives B, D, and D1 apply.

Alternative E

The Forest would achieve and exceed the inventoried VQO's in those viewsheds allocated to management. Land allocation by VQO are:

Visual Quality Objective	Acres	Percent
Preservation	704,686	+ 98
Retention	25,814	- 61
Partial Retention	116,281	- 53
Modification	245,521	- 42

Reductions (relative to the visual inventory) in allocations to Retention, Partial Retention, and Modification are created by increasing acres in Preservation as a result of the Management Area allocations to Backcountry Recreation. The Forest would maintain its current overall appearance.

Forest visitors can expect vistas similar to those described in Alternative A in those viewsheds allocated to management. Undisturbed vistas featuring uninterrupted vegetative patterns would be available throughout the remainder of the Forest

Alternative G

The Forest would achieve and exceed the inventoried VQO's in those viewsheds allocated to management. Land allocations by VQO are:

Visual Quality Objective	Acres	Percent
Preservation	584,952	+ 64
Retention	31,309	- 52
Partial Retention	164,680	- 33
Modification	311,361	- 27

Reductions (relative to the inventoried VQO's) in allocations to Retention, Partial Retention, and Modification are created by increasing acres in Preservation as a result of the Management Area allocations to Backcountry Recreation The Forest would maintain its current overall appearance.

The net effect of implementing this alternative would be the maintenance of the natural character of the Forest in areas allocated to roadless management objectives, and the maintenance of a natural/near-natural character in all of the Forests most sensitive viewsheds Forest visitors can expect foreground views exhibiting a managed old-growth character featuring a vegetative mix of conifer and deciduous tree species. Middle and background distance zones will offer views toward a managed vegetative mosaic of varying size, age class, and distribution. Disturbances to the uninterrupted character of the landscape will vary in size and distribution, depending on distance zone and the requirements of the applicable VQO's. Vistas from some Forest roads (such as Burnt Ridge) will offer views towards undisturbed areas of the Forest that will be maintained in an unaltered condition

Alternative K

The Forest would not achieve the full range of inventoried VQO's. Land allocations by VQO are

Visual Quality Objective	Acres	Percent
Preservation	402,268	+ 13
Retention	15,118	- 77
Partial Retention	145,436	- 41
Modification	529,480	+ 25

Forest visitors can expect undisturbed vistas toward unmanaged stands of conifers, mixed-conifer/deciduous species, deciduous tree species, and shrub stands from the trails and water routes within the Wildernesses and and in the viewshed adjacent to the last six miles of the Wild section of the Illinois River. Foreground views featuring managed stands of conifers and deciduous tree species will be offered in three other of the Forest's most sensitive viewsheds (Oregon Caves, Upper Illinois, and Rogue-Illinois). These same viewsheds will offer views toward middle and background distance zones featuring a managed vegetative mosaic of varying size, age class, and distribution similar to that described in Alternative G above.

In addition to the visual allocations, the inventoried foreground Retention (9,943 acres) within the Rogue-Illinois viewshed would not have programmed timber harvest in order to maintain the old-growth character of the foreground landscape.

Areas currently inventoried for Retention in eight viewsheds (Bolan Lake, Crazy Peak, Babyfoot Lake, Bear Camp, Coquille River, Elk River, Game Lake, and Quail Mountain) would be managed to achieve Partial Retention. These are secondary recreation travel routes (except for Bear Camp, which is primary); the maintenance of near-natural Forest settings is important in that they reflect levels of recreation use and associated viewer concern. Forest visitors can expect views toward fore, middle, and background distance zones featuring young managed stands consisting primarily of conifers Noticeable interruptions would exist in the vegetative character that vary in size and distribution depending on the distance zone and applicable VQO's.

In three viewsheds (Bob's Garden, Chetco, and Winchuck River), the same discussion of effects as described in Alternatives B, D, and D1 apply.

The current inventory in the Brigg's Valley/Shan Creek viewshed would be adjusted toward Modification objectives to more accurately reflect levels of recreation use and the level of viewer concern The Partial Retention objective would be applied to selected areas in Brigg's Valley.

Alternative M

The Forest would achieve and exceed the full range of VQO's in those viewsheds allocated to management. Land allocations by VQO are.

Visual Quality Objective	Acres	Percent
Preservation	726,256	+ 104
Retention	23,329	- 64
Partial Retention	109,448	- 56
Modification	233,269	- 45

Reductions (relative to the inventory) in allocations to Retention, Partial Retention, and Modification are created by increasing acres in Preservation as a result of the Management Area allocations to Backcountry Recreation. The Forest would maintain its current overall appearance as it now exists.

Another significant factor is the extended rotation of 250 years (approximately the same as Retention) for areas already roaded. The net effect of this management scheme would be the restoration of a more natural appearance in all areas of the Forest by approximately the fifth decade Forest visitors can expect an eventual return to a managed old-growth character in those areas allocated to management The remainder of the Forest would exhibit an undisturbed Forest setting.

Alternative S

The Forest would not achieve the full range of inventoried VQO's. Land allocations by VQO are.

Visual Quality Objective	Acres	Percent
Preservation	486,970	+ 37
Retention	21,266	- 68
Partial Retention	148,539	- 40
Modification	435,527	+ 3

Forest visitors can expect undisturbed vistas toward unmanaged stands of conifers, mixed-conifer/deciduous species, deciduous tree species, and shrub stands from the trails and water routes within Wildernesses, Backcountry Recreation areas, and in the viewshed adjacent to the last six miles of the Wild section of the Illinois River. Foreground views featuring managed stands of conifers and deciduous tree species will be offered in six of the Forests most sensitive viewsheds (Oregon Caves, Upper Illinois, Rogue-Illinois, Bolan Lake, Game Lake, and Highway 199) In addition, the inventory of VQO's would be achieved in the Chetco and Winchuck River drainages These same viewsheds will offer views toward middle and background distance zones featuring a managed vegetative mosaic of varying size, age class, and distribution similar to that described in Alternative G above

In addition to the visual allocations, the inventoried foreground Retention (9,943 acres) within the Rogue-Illinois viewshed would not have programmed timber harvest in order to maintain the old-growth character of the foreground landscape

Areas currently inventoried for Retention in six viewsheds (Crazy Peak, Babyfoot Lake, a portion of Bear Camp, Coquille River, Elk River, and Quail Mountain) would be managed to achieve the Partial Retention visual objective. These are secondary recreation travel routes (except for Bear Camp, which is primary); maintenance of near-natural Forest settings is important in that they reflect levels of recreation use and associated viewer concern. Forest visitors can expect views toward fore, middle, and background distance zones featuring young managed stands consisting primarily of conifers. Noticeable interruptions would exist in the vegetative character that vary in size and distribution depending on the distance zone and applicable VQO's.

The current inventory in the Brigg's Valley/Shan Creek and Bobs Garden viewsheds would be adjusted toward Modification objectives to more accurately reflect levels of recreation use and the level of viewer concern. The Partial Retention objective would be applied to selected areas in both viewsheds.

RECREATION SETTINGS

SIGNIFICANT INTERACTIONS

Impacts to the recreation resource will vary through the range of alternatives. Impacts are the result of management activities (direct or indirect) that affect the quality of the recreation setting. Alternatives will also affect the availability of recreation opportunities and the Forest's ability to provide them. These effects are demonstrated through the fluctuations in recreation capacities (refer to Table IV-10 for a display of the various recreation capacities by alternative, and to Table II-57, ROS Acreages by Alternative). Management activities affecting the resource are primarily those associated with timber harvest, related road construction, and other facility construction. Management Area allocations that have the greatest effect on the Recreation resource are General Forest, Wild and Scenic/Recreation Rivers, Retention Visual, Partial Retention Visual, and Backcountry Recreation. Refer to Figure III-21, Recreation Opportunity Spectrum Map, for location of opportunities.

RESPONSE TO PLANNING PROBLEMS

Planning Problem #8, "How will management direction affect recreation opportunities in the wilderness and unroaded areas?" is addressed, in part, here. The allocations are evaluated in the section entitled **WILDERNESS AND ROADLESS AREAS.** The quality of recreation opportunities is analyzed for each alternative, along with recreational development aspects. For a discussion of effects of the management alternatives on the recreation settings of river corridors and adjacent viewsheds of Wild River and Scenic/Recreation River Management Area allocations, refer to the section on **WILD AND SCENIC RIVERS.**

ENVIRONMENT EFFECTS AND MITIGATION

Current land allocations and management policies will remain fixed over the course of the planning period in Alternatives NC, A, and A-Departure. Alternatives B, C, D, and D1 will affect both the recreation settings (reduced visual allocations), and recreation capacities for Primitive and Semi-Primitive recreation opportunities. Alternatives K and S will maintain a natural/near-natural landscape within the areas of the Forest where recreation use is concentrated. Recreation capacities for Primitive and Semi-primitive recreation opportunities will be reduced, but retained in Backcountry Recreation areas and Wilderness. Alternatives E and G will retain the natural/near-natural character throughout much of the Forest, as well as maintain the availability of Primitive and Semi-primitive opportunities in areas outside of the Wildernesses Alternative M is essentially a maintenance alternative which would emphasize the maintenance or improvement of the Forest's existing condition. Timber harvest rotations will be extended to 250 years resulting eventually in a largely natural appearing Forest character.

DIRECT EFFECTS The direct effects include land allocations, construction of developed sites and trails, levels of protection afforded the landscape within and adjacent to Wild and Scenic Rivers, and the construction of trails in the Wildernesses. The range of effects on the recreation resource is expected to vary only in the degree of impact.

INDIRECT EFFECTS. The indirect effects of implementing these alternatives include: recreation use (the effects of people, stock, vehicles, and ORV's), timber harvest and related activities, and mineral exploration and development. The range of indirect effects on the recreation resource is expected to vary only in the degree of impact

CUMULATIVE EFFECTS. Timber harvest is identified as having a cumulative effect on the visual resource and has a bearing on the quality of the recreation setting throughout the Forest (USDA 1974). Impacts of recreation users, particularly in heavily used areas, is a cumulative effect to the recreation resource (USDA 1986a) These effects are monitored in all areas of the Forest, including General Forest as well as

designated areas such as Wilderness. The range of cumulative effects on the recreation resource is expected to vary only in the degree of impact.

Alternatives NC, A, and A-Departure

Current land allocations and management policies will remain unchanged over the course of the planning period for these alternatives Existing developed sites will be maintained or improved in order to increase the Forest's Developed Recreation carrying capacity. Management of the existing sites would be limited to routine maintenance and vegetative management to eliminate potential hazards and offset the impacts of recreation use over time. Recreation settings adjacent to these sites would be maintained in a natural/near-natural condition over the course of the plan

Moderate levels of trail construction (102 miles) will occur in General Forest and the Kalmiopsis Wilderness which increase the recreation carrying capacities Wilderness character and recreation settings are not expected to be significantly affected. Limited trail construction would occur in the Scenic section of the Illinois Wild and Scenic River and some construction in General Forest. Recreation settings will vary between natural/near-natural appearing to modified depending on the location of the trail system. Some trails in General Forest are likely to be displaced by road construction under these alternatives. However, a net increase in non-motorized recreation capacities will occur as a result of trail construction.

Motorized recreation opportunities will be increased as timber-related road construction is completed. The quality of recreation experience may be reduced for some users, though, due to the close proximity of harvest activities in General Forest. Road construction and harvest activities appear consistent and acceptable to many people presently using dispersed, roaded areas. Recreation settings in these areas will vary between near-natural appearing in those areas managed for Visual Quality Objectives to Modification in those areas managed for General Forest objectives Motorized recreation capacities will be increased.

Currently inventoried roadless areas will be entered for timber harvest, resulting in the loss of Primitive opportunities on approximately 14,000 acres outside of Wilderness by the end of the second decade. Land capable of providing Semi-primitive Non-motorized opportunities will be reduced from approximately 99,000 acres to 29,000 acres over time. The undeveloped character (i e , Wilderness potential) would be lost as the areas are scheduled for entry and development through the General Forest allocation. The reduction in the land capable of providing Semi-primitive Non-motorized opportunities would not sustain projected levels of demand over the course of the planning period. The Forest has the capacity to satisfy projected levels of demand for similar opportunities within the existing Wilderness system until the fifth decade of the planning period.

Alternatives B, D, and D-1

Under these alternatives, developed sites would be maintained in a condition in which capacities would be consistent with current patterns of use Developed recreation capacity would be reduced by the closure of seven developed sites As demand for developed sites increases over the first four decades, seven new sites would be constructed in areas where concentrations of recreation use are expected to occur. Developed recreation capacities would consequently be increased from 162 M RVD's to 194 M RVD's. Recreation settings immediately adjacent to these sites would be maintained in a natural condition; however, some effects of timber harvest would be apparent in the middle and background vistas due to reduced land allocations to visual resources

There would be limited trail construction in General Forest under these alternatives It is likely that some trails in General Forest would be displaced by road construction. Most existing trails would be maintained Recreation settings adjacent to existing trail systems will vary between natural and modified depending on the location of the trail and the scheme of visual quality applicable to the area

Trail construction within the Wildernesses will increase the capacity for Primitive opportunities from 11 M RVD's to 19 M RVD's by the fourth decade. Semi-primitive recreation capacities would be increased from 29 M RVD's to 42 M RVD's by the same time The amount of Pristine recreation opportunities will be reduced in the Kalmiopsis Wilderness. The natural appearance and Wilderness character of these areas are not expected to be degraded as a result of trail construction.

Recreation capacities for motorized recreation opportunities will increase by approximately 501 M RVD's. Motorized access to remote areas of the Forest will increase as new roads are built The undeveloped character and opportunities for Primitive recreation available in the North Kalmiopsis Roadless Area (Silver Creek drainage) will be lost and Semi-primitive capacities reduced to a point that will not sustain projected levels of demand by the end of the second decade. The effects of activities on the lands adjacent to Wildernesses would be most apparent under these alternatives.

Alternative C

There would be no new developed sites constructed under this alternative. Existing sites would be improved and capacity expanded by 10 M RVD's. Recreation settings around these sites would be maintained in a natural/near-natural condition, although some activities would be evident in the the middle and background distance zones due to reduced allocations to visual management.

Trail construction and reconstruction under this alternative totals 124 miles and is concentrated in the Kalmiopsis and Wild Rogue Wildernesses. Trail construction in General Forest limited to that required to access Wilderness trail systems No others would be programmed Some of the existing trail system is expected to be displaced by roads. Recreation settings will vary between natural and modified depending on the location of the trail. The quality of recreation experiences on General Forest trail systems may be affected by management activities.

Wilderness capacities for Primitive recreation opportunities would be increased by 8 M RVD's, and Semi-primitive opportunities by 16 M RVD's Wilderness character and the quality of recreation experiences are not expected to be degraded as a result of the proposed trail construction.

Motorized recreation opportunities will be increased by 660 M RVD's and access to remote areas improved as a result of proposed road construction. Recreation settings in General Forest are expected to be in a modified condition due to the close proximity of management activities to roads in General Forest areas. Within two decades, the undeveloped character and opportunities for Primitive recreation will be lost in the Silver Creek drainage As a result, capacities for Semi-primitive Non-motorized opportunities would be reduced to approximately 6 M RVD's which would not sustain projected levels of demand by the second decade. The effects of activities on the lands adjacent to Wildernesses will be apparent to Wilderness users and may affect the quality of their recreation experiences.

Alternative E

This alternative would maintain the Forest in essentially its present condition There would be eight new developed sites constructed under this alternative which would expand the Forest capacity for developed recreation 19 M RVD's by the fifth decade Recreation settings adjacent to all developed recreation sites would be maintained in a natural or near-natural condition.

Trail construction (60 miles) would be limited to General Forest or Backcountry Recreation areas. Existing trail systems in the General Forest would be maintained, although some in areas already entered for harvest would be displaced by road construction. The effect is not expected to be extensive due to the amount of land allocated to Backcountry Recreation.

Motorized recreation capacities would be increased moderately (by 476 M RVD's), but would largely be limited to areas currently harvested Recreation settings in these areas are expected to vary between near-natural and modified

Opportunities for Primitive recreation experiences will be maintained due to the allocation of all of the Forest's roadless areas to Backcountry Recreation Capacities for Semi-primitive opportunities will be reduced slightly due to continued harvest in areas allocated to General Forest. Recreation settings in these areas would be maintained in a natural condition

Alternative G

The effects of implementing Alternative G would be similar to those identified in Alternative E, but vary enough to warrant discussion. Eighteen new developed sites would be constructed, and existing sites maintained. Developed recreation capacity would be expanded by 83 M RVD's by the fifth decade. Recreation settings in areas adjacent to these sites would be maintained in a natural/near-natural condition

Wilderness trail construction (50 miles) would increase recreation capacities by 7 M RVD's. Wilderness character and the quality of recreation experiences are not expected to be significantly affected as a result of trail construction.

Motorized recreation capacities would expand by 415 M RVD's due to road construction and a reduced level of land allocated to Backcountry Recreation. Recreation settings in General Forest lands are expected to vary between near-natural and modified

Primitive opportunities available in the Silver Creek drainage would be maintained due to allocations to Backcountry Recreation Opportunities for Semi-Primitive Non-motorized recreation would be reduced, although the reduction would be partially offset by closing the Hobson Horn/Silver Peak Trail to motorized use Recreation settings in lands allocated to Backcountry Recreation are expected to remain in a natural appearing condition

Alternative K

This alternative will alter the existing condition of the Forest due to reduced allocations to visual management. Four existing developed recreation sites would be closed. Ten new developed sites would be programmed for construction over the first five decades. Developed recreation capacity would be increased by 10 M RVD's by the fifth decade Recreation settings would be maintained in a natural/near-natural condition.

There would be a total of 147 miles of trail programmed for construction and reconstruction. Construction would be split between the General Forest and the Kalmiopsis and Wild Rogue Wildernesses Some existing trail systems are expected to be interrupted or displaced by roads in General Forest. Recreation settings will vary between natural/near-natural and modified depending on the location of the trail.

A moderate amount of trail is proposed for construction in the Kalmiopsis and Wild Rogue Wildernesses (50 miles). Recreation capacities will be increased by 7 M RVD's Wilderness character and the quality of recreation experiences are not expected to be significantly affected as a result of trail construction.

Opportunities for motorized recreation experiences will be improved due to road construction, although the quality may change as a result of activities with lower VQO's. Motorized recreation capacities would be increased by 470 M RVD's. Much of the area allocated to General Forest will exhibit a modified character due to the close proximity of management activities to road systems. Viewsheds adjacent to roads with access to major recreation areas receiving high levels of use such as Bear Camp, Highway 199, Coquille

River, and others will be maintained in a near-natural condition due to allocations to visual resource management. Major Wilderness access routes would exhibit a near-natural foreground character due to allocations to visual management

Within two decades, the opportunity for Primitive and Semi-primitive Non-motorized recreation opportunities are either permanently foregone (Silver Creek drainage) or significantly reduced due to allocations of unroaded areas to General Forest.

Alternative M

Alternative M is essentially a maintenance alternative which would emphasize the maintenance or improvement of the Forest's existing condition Eighteen new developed recreation sites are programmed for construction By the fifth decade, developed recreation capacities would increase by 10 M RVD's Existing sites would be maintained. Recreation settings adjacent to these and all of the potential sites would remain in a natural/near-natural condition.

Opportunities for motorized recreation activities would remain essentially unchanged. Recreation settings in General Forest areas are expected to gradually improve over time to a near-natural condition due to the extended harvest rotations required under this alternative

All of the Forest's unroaded areas would be allocated to Backcountry Recreation which would protect their undeveloped character and maintain capacities for Primitive and Semi-primitive Non-motorized recreation opportunities. Recreation settings are expected to remain in a natural condition in these areas

Alternative S

Existing conditions will be altered on lands allocated to Management Areas 10-14 The character of the lands allocated to Management Areas 1-9 would retain their existing character.

Under this alternative, four existing developed recreation sites would be dropped from maintenance scheduling and closed Nine new developed sites would be programmed for construction over the first two decades, including the Agness Visitor Center. A moderate amount of rehabilitation would be scheduled for the remaining developed sites. Developed recreation would be increased by approximately 10 M RVD's by the second decade. Recreation settings within and adjacent to these sites would be maintained in a natural/near-natural condition.

There would be a total of 193 miles of trail programmed for construction and reconstruction. Construction would occur in Wilderness, Backcountry Recreation, and General Forest areas Some existing trail systems are expected to be interrupted or displaced by roads in General Forest Most of the existing trail system is expected to be retained under this alternative. Recreation settings adjacent to trails will vary between natural, near-natural or modified depending on the location of the trail.

A higher level of trail construction is proposed for the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses (78 miles). Recreation capacities will be increased by approximately 18 M RVD's. Wilderness character and the quality of recreation experiences are not expected to be significantly affected.

Opportunities for motorized recreation experiences will be improved due to road construction and availability of a portion of the Backcountry Recreation areas for motorized uses (generally off-road vehicles) The quality of the recreation settings on some areas of the Forest may change as a result of activities with lower Visual Quality Objectives. Motorized recreation capacities would be increased by 475 M RVD's. Much of the General Forest will exhibit a modified character due to the proximity of management activities to road systems. Viewsheds adjacent to roads with access to recreation areas receiving high levels of use such as Highway 199, Oregon Caves, Bear Camp, and along the river corridors will be

maintained in a near-natural condition due to visual management allocations Major Wilderness access routes would exhibit a natural/near-natural character in fore and middleground distance zones due to the visual management allocations.

Within two to three decades, the undeveloped character and opportunity for Primitive and Semi-primitive Non-motorized recreation are either permanently foregone or reduced due to the allocation of previously unroaded areas to General Forest. For the balance of areas allocated to Backcountry Recreation, the Forest will retain capacity for approximately 15 M RVD's of Primitive and Semi-primitive Non-motorized recreation opportunities outside of Wildernesses.

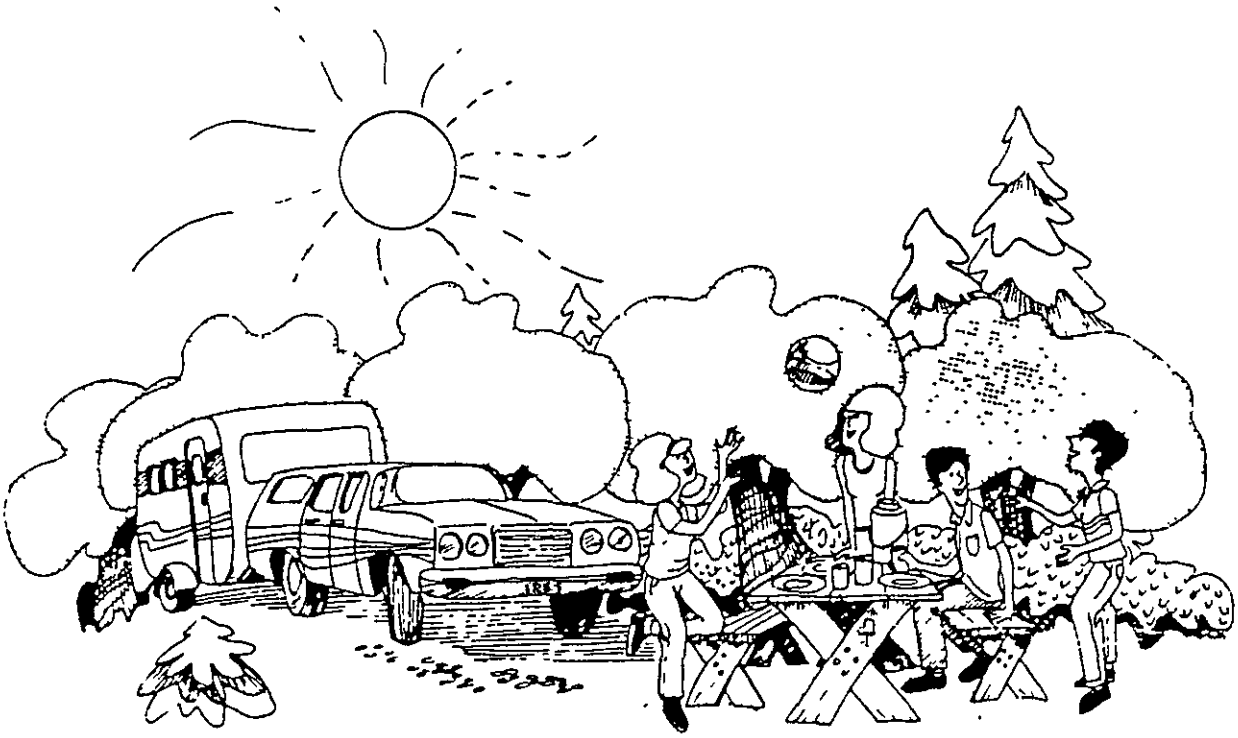


Table IV-10. Recreation Carrying Capacities (M RVD's Fifth Decade) by Alternative

	Exist.	No Change	A	A-Dep	B	C	D	D1	E	G	K	M	S
Wilderness WRS Class													
Primitive	11.4	11.4	11.4	11.4	15.1	19.6	19.4	19.4	11.4	15.8	15.8	15.9	17.3
Pristine	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Semi-primitive	29.5	29.5	29.5	29.6	42.3	45.9	42.3	29.5	29.5	32.3	32.3	32.2	41.9
General Forest Dispersed ROS Class													
Primitive	1.4	0	0	0	0	0	0	0	1.4	1.2	0.4	1.4	2.0
Semi-primitive Non-motorized	20.9	6.2	6.2	6.2	6.2	6.2	6.2	6.2	21.0	21.6	7.1	31.9	12.7
Semi-primitive Motorized	122.1	141.0	141.0	141.0	144.4	144.4	144.4	144.4	129.6	128.5	138.6	122.0	135.4
Roaded Natural	679.0	1,115.6	1,115.6	1,115.6	1,129.0	1,129.0	1,129.0	1,129.0	1,129.0	1,004.6	1,121.9	679.0	1,141.5
Developed Recreation ROS Class													
Roaded Natural	162.0	172.0	172.0	172.3	193.8	172.3	193.8	193.8	180.9	244.8	172.3	172.3	172.3
Wild and Scenic Rivers ROS Class													
Primitive	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2	11.2
Semi-primitive Non-motorized	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2	25.2
Semi-primitive Motorized	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9
Roaded Natural	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5	357.5

ECONOMIC AND SOCIAL

SIGNIFICANT INTERACTIONS

Land allocations and program budgets are used by the Forest Service to generate forest products consumed by the public. The level and mix of goods and services available for public consumption varies by alternative, which creates impacts on the social and economic environment.

The social and economic consequences associated with alternatives are presented in this section. The consequences of each alternative are characterized as direct, indirect, and cumulative economic and social effects *DIRECT EFFECTS* of each alternative are the estimated government expenditures for each alternative As a result of these expenditures, the public consumes forest products (goods and services) which produce *INDIRECT EFFECTS* including benefits, revenue, jobs, and incomes. *CUMULATIVE EFFECTS* on the social and economic environment reflect the net effect of Forest Service programs on the entire array of user groups. Examples of these effects include the economic viability of Forest programs, the total predicted changes in jobs and income, opportunity costs, and resulting impacts on lifestyles, attitudes, and community cohesion.

DIRECT EFFECTS As was shown in Table II-58, total costs vary considerably by alternative· from $330 million for Alternative M to $817 million for Alternative C. Table IV-11 displays the direct effects of the alternatives in response to the Planning Problems. The major variable costs are associated with the timber program and road construction. For example, Alternative M with a total cost of $330 million has low road costs (present value of $16 million) and a small timber program budget (discounted costs of $90 million). Conversely, Alternative C, with total discounted costs of $817 million, has high road costs (discounted costs of $187 million) to support a large timber program budget (discounted costs of $428 million). Undiscounted annual costs are lower in Alternatives E, G, and M during the first decade than the current Forest budget. The remaining alternatives are higher than the current Forest budget.

The amount of selected suitable land for timber production varies across the alternatives. Alternatives NC, A, A-Departure, B, C, D, D1, K, and S have a large selected suitable area (greater than 500,000 acres) while Alternatives E, G, and M have a smaller land base for timber production (less than 410,000 acres).

Significant differences also exist between alternatives on the amount of Oregon and California (O&C) land managed for timber production. The range varies from Alternative M which only manages 29,000 O&C acres for timber production to Alternative C which manages 89,000 acres. Alternatives NC and C have the most O&C land managed for timber production; Alternatives A, A-Departure, B, D, D1, K, and S not far behind. Alternatives E, G, and M have significant reductions in the amount of O&C land managed for timber harvest.

The capital investment program for fisheries varies from $227,000 (Alternative A) to $350,000 (Alternatives B, K and S) and are coordinated with Riparian prescriptions. Watershed capital investments vary from $18,000 in Alternative M to $195,000 in Alternative C, varying primarily with needs for soil and water resource mitigation. The wildlife habitat capital investment programs are constant across all alternatives ($56,000), with the exceptions of Alternatives B, D, and S. In Alternative B, capital investments increase to $110,000 per year; Alternative D, the program is reduced to $28,000 per year; and, for Alternative S, it is increased to $123,000 per year.

The recreation budget, including capital investments, is relatively stable across the range of alternatives due to the excess capacity for most recreational demands on the Forest.

Table IV-11. Direct Effects

	ALTERNATIVE												
	Max. PNV	No Change	A	A Departure	B	C	D	D1	E	G	K	M	S
TIMBER													
Timber Production (MM $ - Present Discounted Value for 150 years)													
Fixed Costs	2	2	2	2	2	2	2	2	2	2	2	2	2
Operations and Maintenance Costs	376	356	364	371	413	426	403	402	209	249	343	88	334
Total Direct Timber Program Costs	378	358	366	373	415	428	405	404	211	251	345	90	336
Capital Investment Costs (MM $ - Present Discounted Value for 150 years)													
PC Road Construction	195	151	148	148	158	164	152	164	83	102	139	15	142
Appropriated Road Construction	0	14	14	14	23	23	20	17	5	5	14	1	14
Amount of Hardwood Conversion													
Planned 1st Decade (M Acres)	2.9	0	.7	0	0.1	14	10	1.5	0	0	0	0	0
Amount of O&C Land Managed for													
Timber Production (M Acres)	89	89	86	87	87	89	88	86	40	54	80	29	78
Selected Suitable Area (M Acres)	566	576	557	558	558	566	560	550	287	406	529	207	505
OLD GROWTH HABITAT													
Protected (M Acres)	175	153	175	173	171	166	171	171	273	254	185	290	198
FISH HABITAT AND WATERSHED													
Fish (MM $ - Present Discounted Value for 150 years)													
Fixed Costs	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
Variable Costs	11.9	5.7	5.7	5.7	8.8	6.5	6.3	6.3	6.3	6.5	8.8	6.5	11.3
Total Fisheries Budget	13.0	6.8	6.8	6.8	9.9	7.6	7.4	7.4	7.4	7.6	9.9	7.6	12.4
Annual Fish Capital Investments (M $)	454	227	227	227	350	260	250	250	250	260	350	260	350
Annual Watershed Capital Invest. (M $)	107	108	108	113	139	195	167	167	69	84	108	18	108
WILD AND SCENIC RIVERS AND UNROADED AREAS													
Wilderness Recreation Budget (MM $ - Present Discounted Value for 150 years)													
Fixed Costs	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Variable Costs	0.0	0.7	0.7	0.7	1.5	2.1	1.5	1.5	0.5	1.0	1.2	1.0	1.5
Total Costs	0.4	1.1	1.1	1.1	1.9	2.5	1.9	1.9	0.9	1.4	1.6	1.4	1.9
General Recreation Budget (MM $ - Present Discounted Value for 150 years)													
Fixed Costs	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6	8.6
Variable Costs	0.0	2.6	2.6	2.6	3.0	2.5	3.0	3.0	3.4	4.0	3.3	4.0	6.7
Total Costs	8.6	11.2	11.2	11.2	11.6	11.1	11.6	11.6	12.0	12.6	11.9	12.6	15.3
Unroaded Area (M acres) 1/	263	268	268	268	263	263	263	263	352	342	271	446	294

Table IV-11. Direct Effects (Continued)

	ALTERNATIVE												
	Max. PNV	No Change	A	A Departure	B	C	D	D1	E	G	K	M	S
SENSITIVE PLANTS													
Acres allocated to RNAs and Botanical Areas (M Acres) Outside Designated Wilderness and Wild Rivers	3	4	4	4	9	9	9	9	29	40	12	40	21
VISUALS													
Preservation, Retention and Partial Retention Management Areas (M Acres)	0	667	667	667	474	450	474	847	781	562	562	858	657
WILDLIFE HABITAT													
(MM $ - Present Discounted Value for 150 years)													
Fixed Costs	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.4
Variable Costs	1.4	1.4	1.4	1.4	2.7	1.4	0.7	1.4	1.4	1.4	1.4	1.4	5.5
Total Wildlife Costs	2.5	2.5	2.5	2.5	3.8	2.5	1.8	2.5	2.5	2.5	2.5	2.5	6.6
Capital Investments (Annual M $)	56.2	56.2	56.2	56.2	110.0	56.2	28.0	56.2	56.2	56.2	56.2	56.2	123.0

1/ Alternative M includes 97,661 acres in general forest which were not selected as suitable for timber management.

INDIRECT EFFECTS Estimated returns to the U.S. Treasury and other benefits are displayed in Table IV-12. Timber receipts comprise the largest share of total revenue However, recreation, fisheries, and wildlife values are also significant from the economic and social perspective.

Alternatives A-Departure and B have harvest schedules which depart from nondeclining flow. Allowable harvest starts above the base level for the first decade and then declines in future decades before increasing to the long-term sustained yield. These fluctuations, measured as the percentage change from timber harvest levels for the previous decade, are graphically depicted for the two departure alternatives in Figure IV-13 Harvest levels decrease in the third decade for both Alternatives. Harvest schedules increase over time in the remaining alternatives which are constrained by the nondeclining yield policy

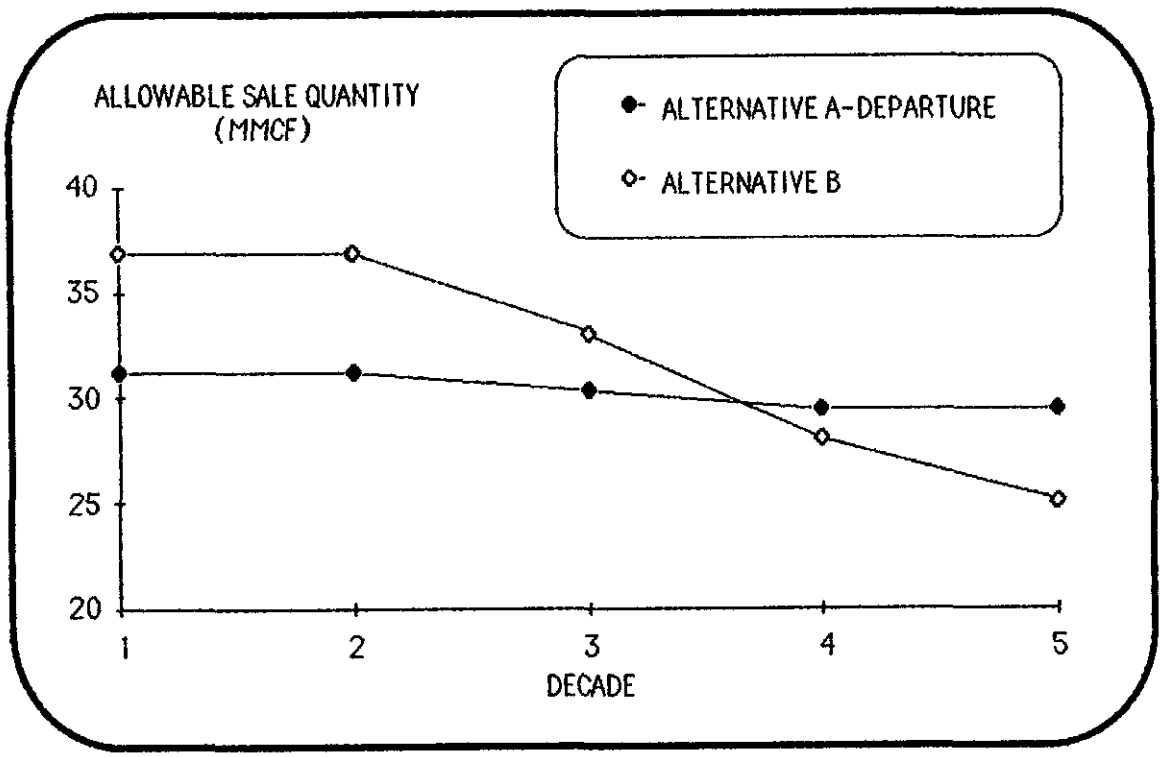


Figure IV-13 Timber Harvest Schedule For Departure Alternatives

Table IV-12. Indirect Effects

	ALTERNATIVE												
	Max. PNV	No Change	A	A Departure	B	C	D	D1	E	G	K	M	S
TIMBER													
TIMBER PRODUCTION													
Allowable Sale Quantity (MMCF)	32.4	31.0	30.1	31.2	36.8	31.8	30.4	33.2	16.2	20.5	27.8	6 1	29.0
Benefits (MM $ - Present Discounted Value for 150 yrs)	1,712	1,614	1,554	1,571	1,691	1,674	1,601	1,666	871	1,092	1,454	286	1,486
CHANGE IN JOBS													
Compared to Avg. Harvest 1975-84 (23.7 MMCF)	788	660	580	679	1,187	784	607	861	-681	-291	371	1,596	560
Compared to Alternative A	208	80	0	99	607	204	27	281	-1,261	-871	-209	-2,176	-20
CHANGE IN ANNUAL INCOME (MM $)													
Compared to Avg. Harvest 1975-84 (23.7 MMCF)	18.7	15.6	13.8	16.1	28 2	17.4	14.4	20.4	-16.1	-6.9	8.8	-37.8	13.0
Compared to Alternative A	4.9	1.8	0	2.3	14.4	3.6	0.6	6 6	-29.9	-20.7	-5.0	-51.6	-0 8
ANNUAL PAYMENTS TO COUNTIES (MM $)													
NFF	--	10.0	9.7	10.1	11 9	10.3	9.8	10.8	5.6	6.9	9.0	2 0	9.5
O&C Receipts	--	3.8	3.7	3 8	4.5	3.9	3 7	4.0	1.2	1.9	3.4	0.7	3.4
POTENTIAL FOR BELOW COST SALES	M-H	M	M	M	H	H	H	H	L	L	M	L	L
RECREATION (MM $ - Present Discounted Value for 150 years)	175	175	175	175	175	175	175	175	175	175	175	175	175
PRIMITIVE & SEMI-PRIMITIVE													
Annual Use - 1st Decade (M RVD's)	<----------							12.7					---------->
Change in Jobs	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Annual Income (M $)	0	0	0	0	0	0	0	0	0	0	0	0	0
WILD & SCENIC RIVERS													
Annual Use - 1st Decade (M RVD's)	123	145	145	145	123	123	123	123	145	145	123	145	145
Predicted Change in Jobs	0	22	22	22	0	0	0	0	22	22	0	22	22
Predicted Change in Ann. Income (M $)	0	319	319	319	0	0	0	0	319	319	0	319	319
DEVELOPED/DISPERSED RECREATION (Associated with Visuals and Old-Growth Planning Problem)													
Annual Use - 1st Decade (M RVD's)	582	560	560	560	582	582	582	582	560	560	582	560	560
Change in Jobs	0	-22	-22	-22	0	0	0	0	-22	-22	0	-22	22
Change in Annual Income (M $)	0	-319	-319	-319	0	0	0	0	-319	-319	0	-319	-319
WILDERNESS RECREATION (MM $ - Present Discounted Value for 150 Years)	<----------							10.5					---------->
PRIMITIVE & SEMI-PRIMITIVE													
Annual Use - 1st Decade (M RVD's)	<----------							22.7					---------->
Change in Jobs	0	0	0	0	0	0	0	0	0	0	0	0	0
Change in Annual Income (M $)	0	0	0	0	0	0	0	0	0	0	0	0	0

Table IV-12. Indirect Effects (Continued)

	ALTERNATIVE												
	Max. PNV	No Change	A	A Departure	B	C	D	D1	E	G	K	M	S
FISH HABITAT													
Annual Use (WFUD's)	74	67	67	67	72	68	69	69	69	69	71	69	72
Benefits (MM $ - Present Discounted Value for 150 Years)	106	90	90	90	104	92	96	96	97	98	101	98	103
Change in Jobs	28	0	0	0	20	4	8	8	12	12	15	12	20
Change in Annual Income (M $)	363	0	0	0	259	52	104	104	155	155	207	155	275
WILDLIFE HABITAT													
Annual Use (WFUD's)	69	77.1	76.5	77.6	83.6	95.8	86.8	80.8	60.1	66.4	75.3	45.2	97.0
Benefits (MM $ - Present Discounted Value for 150 years)	55	53	52	53	57	59	54	55	39	43	50	29	67.0
CHANGES IN JOBS	22	1	0	3	27	42	30	10	-35	-22	-2	-68	60
CHANGES IN ANNUAL INCOMES ($M)	378	22	0	44	459	720	503	164	-601	-370	-36	-1156	1027

Mills in Coos, Curry, Jackson, and Josephine Counties are expected to face a fluctuating timber supply over the next 30 years Projections indicate that the supply of non-National Forest stumpage will increase from the harvest level in the early 1980's for the next 10 years A significant decrease in supply is then forecast for the following 10 to 20 years, with insufficient raw material to satisfy potential consumption needs (as postulated in Chapter III). Therefore, alternatives containing National Forest harvest flows that counterbalance changes in non-National Forest supply could have the beneficial effect of stabilizing the total timber supply over time. Different alternatives then have different levels of projected supply within the four-county area. Table IV-13 displays the historical and projected timber supply by decade for each alternative. Data for the historical period, 1980-84, was extrapolated to provide values representing a decade.

Table IV-13. Total Projected Four County Timber Supply and Needs, by Alternative

	MMCF/Years			
	Historical	Projected Supply		
Alternative	1980-84	1989-98	1999-2008	2009-18
Supply Other Than Siskiyou National Forest	1,447	1,966	1,352	1,939
Total Supply by Alternative, All Sources, All Ownerships, Including Siskiyou National Forest				
NC	1,606	2,276	1,662	2,249
A	1,606	2,267	1,653	2,240
A-Departure	1,606	2,278	1,664	2,242
B	1,606	2,334	1,720	2,269
C	1,606	2,284	1,670	2,257
D	1,606	2,270	1,656	2,243
D1	1,606	2,298	1,684	2,271
E	1,606	2,128	1,514	2,101
G	1,606	2,171	1,557	2,144
K	1,606	2,244	1,630	2,217
M	1,606	2,027	1,413	2,000
S	1,606	2,250	1,636	2,223
Estimated Consumption Needs, All Ownerships'				
High Projection	-	2,282	2,506	2,506
Low Projection	-	2,056	2,282	2,282

In the first decade, Alternatives B, C, and D1 meet or exceed anticipated log consumption needs using the high end of the range for consumption as discussed in Chapter III. Alternatives NC, A, A-Departure, and D exceed the lower end of projected consumption while Alternatives K and S fall just below the projected consumption. Alternatives E, G, and M fall way short of the projected log needs

In the second decade, no alternative meets or exceeds anticipated log consumption needs for the local area of influence at the lowest level of projected demand. Alternative B comes the closest to meeting the projected needs with a total supply of 1,720 MMCF per decade.

In the third decade, the pattern of the second decade is repeated. No alternative meets the low projection of wood consumption needs Alternatives NC, A, A-Departure, B, C, D, D1, K, and S provide levels of harvests which approach the lower limit of projected raw material needs; Alternatives E, G, and M do not meet the low limit of projected consumption. As discussed earlier, the departure alternatives (Alternative A-Departure and B) then have decreases in timber production while the other alternatives maintain or increase their timber outputs

Payments to counties (Table IV-12) in which Siskiyou National Forest land is located constitute the largest direct economic impact made by the Forest on its surrounding area Alternative B has the most O&C and National Forest Fund (NFF) payments for the first decade due to the highest first decade sell quantity. Alternatives NC, A, A-Departure, C, D, D1, K, and S are not far behind Alternatives E, G, and M have significant reductions in the amount of O&C receipts for the first decade.

From the above discussion, it would appear that the level of timber harvest determines the magnitude of payments to counties. While this is true, it is only partly so. Other very important factors are the price of the timber sold and the timing of harvest. The estimates presented here are based on assumptions that sold volume will be harvested, and that the selling price is equal to the average price used in the planning analysis. What will happen in future years may be influenced more by national economic conditions and their ramifications on the timber market than on the Forest's management alternatives.

Alternatives B, C, D, and D1 are projected to have the largest number of sales where the immediate cash flow is negative (sales below cost). These alternatives would harvest large amounts of hardwood stands. Due to the costs of road development and low values of hardwood products, these alternatives have a high potential for some individual sales to have costs exceed revenues. However, the timber program benefits are higher than the program costs for all alternatives.

CUMULATIVE EFFECTS. The present net worth and costs of each alternative by program are displayed in Table IV-14. At first glance it would appear that the high timber harvest alternatives are the most efficient. It should be noted, however, that returns to the Treasury are based to a large extent on timber. If the price remains low, as it has in the recent past, and costs continue to rise, a different relationship will be evidenced in the short run. The long run should follow the predicted trend used for the timber prices.

The total change in jobs varies from an increase of 1,200 jobs to a decrease of 1,600 jobs from the current situation. It is again emphasized that these estimates are derived from planning assumptions which are approximations, only to be used for comparisons between alternatives. Reference should be made to Appendix B for more information on assumptions used in the analysis.

The magnitude of difference for changes in employment between alternatives appears high (Table IV-14). However, taken in context of the four-county labor force, the greatest difference only predicts a three percent change in total employment.

The sectors which show the largest direct changes in employment are lumber and wood products, and pulp and paper which are directly responsive to timber output changed. Auto dealers, gas stations, eating and drinking establishments, services, and retail trade are mostly responsive to recreation visitor use changes, but also benefit from indirect and induced transactions due to changes in the wood products industry. When indirect (second round, inter-industry purchasing effects) and induced impacts (consumer purchasing effects) are added, the economic sectors which exhibit the greatest sensitivity are lumber and wood products, services, transportation, communications, and utilities. The types of jobs which account for approximately 80 percent of the employment change are equipment operators (25 percent); laborers (20 percent); service workers (16 percent); and craft, foremen and mechanical, and clerical (11 percent each). Professional, technical, managerial, and administrative positions comprise about 10 percent of the total employment change by alternative. The proportions of employment change by sector, and the geographic distribution of the employment and income impacts remain relatively constant among alternatives.

The total change in income ranges from an increase of $29 million to a projected decrease of $39 million. Though these numbers appear large and may be significant to individual businesses or communities, the maximum change represents only four percent of the total income in the area of influence.

Table IV-14. Cumulative Economic and Social Effects

Socioeconomic Indicators	ALTERNATIVE												
	Max. PNV	No Change	A	A Departure	B	C	D	D1	E	G	K	M	S
ECONOMIC VIABILITY													
Present Net Worth													
(MM $ 150 years at 4% Interest)													
Timber	1,139	1,105	1,041	1,050	1,119	1,082	1,044	1,098	578	739	970	181	1,008
Wildlife	53	50	49	50	54	56	52	53	36	41	47	26	60
Fisheries	93	84	84	84	94	84	89	89	90	90	91	90	90
Wilderness Recreation	10	9	9	9	9	8	9	9	9	9	9	9	9
Non-Wilderness Recreation	167	164	164	164	163	164	163	163	163	162	163	162	160
Total (Minus Misc. Fixed Costs)	1,278	1,214	1,150	1,160	1,241	1,197	1,160	1,214	679	844	1,083	272	1,131
Cost Per Unit Production													
Timber ($/Cubic Foot)	14.0	14.1	15.0	14.8	14.9	15.2	14.9	15.1	14.3	13.9	14.4	17.2	16.5
Wildlife ($/WFUD)	31.0	30.9	31.3	30.9	42.9	28.9	22.5	29.3	42.3	37.7	32.9	55.6	68.0
Fisheries ($/WFUD)	175.0	101.6	101.0	101.0	137.0	112.0	107.0	107.0	107.0	110.0	139.0	110 0	159.0
Wilderness Recreation ($/RVD)	44.0	43.7	43.7	43.7	75.0	101.5	75.0	75.0	37.3	56.6	64.5	56.5	84.0
Non-Wilderness Recreation($/RVD)	14.0	16.0	16.0	16.0	16.6	16.0	16.6	16.6	16.2	18 1	17.0	18.1	25.7
TOTAL CHANGE IN JOBS													
Compared to Avg. Harvest 1975-84 (23.7 MMCF)	838	660	580	680	1,230	830	640	880	-700	-300	380	-1,650	560
Compared to Alternative A	258	80	0	100	650	250	60	300	-1,280	-880	-200	-2,230	-20
TOTAL CHANGE IN INCOME (MM $)													
Compared to Avg. Harvest 1975-84 (23.7 MMCF)	19.4	15.7	13.8	16.1	28.7	18.2	15.0	20.7	-15.3	-6 4	9.0	-38.8	13.0
Compared to Alternative A	5.6	1.9	0	2.3	14.9	4.4	1.2	6.9	-29.1	-20.2	-4.8	-52.6	-0.8
Opportunity Costs													
(MM $ discounted at 4% for a 150-year period)													
Timber	0	34	98	89	20	57	95	41	561	400	169	958	131
Wildlife	0	3	4	3	0	0	1	0	17	12	6	27	7
Fisheries	0	9	9	9	0	9	4	4	3	3	2	3	3
Wilderness Recreation	0	1	1	1	1	2	1	1	1	1	1	1	1
Non-Wilderness Recreation	0	3	3	3	3	3	3	3	3	4	3	3	6
Total	0	64	128	118	37	81	118	64	599	434	195	1006	147

Caution should be exercised when interpreting the results of the input/output model (IMPLAN) used to make predictions The model uses a 1972 data base, updated to 1977, to determine linkages between industries. No substitutes for any products are assumed to exist and complete consumption of all available products is assumed. The area's economic health is greatly influenced by national forces Inflation, interest rates, conditions in the housing market, and individual preferences for recreational opportunities and living environment have more of an influence on local jobs and incomes than does the Siskiyou National Forest. However, the projected outcomes are useful for evaluating relative differences between alternatives

Three social parameters are used to assess the cumulative impacts of the planning alternatives (1) lifestyles, social organization, and employment of affected communities, (2) attitudes of people within those communities, i e , how people feel about the responsiveness of the National Forest to their interests, and (3) community cohesion, or the degree of unity and cooperation evident in a community as it defines and resolves problems

Four community types with distinct lifestyles, employment, and social organization were identified in Chapter III. Grants Pass, Coos Bay, and Medford represent metropolitan **Urban** areas. Communities, such as Powers and Selma, represent **Rural** communities that are dependent on wood products and agriculture. **Westside** communities, such as Bandon and Brookings, have more diversified economies with tourism and fisheries. Takilma and Ruch are more self-contained and are **Alternate Lifestyle** communities with cottage industries as the main economic enterprise. While these are largely generalizations and do not explicitly reflect a given community structure, they can be used for representing broad value types. As discussed in Appendix B, the trend of changing values for the overall population under existing conditions is predicted to lead toward increased polarization and potential conflict, especially in Urban areas.

Each alternative was assessed with respect to demands, wants, and desires commonly associated with quality of life for major interests within each of the four community types The results are displayed in Table IV-15a. A minus (-) indicates a decrease in activity, lifestyle, or potential disruption in social organization relative to trends predicted for the existing condition (Alternative A). Such a decrease, compared to the existing condition, leads to a negative attitude (-), or lack of responsiveness to that particular issue: people feel they have not been heard. Depending upon the degree of impact, this may accelerate potential internal conflict within a community, especially if other activities have increased at the expense of fewer outputs.

Conversely, a plus (+) signifies an increase in activity, higher standard of living, or potential disruption in social organization due to growth; again relative to predicted trends for the existing condition (Alternative A). This increase then leads to people feeling their needs have been heard on any one issue with resulting positive attitudes (+). If these gains do not detract from other interests within the community, then potential internal community conflict is predicted to decelerate relative to the current trend. A zero (0) signifies circumstances where a given alternative does not vary significantly with respect to the existing condition

Social impacts for all alternatives, as a whole, are then summarized by each community type (Table IV-15b). Any significant change from existing condition is predicted to decrease cohesion (-) in the Urban areas where diverse, and often polarized, interests are represented Due to the existing cohesion in the Alternate Lifestyle communities, any tradeoff of amenity or preservation values is predicted to increase cohesion (+) due to the perception of confronting common adversity The Rural communities are predicted to experience increased internal cohesion when they feel threatened by tradeoffs of timber, motorized recreation, and wildlife (mainly hunting) outputs. These outputs generally increase or decrease hand-in-hand. The Westside communities are predicted to experience increased internal conflict where motorized recreation, scenic characteristics, fisheries, and timber outputs are relatively unbalanced.

Table IV-15a. Cumulative Effects on Communities

Socioeconomic Indicators	ALTERNATIVE 1/											
	No Change	A	A-Dep	B	C	D	D1	E	G	K	M	S
COMMUNITY DEMANDS, WANTS AND DESIRES												
URBAN AREAS												
Timber Related	0	0	0	+	+	0	+	-	-	-	-	0
Stream Protection	0	0	0	-	-	-	-	+	+	0	+	+
Primitive Recreation	-	0	0	-	-	-	-	+	+	+	+	+
Motorized Recreation	0	0	0	+	+	+	+	-	-	0	-	0
Maintenance of Visual Quality	0	0	0	-	-	-	-	+	+	-	-	0
Sensitive Plants	0	0	0	+	+	+	+	+	+	+	+	+
Wildlife												
Hunting & Viewing	0	0	0	+	0	+	0	-	0	0	-	+
Old-growth Species	0	0	0	-	0	0	-	+	+	0	+	+
RURAL												
Timber Related	0	0	0	+	+	0	+	-	-	-	-	0
Motorized Recreation	0	0	0	+	+	+	+	-	-	0	-	0
Wildlife Habitat												
Hunting & Viewing	0	0	0	+	0	+	0	-	0	0	-	+
Mining	0	0	0	+	+	+	+	-	-	-	-	0
WESTSIDE												
Timber Related	0	0	0	+	+	0	+	-	-	-	-	0
Stream Protection	0	0	0	-	-	-	-	+	+	0	+	+
Primitive Recreation	-	0	0	-	-	-	-	+	+	+	+	+
Motorized Recreation	0	0	0	+	+	+	+	-	-	0	-	0
Maintenance in Visual Quality	0	0	0	-	-	-	-	+	+	-	+	0
Fisheries	0	0	0	+	0	+	+	+	+	+	+	+
Wildlife Related												
Hunting & Viewing	0	0	0	+	0	+	0	-	0	0	-	+
Old-growth Species	0	0	0	-	0	0	-	+	+	0	+	+
ALTERNATE LIFESTYLE												
Stream Protection	+	+	0	0	0	0	+	+	0	0	+	+
Primitive Recreation	0	0	0	-	-	-	-	+	+	0	+	+
Maintenance of Visual Quality	0	0	-	-	-	-	+	+	0	0	+	+
Sensitive Plants	0	0	+	+	+	+	+	+	+	+	+	+
Old-growth Species	-	0	-	-	-	-	+	+	+	+	+	+

1/ + = Needs are being heard, positive attitudes from benefiting interests.
0 = No change from current perceptions and attitudes.
- = Leads to negative attitudes, perception of needs not being heard.

Table IV-15b. Cumulative Effects on Community Cohesion

Socioeconomic Indicators	ALTERNATIVE 1/											
	No Change	A	A-Dep	B	C	D	D1	E	G	K	M	S
URBAN AREAS	-	0	-	-	-	0	-	-	-	0	-	0
RURAL	0	0	0	*	*	0	*	+	+	+	+	+
WESTSIDE	0	0	-	+	-	0	-	+	+	0	+	*
ALTERNATIVE LIFESTYLE	0	0	0	+	+	0	+	*	*	0	*	0
COMPOSITE	-	0	-	-	-	0	-	-	-	0	-	0

1/ + = Community cohesion accelerates. (Community unites against common threat.)
0 = No change in existing condition. (Internal conflict continues to grow.)
- = Community cohesion decreases. (Internal conflict accelerates.)
* = Community cohesion stabilizes. (Forest related internal conflicts decrease.)

However, since these communities tend to appreciate the diverse needs of their economies, alternatives that grossly unbalance resource outputs could lead to cohesion due to a feeling of common threat in all factions of the community. Several alternatives do a good job of meeting the wants, needs, and desires of the Rural, Westside, or Alternate Lifestyle communities. Under these circumstances, internal conflict due to Forest-related issues decreases and community cohesion is predicted to stabilize (denoted by an *). Attitudes toward the Forest improve as people feel their wants, needs, and desires are being heard.

Please note that the parameter that indicates community cohesion does not indicate how a community might receive an alternative Rather than indicating whether a community would consider an alternative desirable or not desirable, this parameter indicates whether potential internal conflict would change relative to predicted trends for that community.

ENVIRONMENTAL EFFECTS AND MITIGATION

For each alternative, the direct, indirect, and cumulative effects are discussed below. For cumulative effects, the total present net value of each alternative reflects deductions for certain items that have negative present net values, including overhead, law enforcement, wildfire activities, and natural fuels management. Consequently, the sum of present net values (shown in parenthesis) for timber, recreation, fisheries, and wildlife will exceed the total present net value for each alternative.

For indirect effects, all alternatives except NC, D, and S have been analyzed using older data which were not corrected for the nongame wildlife component of WFUD's. While there are differences compared to revised data in Table II-5, the effects to economic indicators are negligible and do not affect relative differences among the alternatives. Tables IV-16 to IV-27 display the economic and social implications of each alternative.

Alternative NC

DIRECT EFFECTS. The direct effects of the Alternative NC (Table IV-16) are $732 MM total government expenditures for the 150-year period discounted at four percent. The discounted costs of the timber program are $358 MM with additional discounted costs of $165 MM for road construction ($151 MM for purchaser credits and $14 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $12.3 MM. Fisheries ($6.8 MM) and wildlife programs ($2.5 MM) are the other major costs. First decade average annual costs are $21.0 MM.

INDIRECT EFFECTS. These effects are average yearly consumption of 31.0 MMCF of timber harvest, 67,000 WFUD's due to fisheries, 741,000 RVD's for recreation, and 77,000 WFUD's for wildlife for the first decade. Total benefits (discounted at four percent for a 150-year period) equal $1,614 MM for timber, $185 MM for recreation, $90 MM for fisheries, and $53 MM for wildlife Payments to counties would average $13.8 MM each year

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,214 MM (timber, $1,104 MM; recreation, $173 MM; fisheries, $84 MM; and wildlife, $50 MM). Total opportunity costs compared to the maximum PNV benchmark is $64 MM which is mainly lost revenue due to lower timber production. An additional 660 jobs and $15.7 MM of income are generated by this alternative when compared to the average number of jobs and income realized in the last 10 years.

Community cohesion will probably decrease faster than predicted trends. The accelerated decrease in community cohesion is primarily due to conflicts in Urban areas concerning the Management Requirements for old-growth-dependent wildlife species As old-growth habitat is reduced beyond the minimum needed for viable populations, internal tensions would rise sharply. The other three community types would be unchanged; predicted trends would continue with decreasing cohesion and increasing internal conflict.

Table IV-16. Alternative NC - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$358 MM Program Costs $ 2 MM Fixed Costs $356 MM Variable Costs $151 MM Purchaser Credits 89 M Acres O&C Land 573 M Acres Selected Suitable	31.0 MMCF 1st Decade $1,614 MM Benefits PV +660 Jobs +$15.6 MM Annual Income $13.8 MM Annual Payments to Counties Moderate Potential for Below Cost Sales	$1,104 MM PNV $ 14.1/Cubic Foot-average Discounted Costs $ 34 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	175 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 6.8 MM Program Costs $ 1.1 MM Fixed Costs $ 5.7 MM Variable Costs $ 227 M Annual Capital Investments Watershed Capital Investments $ 108 M Annual Investment	$90.0 MM Benefits PV 67 M WFUDS 1st decade use No change in jobs or annual income	$ 84 MM PNV $ 101/WFUD Average discounted cost $ 9 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.1 MM Program Costs $ 0.4 MM Fixed Costs $ 0.7 MM Variable Costs Ultimate Capacity 42.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.2 MM Program Costs $ 8.6 MM Fixed Costs $ 2.6 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 141.0 M RVD's Motorized 1,116.0 M RVD's Roaded Natural 416.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.1 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 44/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 164 MM PNV $16.0/RVD Average Disc. Cost $ 2.6 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	3 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitve plants section for indirect and cumulative effects.	
VISUALS	651 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$53 MM Benefits PV 77.1 M WFUDs	$ 50 MM PNV $30.9/WFUD Average Disc Cost $ 3 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	268,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to decrease at a faster rate than existing trends due to controversy over protection of old growth dependent species.		$+15.7 MM Annual Income/+660 Jobs $1,214 MM PNV $ 64 MM Opportunity Costs

Alternative A

DIRECT EFFECTS. The direct effects of Alternative A (Table IV-17) are government expenditures of $736 MM for the 150-year period discounted at four percent. The discounted costs of the timber program are $366 MM with additional discounted costs of $162 MM for road construction ($148 MM for purchaser credits and $14 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $12.3 MM. Fisheries ($6 8 MM) and wildlife programs ($2.5 MM) are the other major costs. First decade average annual costs are $21.1 MM.

INDIRECT EFFECTS. These effects are average yearly consumption of 30.1 MMCF of timber harvest, 67,000 WFUD'S due to fisheries, 741,000 RVD'S for recreation, and 77,000 WFUD'S for wildlife for the first decade. Total benefits (discounted at four percent for a 150-year period) equal $1,554 MM for timber, $185 MM for recreation, $90 MM for fisheries, and $52 MM for wildlife. Payments to counties would average $13.4 MM each year.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,150 MM (timber, $1,041 MM; recreation, $173 MM; fisheries, $84 MM; and wildlife, $49 MM). Total opportunity costs compared to the maximum PNV benchmark is $128 MM which is mainly lost revenue due to lower timber production. An additional 580 jobs and $13.8 MM of income is generated by this alternative when compared to the average number of jobs and income realized in the last 10 years.

No change in community cohesion is expected. Internal conflicts will continue to increase. Conflicts concerning the Forest will not disappear.

Table IV-17. Alternative A - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$366 MM Program Costs $ 2 MM Fixed Costs $364 MM Variable Costs $148 MM Purchaser Credits 86 M Acres O&C Land 557 M Acres Selected Suitable	30.1 MMCF 1st Decade $1,554 MM Benefits PV +580 Jobs +$13.8 MM Annual Income $13.4 MM Annual Payments to Counties Moderate Potential for Below Cost Sales	$1,041 MM PNV $ 15.0/Cubic Foot-average Discounted Costs $ 98 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	175 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 6.8 MM Program Costs $ 1.1 MM Fixed Costs $ 5.7 MM Variable Costs $ 227 M Annual Capital Investments Watershed Capital Investments $ 108 M Annual Investment	$90.0 MM Benefits PV 67 M WFUDS 1st decade use No change in jobs or annual incomes	$ 84 MM PNV $ 101/WFUD Average discounted cost $ 9 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.1 MM Program Costs $ 0.4 MM Fixed Costs $ 0.7 MM Variable Costs Ultimate Capacity 42.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.2 MM Program Costs $ 8.6 MM Fixed Costs $ 2.6 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 141.0 M RVD's Motorized 1,116.0 M RVD's Roaded Natural 416.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.1 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 44/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 164 MM PNV $16.0/RVD Average Disc. Cost $ 2.6 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	3 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	667 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$52 MM Benefits PV 76.5 M WFUDs No change from current situation	$ 49 MM PNV $31.3/WFUD Average Disc.Cost $ 4 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	268,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	No changes in community cohesion are predicted as existing trends will continue. Conflicts concerning the Forest will not disappear.		$+13.8 MM Annual Income/+580 Jobs $1,150 MM PNV $ 128 MM Opportunity Costs

Alternative A-Departure

DIRECT EFFECTS. The direct effects of Alternative A-Departure (Table IV-18) are $743 MM total government expenditures for the 150-year period discounted at four percent. The discounted costs of the timber program are $373 MM with additional discounted costs of $162 MM for road construction ($148 MM for purchaser credits and $14 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $12.3 MM Fisheries ($6.8 MM) and wildlife programs ($2 5 MM) are the other major costs. First decade average annual costs are $21.6 MM.

INDIRECT EFFECTS These effects are average yearly consumption of 31.2 MMCF of timber harvest, 67,000 WFUD's due to fisheries, 741,000 RVD'S for recreation, and 78,000 WFUD'S for wildlife for the first decade. Total benefits (discounted at four percent for a 150 year period) equal $1,571 MM for timber, $185 MM for recreation, $90 MM for fisheries, and $53 MM for wildlife Payments to counties would average $13.9 MM each year.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,160 MM (timber, $1,050 MM; recreation, $173 MM; fisheries, $84 MM; and wildlife, $50 MM). Total opportunity costs compared to the maximum PNV benchmark is $118 MM which is mainly lost revenue due to lower timber production. An additional 680 jobs and $16.1 MM of income is generated by this alternative when compared to average of the last 10 years.

Community cohesion is predicted to decrease faster than predicted trends in the Urban and Westside areas. This is due to the perception by some factions in the community that timber harvests are being increased at the expense of unroaded areas, visual quality, and old-growth habitat. Rural communities may benefit from increased consumption of timber and increased opportunities for big game and motorized recreation in the first decade. However, these increases would not be sufficient to effect community cohesion. Alternate Lifestyle communities would have little change in existing cohesion, trends toward conflict concerning the Forest will probably continue.

Table IV-18. Alternative A-Departure - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$373 MM Program Costs $ 2 MM Fixed Costs $371 MM Variable Costs $148 MM Purchaser Credits 87 M Acres O&C Land 558 M Acres Selected Suitable	31.2 MMCF 1st Decade $1,571 MM Benefits PV +680 Jobs +$16.1 MM Annual Income $13.9 MM Annual Payments to Counties Moderate Potential for Below Cost Sales	$1,050 MM PNV $ 14.8/Cubic Foot-average Discounted Costs $ 89 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	173 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 6.8 MM Program Costs $ 1.1 MM Fixed Costs $ 5.7 MM Variable Costs $ 227 M Annual Capital Investments Watershed Capital Investments $ 113 M Annual Investment	$90.0 MM Benefits PV 67 M WFUDS 1st decade use No change in jobs or annual income	$ 84 MM PNV $ 101/WFUD Average discounted cost $ 9 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.1 MM Program Costs $ 0.4 MM Fixed Costs $ 0.7 MM Variable Costs Ultimate Capacity 42.0 M RVD's Non-Wilderness/Wild and Scenic Rivers $11.2 MM Program Costs $ 8.6 MM Fixed Costs $ 2.6 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 141.0 M RVD's Motorized 1,116.0 M RVD's Roaded Natural 406.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.2 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 44/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 164 MM PNV $16.0/RVD Average Disc. Cost $ 2.6 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	3 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	667 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$53 MM Benefits PV 77.6 M WFUDs +3 Jobs +$44.0 M Annual Income	$ 50 MM PNV $30.9/WFUD Average Disc.Cost $ 3 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	267,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is expected to decrease more rapidly than existing trends due to controversy over increasing timber harvests at the expense of other resources.		$+16.1 MM Annual Income/+680 Jobs $1,160 MM PNV $ 118 MM Opportunity Costs

Alternative B

DIRECT EFFECTS. The direct effects of Alternative B (Table IV-19) are $799 MM total government expenditures for the 150-year period discounted at four percent The discounted costs of the timber program are $415 MM with additional discounted costs of $181 MM for road construction ($158 MM for purchaser credits and $23 MM for appropriated dollars) The next highest cost is for the recreation program which has discounted costs of $13.5 MM Fisheries ($9 9 MM) and wildlife programs ($3 8 MM) are the other major costs First decade average annual costs are $24.9 MM

INDIRECT EFFECTS. These effects are average yearly consumption of 36.8 MMCF of timber harvest, 72,000 WFUD'S due to fisheries, 741,000 RVD'S for recreation, and 89,000 WFUD'S for wildlife for the first decade. Total benefits (discounted at four percent for a 150-year period) equal $1,691 MM for timber, $185 MM for recreation, $104 MM for fisheries, and $58 MM for wildlife. Payments to counties would average $16.4 MM each year.

CUMULATIVE IMPACTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,241 MM [timber, $1,119 MM; recreation, $172 MM; fisheries, $94 MM; and wildlife, $54 MM)] Total opportunity costs compared to the maximum PNV benchmark is $37 MM which is mainly lost revenue due to lower timber production. An additional 1,230 jobs and $28 7 MM of income is generated by this alternative when compared to the average of the last 10 years.

Decreases in community cohesion are predicted to accelerate in Urban areas as timber harvests are increased at the expense of unroaded areas, visual quality, and old-growth habitat. Rural communities would benefit from increased consumption of timber and increased opportunities for big game and motorized recreation in the first decade This stabilizes community cohesion; as people feel their needs are being met, attitudes toward the Forest become positive. Westside communities gain cohesion as the vast majority of the population, including most timber interests, collectively feel threatened by the gross imbalance of resource outputs and management. As negative attitudes toward external interests intensify due to increased commodity outputs at the expense of amenity values, community cohesion accelerates in Alternate Lifestyle communities

Table IV-19. Alternative B - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$415 MM Program Costs $ 2 MM Fixed Costs $417 MM Variable Costs $158 MM Purchaser Credits 87 M Acres O&C Land 558 M Acres Selected Suitable	36.8 MMCF 1st Decade $1,691 MM Benefits PV +1,187 Jobs +$28.2 MM Annual Income $16.4 MM Annual Payments to Counties High Potential for Below Cost Sales	$1,119 MM PNV $ 14.9/Cubic Foot-average Discounted Costs $ 20 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	170 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 9.9 MM Program Costs $ 1.1 MM Fixed Costs $ 8.8 MM Variable Costs $ 350 M Annual Capital Investments Watershed Capital Investments $ 139 M Annual Investment	$104.0 MM Benefits PV +20.0 Jobs $259.0 M Annual Income 72 M WFUDS 1st decade use	$ 94 MM PNV $ 137/WFUD Average discounted cost $ 0 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.9 MM Program Costs $ 0.4 MM Fixed Costs $ 1.5 MM Variable Costs Ultimate Capacity 58.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.6 MM Program Costs $ 8.6 MM Fixed Costs $ 3.0 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 144.0 M RVD's Motorized 1,323.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 388.1 M RVD's Roaded Natural 123.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 75/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 163 MM PNV $16.6/RVD Average Disc. Cost $ 3.0 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	9 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	474 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 3.8 MM Program Costs $ 1.1 MM Fixed Costs $ 2.7 MM Variable Costs $110.0 M Annual Capital Investment Program	$57 MM Benefits PV 88.6 M WFUDs + 27 Jobs +$459.0 M Annual Income	$ 54 MM PNV $42.9/WFUD Average Disc.Cost $ 0 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	266,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to decrease faster than existing rate due to increased timber outputs at expense of roadless areas and old growth		$+28.7 MM Annual Income/+1,230 Jobs $1,241 MM PNV $ 37 MM Opportunity Costs

Alternative C

DIRECT EFFECTS. The direct effects of Alternative C (Table IV-20) are $817 MM total government expenditures for the 150-year period discounted at four percent. The discounted costs of the timber program are $428 MM with additional discounted costs of $187 MM for road construction ($164 MM for purchaser credits and $23 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $13 6 MM. Fisheries ($7.6 MM) and wildlife programs ($2.5 MM) are the other major costs. First decade average annual costs are $26.3 MM.

INDIRECT EFFECTS. These effects are average yearly consumption of 31.8 MMCF of timber harvest, 68,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 96,000 WFUD's for wildlife Total benefits equal $1,674 MM for timber, $185 MM for recreation, $92 MM for fisheries, and $59 MM for wildlife programs Payments to counties would average $14 2 MM each year

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,197 MM (timber, $1,082 MM, recreation, $172 MM; fisheries, $84 MM; and wildlife, $56 MM).

Total opportunity costs compared to the maximum PNV benchmark is $81 MM which is mainly lost revenue due to lower timber production An additional 830 jobs and $18 2 MM of income is generated by this program mainly due to increased timber outputs relative to past timber harvest

Decreases in community cohesion are predicted to accelerate in Urban areas as timber harvests are increased at the expense of unroaded areas, visual quality, and old-growth habitat. Rural communities would benefit from increased consumption of timber and increased opportunities for big game and motorized recreation in the first decade. This would stabilize community cohesion, as people feel their needs are being met, attitudes toward the Forest become positive. Westside communities suffer decreased cohesion as the perception that fisheries and recreation values are being sacrificed for timber interests polarizes the community There is disagreement over "balanced" resource management and this leads to accelerated internal conflict. Community cohesion is accelerated in Alternate Lifestyle communities, as negative attitudes toward external forces intensify due to increased commodity outputs at the expense of amenity values

Table IV-20. Alternative C - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$428 MM Program Costs $ 2 MM Fixed Costs $426 MM Variable Costs $164 MM Purchaser Credits 89 M Acres O&C Land 566 M Acres Selected Suitable	31.8 MMCF 1st Decade $1,674 MM Benefits PV + 784 Jobs +$17.4 MM Annual Income $14.2 MM Annual Payments to Counties High Potential for Below Cost Sales	$1,082 MM PNV $ 15.2/Cubic Foot-average Discounted Costs $ 57 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	169 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.6 MM Program Costs $ 1.1 MM Fixed Costs $ 6.5 MM Variable Costs $ 260 M Annual Capital Investments Watershed Capital Investments $ 195 M Annual Investment	$ 92.0 MM Benefits PV + 4.0 Jobs +$ 52.0 M Annual Income 68 M WFUDS 1st decade use	$ 84 MM PNV $ 112/WFUD Average discounted cost $ 9 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 2.5 MM Program Costs $ 0.4 MM Fixed Costs $ 2.1 MM Variable Costs Ultimate Capacity 66.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.1 MM Program Costs $ 8.6 MM Fixed Costs $ 2.5 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 144.0 M RVD's Motorized 1,323.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 388.1 M RVD's Roaded Natural 123.0 M RVD's Wild and Scenic Rivers	$ 8 MM PNV $ 101/RVD Average Disc. Cost $ 2 MM Opportunity Costs $ 164 MM PNV $16.0/RVD Average Disc. Cost $ 2.5 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	9 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	474 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$59 MM Benefits PV 95.8 M WFUDs + 42 Jobs +$720.0 M Annual Income	$ 56 MM PNV $28.9/WFUD Average Disc.Cost $ 0 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	265,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to increase due to contoversy over increased outputs at expense of unroaded areas, old-growth habitat, and visual quality.		$+18.2 MM Annual Income/+830 Jobs $1,197 MM PNV $ 81 MM Opportunity Costs

Alternative D

DIRECT EFFECTS. The direct effects of Alternative D (Table IV-21) are $780 MM total government expenditures for the 150-year period discounted at four percent The discounted costs of the timber program are $405 MM; with additional discounted costs of $172 MM for road construction ($152 MM for purchaser credits and $20 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $13.5 MM Fisheries ($7.4 MM) and wildlife programs ($1 8 MM) are the other major costs First decade average annual costs are $24 2 MM

INDIRECT EFFECTS. These effects are average yearly consumption of 30 4 MMCF of timber harvest, 69,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 87,000 WFUD'S for wildlife for the first decade Total benefits equal $1,601 MM for timber, $185 MM for recreation, $96 MM for fisheries, and $54 MM for wildlife programs (discounted values for a 150-year period at four percent interest) Payments to counties would average $13.5 MM each year

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,160 MM (timber, $1,044 MM; recreation, $174 MM; fisheries, $89 MM; and wildlife, $52 MM). Total opportunity costs compared to the maximum PNV benchmark is $118 MM which is mainly lost revenue due to lower timber production. An additional 640 jobs and $15 0 MM of income is generated by this program mainly due to increased timber outputs relative to past timber harvest.

No change in expected trends for community cohesion is expected Internal conflicts will continue to increase. Conflicts concerning the Forest will not disappear

Table IV-21. Alternative D - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$405 MM Program Costs $ 2 MM Fixed Costs $403 MM Variable Costs $152 MM Purchaser Credits 88 M Acres O&C Land 560 M Acres Selected Suitable	30.4 MMCF 1st Decade $1,601 MM Benefits PV + 607 Jobs +$14.4 MM Annual Income $13.5 MM Annual Payments to Counties High Potential for Below Cost Sales	$1,044 MM PNV $ 14.9/Cubic Foot-average Discounted Costs $ 95 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	171 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.4 MM Program Costs $ 1.1 MM Fixed Costs $ 6.3 MM Variable Costs $ 250 M Annual Capital Investments Watershed Capital Investments $ 167 M Annual Investment	$ 96.0 MM Benefits PV + 8.0 Jobs +$104.0 M Annual Income 69 M WFUDS 1st decade use	$ 89 MM PNV $ 107/WFUD Average discounted cost $ 4 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.9 MM Program Costs $ 0.4 MM Fixed Costs $ 1.5 MM Variable Costs Ultimate Capacity 63.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.6 MM Program Costs $ 8.6 MM Fixed Costs $ 3.0 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 144.0 M RVD's Motorized 1,323.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 388.1 M RVD's Roaded Natural 123.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 107/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 163 MM PNV $16.6/RVD Average Disc. Cost $ 3.0 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	9 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	474 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 1.8 MM Program Costs $ 1.1 MM Fixed Costs $ 0.7 MM Variable Costs $28.0 M Annual Capital Investment Program	$54 MM Benefits PV 86.8 M WFUDs + 30 Jobs +$503.0 M Annual Income	$ 52 MM PNV $22.5/WFUD Average Disc.Cost $ 1 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	266,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to decrease at the same rate as the existing trend. Forest-related internal conflicts will continue to increase.		$+15.0 MM Annual Income/+640 Jobs $1,160 MM PNV $ 118 MM Opportunity Costs

Alternative D1

DIRECT EFFECTS The direct effects of Alternative D1 (Table IV-22) are $792 MM total government expenditures for the 150-year period discounted at four percent. The discounted costs of the timber program are $404 MM with additional discounted costs of $181 MM for road construction ($164 MM for purchaser credits and $17 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $13.5 MM Fisheries ($7.4 MM) and wildlife programs ($2 5 MM) are the other major costs. First decade average annual costs are $23 1 MM.

INDIRECT EFFECTS These effects are average yearly consumption of 33 2 MMCF of timber harvest, 69,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 81,000 WFUD'S for wildlife for the first decade. Total benefits equal $1,666 MM for timber, $185 MM for recreation, $96 MM for fisheries, and $55 MM for wildlife programs (discounted values for a 150-year period at four percent interest) Payments to counties would average $14.8 MM each year.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,214 MM (timber, $1,098 MM; recreation, $172 MM; fisheries, $89 MM, and wildlife, $53 MM). Total opportunity costs compared to the maximum PNV benchmark is $64 MM which is mainly lost revenue due to lower timber production. An additional 880 jobs and $20 7 MM of income is generated by this program mainly due to increased timber outputs relative to past timber harvest.

Decreases in community cohesion are predicted to accelerate in Urban areas as timber harvests are increased at the expense of unroaded areas, visual quality, and old-growth habitat. Rural communities would benefit from increased consumption of timber and increased opportunities for big game and motorized recreation in the first decade. This would stabilize community cohesion; as people feel their needs are being met, attitudes toward the Forest become positive Westside communities suffer decreased cohesion as the perception that fisheries and recreation values are being sacrificed for timber interests polarizes the community. There is disagreement over "balanced" resource management and this leads to accelerated internal conflict. Community cohesion is accelerated in Alternate Lifestyle communities, as negative attitudes toward external forces intensify due to increased commodity outputs at the expense of amenity values.

Table IV-22. Alternative D1 - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$404 MM Program Costs $ 2 MM Fixed Costs $402 MM Variable Costs $164 MM Purchaser Credits 86 M Acres O&C Land 550 M Acres Selected Suitable	33.2 MMCF 1st Decade $1,666 MM Benefits PV + 861 Jobs +$20.4 MM Annual Income $14.8 MM Annual Payments to Counties High Potential for Below Cost Sales	$1,098 MM PNV $ 15.1/Cubic Foot-average Discounted Costs $ 41 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	171 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.4 MM Program Costs $ 1.1 MM Fixed Costs $ 6.3 MM Variable Costs $ 250 M Annual Capital Investments Watershed Capital Investments $ 167 M Annual Investment	$ 96.0 MM Benefits PV + 8.0 Jobs +$104.0 M Annual Income 69 M WFUDS 1st decade use	$ 89 MM PNV $ 107/WFUD Average discounted cost $ 4 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.9 MM Program Costs $ 0.4 MM Fixed Costs $ 1.5 MM Variable Costs Ultimate Capacity 63.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.6 MM Program Costs $ 8.6 MM Fixed Costs $ 3.0 MM Variable Costs Ultimate Capacity 0.0 M RVD's Primitive 6.2 M RVD's Semi-P. Non-motorized 144.0 M RVD's Motorized 1,323.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 388.1 M RVD's Roaded Natural 123.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 75/RVD Average Disc. Cost $ 1 MM Opportunity Costs $ 163 MM PNV $16.6/RVD Average Disc. Cost $ 3.0 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	9 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	474 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$55 MM Benefits PV 80.8 M WFUDs + 10 Jobs +$164.0 M Annual Income	$ 53 MM PNV $29.3/WFUD Average Disc.Cost $ 0 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	266,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Decrease in community cohesion is predicted to proceed more rapidly than under existing conditions due to concerns over increases in timber outputs at the expense of old growth species.		$+20.7 MM Annual Income/+880 Jobs $1,214 MM PNV $ 64 MM Opportunity Costs

Alternative E

DIRECT EFFECTS. The direct effects of Alternative E (Table IV-23) are $517 MM total costs for the 150-year period discounted at four percent The discounted costs of the timber program are $211 MM with additional discounted costs of $88 MM for road construction ($83 MM for purchaser credits and $5 MM for appropriated dollars) The next highest cost is for the recreation program which has discounted costs of $12.9 MM Fisheries ($7 4 MM) and wildlife programs ($2 5 MM) are the other major costs. First decade average annual costs are $16 7 MM.

INDIRECT EFFECTS. These effects are average yearly consumption of 16.2 MMCF of timber harvest, 69,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 60,000 WFUD'S for wildlife for the first decade. Total benefits equal $871 MM for timber, $185 MM for recreation, $97 MM for fisheries, and $39 MM for wildlife programs (discounted values for a 150-year period at four percent interest) Payments to counties would average $6.8 MM each year.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $679 MM (timber, $578 MM; recreation, $172 MM, fisheries, $90 MM; and wildlife, $36 MM) Total opportunity costs compared to the maximum PNV benchmark are $599 MM which is mainly lost revenue due to lower timber production A loss of 700 jobs and $15.3 MM of income is mainly due to decreased timber outputs relative to past timber harvest

A reduction in community cohesion is predicted for Urban areas as unroaded areas and old growth are preserved at the expense of timber harvest Community cohesion accelerates rapidly in Rural areas due to the collective perception that jobs and livelihood are being sacrificed to protect unroaded areas and old growth. Similarly, community cohesion increases in Westside areas since resource use is perceived to be out of balance; the community as a whole feels threatened by adverse impacts on the timber industry. Community cohesion will tend to stabilize in the Alternate Lifestyle communities, since their wants, needs, and desires have been heard Their attitude toward the Forest improves and Forest-related external conflicts decline.

Table IV-23. Alternative E - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$211 MM Program Costs $ 2 MM Fixed Costs $209 MM Variable Costs $ 83 MM Purchaser Credits 40 M Acres O&C Land 287 M Acres Selected Suitable	16.2 MMCF 1st Decade $ 871 MM Benefits PV - 681 Jobs -$16.1 MM Annual Income $ 6.8 MM Annual Payments to Counties Low Potential for Below Cost Sales	$ 578 MM PNV $ 14.3/Cubic Foot-average Discounted Costs $ 561 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	326 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.4 MM Program Costs $ 1.1 MM Fixed Costs $ 6.3 MM Variable Costs $ 250 M Annual Capital Investments Watershed Capital Investments $ 69 M Annual Investment	$ 97.0 MM Benefits PV +12.0 Jobs +$155.0 M Annual Income 69 M WFUDS 1st decade use	$ 90 MM PNV $ 107/WFUD Average discounted cost $ 3 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 0.9 MM Program Costs $ 0.4 MM Fixed Costs $ 0.5 MM Variable Costs Ultimate Capacity 42.0 M RVD's Non-wilderness/Wild and Scenic Rivers $12.0 MM Program Costs $ 8.6 MM Fixed Costs $ 3.4 MM Variable Costs Ultimate Capacity 1.4 M RVD's Primitive 21.0 M RVD's Semi-P. Non-motorized 130.0 M RVD's Motorized 1,309.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.2 M RVD's Roaded Natural 145M RVD's Wild and Scenic Rivers	$ 9 MM PNV $37.3 M RVD Average Disc. Cost $ 0.5 MM Opportunity Costs $ 163 MM PNV $16.2/RVD Average Disc. Cost $ 3.4 MM Opportunity Costs
SENSITIVE PLANTS	29 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	847 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$39 MM Benefits PV 60.1 M WFUDs - 35 Jobs -$601.0 M Annual Income	$ 36 MM PNV $42.3/WFUD Average Disc.Cost $ 17 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	268,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Accelerated decrease in community cohesion is predicted due to increases in unroaded areas, preserved old-growth, and visual quality at the expense of timber.		$-15.3 MM Annual Income/-700 Jobs $ 679 MM PNV $ 599 MM Opportunity Costs

Alternative G

DIRECT EFFECTS The direct effects of Alternative G (Table IV-24) are $577 MM total costs for the 150-year period discounted at four percent. The discounted costs of the timber program are $251 MM with additional discounted costs of $107 MM for road construction ($102 MM for purchaser credits and $5 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $14 0 MM. Fisheries ($7.6 MM) and wildlife programs ($2.5 MM) are the other major costs First decade average annual costs are $17 8 MM

INDIRECT EFFECTS. These effects are average yearly consumption of 20.5 MMCF of timber harvest, 69,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 66,000 WFUD'S for wildlife for the first decade. Total benefits equal $1,092 MM for timber, $185 MM for recreation, $98 MM for fisheries, and $43 MM for wildlife programs (discounted values for a 150-year period at four percent interest). The potential for below cost timber sales is low due to limited road construction and no hardwood conversion program Payments to counties would average $8.8 MM each year

CUMULATIVE EFFECTS The cumulative impacts on economic and social aspects of the environment are a present net value of $844 MM (timber, $739 MM; recreation, $171 MM, fisheries, $90 MM, and wildlife, $41 MM). Total opportunity costs compared to the maximum PNV benchmark are $434 MM which is mainly lost revenue due to lower timber production. A loss of 300 jobs and $6.4 MM of income is mainly due to decreased timber outputs relative to past timber harvest

A reduction in community cohesion is predicted for Urban areas as unroaded areas and old growth are preserved at the expense of timber harvest Community cohesion accelerates rapidly in Rural areas due to the collective perception that jobs and livelihood are being sacrificed to protect unroaded areas and old growth Similarly, community cohesion increases in Westside areas since resource use is perceived to be out of balance, the community as a whole feels threatened by adverse impacts on the timber industry. Community cohesion will tend to stabilize in the Alternate Lifestyle communities, since their wants, needs and desires have been heard Their attitude toward the Forest improves and Forest-related external conflicts decline.

Table IV-24. Alternative G - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$251 MM Program Costs $ 2 MM Fixed Costs $249 MM Variable Costs $102 MM Purchaser Credits 54 M Acres O&C Land 406 M Acres Selected Suitable	20.5 MMCF 1st Decade $1,092 MM Benefits PV - 291 Jobs -$ 6.9 MM Annual Income $ 8.8 MM Annual Payments to Counties Low Potential for Below Cost Sales	$739 MM PNV $ 13.9/Cubic Foot-average Discounted Costs $ 400 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	263 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.6 MM Program Costs $ 1.1 MM Fixed Costs $ 6.5 MM Variable Costs $ 260 M Annual Capital Investments Watershed Capital Investments $ 84 M Annual Investment	$ 98.0 MM Benefits PV +12.0 Jobs +$155.0 M Annual Income 69 M WFUDS 1st decade use	$ 90 MM PNV $ 107/WFUD Average discounted cost $ 3 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.4 MM Program Costs $ 0.4 MM Fixed Costs $ 1.0 MM Variable Costs Ultimate Capacity 49.0 M RVD's Non-wilderness/Wild and Scenic Rivers $12.6 MM Program Costs $ 8.6 MM Fixed Costs $ 4.0 MM Variable Costs Ultimate Capacity 1.2 M RVD's Primitive 21.6 M RVD's Semi-P. Non-motorized 128.0 M RVD's Motorized 1,249.0 M RVD's Roaded Natural 426.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.2 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $57/RVD Average Disc. Cost $ 1.0 MM Opportunity Costs $ 162 MM PNV $18.1/RVD Average Disc. Cost $ 4.0 MM Opportunity Costs
SENSITIVE PLANTS	40 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	781 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visuals section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$43 MM Benefits PV 66.4 M WFUDs - 22 Jobs -$370.0 M Annual Income	$ 41 MM PNV $37.7/WFUD Average Disc.Cost $ 12 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	268,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Accelerated decrease in community cohesion is predicted due to increases in roadless areas, preserved old growth and visual quality at the expense of timber Production.		$- 6.4 MM Annual Income/-300 Jobs $ 844 MM PNV $ 434 MM Opportunity Costs

Alternative K

DIRECT EFFECTS The direct effects of Alternative K (Table IV-25) are $713 MM total costs for the 150-year period discounted at four percent. The discounted costs of the timber program are $345 MM with additional discounted costs of $153 MM for road construction ($139 MM for purchaser credits and $14 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $13.5 MM Fisheries ($9.9 MM) and wildlife programs ($2 5 MM) are the other major costs First decade average annual costs are $21 4 MM

INDIRECT EFFECTS These effects are average yearly consumption of 27 8 MMCF of timber harvest, 71,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 75,000 WFUD'S for wildlife for the first decade. Total benefits equal $1,454 MM for timber, $185 MM for recreation, $101 MM for fisheries, and $50 MM for wildlife programs (discounted values for a 150-year period at four percent interest). The potential for below cost timber sales is moderate due to limited road construction, entry into previously unroaded areas, and limited hardwood conversion program. Payments to counties would average $12 4 MM each year.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,083 MM (timber, $970 MM, recreation, $172 MM, fisheries, $91 MM; and wildlife, $47 MM). Total opportunity costs compared to the maximum PNV benchmark are $195 MM which is mainly lost revenue due to lower timber production. A gain of 380 jobs and $9 0 MM of income is mainly due to increased timber outputs relative to past timber harvest.

A slight increase in community cohesion is predicted in Rural areas as unroaded areas and old growth are perceived to be preserved at the expense of timber harvest, and common adversity is confronted. The other three community types would be unchanged, predicted trends would continue with decreasing cohesion and increasing internal conflict.

Table IV-25. Alternative K - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$345 MM Program Costs $ 2 MM Fixed Costs $343 MM Variable Costs $139 MM Purchaser Credits 80 M Acres O&C Land 529 M Acres Selected Suitable	27.8 MMCF 1st Decade $1,454 MM Benefits PV + 371 Jobs +$ 8.8 MM Annual Income $12.4 MM Annual Payments to Counties Moderate Potential for Below Cost Sales	$ 970 MM PNV $ 14.4/Cubic Foot-average Discounted Costs $ 169 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	189 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 9.9 MM Program Costs $ 1.1 MM Fixed Costs $ 8.8 MM Variable Costs $ 350 M Annual Capital Investments Watershed Capital Investments $ 108 M Annual Investment	$101.0 MM Benefits PV +15.0 Jobs +$207.0 M Annual Income 71 M WFUDS 1st decade use	$ 91 MM PNV $ 139/WFUD Average discounted cost $ 2 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.6 MM Program Costs $ 0.4 MM Fixed Costs $ 1.2 MM Variable Costs Ultimate Capacity 49.0 M RVD's Non-wilderness/Wild and Scenic Rivers $11.9 MM Program Costs $ 8.6 MM Fixed Costs $ 3.3 MM Variable Costs Ultimate Capacity 0.4 M RVD's Primitive 7.1 M RVD's Semi-P. Non-motorized 139.0 M RVD's Motorized 1,122.0 M RVD's Roaded Natural 406.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 388.1 M RVD's Roaded Natural 123.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 65/RVD Average Disc. Cost $ 1.2 MM Opportunity Costs $ 163 MM PNV $17.0/RVD Average Disc. Cost $ 3.3 MM Opportunity Costs Capacity exceeded for Primitive and Semi-primitive areas in future decades.
SENSITIVE PLANTS	12 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plant section for indirect and cumulative effects.	
VISUALS	562 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $ 56.2 M Annual Capital Investment Program	$50 MM Benefits PV 75.3 M WFUDs - 2 Jobs -$ 36.0 M Annual Income	$ 47 MM PNV $32.9/WFUD Average Disc.Cost $ 6 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	266,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to decrease at the same rate as existing trends. Forest-related internal conflicts will continue to increase.		$+ 9.0 MM Annual Income/+380 Jobs $1,083 MM PNV $ 195 MM Opportunity Costs

Alternative M

DIRECT EFFECTS. The direct effects of Alternative M (Table IV-26) are $330 MM total costs for the 150-year period discounted at four percent. The discounted costs of the timber program are $90 MM with additional discounted costs of $16 MM for road construction ($15 MM for purchaser credits and $1 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $14 0 MM. Fisheries ($7.6 MM) and wildlife programs ($2.5 MM) are the other major costs. First decade average annual costs are $12.2 MM.

INDIRECT EFFECTS. These effects are average yearly consumption of 6.1 MMCF of timber harvest, 69,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 45,000 WFUD'S for wildlife for the first decade. Total benefits equal $286 MM for timber, $185 MM for recreation, $98 MM for fisheries, and $29 MM for wildlife programs (discounted values for a 150-year period at four percent interest). The potential for below cost timber sales is low due to limited road construction, no entry into previously unroaded areas, and limited hardwood conversion program. Payments to counties would average $2.7 MM each year for the first decade.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $272 MM (timber, $181 MM; recreation, $171 MM; fisheries, $90 MM, and wildlife, $26 MM). Total opportunity costs compared to the maximum PNV benchmark are $1,006 MM which is mainly lost revenue due to lower timber production. A loss of 1,650 jobs and $38.8 MM of income in the first decade is mainly due to decreased timber outputs relative to past timber harvest

A reduction in community cohesion is predicted for Urban areas as unroaded areas and old growth are preserved at the expense of timber harvest. Community cohesion accelerates rapidly in Rural areas due to the collective perception that jobs and livelihood are being sacrificed to protect unroaded areas and old growth. Similarly, community cohesion increases rapidly in Westside areas since resource use is perceived to be way out of balance, the community as a whole feels threatened by severely adverse impacts on the timber industry. Community cohesion will tend to stabilize in the Alternate Lifestyle communities, since their wants, needs, and desires have been heard. Their attitude toward the Forest improves significantly and Forest-related external conflicts decline.

Table IV-26. Alternative M - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$ 90 MM Program Costs $ 2 MM Fixed Costs $ 88 MM Variable Costs $ 15 MM Purchaser Credits 29 M Acres O&C Land 207 M Acres Selected Suitable	6.1 MMCF 1st Decade $ 286 MM Benefits PV -1,600 Jobs -$37.8 MM Annual Income $ 2.7 MM Annual Payments to Counties Low Potential for Below Cost Sales	$ 181 MM PNV $ 17.2/Cubic Foot-average Discounted Costs $ 958 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	389 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $ 7.6 MM Program Costs $ 1.1 MM Fixed Costs $ 6.5 MM Variable Costs $ 260 M Annual Capital Investments Watershed Capital Investments $ 18 M Annual Investment	$ 98.0 MM Benefits PV +12.0 Jobs +$155.0 M Annual Income 69 M WFUDS 1st decade use	$ 90 MM PNV $ 110/WFUD Average discounted cost $ 3 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.4 MM Program Costs $ 0.4 MM Fixed Costs $ 1.0 MM Variable Costs Ultimate Capacity 42.0 M RVD's Non-wilderness/Wild and Scenic Rivers $12.6 MM Program Costs $ 8.6 MM Fixed Costs $ 4.0 MM Variable Costs Ultimate Capacity 1.4 M RVD's Primitive 20.9 M RVD's Semi-P. Non-motorized 122.0 M RVD's Motorized 851.0 M RVD's Roaded Natural 406.0 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.2 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $ 56/RVD Average Disc. Cost $ 1.0 MM Opportunity Costs $ 162 MM PNV $18.1/RVD Average Disc. Cost $ 3.0 MM Opportunity Costs
SENSITIVE PLANTS	40 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	913 M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 2.5 MM Program Costs $ 1.1 MM Fixed Costs $ 1.4 MM Variable Costs $56.2 M Annual Capital Investment Program	$29 MM Benefits PV 45.2 M WFUDs - 68 Jobs -$1160.0 M Annual Income	$ 26 MM PNV $55.6/WFUD Average Disc.Cost $ 27 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	268,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	*Community cohesion will decrease rapidly due to decrease in amount of offered timber with increased allocations of unroaded areas and preserved old-growth.*		$-38.8 MM Annual Income/-1,650 Jobs $ 272 MM PNV $1,006 MM Opportunity Costs

Alternative S

DIRECT EFFECTS. The direct effects of Alternative S (Table IV-27) are $712 MM total costs for the 150-year period discounted at four percent. The discounted costs of the timber program are $336 MM with additional discounted costs of $156 MM for road construction ($142 MM for purchaser credits and $14 MM for appropriated dollars). The next highest cost is for the recreation program which has discounted costs of $17.2 MM. Fisheries ($12.4 MM) and wildlife programs ($6.6 MM) are the other major costs First decade average annual costs are $21.7 MM

INDIRECT EFFECTS. These effects are average yearly consumption of 29.0 MMCF of timber harvest, 79,000 WFUD'S due to fisheries, 718,000 RVD'S for recreation, and 97,000 WFUD'S for wildlife for the first decade Total benefits equal $1,486 MM for timber, $185 MM for recreation, $103 MM for fisheries, and $67 MM for wildlife programs (discounted values for a 150-year period at four percent interest). The potential for below cost timber sales is low due to limited road construction, limited entry into previously unroaded areas, and a limited hardwood conversion program. Payments to counties would average $12.9 MM each year for the first decade.

CUMULATIVE EFFECTS. The cumulative impacts on economic and social aspects of the environment are a present net value of $1,131 MM (timber, $1,008 MM; recreation, $169 MM; fisheries, $90 MM; and wildlife, $60 MM). Total opportunity costs compared to the maximum PNV benchmark are $147 MM which is mainly lost revenue due to lower timber production. A gain of 560 jobs and $13 MM of income in the first decade is mainly due to increased timber outputs relative to past timber harvest.

A slight increase in community cohesion is predicted in Rural areas as unroaded areas and old growth are perceived to be preserved at the expense of timber harvest; and common adversity is confronted Urban areas and Alternate Lifestyle communities would be unchanged, predicted trends would continue with decreasing cohesion and increasing internal conflict in these areas. Internal conflicts in Westside communities would decrease as the management of Forest resources are perceived to be balanced. Community cohesion stabilizes and attitudes toward the Forest become positive as wants, needs, and desires are felt to be heard.

Table IV-27. Alternative S - Social and Economic Effects.

PLANNING PROBLEM	DIRECT EFFECT	INDIRECT EFFECT	CUMULATIVE EFFECT
TIMBER PRODUCTION	$336 MM Program Costs $ 2 MM Fixed Costs $334 MM Variable Costs $142 MM Purchaser Credits 78 M Acres O&C Land 505 M Acres Selected Suitable	29.0 MMCF 1st Decade $1,486 MM Benefits PV + 480 Jobs +$11.7 MM Annual Income $12.9 MM Annual Payments to Counties Low Potential for Below Cost Sales	$1008 MM PNV $ 16.5/Cubic Foot-average Discounted Costs $ 131 MM Opportunity Costs Compared to PNV Timber
OLD-GROWTH HABITAT	198 M Acres Preserved	See Recreation	See Recreation
FISH HABITAT & WATERSHED	Fisheries Budget $12.4 MM Program Costs $ 1.1 MM Fixed Costs $11.3 MM Variable Costs $ 350 M Annual Capital Investments Watershed Capital Investments $ 108 M Annual Investment (P&M)	$102.7 MM Benefits PV +20.0 Jobs +$275.0 M Annual Income 78 M WFUDS 1st decade use	$ 90 MM PNV $ 159/WFUD Average discounted cost $ 3 MM Opportunity Costs Compared to PNV Fish
RECREATION	Wilderness $ 1.9 MM Program Costs $ 0.4 MM Fixed Costs $ 1.5 MM Variable Costs Ultimate Capacity 49.0 M RVD's Non-wilderness/Wild and Scenic Rivers $15.3 MM Program Costs $ 8.6 MM Fixed Costs $ 6.7 MM Variable Costs Ultimate Capacity 2.0 M RVD's Primitive 12.7 M RVD's Semi-P. Non-motorized 135.4 M RVD's Motorized 1313.8 M RVD's Roaded Natural 415.8 M RVD's Wild and Scenic Rivers	$10.5 MM Benefits PV Annual Public Use - 1st Decade 22.7 M RVD's $175.0 MM Benefits PV 1st decade-No change in jobs or annual incomes Annual Public Use - 1st Decade 0.6 M RVD's Primitive 12.1 M RVD's Semi-P. Non-motorized 72.3 M RVD's Motorized 366.2 M RVD's Roaded Natural 145.0 M RVD's Wild and Scenic Rivers	$ 9 MM PNV $84/RVD Average Disc. Cost $ 1.0 MM Opportunity Costs $ 160 MM PNV $25.7/RVD Average Disc. Cost $ 6.0 MM Opportunity Costs
SENSITIVE PLANTS	20.9 M Acres Allocated to Botanical and Research Natural Areas	Refer to sensitive plants section for indirect and cumulative effects.	
VISUALS	*** M Acres of Preservation, Retention, and Partial Ret. Management Areas	Refer to visual resource section for indirect and cumulative effects.	
WILDLIFE HABITAT	$ 6.6 MM Program Costs $ 1.1 MM Fixed Costs $ 5.5 MM Variable Costs $123.0 M Annual Capital Investment Program	$67 MM Benefits PV 97.0 M WFUDs + 60 Jobs +$1,027 M Annual Income	$ 60 MM PNV $68.0/WFUD Average Disc.Cost $ -7 MM Opportunity Costs Compared to PNV Wildlife
MINERALS	269,000 Acres Withdrawn From Mineral Entry		
TOTAL CUMULATIVE EFFECTS	Community cohesion is predicted to decrease at the same rate as existing trends. Forest-related internal conflicts will continue to increase.		$+13.0 MM Annual Income/+560 Jobs $1,131 MM PNV $ 147 MM Opportunity Costs

1987 FIRES

The Siskiyou was impacted by several large fires in 1987. The effects of those fires and subsequent timber salvage projects, and the changes in the environmental components relevant to this Forest Plan analysis are described in the section **1987 FIRES** of Chapter III Numerous changes have occurred which have only limited implication for the Forest Plan analysis; while they affect the Forest potential to produce a particular output or condition, the changes are small fractions of the Forest totals Additionally, the fire effects, having already taken place and a decision made relative to the Silver Fire Recovery Project, will be the same for all alternatives in this analysis regardless of the one selected. For Forest Planning purposes, none of the alternatives or environmental components are significantly affected when viewed on a Forest-wide scale. Only those elements which have implications for changed outputs or environmental conditions are discussed here.

WILDERNESS AND ROADLESS AREAS

The character of parts of the Kalmiopsis and Siskiyou Wildernesses have been altered by the affects of the fires on the vegetation. These changes are part of the natural ecological processes that have occurred repeatedly in these areas for centuries and do not affect their quality as Wilderness. For some of the unroaded areas, Wilderness potential (i e , presence of Wilderness characteristics or attributes) has been affected by the road construction and timber salvage in the Silver Fire area. The changes in Recreation Opportunity Spectrum (ROS) Class are described in Chapter III, **1987 FIRES**, and the changes in the former North Kalmiopsis Roadless Area are described in Appendix C. Alternatives that would allocate areas involved in the roading and timber salvage to Backcountry Recreation (Alternatives E, G, and M) would require restoration of the affected areas to accelerate their return to more natural conditions

SOIL AND WATER

Impacts to soil and water are described in detail in the environmental documents prepared for the individual timber salvage and recovery projects referenced in Chapter III. The more important effects of water temperature increases and sediment production are also summarized in Chapter III. Sediment production will be higher in the immediate future in the burned drainages than displayed earlier in this Chapter. These effects will occur regardless of the actions taken with this Forest Plan analysis, and irrespective of the alternative selected. The consideration here is for cumulative effects that could result from implementation of a Forest Plan alternative

The most critical area of consideration is associated with the Silver Fire area. The Record of Decision for the Silver Fire Recovery Project (1988d) precludes additional timber harvest in the fire area until project monitoring indicates that watershed recovery is sufficient to allow activities to proceed without significant adverse cumulative impacts (probably about 10 years) Any alternative selected for the Forest Plan would need to honor this additional mitigation, Forest-wide outputs would not be affected. An additional mitigation for the Silver Fire and associated timber salvage project activity can be made through adjusting the basin harvest dispersion constraints for the unburned portions of Silver and Indigo Planning Basins Such an adjustment has been applied in Alternative S. See discussions in **SOIL AND WATER** and **FISH** sections of this chapter for the effects of these dispersion constraints.

VEGETATION (including TIMBER)

Fire is a natural process, affects on sensitive plants and other vegetation resources are generally not adverse. However, the loss of timber volume from the inventory has implications for some alternatives, particularly those that project high levels of timber harvest The volumes salvaged in place of sales that would normally have been scheduled offset part of the potential loss Since most of the available volume in the Galice and Longwood Fire areas will be salvaged, the only losses of any importance occur in the

Silver Fire area. Alternatives that would allocate part or all of the burned areas to uses with programmed timber outputs would be affected, others would not

The Silver Fire Recovery Project analysis also identified some additional lands that are unsuitable due to reforestation difficulty or potential for irreversible soil damage. The Record of Decision for the project indicated that the final Forest Plan would account for these inventory changes along with the changes from the fires themselves Table II-63 displays the ASQ projected for each alternative of this FEIS, and the ASQ that would be projected with the changes from the 1987 fires and revised land suitability status in the Silver Fire area. Any alternative selected would be modified to be consistent with these resource potentials prior to development of the Forest Plan for implementation. Departure Alternatives A-Departure and B could remain the same for the first decade, but would have slightly more reduction in future decades than projected.

FISH

The discussion in Chapter III explains the scope of the impacts to the fisheries resource (the primary beneficial use of water for the areas impacted). The total impact to fish production is projected to be less than one percent when viewed in the Forest-wide context. This impact has already been incurred and will not be affected by the alternatives considered in this analysis The only consideration here is the need to allow the burned areas to recover before additional timber harvest is scheduled within the perimeter of the Silver Fire area Harvest scheduling for any alternative selected for implementation could be modified to provide additional mitigation in these areas until recovery has progressed to a stage allowing further harvest activities without significant adverse cumulative impacts. Additional mitigation could be in the form of precluding timber harvest within the fire perimeter during a period to allow recovery as described under SOIL AND WATER above. It could also include delaying or modifying harvests in riparian areas in the affected watersheds.

WILDLIFE

Impacts to many species of wildlife are positive as greater diversity and distribution of seral stages has been created by the fires. Habitat for species favoring mature and old-growth forest has been reduced, though not significantly when viewed on the Forest-wide scale Impacts to the habitat networks for species dependent on mature and old growth habitat are described in Chapter III. Although mature and old-growth forests are now approximately 25,000 acres less than displayed from the planning inventory (443,000 acres), Forest-wide there is no serious impact as a result of the fires on the habitat network proposed to maintain minimum viable populations of wildlife species dependent on mature and old-growth forest

RECREATION SETTING

The character of the recreational setting is changed in the burned areas as a result of changes in the vegetation caused by the fires. The more important change relative to this analysis is the modification of the unroaded character and the ROS inventory resulting from the roading associated with the Silver Fire Recovery Project as described under WILDERNESS AND ROADLESS AREAS above. Alternatives which would allocate areas with new roads to the Backcountry Recreation Management Area would need restoration for these areas to return them to a more natural, undeveloped condition over time Alternatives that would be affected are E, G, and M

POTENTIAL CONFLICTS WITH PLANS AND POLICIES OF OTHER JURISDICTIONS

The following statements are provided to help define areas of potential differences between the proponent of the action (USDA Forest Service) and the policies, management, and enforcement responsibilities of other agencies

CULTURAL RESOURCES

The Oregon State Historic Preservation Office is presently preparing a State-wide Preservation Plan for cultural resources. Since it is in the preliminary stages, potential conflicts between the management alternatives and the objectives of the Plan cannot be determined However, the laws and policies that govern cultural resource work on Federal lands are coordinated and consistent with those of the State

Potential conflicts are not anticipated with the plans and policies of Native American tribes located adjacent to the Forest However, should issues arise, the Forest will work with those groups to seek resolution.

MINERAL DEPOSITS

Mining and minerals are important to county, state, and national plans at all levels of the economy. The effects of implementing any alternative may conflict with their objectives and Federal mining laws. The U.S. Mining Laws Act of 1872 predates all other laws that govern Forest Service activity Because of this, frequent conflicts arise between administration of mining and other resources such as visuals, water, sensitive plants, and recreation.

SOIL AND WATER

Cumulative Effects

Essentially all private land adjacent to the Forest have been cut at one time or another Little timber harvest or associated road construction (most road systems are in place) is expected in the next 10 to 15 years on private lands in the watersheds of multiple ownership (National Forest, BLM, State, and private land). The potential for cumulative effects by specific basins from harvest and associated roading is discussed in the Planning Basin analyses under the **FISH** section of this chapter. Nevertheless, conflicts may exist between State administration and enforcement of Best Management Practices (BMP's) on private timber harvest activities versus those practices implemented through the Forest's policies, Standards and Guidelines, and BMP's.

Water Supply

During the summer months the demand for water often exceeds supply, especially on the east side of the Forest. In the main stem and several tributaries of the Illinois River, water withdrawal by private landowners may interfere with the Forest meeting its goal of maintaining instream flows for recreation, aesthetics, ecosystem maintenance, and fishery values associated with the designated Wild and Scenic Illinois River. The Federal requirements and authorities for maintenance and protection of the resources may conflict with the State's administration of water rights

Water Quality

Appendix F of the Forest Plan describes the process for determining appropriate BMP's and ensuring their implementation at both the Forest Plan and Project level. Potential for conflicts exist over jurisdictional responsibilities, problem identification, interpretation of potential management activity impacts on water quality, and the selection, effectiveness, and appropriate monitoring level for BMP's

Implementation of the State Water Quality Management Plan on lands administered by the USDA Forest Service is described in Memoranda of Understanding between:

(a) The Oregon Department of Environmental Quality (DEQ) and USDA Forest Service (2/12/79 and 12/7/82), and "Attachments A and B" referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and BMP's for Range and Grazing Activities on Federal lands, respectively).

(b) The State Water Resources Control Board (SWRCB), State of California, and USDA Forest Service, Pacific Southwest Region, 1981

These Memoranda of Understanding and plans provide the basis for the interagency agreement whereby the Governor of the State designates the Forest Service as the implementing agency for nonpoint source pollution control for lands under its jurisdiction. The agreement provides for annual meetings between the Pacific Northwest Region of the Forest Service and DEQ to evaluate the program and progress being made, and provides the basis for recertification by the Governor. Available monitoring information is reviewed, revisions or additions to the BMP's are addressed, progress on problem identification and treatment is provided, and reports are written and resubmitted by the State to the U.S. Environmental Protection Agency (EPA).

There is essentially little difference in the EPA, State of California, and Forest Service process interrelationships than described for Oregon However, the development and implementation of BMP's appears to be more structured.

Compliance with State requirements for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41), and the State of California (Porter-Cologne Water Quality Control Act, Division 7) will be achieved through planning, application, and monitoring of BMP's, in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.

The key beneficial uses of water which BMP's are designed to protect are fishery and domestic uses. The Standards and Guidelines and Appendix F require consistency with the BMP's contained in:

California

"Water Quality Management For National Forest System Lands in California - BMP's," Chapter 10, **Draft** Soil and Water Conservation Handbook, Pacific Southwest Region, San Francisco (1988).

Oregon

"General Water Quality BMP's," Pacific Northwest Region (1988).

"Siskiyou National Forest Best Management Practices," Forest Planning Records (1988).

The Forest lies partially within two Oregon Regional Water Quality Basins, the Rogue Basin and South Coast Basin, and one California Regional Water Quality Basin, the North Coast Region Intermingled basins (i.e., differing levels of water quality standards within the same watershed), such as the East and West Fork Illinois, North Fork Smith, and Winchuck Rivers, could pose some problems relative to whose standards apply to what part, when. Any conflicts that arise, however, will likely be worked out through communication between the affected agencies.

FIRE

Only minor impacts are expected in the areas of fire prevention and detection. These conflicts will be resolved through modification of existing Cooperative Agreements and Operating Plans

The Forest's use of appropriate suppression response is expected to cause minor conflicts with the agencies that are responsible for wildland fire protection on lands adjacent to the National Forest. These conflicts will be resolved as the other agencies gain a better understanding of the Forest's suppression response concept and have an opportunity to view its application.

AIR QUALITY

All prescribed burning operations on the Oregon portions of the Forest would be conducted in accordance with the Oregon Smoke Management Plan (OAR 629-43-043). The actual burning operations would be further regulated by Oregon State Forestry Directive 1-4-1-601, Operational Details for the Oregon Smoke Management Plan Prescribed burning operations in California would comply with the appropriate regulations.

Potential conflicts exist between Federal land managers and the agencies of each state (Oregon State Department of Environmental Quality, the Oregon Department of Forestry, and the California Air Resources Board) responsible for the regulation of forestry and wildland burning operations. This conflict would revolve around the state agency's commitment to clean air and the Forest's goal of meeting management goals and objectives.

Another area of potential conflict exists between adjoining National Forests, other State and Federal land management agencies, and corporate and private land owners. The conflict here will be a question of burning priorities, i.e., who gets to burn which units on days when only limited burning is allowed.

A third area of potential conflict involves the Class I areas managed by other Federal land managers Smoke from prescribed fire activities on the Forest could intrude into these Class I areas, creating interdepartmental as well as political dissatisfaction. The reverse is also true for smoke that could intrude in the Class I area managed by the Forest from activities off the Forest.

The potential for conflict also exists between local governments, Oregon Department of Environmental Quality, and the Forest over the amounts of readily available firewood which could contribute to the air quality problems in the Rogue Valley during the winter months.

WILDLIFE

The mission of the State wildlife agencies differs from the mission of the Siskiyou National Forest. The Forest manages the habitat, the Department manages the animals. Therefore, plans for the management of the wildlife occupying Forest land may conflict, special efforts to address differences will be necessary

The Oregon Department of Fish and Wildlife (ODFW) has offered goals for deer and elk populations on National Forests Alternatives E, G, and M, with lower levels of timber harvest, will never meet these objectives Alternatives K and S come close to the current situation in most decades. During the next five decades, habitat capability is significantly higher than at present in Alternatives NC, A, A-Departure, B, C, D, and D1. The ODFW goals are probably achievable for Alternatives E and G (but not M) with special management direction to invest in forage enhancement projects, manage cover and access, and cooperate in restocking elk in their historical range.

PROBABLE ADVERSE ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED

Implementation of any of the alternatives would inevitably result in some adverse environmental effects. The severity of the effects can be minimized by adhering to the direction in the management prescriptions and Standards and Guidelines in Chapter IV of the Forest Plan. Some impacts, however, generally cannot be avoided if management activities are implemented.

CULTURAL RESOURCES

Current methodology cannot insure that all sites will be located. Some significant sites may be inadvertently destroyed or damaged. Pending advances in inventory techniques, such impacts are unavoidable.

Mitigation of adverse effects at significant sites will release affected acres for project activity. Elsewhere, continued avoidance of sites will prevent or minimize the activities within the affected acres.

IMPROVEMENTS

The construction of new roads will have a long-lasting impact by changing the line, color, texture, and vegetative growth along the road as viewed by the Forest user. As an access for recreation, timber, and administration activities, use causes wear on roads and trails. The wear effects can be mitigated by maintenance or reconstruction activities

Developed recreation sites are susceptible to use and vandalism effects Some impacts can be mitigated through maintenance, reconstruction, and various preventative or enforcement methods applied to vandalism problems.

WILDERNESS AND ROADLESS AREAS

The primitive (undeveloped and trailless) character of the Kalmiopsis Wilderness will be degraded to a limited extent due to trail construction.

The existing Wilderness potential in any of the inventoried roadless areas would be foregone under alternatives where these areas are allocated to some form of development.

Mineral exploration and development will be prohibited or restrained in designated Wildernesses.

SOIL AND WATER

Although the Forest Standards and Guidelines, BMP's, and Monitoring and Evaluation Plan have been designed to prevent significant adverse effects to soil and water, the potential for their occurrence does exist. Sediment production will exceed natural rates as long as roads are built, timber is harvested, and other activities take place which disturb the vegetation and soil. Sediment will be produced by surface erosion, channel erosion, and landslides.

State and Federal water quality standards for turbidity may not be met temporarily, nor in some specific locations, because of the difficulty in preventing all soil erosion from newly disturbed sites. A greater rate of landsliding will occur in clearcut units and along roads than in unmanaged or existing stable areas. However, BMP's currently being implemented, coupled with the Standards and Guidelines and monitoring, will prevent or mitigate any major or highly adverse soil and water impact to the established beneficial uses In addition, the Forest will coordinate with the State water quality agencies and the EPA in regard to BMP's

implementation Current practices will be continually updated when new information or improved methods are developed that are both technically correct and practical in application

Sediment and turbidity originating from areas being managed for timber production have the greatest potential to adversely impact fish habitat Stream water temperatures will increase in certain stream reaches if riparian vegetation is inadvertently removed (such as blowdown), but should remain unchanged or be reduced under normal conditions over time.

Drinking water may be contaminated by human use, especially when such use is concentrated along streams. Domestic water supply, if diverted directly from Forest streams, could be adversely affected during or shortly after road construction or other activities, and for short periods during more intense winter storms However, the degree of impact will be both short in duration and limited due to site-specific planning requirements and mitigations provided through the Standards and Guidelines Existing or potential conditions that are or have a good probability of adversely impacting the soil or water resource will be treated through watershed restoration or rehabilitation improvement projects.

FIRE

Impacts to the total array of Forest resources from wildfire cannot be totally avoided; wildfires will continue to occur Their occurrence will be random in both time and space, but areas with the highest probabilities for an ignition can be identified. The severity of the impact will be dependent on the intensity of the fire, and this will be determined by site-specific parameters such as fuel loading, weather conditions, and topography

Short-term loss of soil that is due to the construction of firelines and the loss of vegetation will occur, despite preventive measures The buildup of fuels will continue in areas protected by a fire exclusion philosophy. Soil erosion and the use of aerially delivered fire retardants may result in short-term water quality degradation. Recreational opportunities may be interrupted or limited in fire areas for short periods of time The aftermath of the fire will remain visible for a short time, and the location of a major fire will remain visible through the vegetation for decades. Smoke will be produced.

Adverse impacts will also occur to some resources, such as soil and air quality, from the use of prescribed fire in the treatment of activity and natural fuels, and from wildlife habitat maintenance The severity of these impacts will be dependent on the intensity and duration of the prescribed fire Normally the prescription will be designed so that the activity is implemented to achieve an acceptable level of impact to the target and nontarget resource values.

VEGETATION

Implementation of Standards and Guidelines in the proposed action allows protection of sensitive plant sites. This can affect the amount of timber, minerals, and grazing resources available for consumption.

AIR QUALITY

Impacts to air quality cannot be avoided in the range of alternatives, however, all of the impacts will be temporary. Wildfires will continue to occur, and generally at times and under conditions that produce more TSP than a prescribed fire of equal size In addition, these will usually occur under meteorological conditions that are not conducive to good smoke dispersal

Prescribed fire is a necessary, integral part of resource management on the Siskiyou National Forest When prescribed fire is utilized, there is smoke.

Road construction, silviculture practices such as the aerial application of herbicides, and motorized recreation will all contribute in one degree or another to the temporary degradation of air quality on the Forest

WILDLIFE

Acres of mature and old-growth forest will be significantly reduced. Populations of wildlife species which depend on these habitat types will be smaller. Hardwood habitat will also be reduced.

Wildlife will be temporarily displaced (permanent in limited cases) when habitat is disturbed by timber management activities, facility development, or recreation use.

Decreases in snag habitat for cavity dependent wildlife will occur due to timber harvesting, firewood cutting, and salvage programs.

VISUAL RESOURCE

Standards and Guidelines for visual resource management under the VQO of "Modification" require that harvest units, road construction, and related activities blend with the patterns exhibited by the characteristic landscape and appear as a natural occurrence when "viewed in the background " Due to the steep topography typical of the Forest, the majority of the roads constructed in General Forest are on ridgetops or in mid-slope locations that expose recreation users to a modified forest in the near foreground (adjacent to roads), middle ground, and background This situation cannot be avoided if additional roading is permitted by the selected alternative

RECREATION SETTINGS

The Primitive and Semi-primitive Non-motorized character and recreation opportunities of all or parts of the inventoried unroaded areas allocated to Management Areas 10-14 will be significantly altered or entirely foregone

Developed sites are responsible for the suppression or loss of vegetation and a resultant change in natural setting. Wildlife habitat would be concurrently degraded.

RELATIONSHIP BETWEEN SHORT-TERM USE AND LONG-TERM PRODUCTIVITY

The relationship between short-term uses of man's environment and the maintenance and/or enhancement of long-term productivity is complex Short-term uses are those that generally occur on an annual basis on some area of the Forest Long-term productivity refers to the land's capability to produce a continuous supply of resources and values for future generations For purposes of this analysis, the period is either beyond the first decade or the planning horizon (150 years), depending on the specific resource. Under all alternatives, the long-term productivity of the Forest is protected from unacceptable degradation by specific Standards and Guidelines. Below are those environmental components that relate today's uses, allocations, and activities to tomorrow's productivity

MINERAL DEPOSITS

Management prescriptions which call for increasing accessibility restrictions on mineral entry have a short-term effect on mineral availability The effect, however, can be long-term if minerals are withdrawn from entry.

IMPROVEMENTS

Structural improvements contribute towards the opportunity to utilize the potential productivity of Forest resources. Producing the goods and services associated with forest environments require functional improvements which enhance economic values. Roads and trails provide the necessary access. Roads are considered to be long-term improvements which provide for continued use over time.

Wildlife use the created openings resulting from the presence of roadways. When people use vehicles on these roads, wildlife are at risk to "road kill," hunting, and harassment during their life cycle. These actions may modify future population levels, with a greater effect on nongame species and selected species types as game species have regulated population levels.

Where a road is temporarily closed between periods of use, the ability to use the road for other purposes is foregone. Revegetation of these closed roadways will have to be removed before reuse to permit travel. Compaction of the roadbed reduces the ability of some vegetation (especially commercial tree species) to grow on many closed roads; however, this is irrelevant to long-term site productivity as the area encompassing the road has been removed from the land base suitable for the production of timber.

WILDERNESS AND ROADLESS AREAS

The designation of Wilderness has some effect on long-term productivity Opportunities to increase productivity or capture sustainable outputs through management of timber and wildlife habitat are foregone. The maintenance of Primitive recreation opportunities is maximized, however other recreation opportunities are not. Maximum protection is afforded water quality and the related fishery, old-growth trees, and associated wildlife species However, any enhancement or restoration opportunities are severely constrained. Threatened and endangered plant and animal species are protected, but little can be done to improve their habitats Natural-appearing landscapes are preserved, although buildup of natural fuels may increase risks of catastrophic wildfire. Prescribed fire may be used to mitigate this impact.

WILD AND SCENIC RIVERS

The designation of the inventoried Wild and Scenic Rivers has some effect on long-term productivity Harvest levels are reduced in the Recreation and Scenic sections No harvest is programmed in the Wild sections, opportunities to increase productivity through management of timber are thereby foregone. Mineral outputs may be severely constrained or lands withdrawn.

SOIL AND WATER

Preserving long-term soil productivity is essential for allowing the sustained yield of timber and other renewable resources from the Forest. Recognized are the potentials for adverse direct, indirect, and cumulative impacts due to management activities on the soil resource. Conclusive evidence relative to short-term impacts of timber harvest and prescribed fire adversely effecting long-term site productivity does not exist. Considerable research suggests, however, that nitrogen reserves, organic residues, and soil physical properties are critical elements of the ecosystem that must be carefully managed to ensure long-term productivity (Little and Klock 1985; Sachs and Sollens 1986; Harvey and others 1987, Powers and Weatherspoon 1984, and Amaranthus and Perry 1987). These researchers suggest that the various components of the site should be maintained to ensure that potential losses of nutrients and changes in soil physical and biological properties do not occur.

Based on current literature, peer review in associated sciences, and field observations, soil protection measures proposed in the Standards and Guidelines will maintain long-term soil productivity. While these newer practices may reasonably assure a good degree of protection to the soil resource, new information provided through research and Forest Plan monitoring efforts will lead to changes (improvements) in the Standards and Guidelines.

No long-term effects to the water resource and beneficial uses are known to occur or are expected from the proposed Forest management activities under any alternative. However, stream channel morphology may be temporarily or permanently altered as a consequence of short-term direct or indirect effects of management, i e., road crossings, erosion, and deposition of sediments, etc.

FIRE

Effective fire prevention and suppression action will minimize damage to existing timber stands and other resources. The long-term change in vegetative composition and density may reduce timber productivity. Site productivity may also be reduced by a catastrophic wildfire resulting from excessive fuel buildups

Slash disposal, if done through a proper prescription, will have little effect on long-term productivity. However, productivity may be adversely affected if slash is not treated or is inadequately treated. Burning at the wrong time and allowing for a high intensity, long duration fire (i.e., too hot too long) will result in loss of soil fertility. Most other effects of slash disposal are short-term and have little effect on productivity.

VEGETATION

Short-term use of timber, mining, and grazing resources can result in long-term loss of productivity within sensitive plant habitats, especially in potential Botanical areas not allocated in the proposed action.

Management of the timber resource today will have effects upon long-term productivity depending on the intensity of management selected. All alternatives would increase projected per acre productivity over time

AIR QUALITY

The temporary impacts of smoke from prescribed fire will have minor effects on the short-term use of Forest resources such as recreation sites, visual resources, and Wilderness. A fire exclusion policy that is developed for the purpose of maintaining air quality would have significant effects on long-term productivity of the Forest as well as set the stage for significant impacts to air quality and other forest resources from wildfires at a later date.

Fire has been of great ecological significance in the development and perpetuation of Douglas-fir and other valuable tree species The future of these species depends to a considerable extent on the skillful

application of fire as a management tool (Weaver 1974) Wright and Bailey (1982) concluded, however, that there is not a straightforward "yes" or "no" answer to the question· Does slash burning after logging benefit Douglas-fir regeneration?

The use of prescribed fire to reduce the flammability of activity fuels affects long-term forest productivity by reducing the risks and consequences of a major wildfire. The long-term benefits of prescribed fire in natural fuels more than outweigh the short-term impact to air quality. Unnatural fuel accumulations have developed as a result of fire exclusion This is particularly true in Wildernesses, where there have been no offsetting resource management actions to provide diversity and discontinuity in the fuels complex

Only one factor in the fire environment is within the control of land managers. Fuels (Countryman 1972). The other elements, weather and topography, are beyond control. Topography is usually considered static since it changes slowly with time. Air mass characteristics are highly variable, and little can be done to control or modify them.

Prescribed fire can be utilized both effectively and efficiently to reduce fuel loadings and otherwise manipulate the various fuels complexes found on the Forest This will greatly reduce the consequences of a wildfire in the manipulated fuels complexes and in adjacent complexes It will also enhance the long-term productivity of wildlife habitat, increase stream flows, provide more visual diversity, and provide the disturbance necessary for the perpetuation of important plant species, such as *Kalmiopsis leachiana*.

WILDLIFE

All wildlife species residing on the Siskiyou National Forest will be assured of long-term population viability; however, changes will occur in species populations Long-term reductions will occur in populations of species utilizing mature/old-growth forest, hardwood stands, and snag habitat. An enduring decline in deer numbers would occur in Alternatives E, G, and M, and is not confined to a specific segment of the planning period.

BIOLOGICAL DIVERSITY

In the long-term, biological diversity is directly related to forest health, productivity, and the Forest's ability to respond to change. Tree species diversity, for example, slows insect epidemics and provides habitat for animals that prey on insects. Habitat diversity provides homes for rodents that reinfect the forest with beneficial mycorrhiza after a fire.

VISUAL RESOURCE

The commitment of land currently inventoried for Retention and Partial Retention to management under Modification visual objectives would constitute a long-term commitment of the scenic values in those areas Restoring these areas to their current condition would be a costly, time-consuming process that is not likely to occur The management of the Forest's viewsheds to achieve the Retention and the Partial Retention visual objectives will constrain the Forest's ability to produce more timber due to extended harvest rotations.

Management of large areas of the Forest under the Modification visual objective would not produce a noticeable effect on the natural appearance of these areas over the short-term (first decade), but will result in the modification of the natural appearance over the long-term (the second decade and beyond).

RECREATION SETTINGS

The management of developed sites will have an adverse effect on the long-term productivity of the land and mineral production The vegetation and soils on much of each site will remain impacted by the

presence of compacted, graveled, or paved roads, paths, and camp spots These impacts will be increased on some sites as they are redesigned or reconstructed to conform to modern standards The vegetation and soils on much of the remainder will be affected by the concentration of users. These effects would remain evident for a long time even if the sites are abandoned Efforts to restore sites to previous productivity levels would be costly, however, many mitigation measures are designed into developments to reduce the overall impact to existing vegetation.

The short-term use (construction and maintenance) of trails, trailheads, toilets, or other facilities to enhance the dispersed recreation experience will have long-term effects on productivity similar to those described for developed recreation sites. Most are very insignificant in extent (area).



IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

An irreversible commitment of resources results from a decision to use or modify resources that are renewable only over a long period of time Nonrenewable resources, e g., rock resources, minerals, etc., are an irreversible commitment once used An irretrievable commitment of resources refers to resource production or the use of a renewable resource that is lost because of land allocation and/or scheduling decisions. In other words, opportunities are foregone for the period of time that the resource cannot be used The Forest Plan and the alternatives examined are all based on the principles of multiple use and long-term productivity for all resources Measures to protect natural resources that could be irreversibly affected by management practices are incorporated into the Standards and Guidelines of the Forest Plan.

CULTURAL RESOURCES

Data recovery efforts represent, in essence, the scientific and controlled destruction of a cultural resource site Once undertaken, the effects of data recovery are irreversible; this mitigation measure represents an irretrievable commitment to the resource At a minimum, conventional archaeological techniques and methods will be employed for data recovery projects This commitment to high quality field and laboratory work will ensure the consistency and usefulness of the data.

The combination of impacts from past and proposed future landscape modification, private developments, natural deterioration, and vandalism will significantly reduce the existing cultural resource data base Information on past ways of life within southwestern Oregon, beyond our current understanding, may eventually be unavailable

An incremental decrease of the cultural resource data base will occur wherever sites are lost due to ground-disturbing activities of other ownerships adjacent to the Siskiyou National Forest. For example, private logging and road building in the Pistol River basin are disturbing cultural evidence which would be valuable for comparative studies underway in that same drainage on Forest Service lands. In other cases, nonprofessional excavation of sites on private lands, such as at the Indian sites near Agness, Oregon, further reduce the cultural resource data base as well as our opportunity to understand the heritage of southwestern Oregon. Such actions have irreversible and cumulative effects on this resource.

For each alternative, mitigation measures are developed whenever a Class I cultural resource is affected by projects, vandalism, or natural deterioration These measures include· site avoidance, data recovery, photo documentation, restoration, and analysis. The Standards and Guidelines outline the mitigation measures, as necessary, and the Monitoring Plan insures compliance. Mitigation measures will improve in the future Techniques used for data recovery and other professional analyses will be refined.

Any cultural resource lost, either overlooked or unmitigated, will be unavailable either for future analysis or interpretative opportunities Current management practices will continue for those sites previously treated; newly discovered sites will be managed as prescribed by any revised direction, including any forthcoming changes in the scope of standards for survey, analysis, reporting, and mitigation.

Sites which are known to exist outside of proposed project boundaries are difficult to manage. Inventory, as a rule, occurs within areas selected for timber harvest, road building, or other ground-disturbing activities Therefore, sites may be lost which are: (1) never identified or recorded, and (2) identified, yet are located outside of proposed project areas

ENERGY

The use of fossil fuels in the administration of the National Forest is an irreversible resource commitment. Alternatives only vary by the amount; none abstain from use.

IMPROVEMENTS

Because the majority of the roads constructed on the Forest traverse steep ground slopes, they become permanent features on the landscape. Many roads which are scheduled for reclamation do not return the land to the prior productive state For these and all other roads on the transportation system, there is a definite long-term loss of either some or all of site productivity within the excavated road prism.

Although rock used for surfacing can be found in many places, once it is ground to dust by traffic on the road or broken up by weathering agents, it can no longer retain the desired characteristics

WILDERNESS AND ROADLESS AREAS

Wilderness potential (characteristics) in those roadless areas allocated to management where development may occur is irretrievably lost. This irretrievable loss, though, will only occur upon project implementation and not as a direct effect of the Forest Plan allocation. However, this is more a preference than real as evidenced by existing developments when specific areas were designated as Wilderness on this Forest and elsewhere.

WILD AND SCENIC RIVER

Designation of the inventoried Wild and Scenic Rivers would permanently reduce or prohibit timber harvest. Mineral exploration and development is also restricted or prohibited. Opportunities for the construction of dams, diversions, and hydropower development are prohibited.

SOIL AND WATER

There is an inherent risk of accelerating landslides, erosion, and other changes in the soil physical and biological properties when harvesting timber and building roads in the steep, rugged terrain on the Forest. Debris avalanches, when they occur, often scour to bedrock Surface and channel erosion, severe soil compaction and displacement, damage to proper functioning of soil biological processes, etc , could lead to either a limited or total loss of site productivity. Productivity, once lost, requires a long time for natural processes to restore. The soil and water protection measures identified in the Standards and Guidelines are designed to avoid or minimize the potential for irreversible losses from the proposed management practices.

FIRE

There is no irreversible commitment of resources associated with the fire prevention, suppression, or fuels programs as they could be curtailed at any time. There will be a minor irreversible commitment of fossil fuels involved with various fire management activities.

VEGETATION

Grazing allotments may be restricted to protect sensitive plant species. This would constitute an irretrievable loss to the permittees

Old-growth forests, once harvested, are considered an irretrievable loss. Once harvested, the stand begins anew To again develop old-growth forest characteristics will require approximately 200 years Insects, disease, and fire can also contribute to this loss. If left unmanaged, stand decadence may alter the old growth sufficiently to set the vegetative structure back to an early successional stage. The result would be a natural change, or loss, of old growth.

AIR QUALITY

There is no irreversible or irretrievable commitment of resources associated with the temporary impacts to air quality over the range of alternatives Mitigating measures such as YUM, PUM, chipping, and burying will, however, require the irretrievable commitment of fossil fuels.

WILDLIFE

Old-growth wildlife habitat, once harvested, cannot be replaced through regrowth over the planning horizon (150 years) It is possible that the number, size, and dispersal of mature and old-growth blocks allocated to spotted owl, pileated woodpecker, and pine martin (and the species they represent) may not be sufficient to maintain viable populations over time. If land allocations were not corrected in subsequent planning cycles, species could be lost.

There will be a reduction in some types of hunting opportunities because of changes in habitat Some wildlife species will be reduced and others will increase, depending on the kind of habitat available.

Forage reserved for wildlife within grazing allotments constitutes an irretrievable loss to the permittees, unless reallocated to permittees

BIOLOGICAL DIVERSITY

Species extinction is irreversible It is essential that habitat for sensitive species be maintained or enhanced, although the risk of extinction is very low

VISUAL RESOURCE

The commitment of Forest land to development of such facilities as roads or rock pits constitute an irreversible and irretrievable commitment of the natural appearance of the landscape.

RECREATION SETTINGS

The Forest's established developed sites are programmed for a full level of maintenance and so become an irreversible, long-term commitment of a resource. Wood fiber or forage which would have been produced on the sites is irretrievably lost

The commitment of the Forest's unroaded areas to timber production constitutes an irretrievable loss of the primitive character required to maintain the physical and psychological settings necessary for Primitive and Semi-primitive Non-motorized recreation experiences

ENVIRONMENTAL EFFECTS UNCHANGED BY ALTERNATIVES

Some of the resources on the Forest are not affected by implementation of any of the alternatives More often, the activity-induced impacts are either similar or conditions of the environment remain unaffected

LAND ALLOCATIONS

The relationships of National Forest planning to statewide planning programs, along with Oregon's Coastal Management Program, is briefly discussed herein. In Oregon, the Land Conservation and Development Commission (LCDC) sets overall rules for planning decisions, cities and counties adopt plans which meet the statewide requirements. Statewide Planning Goals are Oregon's standards for comprehensive planning. Of the 19 Goals, a number are strongly interrelated with management of the Siskiyou National Forest, a few are indirectly related, and several others have little or no bearing on or from the Forests uses, activities, or outputs.

In summary, the alternatives either complement, meet, or exceed the Statewide Planning Goals and the intent of the Coastal Management Program (Federal Coastal Zone Management Act of 1972). Proposed activities that would be implemented under the alternatives comply with the Goals, are compatible with county comprehensive plans and land use regulations, and conform with various State agency statutory authorities. Input and coordination on a wide array of planning topics has been ongoing between the Forest and adjacent counties and State agencies. Planned activities will continue to be conducted consistent with the state management programs.

Activities which produce offsite effects on the coastal zone have been analyzed in this chapter under numerous section headings. Portions of the coast in Curry, Coos, and Del Norte Counties were evaluated for potential indirect and cumulative effects The effects predicted for all alternatives have been compared to the county plans and are consistent at this programmatic level.

ENERGY

Utility corridors do not vary by alternative They will continue basically as they exist today, with normal *maintenance as needed There are no proposed corridors, future proposals will be analyzed on a* project-specific basis

Small hydroelectric projects do not vary by alternative. They, too, will be dealt with on a case by case basis as proposals are administered through established Federal Energy Regulatory Commission procedures and Agency analysis

MINERAL DEPOSITS

Roads developed for minerals access and development can add to dispersed motorized recreation opportunities.

Mined-area rehabilitation has the potential to improve fish and wildlife habitat, and restore old erosion and water pollution sources.

IMPROVEMENTS

There will continue to be a road system to serve the needs of Forest users and for Forest management and protection. Each alternative has a transportation system; the only change occurs in extent and management objectives. All alternatives provide for some degree of accessibility for various resources, such as timber management, fire prevention and suppression, recreation, and special uses

Although it could be increased or decreased in size, the basic arterial road system will remain unchanged Trails will continue to be present, and will help in the use and protection of the Forest New road construction will be subject to the project prescription and Standards and Guidelines in meeting the specific management objectives of the area served

All existing developed recreation sites in use will remain in service, whereas some of the existing minimum developed recreation sites may be closed as a result of different alternatives The number and location of administrative sites and water developments are not based directly on the alternatives, but are based on physical and economic considerations common to all alternatives. Other improvements unchanged by the alternatives include utility and transportation corridors, the solid waste collection site, communication facilities, and fire lookout structures.

A variety of users will travel on roads and trails they find to be suitable or need upgrading for their needs. All alternatives recognize there will be use at developed recreation sites There will be continued use of the existing utility and transportation corridors There will be very little or no change in established use of the existing miscellaneous improvements.

Use of roads during wet ground or freezing conditions can cause excessive damage to the road bed. Limitations in road use permits or suspension of commercial use offers some control of the problem; however, it is recognized that control of public use even with area closures is difficult. With the addition of new roads, all alternatives except M, account for the cumulative increase in maintenance and reconstruction, along with the accompanying effects.

WILDERNESS AND ROADLESS AREAS

The character of the designated Wildernesses on the Siskiyou National Forest is not expected to change as a result of programmed management activities under any of the alternatives.

Recreation use can have a cumulative effect on the character of the Wilderness However, the impacts of recreation users are monitored within each Wilderness in order to insure that they do not exceed a point detrimental to the area The Limits of Acceptable Change concept (Stankey and others 1985) will be applied, along with the Standards and Guidelines, to all Wildernesses over the course of the planning period, and will be the primary "tools" used to prevent resource degradation associated with recreation use.

WILD AND SCENIC RIVERS

The "outstandingly remarkable" attributes of the designated Wild and Scenic Rivers are not expected to significantly change as a result of management activities programmed within any of the alternatives

Both timber harvest and recreation use can have a cumulative effect on the Wild and Scenic River resource. Management (both past and planned) seeks to tailor the degree of management to meet specific objectives designed to protect the character of the Wild and Scenic River corridors regardless of the alternative. Cumulative effects are common to all alternatives and are not expected to vary.

SOIL AND WATER

Naturally occurring landslides, those not related to management activities, will continue to occur under all alternatives.

Annual water yield for the Forest will remain essentially unchanged except for small increases in some watersheds. The additional water produced by the removal of forest vegetation during timber harvest and other management practices represents less than one percent of the total Forest water yield

With few exceptions, research has shown that timber harvest increases water yield from 5 to 20 years The magnitude of increase depends on the amount of cutting, vegetation type, soils, geology, and climatic factors. Water yield will decline with time as harvested areas reforest. When the extra water contributed from newly harvested areas is added to the vast areas yielding water at the background level, the increase in water yield becomes insignificant. Harr (1979) succinctly puts the issue of water yield increases into perspective

> "Certain characteristics of water yield increases combine to make such increases in headwaters of basins of little consequence downstream First, increases tend to diminish over time, so that only a fraction of a watershed managed for sustained production of timber products will be in a condition to yield appreciably more water. The remainder will yield normal or nearly normal flows which tend to mask increased flows from freshly logged upland areas.
>
> Examples used by Rothacher (1970), Bethlahmy (1974), and Harr and others (1979) show that forest cutting in large watersheds--about 100 kilometers squared--probably would be only about four to six *percent, an amount well within the normal accuracy of streamflow measurement for the large* watershed. Management under nonsustained yield of timber products, however, could result in somewhat greater water yields for a large watershed.
>
> A second characteristic of water yield increases that bears on the value or utility of increases downstream is their timing. Substantial increases during the fall-winter rainy season will do little to satisfy summer demand for water. This timing, coupled with the fact that water yield increases tend to occur during wet years, further limits the real benefits commonly attributed to increased water yield after timber cutting. To use these increases would require storage facilities; and if storage facilities were present, storage of yield increases would be of miniscule importance compared with storage of normal winter runoff for release during the summer dry period."

For the departure alternatives, more water will be available in the short-term by departing from base harvest schedules, but sizable long-term increases in water yield will not occur Even if sizable increases in water yield were expected, it would be difficult to attribute significant adverse environmental consequences to them. Within the transient snow zone, the possibility exists that harvest clearcuts for reforestation may increase peak discharges within large basins; however, the research to date is inconclusive. Even if large increases in peak discharge result from clearcutting in the drainage basins, the adverse effects and their significance remain to be established. In many alternatives, mitigation of this potential impact is provided through the basin timber harvest dispersion constraints; the Management Requirement of 20 percent is provided in all alternatives

A positive result of harvest clearcuts and water yield is the increase in streamflow during the critical summer low-flow months. As discussed above, substantial increases in water yield occur per acre harvested, but most of the extra water yield occurs in the large base flow of the winter high-flow months. Whereas the increased flow in the summer period is small, the greatest increase percentage-wise occurs during the summer. Also, current research suggests that the duration of increase for summer low-flows is shorter, perhaps only five years, even though the increase in total annual yield may persist for up to 25 years.

As discussed above, water yield is almost always increased by timber harvest. One exception, however, may occur in areas of frequent fog (Harr 1982). The Siskiyou has a fog zone that is confined to a narrow strip and river valleys along the coast Decreases in water yield will likely be of the same magnitude, or less, as the fog increases. Research is not as clear on long-term water yield changes resulting from timber harvest, and particularly if 20- to 100-year old trees transpire more water than slower growing trees. All changes in water yield are expected to be minimal and vary little between alternatives.

FIRE

The microclimate of the Forest will be modified by management activities such as timber harvest, resulting in an environment more suitable for an unplanned ignition.

Fuel accumulations will continue to increase in areas, such as Grassy Knob Wilderness, that are subjected to a fire exclusion policy Fuel treatment activities in timber harvest units will reduce material by amounts prescribed through the Standards and Guidelines

SENSITIVE PLANTS

Serpentine and rocky habitats will be maintained at current levels for sensitive plant species in areas withdrawn from mineral entry.

AIR QUALITY

Wildfire smoke will affect air quality and air quality-related values throughout the array of alternatives Since the occurrence of wildfires is a random event in both time and space, the severity of the air quality impact will vary depending upon fire intensity, fuel type and conditions, size of the fire, and meteorological conditions Wildfires, and lightning fires in Wilderness that are managed as prescribed fires, are not considered in TSP production estimates.

Forest protection efforts would occasionally be hampered by smoky conditions. The visibility from fixed detection points (lookout towers) would be reduced and aerial detection capabilities restricted, increasing the probability of a wildfire being undetected for a short period of time. This could lead to more costly wildfires through increased fire suppression costs and resource damage. Wildfire smoke would add to already existing smoky conditions, compounding the visibility impact.

Management efforts to meet air quality standards and direction, and not exceed the TSP baseline value of 7,300 tons annually, will compound resource management complexities and raise the overall Forest management costs. Day-to-day burning restrictions could limit the actual fuel reduction accomplishments, thereby extending the amount of time and increasing the effort required to complete the necessary prescribed burning. Reforestation efforts, for example, in some harvested units could be slowed or delayed because of inadequately treated or unburned logging slash due to the limited availability of suitable burning days, from a smoke management standpoint Planting costs could be higher due to additional "scalping" requirements and slower production rates associated with untreated or marginally treated units.

From a forest protection standpoint, the risk of wildfire could increase because of the insufficient treatment of timber harvest slash and other fuels due to smoke management and short-term economic considerations. The ability of the Forest to provide visually acceptable harvest areas could also be hampered by accumulations of marginally-treated slash.

FISH

The following cumulative effects are considered common to all alternatives in terms of low water flow and fish habitat capability interrelationships:

Natural

This effect is inherent to Siskiyou National Forest streams. Low elevations and physiography, coupled with long, hot and dry summers contribute to the naturally low stream flows experienced across the Forest. This situation reduces the capability to rear anadromous salmonids to the smolt stage primarily because of shallow pool depths during summer months

Human Caused

Off-Forest water withdrawal presents a serious problem to water quality and survival of juvenile and adult salmonids on several basins within the Forest (OWRD 1984b). This problem is expected to continue and expand in magnitude as population and accompanying demand for water increase. Current State water appropriation laws do not prevent this serious threat to salmonid survival.

Harvest of salmonids is in direct relationship to available supply as projected by State agencies, National Marine Fisheries Service, and International agreement.

Off-Site Habitat Conditions

The life cycle of anadromous salmonids places them in a vulnerable position to any weak links in the cycle from the small stream to ocean environment Obstructions to adult or juvenile passage, such as poorly placed road crossings, open-ditch water diversions, and dams, along with off-shore food source availability, water temperature problems, sedimentation, and diseases all combine in the life cycle to create habitat problems for wild stock

Competition from Hatchery Stock

A serious threat to wild (nonhatchery) stock can occur when these fish are intermixed with larger populations of hatchery salmonids available to the sport and commercial fishery. Direct competition for food and space is very apparent between hatchery and wild stock salmonids Hatchery stock are usually larger and more aggressive than wild stock juvenile salmonid steelhead. Often wild stock salmonids are forced out of their native environment to rear elsewhere or perish from lack of space or food.

Interspecies Competition

Competition between salmonids and nongame fish is generally a direct reflection of water quality and quantity. Competition between various fish species for food and space is a problem in the Illinois River and upper basins, and is limiting capability in other basins such as the Winchuck and Coquille. Without increased flows from water storage it is doubtful that this situation will be reversed.

WILDLIFE

Serpentine and cliffs/talus habitats will be maintained at current levels.

VISUAL RESOURCE

The visual character of the designated Wildernesses is not expected to change significantly as a result of programmed management activities designed to achieve the Preservation visual objective

Timber harvest has a cumulative effect on the visual resource within a viewshed. Harvest activities are modeled in Retention and Partial Retention areas based on acre per decade coefficients for each objective (DeWerff and others 1981). Harvest levels will be monitored so that agency activities meet the Standard and Guidelines for visual management objectives within each viewshed. Monitoring and evaluation will also take into consideration the incremental impacts of other ownerships within the Forest boundary as well. These effects are the same regardless of the alternative.

RECREATION SETTINGS

At least 30,000 acres of unroaded area capable of providing Semi-primitive Non-motorized recreation opportunities is not expected to change as a result of programmed management activities. The largest tract of this occurs in the South Kalmiopsis.

SPECIFICALLY REQUIRED DISCLOSURES

EFFECTS OF ALTERNATIVES ON THREATENED AND ENDANGERED SPECIES, AND CRITICAL HABITAT

Regardless of the alternative, protection of listed species will take precedence over other land management direction. The bald eagle and the peregrine falcon are the only threatened/endangered species identified as present by the USDI Fish and Wildlife Service (bald eagle is threatened in Oregon and endangered in California, but only known from the Oregon portion of the Forest; peregrine falcon is endangered). None of the alternatives would have an impact on threatened or endangered species.

The Forest will comply with all appropriate threatened and endangered species recovery plans. Provision is made in the plan to pursue informal or formal consultation as necessary during project design and analysis. The Siskiyou National Forest contains no listed critical habitat areas (as defined by the Endangered Species Act).

EFFECTS OF ALTERNATIVES ON PRIME FARM LAND, RANGELAND, AND FOREST LAND

All alternatives are in keeping with the intent of Secretary of Agriculture Memorandum 1827 for prime rangeland, farm land, and forest land. Regardless of alternative, Forest Service lands will be managed with a sensitivity to the effects which their management will have on adjacent private and public lands.

The Forest does not contain prime farm lands or rangelands. "Prime" forest land is a term used only for non-Federal land and does not apply to lands within the National Forest System.

ENERGY REQUIREMENTS OF ALTERNATIVES

There are direct and indirect effects upon the energy requirements necessary to carry out the proposed alternatives. The approximate energy requirements for each alternative are listed in Table IV-28.

Table IV-28. Annual MM BTU's for First Decade by Alternative

Alternative	MM BTU
NC	4,384,122
A	4,293,102
A-Departure	4,433,679
B	5,171,022
C	4,583,388
D	4,352,947
D1	4,720,065
E	2,394,452
G	2,987,814
K	3,962,206
M	1,011,175
S	4,067,865

EFFECTS OF ALTERNATIVES ON THE HUMAN ENVIRONMENT

Local consumers will be affected by the supplies of various commodities documented previously in Chapter IV.

The civil rights of any American citizen are not differentially affected by implementation of any alternative.

EFFECTS ON WETLANDS AND FLOODPLAINS

No significant adverse effects within areas of wetlands and floodplains are anticipated. This is largely due to the very small size of upslope wetlands, i.e , tiny bogs and small ponds, and the position of the limited floodplains in the stream and river areas. Siskiyou National Forest landform is steep and most drainages are tightly confined to a narrow strip and rapidly drained due to stream slope. However, where narrow floodplains do exist, they correspond to the Riparian Management Area and other land allocations which restrict or prohibit management activities and development. Other than existing developments such as roads and campgrounds, human habitation in the riverine areas on National Forest lands is extremely limited.

Protection is afforded to these areas through BMP's incorporated in the Standards and Guidelines, NEPA analyses, and accompanying management requirements, Executive Orders 11988 (floodplains) and 11990 (wetlands). Collectively, these provide excellent direction to ensure that road construction, campground development, structural placements, and other facilities will not have unacceptable adverse impacts on the wetlands and floodplains. Except along the major river areas, avoidance or measures to protect the high values of these sensitive sites are the normal prescription Many sites are associated not only with high wildlife values, but often are indicators of major areas of old or recent mass instability.

The riparian ecosystems contiguous to several thousand miles of streams across the Forest are protected and managed through the prescriptions and Standards and Guidelines applied to the Riparian Management Area and other Management Areas that have little or no development activity, and Regional and Forest policy. Considerable discussion, management direction, and evaluation of impacts are provided in all chapters of this document under the sections titled LAND ALLOCATIONS, WILD AND SCENIC RIVER, SOIL AND WATER, and FISH.

LIST OF PREPARERS

LIST OF PREPARERS

The following is a list of Forest Interdisciplinary Team (IDT) members and/or the Forest Planning core team (CORE) personnel. Provided are their qualifications (position, education, and experience) and responsibilities in preparation of the Final Environmental Impact Statement and Forest Plan, including significant methodology and/or analysis as indicated. Numerous other Forest Service employees contributed to the completion of the document through assignments to the Forest Supervisor's Office, by providing needed information, or by assuming the duties of co-workers who were deeply involved in the planning effort.

AMARANTHUS, Michael P. — Eastside Soil Scientist

Education: B.S., Soil Resource Management; M.S., Ecosystem Management, PhD, Forest Ecology
Experience: Forest Service - 11 yrs; soils and watershed management (California and Oregon). University - 1 yr; soils instructor.
Function: IDT (4 yrs). Soil, geology, and water temperature modeling input.

ARNESON, Kerry A. — Writer-Editor

Experience: US Army Corps of Engineers - 2 yrs, public information. Forest Service - 6 yrs; public information and planning (Washington and Oregon).
Function: CORE (1 yr). Coordinated analysis of public response; assisted in edit and review of documents.

ATZET, Thomas — Area Ecologist

Education: B.S., Forest Science; M.S., Physiological Ecology; PhD, Plant Ecology
Experience: Forest Service - 20 yrs; forest management and ecology (California, Colorado, Washington, and Oregon).
Function: IDT (1 yr). Vegetative input and analysis.

CONKLIN, William F. — Lands and Recreation Staff

Education: B.S., Forestry
Experience: Forest Service - 30 yrs; forest management, lands, minerals, fish and wildlife, range, and recreation (Colorado, Pacific Northwest Region, Oregon).
Function: IDT (7 yrs). Minerals input and analysis.

COX, Gregory L. — Forest Planner; Planning Team Leader (Transferred 9/87)

Education: B.S , Forest Management; M.S., Natural Resource Economics
Experience: Private industry - 1 yr; forestry (Texas).
Forest Service - 9 yrs; forest economics and planning (Oregon).
Function: IDT (3 yrs); CORE. Administered Forest planning process.

CRAIG, David W. — Silviculturist, Resource Analyst

Experience: Forest Service - 18 yrs; forest management (Oregon).
Function: IDT (5 yrs); CORE. Developed timber yield tables. Formulated and ran FORPLAN model, analyzed data. Timber input and analysis.

ETTNER, Robert F. — Planning and Watershed Management Staff

Education: B.S., Forest Management; Graduate level - Watershed Management/Water Resources
Experience: Forest Service - 22 yrs; watershed and forest management, hydrology, environmental coordination, and planning (California, Pacific Southwest Region, Colorado, and Oregon).
Function: CORE (4 yr). Forest Management Team and Forest Plan Steering Committee member (8 yrs). Provides direction and coordination for the Forest planning effort. Responsible for unroaded area analyses; NEPA sufficiency.

GRIPP, Russell A. — Assistant Aviation and Fire Management Staff

Education: B.S , Forest Management; M.S., Natural Resources
Experience: Dept. of Army and Bureau of Land Management - 3 yrs; forest management, aviation and fire management (Kansas and Alaska). Forest Service - 15 yrs; aviation, fire and fuels management, air quality (Oregon, Idaho and California).
Function: IDT (8 yrs). Input and analyses for air quality, fire and fuels management.

HALSHAW-PROWELL, Sharon A. — Data Manager

Experience: Dept. of Defense - 3 yrs; Veterans Admin. - 6 yrs (California)
Forest Service - 11 yrs; computer mapping and data management (Oregon).
Function: CORE (5 yrs). Responsible for inventory and other data bases.

JOYER, Janet E. — Forest Archeologist

Education: B.A., Anthropology
Experience: University - 4 yrs; archaeological research (Missouri, Washington, and Colorado)
Forest Service - 7 yrs; cultural resource management (Oregon)
Function: IDT (2 yrs). Cultural and historic resources input and analyses, assisted in edit and review of documents.

KING, Don N. — Forest Fisheries Biologist

Education: B.S., Fish and Wildlife Management
Experience: State Dept. of Fish and Wildlife - 7 yrs; fishery biology (Oregon). Bureau of Land Management - 8 yrs; fishery biology (Oregon). Forest Service - 11 yrs; fisheries management (Oregon).
Function: IDT (10 yrs). Fisheries input and analysis.

KING, Joel — Forest Economist (Transferred 8/88)

Education: B.S., Forest Management; M S., Soil Science; Minor, Resource Economics
Experience: Private industry - 1 yr; forest management (Oklahoma).
Forest Service - 9 yrs; forest management; soil science, planning and economics (Oregon and Washington).
Function: IDT (2 yrs); CORE. Conducted social and economic analyses.

LYKE, Donald J. — Computer Specialist (Transferred 3/88)

Education: B.S., Computer Science/Business Administration
Experience: Private industry - 3 yrs; computer programming. Forest Service - 12 yrs; computer programming and systems mgmt.
Function. CORE (3 yrs). Provided computer analysis and programming support.

MENDENHALL, Roger L. — Forest Environmental Coordinator

Education: B S., Forestry
Experience: Forest Service - 24 yrs; forest management and appeals/environmental coordination (Montana, Oregon and Washington).
Function: IDT (4 yrs). Energy input and analysis.

O'LEARY, Robert E. — Assistant Forest Engineer, Operations & Maintenance

Education: B.S., Forest Management; B.S., Forest Engineering
Experience: Forest Service - 31 yrs, forest management and engineering (Oregon).
Function: IDT (3 yrs). Transportation system input and analysis.

PUGH, Ronald L. — Forest Landscape Architect

Education: B.S., Landscape Architect
Experience. Private industry - 1 yr; landscape architecture. Forest Service - 12 yrs; landscape architecture and recreation planning (Idaho, Utah and Oregon).
Function: IDT (9 yrs). Input and analyses for recreation, wilderness, visual, and wild and scenic river resources.

ROLLE, Susan E. — Forest Planner; Planning Team Leader

Education: B.S., Soil Resource Management
Experience: Soil Conservation Service - 1 yr; soil scientist. Forest Service - 11 yrs; soil resource management; watershed, recreation, range, wildlife, timber management.
Function: IDT (1 yr); CORE. Administers Forest planning process.

SCHUSTER, Barbara A. — Writer-Editor

Education: B S., Forestry
Experience: Peace Corps - 2 yrs; agroforestry. Forest Service - 6 yrs; silviculture, timber.
Function: IDT (1 yr). Prepared Record of Decision.

STEINBLUMS, Ivars J. — Forest Hydrologist

Education: B.S , Forest Management; M.S., Wildland Hydrology
Experience: Local Government - 1 yr; timber appraisal (California) Forest Service - 11 yrs; lands, watershed management (California, Pacific Southwest Region, Oregon).
Function: IDT (3 yrs). Soil, water, and geology resource analyses.

TUSO, Thomas D. — Civil Engineering Technician

Experience: Forest Service - 27 yrs; engineering and planning.
Function: IDT (10 yrs). Assisted with computer mapping data base, transportation planning, and minerals assessments.

WEBB, Lee O. — Forest Wildlife Biologist

Education: B.S., Wildlife Biology; M S., Wildlife Management
Experience: Forest Service - 14 yrs; wildlife biology and botany.
Function: IDT (10 yrs). Input and analyses for wildlife, sensitive plant resources, and threatened and endangered species.

SIGNIFICANT CONTRIBUTORS:

Mark Anderson
Glenn Chen
Joe Cornell
Mark Cooper
Ed Gross
Kendrick Greer
Phil Hicks
Dallas Hughes
Kathy Johnson
Lee Johnson
Tom Levering
Susan Mathison
Kathy Minor
Linda Owen
Richard Reeves
Betsy Rickards
Craig Snider
Monica Staar
Patricia Steinfeld
Ben Worthington

Many other people contributed time and energy to completion of these documents. Their help is greatly appreciated.

LIST OF

AGENCIES, ORGANIZATIONS, AND PERSONS TO WHOM COPIES OF STATEMENT WERE SENT

FEDERAL AGENCIES AND OFFICIALS

ADVISORY COUNCIL ON HISTORIC PRESERVATION (ACHP)
- Office of Architectural and Environmental Preservation

AGRICULTURE, U.S. DEPARTMENT OF
- Agriculture Stabilization and Conservation Service
- Animal and Plant Health
- Equal Opportunity Office
- Secretaries Office
- Forest Service
  - Chief's Office
  - Regional Offices
    - Region 1
    - Region 2
    - Region 3
    - Region 4
    - Region 5
    - Region 6
    - Region 8
    - Region 9
    - Region 10
  - National Forests
    - Colville
    - Deschutes
    - Fremont
    - Gifford Pinchot
    - Klamath
    - Malheur
    - Mt. Baker-Snoqualmie
    - Mt Hood
    - Ochoco
    - Okanogan
    - Olympic
    - Rogue River
    - Siuslaw
    - Six Rivers
    - Umatilla
    - Umpqua
    - Wallowa-Whitman
    - Wenatchee
    - Willamette
    - Winema
  - Ranger Districts
    - Applegate
    - Gasquet
    - Happy Camp
  - Forest and Range Experiment Stations
    - Pacific Northwest
      - Assistant State Director
      - Research Planning and Applications
      - R O. Woodfin
      - Sarah Greene
    - Pacific Southwest
      - Redwood Sciences Laboratory
    - Rocky Mountain - Tony Baltic
    - WESTFORNET/South - Pacific Southwest Library
    - WESTFORNET/North - Forest Resources Library

- Soil Conservation Service
  - Coos-Curry County
  - Environmental Coordinator - Washington, D.C.
  - Illinois Valley Soil and Water Conservation District
  - Josephine County
  - State Resource Conservationist (Oregon)

COMMERCE, U.S. DEPARTMENT OF
- National Marine Fisheries Service
  - Habitat Conservation Division - Portland, Oregon
- National Oceanic and Atmospheric Administration
  - Ecology and Conservation Division - Washington, D.C

DEFENSE, U.S DEPARTMENT OF
- Air Force
  - Environment and Safety - Washington, D C.
- Army Corps of Engineers
  - Washington, D C.
  - Portland, Oregon
- Coast Guard
  - Environmental Impact Branch - Washington, D.C.
- Deputy Assistant Secretary
- Explosives Safety Board
- Navy
  - Chief of Operations - Washington, D.C.

ENERGY, U S. DEPARTMENT OF
- Bonneville Power Administration
  - Portland, Oregon - Anthony Morrell
- Federal Energy Regulatory Commission
  - Environmental Quality - Washington, D.C.
- Office of Environmental Compliance

ENVIRONMENTAL PROTECTION AGENCY
- Office of Environmental Review
- Regional Offices
  - San Francisco, California
  - Seattle, Washington - Robert Burd

EQUAL EMPLOYMENT OPPORTUNITY OFFICE

FEDERAL AVIATION ADMINISTRATION
- Regional Directors
  - Hawthorne, California
  - Seattle, Washington

FEDERAL CONGRESSIONAL DELEGATION
- U S Representative
  - Honorable Les Aucoin - Oregon
  - Honorable Pete DeFazio - Oregon
  - Honorable Wally Herger - California
  - Honorable Bob Smith - Oregon
- U S Senators
  - Honorable Alan Cranston - California
  - Honorable Mark Hatfield - Oregon
  - Honorable Robert W. Packwood - Oregon
  - Honorable Pete Wilson - California

FEDERAL HIGHWAY ADMINISTRATION
- Regions
  - Region 9
  - Region 10

FEDERAL RAILROAD ADMINISTRATION
- Policy and Plans

GENERAL SERVICES ADMINISTRATION
- Environmental Staff

HEALTH AND HUMAN SERVICES, U.S. DEPARTMENT OF
- Department of Environmental Review
  - Washington, D.C.
  - San Francisco, California

HOUSING AND URBAN DEVELOPMENT, U.S DEPARTMENT OF
- Energy and Environmental Review
- Environmental Officer
  - San Francisco, California
  - Seattle, Washington

INTERIOR, U.S. DEPARTMENT OF
- Bureau of Mines - Spokane, Washington
- Bureau of Land Management
  - Division of Forestry - Washington, D.C
  - State Office - Portland, Oregon
  - District Offices
    - Coos Bay, Oregon
    - Medford, Oregon
- Bureau of Reclamation - Salem, Oregon
- Delaware River Basin Commission
  - Head Environmental Unit - West Trenton, NJ
- Environmental Review
- National Park Service
  - Oregon Caves National Monument

INTERSTATE COMMERCE COMMISSION
- Energy and Environment

JAPAN CONSOLATE GENERAL - Seattle, Washington

LABOR, U.S. DEPARTMENT OF
- Occupational Safety and Health Administration
  - Evaluation - Washington, D.C.

NATIONAL MARINE FISHERIES SERVICE
- Habitat Conservation Division - Portland, Oregon

NATIONAL ENDOWMENT FOR ARTS

RURAL ELECTRIC ADMINISTRATION
- Assistant Administrator for Management
- Environmental Policy Office

TRANSPORTATION, U.S DEPARTMENT OF
- Policy and International Affairs

STATE AGENCIES AND OFFICIALS

CALIFORNIA
- Assembly - Stan Stathum
- Clearing House
- Department of Fish and Game - Redding
- Senate - John Doolittle
- Water Quality Control Board - William Winchester - Santa Rosa

OREGON
- Executive Department
  - Clearing House Coordinator
- Department of Environmental Quality
  - Southwest Region Branch Office - Roseburg
- Joint Legislative Committee
  - Trade and Economic Development

- State Information Center
- Klamath Falls
- Department of Fish and Wildlife
  - Environmental Management - Portland
  - Southwest Regional Office - Roseburg
  - Environmental Management - Salem
  - District Offices
    - Gold Beach
    - Charleston
    - Grants Pass
- House of Representatives
  - Honorable Bill Markham
  - Honorable Bob Repine
  - Honorable Eldon Johnson
  - Honorable Walt Schroeder
- Office of the Governor
- Oregon State Forestry Department
  - Forest Resource Study Program - Salem
  - Southern Oregon Area Director - Roseburg
  - District Forester
    - Central Point
    - Coos Bay
- Senate
  - Honorable Bill Bradbury
  - Honorable George Trahern
  - Honorable John Kitzhaber
  - Honorable Ron Grensky
  - Senate Majority Office
- State Geology Department - Grants Pass
- State Lands Office - Pam Wiley

COUNTY/CITY AGENCIES AND OFFICIALS

ASSOCIATION OF O&C COUNTIES

CITIES
- Brookings - Roy Rainey
- Cave Junction - Irvin Whiting
- Glendale - David Malinoff
- Gold Beach - Sam Wilson
- Grants Pass
  - Chamber of Commerce
  - City Manager
  - Jane Reyneke
  - Planning Commission
  - Planning Department
- Medford
  - Mayor's Office
  - Jerry Lausmann
- Myrtle Point - Edward Cook
- North Bend - Joseph Mulloy
- Port Orford - Gary Cully
- Powers

COOS COUNTY
- Board of County Commissioners - Jack Beebe
- Chairman, Board of County Commissioners
- Planning Department

COOS-CURRY COUNCIL OF GOVERNMENTS

CURRY COUNTY
- Board of County Commissioners
- Planning Department
- Rocky McVay
- T.V. Skinner

DEL NORTE COUNTY
- Board of Supervisors
- Planning Department

DOUGLAS COUNTY
- Board of County Commissioners
- Planning Department

JACKSON COUNTY
- Board of County Commissioners
- Planning Department

JOSEPHINE COUNTY
- Commissioners
- Forestry Department
- Parks Department
- Planning Director
- William Ford

LINN COUNTY
- Board of County Commissioners
- Planning Department

SISKIYOU COUNTY
- Board of Supervisors
- Planning Department

PORTS
- Bandon - Bandon, Oregon
- Brookings/Harbor - Brookings, Oregon
- Gold Beach - Gold Beach, Oregon
- Port Orford - Port Orford, Oregon
- Crescent City - Crescent City, California

ROGUE VALLEY COUNCIL OF GOVERNMENTS

COLLEGES, SCHOOLS, AND UNIVERSITIES (Also, see LIBRARIES)

Agness School District (Sue Hunt)
Antioch College - Yellow Springs, Ohio
Bandon School District (David Hamilton)
Brookings/Harbor School District (John Rapraeger)
Coos County School District (Ward Colerick)
Coquille School District (Jim Harris)
Glendale School District (Donald Currey)
Gold Beach High School (Jay Johnson)
Gold Beach/Riley Creek School District (Reed Ringer)
Lewis and Clark College - Portland, Oregon
Ophir Elementary School (James Shockley)
Oregon State University (NCASI, George Ice; Environmental Center)
Pistol River School Board (Neil Walker)
Reed College - Portland, Oregon
Siskiyou County Board of Education (Frank Tallerico)
Southern Oregon State College (Biology Department, Frank Lang and Steve Cross)
Southwestern Oregon Community College (Bob Cooper)
University of California (Jurisprudence and Social Policy, Ruth Lawrence)

University of Colorado - Colorado Springs
University of Illinois - Champaign, Chicago, Evanston, Urbana
University of Oregon (Survival Center, Lands Coordinator; Law Center, Environmental Research Group, Sharon Raymond)
University of Texas - Austin, Houston
University of Wisconsin-Madison, Milwaukee
University of Wyoming (Department of Economics, David S. Brookshire)
Willamette University (Environmental Science Program, Gilbert Lafreniere)

LIBRARIES

Agness Public Library
Bandon Public Library
Chetco Community Library
Colorado State University Library
Curry Public Library
Del Norte Public Library
Douglas County Library
Flora Laird Memorial Library (Myrtle Point)
Illinois Valley Branch Library
Jackson County Public Library
Josephine County Library
Oregon State University Library
Port Orford Public Library
Powers Public Library
Rogue Community College Library
Southern Oregon State College Library
Southwestern Oregon Community College Library
University of Oregon Library

NEWS MEDIA

Arizona Daily Star (Ray Ring)
Curry Coastal Pilot (News Room)
Del Norte Triplicate
Eugene Register Guard
Grants Pass Daily Courier (News Editor)
KAGI Radio
KBGG AM/FM Radio
KEZI TV
KFMJ - 97 Radio
KRWG FM Radio
Medford Mail Tribune (Local News Editor)
Open Line Bulletin
Oregon Daily Emerald (Environmental Editor)

ORGANIZATIONS AND BUSINESSES

American Fisheries Society (Steve Smith)
American Mining Congress (Keith R Knoblock)
American Rivers (Kevin Coyle)
American Wilderness Alliance
Association of Oregon Archaeologists (Paul Jenkins)
Association of Oregon Loggers (Steven Kadas, Greg Miller)
Audubon Society (Frederick Allen, M. Draper, Arthur Farley, Felice Pace, Orley Ringering, Jim Rogers, Chuck Sisco, Dave Werschkul, Glenn Vancise)
Bain Insurance Agency (Joseph Bain)
Bandon Rotary Club (Joseph Bain)
Bay Area Chamber of Commerce (Crystal Shoji)
Beaver State Sand and Gravel (Don Barnes)
Boise Cascade Corporation (Kirk Ewart, Russ McKinley)
Brauner Trucking
Breitenbush Retreat Center (Mark Ottenad)
Brookings/Harbor Chamber of Commerce (Terry Connolly)
Broyles Lumber Company
Campground Management
Cardinal Trading Limited (Jim Schlauch)
Cascade Holistic Economic Consultants (Randal O'Toole)
Caveman 4-Wheelers (Dennis Sellards)
CCD Business Development Corporation
C&D Lumber Company (Ricki Barnes)
Citizen's Task Force Timber Review (Joseph Spivack)
Coastal Mining Company
Coquille Chamber of Commerce (Eloise Freauff)
Courts Whitewater Trips (Court Boice)
Del Norte Taxpayers League (Bill Ambrose)
Douglas Timber Operators (Troy Reinhart, Ralph Saperstein)
Douglas Pacific Lumber Company (Kim McLaughlin)
Earth First! (Biodiversity Project, Robert Brothers, Peter Bralver, Don Morris)
Ellingson Lumber Company (Peter Ellingson)
Eugene Burrill Lumber Company (Michael Burrill)
Forest Manager
Friends of the Earth Northwest (David Ortman)
Gebhardt's
Georgia Pacific (Carl Ehlen, Blair Holman, Norm Smith)
Gold Beach Plywood (Frank St. Clair)
Grants Pass - Josephine County Chamber of Commerce (Robert Repine)
Grayback Forestry Contractors (Michael Wheelock)
Gregory Forest Products (T.H. Mehl)
Hambro Forest Products (Lee Wetzel)
Headwaters (Julie Norman)
Health Future Enterprises (Dennis Olson)
Hi-Ridge Lumber (Gerhart Bendix)
H.H. Ketcham Timber Company (Victor Tarr)
Illinois Valley Chamber of Commerce (Leonard Frick)
Illinois Valley Grange (William Lytle)
Independent Troll Fisherman of Oregon (Harold Dixon)
Industrial Lumber Company (R.W. Edwards)
Izaak Walton League (Glenn Welden)

Josephine Forest Farm Association (Jerry Schaeffer)
Kauffmans Streamborn Fly Shop (Randall Kauffman)
Key Log Limited (Greg Keylock)
Klamath Alliance Res. and Environment (William Overman)
League of Conservation Voters (J. Martineau)
Leonard Charles and Associates Environmental Consultants
Mail Boat Hydro-Jets (Ed Kramer)
Marquart-Wolfe Lumber Company (Jonathan Wolfe)
Mason, Bruce, and Girard, Inc. (Carl Newports)
Mazamas (Oran Abbott, Gregory Parsons, Bob Powne)
M C Lininger and Sons (Dale Lininger)
Medford/Jackson County Chamber of Commerce (Nick King)
Medford Corporation (Bruno Meyer)
Menasha Corporation (William Lansing)
Motorcycle Riders Association (Will Hislebeard)
Mountain Lumber Company (C C Lloyd)
National Forest Products Association (Beth Norcross)
National Wildlife Federation (Andy Stahl)
National Organization for River Sports (Eric Leaper)
Native Plant Society of Oregon (Clara Fairfield, Warren Pavlat, Wayne Rolle)
Native Plant Society of Washington (Mark Egger, Arthur Kruckeberg)
Natural Resources Conservation Association (Jean Patterson)
Natural Resources Defense Council (David Edelson)
Northcoast Environmental Center (Tim McKay)
Northwest Center For A Future (Larry Svart)
Northwest Forest Resource Council (Gerry Hamilton)
Northwest Forestry Association (Charles Shotts)
Northwest Mining Association (Karl Mote)
Northwest Rivers Council (Douglas North)
Northwest Steelheaders Association (Glen Welden)
Northwest Timber Association (Gregory Miller)
Obsidians (Douglas Long)
Oregon Coastal Zone Management Association
Oregon Council of Rock and Mineral Clubs (Ronald Stockhoff)
Oregon Environmental Council (Jean Meddaugh)
Oregon Mr. Longears Club (Robert Clarke)
Oregon Natural Resources Council (Andy Kerr, Marc Prevost)
Oregon Rare and Endangered Plant Species Task Force
Oregon Trout (William Bakke)
Pacific Marine Technology (M B Wagner)
Pacific Fisheries Enhancement Corporation (Jan Obrien)
Pacific Lumber and Shipping Company (Marla Marvin)
Pacific Power and Light Company (Faye Albertson, Scott Hannigan)
Pacific Southeast Forest Products (Donald Crane)
Prairie Wood Products (Ronald Yockim)
Redwood Lions Club (Wayne Ray)
Reservation Ranch (Bob Brown)
Roseburg Chamber of Commerce (Richard Eisenhauer)
Roseburg Forest Products Company (Allyn Ford)
Roseburg Lumber Company (Jim Churchill)
Roseburg Paving Company (Jeff Braun)
Rough and Ready Lumber Company (Lew Krauss)
Save the Redwoods League (John Dewitt)

Scenic Shoreline Preservation Conference (Fred Eissler)
Sierra Club (Bill Arthur, Alan Carlton, Candace Cloud, Vicky Hoover, Daniel Kellog, Joe Knotts)
Sierra Forest Products (Glen Duysen)
Siskiyou Mountains Resources Council (Chris Jenican)
Siskiyou Regional Education Project
Society of American Foresters (Mike Meredith)
SONCAP (Marie Reeder)
Sorenson and Atkin (David Atkin)
South Coast Lumber Company (Mack Brown, James Murphy)
Southern Oregon Citizens Against Toxic Sprays (Phyllis Cribby)
Southern Oregon Timber Industry Association (Greg Miller)
Southern Oregon Regional Economic Development (Art Jackson)
Southern Oregon Resource Reliance (Anne Basker)
Southwest Forest Industries (Leonard Smith)
Southwestern Forest Industries (E.A. Kupillas)
Sunstar
Tahana Whitecrow Foundation (Melanie Smith)
Takilma Community Association (Romain Cooper)
Teeco Corporation (Jean Loosley)
The Friends of Del Norte County (Martin C. Kelly)
The Nature Conservancy (Dick Vander Schaaf)
The Oregon Extension (Dave and Kate Willis)
The Oregon Rivers Council (Bob Doppelt)
The Wilderness Society (Jean Durning, Peter Kirby)
Tidewater Veneer (Les Hoffer)
Timber and Wood Products Group (Russell McKinley)
Tri-City Ready Mix (Steve Loosley)
Trinity Resource Action Council (Judy Bendix)
Tri-State Building Materials (David Paul)
Trout Unlimited of Oregon (Eric Schulz)
Tualatin Dam Park Citizens League (Pete Paul)
Wallowas Alliance (Kifar Yosemite)
Washington Native Plant Society (Mark Egger)
West Coast Alliance for Resources and Environment (David Dillon)
Western Forest Industry Association (Ralph Saperstein)
Western Wood Products Association (R.M. Fredsall)
Weyerhaeuser Company (Richard Pierson, James Romback)
Wilderness Society (Northwest and Washington, D C Representatives)
Wildlife Management Institute (Kieth Harmon)
Wildwater Whitewater Trips
Women's Oregon Trail Riders (Merrianne Metzger)
Virginia 4-Wheel Drive Association (David Hook)

INDIVIDUALS

Charles Barber
Bryan Bence
George Botho
Kathleen Chester
Ronald Cook
Jean Crawford
Brenda Douglas
Rebecca Erlij
Michael Fitzgerald
Jack Friberg
Susan Gresens
Kurt Herzog
Roya Houdei
Nicole Jarnagir
Charles Landman
Mark Lawler
Christopher Miller
Patricia Muller
Beth Newman
Robert O'Brien
Tom Patzkowski
Jeff Poniewaz
Mary Root
John R. Swanson
Shirlee Vansluys-Lendved
Janice Widran
Robert Bauman
Parme Bohrayson
Elizabeth Chato
Lorenzo Cohen
Fred Craig
Todd Cunningham
Barbara Dugelby
Dorothy Evans
Patrick Fitzgerald
W.W. Gaskins
Karen Heneghan
Ginny Orr
Lou Jost
Jeffers Larson
Jennifer Mechem
Brenda Moseley
Bill Newby
Roger Nieson
Ernest Obyrne
Beth Peterson
Michael Robinson
Martin Schrattenholzer
Al Thompson
Ann Werner

LITERATURE CITED

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Adams, Darius M., and Richard W. Haynes 1979. The 1980 softwood timber assessment market model· structure, projections, and policy stimulations. Number 30.

Adams, Darius M., and Richard W. Haynes 1985. Changing perspectives on the outlook for timber in the United States. Journal of Forestry.

Agee, James K. 1981. Fire effects on Pacific Northwest forests. flora, fuels and fauna. In: Proceedings Northwest Fire Council Meeting, November 23-24, 1981, Portland, OR p 54-66.

Agee, James K. 1974 Environmental impacts from fire management alternatives. USDI National Park Service, Western Regional Office, San Francisco, CA

Alexander, Robert R. and Carleton B. Edminster. 1977. Regulation and control of cut under uneven-aged management. USDA Forest Service Research Paper RM-182. Rocky Mountain Forest and Range Experiment Station, Fort Collins, CO. 7 p

Amaranthus, M. P. 1982 Investigation of a rare conifer, *Picea breweriana*. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR

Amaranthus, M P., and D A Perry. 1987 Mycorrhizal formation and growth of Douglas-fir seedlings in three southern Oregon vegetation types. In: Maintaining long-term productivity of Pacific Northwest forests. Proceedings of a symposium, March 31-April 2, Corvallis, OR Timber Press, Portland, OR

Anderson, H. W., M D. Hoover, and K. G. Reinhart. 1976. Forests and water: effects of the forest management of floods, sedimentation, and water supply: USDA Forest Service General Technical Report PSW-18. Pacific Southwest Experiment Station, Berkeley, CA.

Anderson, John. 1985a. Business & employment outlook JTPA District 7, Coos and Curry counties Labor Market Information, Department of Human Resources, State of Oregon.

Anderson, John. 1985b. Business & employment outlook JTPA District 8, Jackson and Josephine counties. Labor Market Information, Department of Human Resources, State of Oregon.

Arnold, R. Keith. 1972. The time is now--new technology opportunities for fire in the environment. In· Fire in the Environment Symposium Proceedings, USDA Forest Service, May 1-5, 1972, Denver, CO.

Atzet, Thomas and David L. Wheeler 1982. Historical and ecological perspective on fire activity in the Klamath Geological Province of the Rogue River and Siskiyou National Forests USDA Forest Service, Pacific Northwest Region, Portland, OR. 16 p

Atzet, T. and D. Wheeler. 1984. Preliminary plant associations of the Siskiyou Mountains Province. USDA Forest Service, Pacific Northwest Region, Portland, Oregon. 315 p

Axelrod, D. I. 1976. History of the coniferous forests, California and Nevada University of California Publications in Botany. 70·1-62.

Bailey, E., (ed.). 1966. Geology of northern California California Department of Mines and Geology. Bulletin 190.

Barnett, Harold J and Chandler Morse. 1963 Scarcity and growth. John Hopkins Press, Baltimore, MD. p. 213.

Baldwin, Ewart M. 1986 Geology of Oregon. 3rd Edition. Kendall/Hunt Publishing Company, Dubuque, IO

Baldwin, E , J Beaulieu, L. Ramp, J Gray, V Newton Jr, and R Mason 1973. Geology and mineral resources of Coos County, Oregon Oregon Department of Geology and Mineral Industries. Bulletin 80

Beckham, Stephen D. 1978 Cultural resource overview of the Siskiyou National Forest, I and II. Siskiyou National Forest Contract

Bennett, K. A 1982. Effects of slash burning on surface soil erosion rates in the Oregon coast range. USDA Forest Service, Siuslaw National Forest, Corvallis, OR

Beschta, R L 1980 turbidity and suspended sediment relationships. In: Proceedings of the Symposium on Watershed Management p. 271-282.

Bisson, P A , R. E Bilby, M D Bryant, C. A. Dolloff, G B. Grette, R. A. House, M. L Murphy, K V Koski, and J. R. Sedell. 1986. Large woody material in forested streams in the Pacific Northwest: past, present and the future In Streamside management forestry and fishery interactions E. O. Salo and T W. Cundy (editors), University of Washington, Seattle, WA

Boyer, Donald E., and John D Dell. 1980 Fire effects on Pacific Northwest forest soils USDA Forest Service, Pacific Northwest Region, Portland, OR. 59 p

Bradshaw, Larry S., John E. Deeming, Robert E. Burgan and Jack D Cohen. 1983 The 1978 National Fire Danger Rating System. technical documentation USDA Forest Service General Technical Report INT-169. 44 p.

Breysse, Peter A 1984. Health hazards of smoke Journal of Forestry 82(2) 89

Brodie, Douglas J 1981 General economic considerations in selecting regeneration systems for the multi-site multi-species conditions of southwestern Oregon Paper presented at FIR regeneration conference, June 8, Roseburg, OR 5 p.

Brown, E.R. (Tech. Ed.). 1985. Management of wildlife and fish habitats in forests of western Oregon and Washington (two volumes). USDA Forest Service Publication No R6-F&WL-192-1985. Pacific Northwest Region, Portland, OR. 332 p , 302 p

Brown, G. W. 1980. Forestry and water quality. School of Forestry, Oregon State University 124 p.

Brown, George W. 1974. Fish habitat. In: Environmental Effects of Forest Residues Management in the Pacific Northwest USDA Forest Service General Technical Report PNW-24. Pacific Northwest Forest and Range Experiment Station, Portland, OR

Burns, Russell M , (Tech compiler) 1983. Silvicultural systems for the major forest types of the United States. USDA Forest Service Agricultural Handbook 445 rev. 191 p.

Butcher, S. S., and E. M Sorenson 1979. A study of woodstove particulate emissions. Journal of the Air Pollution Control Association 29(7).724-728

California Department of Transportation. Master plan of state highways eligible for official scenic highway designation

Calish, Steven. 1980 A socioeconomic overview of the Deschutes National Forest and its surrounding communities. Deschutes National Forest.

Campbell, C Duncan 1983. Future market conditions in forest products and their effect on Washington's industry Department of Natural Resources, State of Washington.

Clark, R. N., R W. Koch, M L Hogans, H H. Christensen, and J. C Hendee 1984. USDA Forest Service Research Paper PNW-319 Pacific Northwest Forest and Range Experiment Station, Portland, OR

Clopper, Almon. 1983. Interindustrial forecasts of the American economy Lexington, MA: D C. Heath and Company.

Cook, Jonathan D., James H. Himel and Rudolph H. Moyer. 1978 Impact of forestry burning upon air quality: a state of the knowledge characterization in Washington and Oregon. U S Environmental Protection Agency Report No. 910/9-78-052. Region 10, Seattle, Washington 253 p

Cooper, L. J. 1939. A History of the Siskiyou National Forest. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR

Cooper, Robert W. 1976 The tradeoffs between smoke from wild and prescribed forest fires In Proceedings of the Air Quality and Smoke from Urban and Forest Fires Symposium. National Academy of Sciences, October 24-26, 1973, Fort Collins, CO. p. 19-26.

Coos County Planning Department. 1979 Coos county comprehensive plan. Coos County Planning Department. Coquille, OR.

Coos-Curry-Douglas Economic Improvement Association. 1978. Projection of future job losses in the timber industry in the Coos-Curry-Douglas district due to timber supply decline and productivity increases. Coos-Curry-Douglas Economic Improvement Association.

Coos-Curry-Douglas Economic Improvement Association 1980. Comprehensive Economic Development Strategy, 1980-81 Action Program.

Coos-Curry Electric Cooperative Inc. 1984 Oregon 21 Coos borrower's environmental report. Coos-Curry Electric Cooperative Inc.

Countryman, Clive M. 1955. Old growth conversion also converts fire climate. Proceeding Society of American Foresters Annual Meeting Portland, OR. p. 158-160.

Countryman, Clive M 1972 The fire environment concept. USDA Forest Service, Pacific Southwest Forest and Range Experiment Station, Berkeley, CA. 12 p

Craig, David W 1984. Managed yield tables for the Siskiyou National Forest. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Cramer, Owen P. 1974. Air quality influences In: Environmental Effects of Forest Residues Management in the Pacific Northwest. USDA Forest Service General Technical Report PNW-24. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 550 p.

Crocker, Thomas D., 1986 Economic benefits of visibility in Oregon's urban wilderness areas Oregon Department of Environmental Quality, Portland, OR 74 p.

Cross, S. P. 1985. Responses of small mammals to forest riparian perturbations. In: Riparian Ecosystems and Their Management:Reconciling Conflicting Uses USDA Forest Service General Technical Report RM-120:269-275.

Curtis, Robert O. 1978 Growth and yield in uneven-aged stands. In: Uneven-aged silviculture and management in the United States. Combined proceedings of two in-service workshops. (Morgantown, WV, July 15-17, 1975, and Redding, CA, October 19-21, 1976.) USDA Forest Service General Technical Report WO-24. 234 p.

Darley, E. F. and S L Lerman. 1974 Air pollution emissions from burning sugar cane and pineapple residues from Hawaii U S. Environmental Protection Agency Final Report R 800711. Triangle Park, NC. 22 p

Daubenmire, R. 1968. Ecology of fire in grasslands. Advanced Ecological Research 5 209-266.

Davis, Lawrence S. and K Norman Johnson 1987. Forest management 3rd Edition McGraw-Hill Book Company, New York. 715 p.

Davis, L S and R. W Cooper. 1963 How prescribed burning affects wildfire occurrence Journal of Forestry 61(12):915-917.

Debyle, W. F., and P E. Pacher, 1972 Plant nutrient and soil losses in overland flow from burned forest clearcuts. In. Watersheds in Transition, Proceedings of a Symposium by American Water Resource Association and Colorado State University.

Dell, John D. 1980. Guidelines for predicting fire effects on forest and rangeland resources in Region 6. USDA Forest Service, Pacific Northwest Region, Portland, OR 26 p.

Dell, John D. and Lyle R. Green 1968. Slash treatment in the Douglas-fir region Journal of Forestry 66(8)610-614

Deeming, John E. 1980. Smoke management and air quality. Paper presented at Region 6 Fuel Managers Conference, Redmond, OR. April 21-25, 1980 10 p.

Deeming, John E., Robert E. Burgan and Jack D. Cohen. 1977 The National Fire Danger Rating System - 1978. USDA Forest Service General Technical Report INT-39 63 p.

Department of Environmental Quality 1985. Visibility in Oregon's wilderness and National Park lands (1982-1984). State of Oregon, Department of Environmental Quality, Air Quality Division, Portland, OR 51 p.

Department of Human Resources. 1980. Social accounting for Oregon, socioeconomic indicators 1980. State Community Services Program, Department of Human Resources. Socioeconomic Overview Klamath National Forest Area of Influence. Yreka, CA.

Detling, L. E 1961. The chaparral formation of Southwestern Oregon, with considerations of its postglacial history. Ecology 42:348-357 p

DeWerff, Lloyd, Ronald Pugh, Teresa Rebagliati, and Jeffery White. 1981. Scheduling timber harvest to meet visual objectives. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Dodge, Marvin. 1972. Forest fuel accumulation - a growing problem. Science 177(4044):139-142

Duncan, J R., and others. 1979 Air quality impact potential from residential wood-burning stoves. Tennessee Valley Authority, Division of Natural Resource Services, Muscle Shoals, AL.

Dyrness, C. T. 1973. Early stages of plant succession following logging and burning in the western Cascades of Oregon. Ecology 54(1):57-69.

Dyrness, C. T., J. Franklin, C. Maser, S. Cook, J Hall, and G Faxon. 1975 Research natural area needs in the Pacific Northwest, a contribution to land-use planning. USDA Forest Service General Technical Report PNW-38. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon

EPA. 1975. Logging roads and protection of water quality. U.S. Environmental Protection Agency, Region 10, Water Division, Seattle, WA. 312 p

EPA. 1980. An approach to water resources evaluation of non-point silvicultural sources (a procedural handbook). U S Environmental Protection Agency, Athens, GA

Everest, F. H. 1973. Ecology and management of summer steelhead in the Rogue River Fisheries Research Report Number 7. Oregon State Game Commission (Now Oregon Department of Fish and Wildlife), Research Division.

Farris, Mary R. 1978. Productivity in the veneer and plywood industry Bureau of Labor Statistics.

Forest Service Handbook Title 1000, Chapter 1023.4. USDA Forest Service

Forest Service Handbook Title 2300, Chapter 2309 24. USDA Forest Service

Franklin, Jerry F. 1978. Effects of uneven-aged management on species composition In: Uneven-aged silviculture and management in the United States. Combined proceedings of two in-service workshops. (Morgantown, WV, July 15-17, 1975, and Redding, CA, October 19-21, 1976) USDA Forest Service General Technical Report WO-24. 234 p

Franklin, J., K. Cromack Jr., W. Denison, A. McKee, C Maser, J Sidell, F. Swanson, and G Juday. 1981 Ecological characteristics of old-growth Douglas-fir forests. USDA Forest Service General Technical Report PNW-118, Pacific Northwest Forest and Range Experiment Station, Portland, OR. 48 p.

Frear, S.F. 1982. Biological benefits of large organic material in streams USDA Forest Service, Pacific Northwest Forest and Range Experiment Station.

Fredriksen, R. L. 1972. Impact of forest management on stream water quality in western Oregon In. Pollution Abatement and Control in the Forest Products Industry, 1971-72. USDA Forest Service p. 37-50.

Fredriksen, R. L , D. G. Moore and L. A. Norris 1975. The impact of timber harvest, fertilization, and herbicide treatments on streamwater quality in western Oregon and Washington In. Forest Soils and Forest Management Proceedings - Fourth North American Forest Soils Conference. B. Bernier and C H. Winget (editors), University of Laval Press, Quebec, Canada. p. 283-313

Frissell, Liss, Nawa. 1987 Life history and persistence of anadromous salmonid stocks in relationship to stream habitats and watershed classification. Oregon Department of Fish and Wildlife Progress Report.

FSM 1979. Forest Service Manual Title 2500· Watershed Management USDA Forest Service, Siskiyou National Forest Supplement 1.

FSM. 1983 Forest Service Manual Title 2500, Chapters 2526.03-2563.3: Water Quality and Riparian Zone Management. USDA Forest Service.

FSM. 1988. Forest Service Manual Title 2600, Chapter 2630.3-1· Dead and Defective Tree Habitat, 8/87 R-6 Supp 45. USDA Forest Service.

Gibbs, Kenneth C., Lewis Queirolo, and Craig Lomnicki 1979. The valuation of outdoor recreation in a multiple-use forest. Oregon State University Research Bulletin 28 Forest Research Laboratory, Corvallis, OR

Glasey, J. M. and T. L Svalberg. 1982. Effects of intense dozer pile burns on soils of the Kootenai N F. USDA Forest Service, Kootenai National Forest, Libby, MT.

Gordon, Donald T 1978. Regeneration In: Uneven-aged silviculture and management in the United States Combined proceedings of two in-service workshops. (Morgantown, WV, July 15-17, 1975, and Redding, CA, October 19-21, 1976) USDA Forest Service General Technical Report WO-24. 234 p

Guenther, K. and T. Kucera 1978 Wildlife of the Pacific Northwest: Occurrence and distribution by habitat, BLM District, and National Forest. USDA Forest Service, Pacific Northwest Region 128 p.

Haefner, Henry E. 1975 Reminiscences of an early forester. Oregon Historical Quarterly 76(1) 39-88

Hall, Alfred J 1972. Forest fuels, prescribed fire and air quality. USDA Forest Service, Pacific Northwest Forest and Range Experiement Station, Portland, OR. 44 p.

Hall, Frederick C 1977 Ecology of natural underburning in the Blue Mountains of Oregon. USDA Forest Service, Pacific Northwest Region, Portland, OR. 11 p

Hall, Fredrick C., Charles McComb, and William Ruediger. 1985 Silvicultural options. In. Management of wildlife and fish habitats in forests of western Oregon and Washington E. Reade Brown (tech ed), USDA Forest Service, Pacific Northwest Region, Portland, OR 332 p.

Hall, J. D and C. O. Baker 1982 Rehabilitating and enhancing stream habitat: 1 review and evaluation. USDA Forest Service General Technical Report PNW-188.

Hankin, D. G. and G. Reeves. 1986. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Canadian Journal of Fisheries. Ag Sci 45:in Press.

Hankin, D. G. and G. H. Reeves 1988 Estimating total fish abundance and total habitat area in small streams. USDA Forest Service Research Paper PNW-360, Pacific Northwest Research Station, Portland, OR. 33p.

Hannigan, Richard D. 1976. Oregon: a statistical profile. Department of Economic Development, Research, and Agency Liaison Division, State of Oregon.

Harr, R. D. 1976 Forest practices and streamflow in western Oregon. USDA Forest Service General Technical Report 49. Pacific Northwest Forest and Range Experiment Station 18 pp.

Harr, R. D. 1979. Effects of timber harvest on streamflow in the rain-dominated portion of the Pacific Northwest. In: Proceedings of Workshop on Scheduling Timber Harvest for Hydrologic Concerns. USDA Forest Service, Pacific Northwest Region. December 136 p.

Harr, R D ; Fredericksen, R. L.; Rothacher, J. 1979. Changes in streamflow following timber harvest in southwestern Oregon. USDA Forest Service General Technical Report PNW-249. Pacific Northwest Forest and Agriculture Research Station, Portland, OR.

Harr, R. D. 1982 Fog drip in the Bull Run municipal watershed, Oregon. Water Resources Bulletin 18(5):785-789.

Harris, L. 1984. The fragmented forest. island biogeography theory and the preservation of biotic diversity. University of Chicago, Chicago, IL.

Harvey, A E , M. F. Jurgensen, M J. Larsen, and R. T. Graham. 1987. Decaying organic materials and soil qulaity in the inland Northwest: A management opportunity USDA Forest Service General Technical Report INT-225 Intermountain Forest and Range Experiment Station, Ogden, UT.

Harvey, Robert D , Jr., James S. Hadfield, and Mel Greenup 1985. Port-Orford-cedar root rot on the Siskiyou National Forest in Oregon USDA Forest Service, Pacific Northwest Region, Portland, OR. 10 p.

Haynes, R., K. Connaughton, and D. Adams. 1980 Demand for Forest Service stumpage, by region 1980-2030. USDA Forest Service

Heinselman, Miron L. 1981. Fire intensity and frequency as factors in the distribution and structure of northern ecosystems. In: Fire Regimes and Ecosystem Properties USDA Forest Service General Technical Report WO-26. p 7-57.

Henley, J. W and E. H Clarke. 1976. Forest residues. a manageable problem In. Land Applications of Waste Materials. Soil Conservation Society of America.

Henny, C J., J. A. Collins, and W. J. Deibert, 1978. Osprey distribution, abundance, and status in western North America: II The Oregon Population The Murrelet 59 14-25.

Howard, James O., and Bruce A Hiserote. 1978. Oregon's forest products industry, 1976. USDA Forest Service Resource Bulletin PNW-79. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Howard, James O. 1984 Oregon's forest products industry: 1982 USDA Forest Service Research Bulletin PNW-118. USDA Forest Service, Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Johnson, K. Norman, Thomas W. Stuart, and Sarah A. Crim. 1986. Forplan version 2: an overview. USDA Forest Service, Land Management Planning Systems Section, Washington DC.

Josephine County Planning Department. 1981. Comprehensive plan for Josephine County. Grants Pass, OR.

Kaiser, J. R , James D Keyser and E. Gail Throop 1983. Cultural resource management· a guidebook of procedures and techniques for managing historical and archaeological resources. USDA Forest Service, Pacific Northwest Region, Portland, OR.

King, D. N. 1985. Documentation of existing sport and commercial fish harvest attributable to Siskiyou Forest stream and river habitat. Unpublished Forest Report. Siskiyou National Forest, Grants Pass, OR.

King D., L. Johnson, and M. Amaranthus. 1984. Unpublished fish populations sampling data for Winchuck River basin and Taylor Creek, Siskiyou National Forest. Siskiyou National Forest, Grants Pass, OR.

King, Rickula, Jennings, Mullarkey. 1985. Unpublished data compiled from State fish harvest data (creek census records) Oregon Department of Fish and Wildlife, Grants Pass, OR.

Kohl, Don C. 1980. Social accounting for Oregon, socioeconomic indicators. Department of Human Resources, State Community Services Program.

Komarek, E. V., Sr. 1970. Controlled burning and air pollution: an ecological review. Tall Timbers Fire Ecology Conference No. 10:141-173

Kozlowski, Theodore T , and Clifford E. Ahlgren 1974 Fire and ecosystems. Academic Press, New York. 542 p.

Kraemer, James P. 1977. The long term effect of burning on plant succession Unpublished M.S. Thesis Oregon State University, Department of Forest Science.

Lewis, Henry T 1982. A time for burning Occasional Publication No. 17. Boreal Institute for Northern Studies, University of Alberta, Edmonton, Alberta, Canada.

Little, S. N , and G. O. Klock. 1985. The influence of residue removal and prescribed fire on distributions of forest nutrients. USDA Forest Service Research Paper PNW-338. Pacific Northwest Forest and Range Experiment Station, Corvallis, OR.

Litton, R. B 1968 Forest landscape description and inventories. USDA Forest Service Research Paper PSW-49. Pacific Southwest Forest and Range Experiment Station, Berkely, CA. 64 p.

Lloyd, D. S. 1987. Turbidity as a water quality standard for salmonid habitats in Alaska. North American Journal of Fisheries Management 7(1): 34-35.

Logan, Wayne, E. Reade Brown, Dean Longrie, Gene Herb, and Robert A. Corthell. 1985. Edges. In: Management of wildlife and fish habitats in forests of western Oregon and Washington. E Reade Brown (technical editor). USDA Forest Service, Pacific Northwest Region, Portland, OR. 332 p.

Lotan, James E , Martin E. Alexander, Stephen F. Arno (and others). 1981. Effects of fire on flora. USDA *Forest Service General Technical Report WO-16. USDA Forest Service, Washington, DC. 71 p.*

Lyon, L Jack., Hewlette S. Crawford, Eugene Czuhai (and others). 1978 Effects of fire on fauna. USDA Forest Service General Technical Report WO-6. USDA Forest Service, Washington, DC. 22 p

Marcus, Alfred A. 1983. Prescribed burning in the Pacific Northwest: costs and benefits in light of the Clean Air Act visibility standards. In: Proceedings of the 76th meeting of the Air Pollution Control Association, 83-45 5, June 19-24, 1983. Atlanta, GA 13 p.

Marshall , D. B. 1986. Nongame wildlife management plan for Oregon. Oregon Department of Fish and Wildlife, Portland, OR.

Martin, Robert E. and Arthur P. Brackebusch. 1974. Fire hazard and conflagration prevention. In: Environmental Effects of Forest Residues Management in the Pacific Northwest. USDA Forest Service General Technical Report PNW-24.

Maser, C. and J. M. Trappe. 1984. The seen and unseen world of the fallen tree. USDA Forest Service General Technical Report PNW-164. Pacific Northwest Forest and Range Experiment Station, Portland, OR. 56 p.

McHugh, M. H. 1986. Landslide occurrence in Elk and Sixes River Basins, southwest Oregon. Unpublished M.S. Thesis. Oregon State University, Corvallis, OR. 106 p.

McKillop, William. 1970. An analysis of recent fluctuations in Douglas-fir lumber prices. Forest Products Journal. 20(8).

McLaughlin, P. L. 1984. The Smith River deer herd management plan. California Department of Fish and Game, Region 1, Redding, CA. 98 p.

Meehan, W. R , F. J. Swanson, J. R. Sedell. 1977. Influence of riparian vegetation on aquatic ecosystems with particular reference to salmonid fishes and their supply. USDA Forest Service.

Megahan, W. F., and W. J. Kidd. 1972. Effects of logging and logging roads on sediment production rates in the Idaho Batholith. USDA Forest Service Resource Paper INT-23. Intermountain Experiment Station, Ogden, UT.

Minore, Don and Duane Kingsley. 1983. Mixed conifers of southwestern Oregon In: Silvicultural systems for the major forest types of the United States. Russell M. Burns, (Tech. compiler). USDA Forest Service Agricultural Handbook 445 rev. 191 p.

Moore, James E , R. W. Johansen, and H E Mabley, Jr. 1976 Southern guide for using fire retarding chemicals in ground tankers. USDA Forest Service, State and Private Forestry, Southwestern Area, Atlanta, GA

Morris, William G 1934 Forest fires in western Oregon and western Washington. Oregon Historical Quarterly 35(4):313-339

Morris, William G. 1941. Fire weather on clearcut, partly cut and virgin timber areas at Westfir, Oregon. Timberman 42(10).5-8.

Morris, William G. 1970. Effects of slash burning in overmature stands of the Douglas-fir region Forest Science 16(3).258-270.

MUSYA. 1960. Multiple-Use Sustained-Yield Act. Act of June 12, 1960 (P.L. 86-517, 74 Stat 215, 16 U.S C 528 [note], 528-531).

NEPA 1969. National Environmental Policy Act Act of January 1, 1970 (P.L. 91-190, 83 Stat 852; 42 U.S.C 4321[note], 4321, 4331-4335, 4341-4347)

NFMA. 1976. National Forest Management Act. Act of October 22, 1976, (P.L. 94-588, 90 Stat. 2949, as amended; 16 U.S C 472a, 476, 500, 513-516, 521b, 528[note], 576b, 594-2[note], 1600[note], 1601[note], 1600-1602, 1604, 1606, 1608-1614).

Nomura, I. 1981. Long range timber demand/supply prospects in Japan and some problems. Chief of Forest Economy Section, National Forestry and Forest Products Research Institute.

Norris, L. A., H. W. Lorj, and S V. Gregory. 1983. Forest chemicals. In: Influence of Forest and Rangeland Management on Anadromous Fish Habitat in Western North America USDA Forest Service General Technical Report PNW-149 Pacific Northwest Forest and Range Experiment Station, Portland, OR. 95 p.

Omi, Philip N. and Richard D Laven. 1982. Prescribed fire impacts on recreation wildlands: A status review and assessment of research needs Ensenhower Consortium for Western Environmental Forestry Research. Bulletin 11. 18 p.

ODEQ. 1978. Oregon's statewide assessment of nonpoint source problems. Oregon Department of Environmental Quality, Portland, OR. 71 p. and maps.

ODEQ. In Press. 1988 Oregon statewide assessment of nonpoint sources of water pollution. Oregon Department of Environmental Quality, Portland, OR.

ODFW. 1977. Manual for fish management Oregon Department of Fish and Wildlife

ODFW. 1980. Oregon Department of Fish and Wildlife proposed deer and elk population objectives by wildlife unit for the regional plan [FS R-6]. June 20 letter to Rod Canutt [Regional FS Office] from Dan L. Eastman, Oregon Department of Fish and Wildlife, Portland, OR.

ODFW. 1982. Comprehensive plan for production and management of Oregon's anadromous salmon and trout. Part 1, General Consideration. Oregon Department of Fish and Wildlife.

ODFW. 1985a. Fish and wildlife habitat protection criteria for forest lands. Environmental Management Section, Oregon Department of Fish and Wildlife, Portland, OR

ODFW. 1985b. The Effects of stream alterations on salmon and trout habitat in Oregon. Oregon Department of Fish and Wildlife.

ONHDB. 1987. Rare, threatened and endangered plants and animals of Oregon. Oregon Natural Heritage Data Base, Portland, OR. 40 p.

Oregon Agricultural Experiment Station. 1980. Public goods, residential preferences, and the population turnaround. Technical Paper 5624. Oregon Agricultural Experiment Station, Corvallis, OR.

Oregon State Board of Forestry. 1982. Forestry Program for Oregon - An Action Program for the Eighties. Oregon State Board of Forestry, Salem, OR. 57 p.

Oregon State Employment Division. Labor trends, labor market information by county, state of Oregon. Employment Division, Department of Human Resources. Various issues.

Oregon State University, School of Forestry. 1983. Generating electricity with wood and solid wastes in southern Oregon. School of Forestry, Oregon State University, Corvallis, OR.

OSGC. 1970. Fish and wildlife resources of the Rogue Basin and their water requirements. Oregon State Game Commission

Osis, Laimons. *1988. Commercial salmon troll harvest, Coos Bay-Brookings Ports, 1980-87. Personal* communication, 9-27-88.

Oswald, Daniel D. 1975. A technique and relationship for projections of employment in the Pacific coast products industry. USDA Forest Service Research Paper PNW-189. Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Owen, Linda P. 1979. Migration and economic change in timber reliant counties: an econometric analysis. Unpublished M.S. Thesis. Department of Agricultural and Resource Economics. Oregon State University, Corvallis, OR.

OWRD. 1984a. South Coast Basin program. State of Oregon Water Resources Department, Salem, OR. 12 p.

OWRD. 1984b. Rogue River basin program. State of Oregon Water Resources Department, Salem, OR. 49 p.

OWRD. 1985. Rogue River basin study. State of Oregon Water Resources Department. Salem, OR. 292 p. and maps.

Pacific Fisheries Marine Council Records. 1982-83. Protection of offshore salmon harvest.

Pecora, W. T. 1970 Science and the quality of our environment. Bulletin of Atmospheric Sciences 26(8):20-23.

Perry, D. A 1983. Generating electricity with wood and solid wastes in southern Oregon. Oregon State University Forest Research Lab. Research bulletin 40.

Peterson, Linda J. 1980. Socioeconomic overview of the zone of influence for the Rogue River National Forest and Siskiyou National Forest. USDA Forest Service Contract.

Physical and Biological Stream Survey. 1935-1986. USDA Forest Service, Siskiyou National Forest and Oregon Department of Fish and Wildlife, Grants Pass, OR.

Portland State University. 1976. Center for population research and census (CPRC) population projections for Oregon and its counties: 1975-2000 Portland State University.

Powers, R. F. and C. P. Weatherspoon. 1984 Analysis of soil and site properties in paired clearcut and uncut douglas-fir stands on the Galice Formation, Fox Planning Unit, Six Rivers National Forest

Pyne, Steven J. 1983 Fire in America. Princeton University Press, Princeton, NJ. 654 p

Ramp, L 1976. Oregon Department of Geology and Mineral Industries Letter dated March 16, 1976

Ramp, L , and N. V. Peterson. 1979. Geology and mineral resources of Josephine County, Oregon Oregon Department of Geology and Mineral Industries. Bulletin 100

Ramp, L , J. G. Schlicker, and J. J. Gray. 1977. Geology, mineral resources, and rock materials of Curry County, Oregon. Oregon Department of Geology and Mineral Industries. Bulletin 93.

Reeves, G. H and T. D. Roelofs 1982. Rehabilitation and enhancing stream habitat: 2. Field Application. USDA Forest Service General Technical Report PNW - 140.

Reiser, D. W. and J C. Bjornn. 1979. Habitat requirements of anadromous salmonids. USDA Forest Service General Technical Report PNW-96.

Resler, Rexford A. 1976. Fire as a tool for land management. In. Proceedings of the Fire by Prescription Symposium. USDA Forest Service, October 13-15, 1976, Atlanta, GA p. 5-7.

Rice, Raymond M. 1980. A perspective on the cumulative effects of logging on streamflow and sedimentation. In: Proceedings of the Edgebrook Conference, July 2-3, Berkeley, CA. University of California Division of Agricultural Sciences Special Publication 3268.

Richardson, H W. 1972. Input-output and regional economics. John Wiley and Sons, New York, NY.

Rilchie, Jerry C. 1972. Sediment, fish and fish habitat Journal of Soil and Water Conservation 27: 145-165.

Ruderman, Florence K 1980. Production, prices, employment, and trade in Northwest forest industries, second quarter 1980. USDA Forest Service, Pacific Northwest Forest Range and Experiment Station

Ryan, P. W. and Charles K. McMahon 1976. Some chemical and physical characteristic of emissions from forest fires. Paper 76-2.3 presented at 69th Annual Meeting of the Air Pollution Control Association, Portland, OR, June 22 - July 1, 1976. 15 p.

Sachs, D., and P. Sollens. 1986. Potential effects of management practices on nitrogen nutrition and long-term productivity of western hemlock stands. Forest Ecology and Management 17(1):25-36.

Sandberg, David V. 1983a. Emission reduction for prescribed burning In: Proceedings of the 76th Annual Meeting of the Air Pollution Control Association, 83-45.3, June 19-24, 1983. Atlanta, GA 13 p.

Sandberg, David V. 1983b. Research leads to less smoke from prescribed fires. In: Proceedings 1983 Northwest Fire Council Annual Meeting, November 21-23, 1983, Olympia, WA. p. 107-121.

Sandberg, David V 1985. Scheduling prescribed fires for wetter periods reduces air pollutant emissions. In: Proceedings 8th National Conference on Fire and Forest Meteorology, April 29-May 2, 1985, Detroit, MI. p. 132-138

Sandberg, David V , J. M. Pierovich, D. G. Fox, and E. W. Ross. 1979. Effects of fire on air. USDA Forest Service General Technical Report WO-9. USDA Forest Service, Washington, DC. 40 p.

Sandberg, David V. and R Gordon Schmidt. 1982. Smoke management costs for forest burning In Proceedings of the Annual Meeting of Pacific Northwest International Section, Air Pollution Control Association, November 15-17, 1982, Vancouver, British Columbia, Canada. 10 p

Sandberg, David V. and Robert E. Martin 1975. Particle sizes in slash fire smoke USDA Forest Service Research Paper PNW-199. 7 p.

Satherwaite, Tom. 1988. Rogue River Basin fisheries investigations Oregon Department of Fish and Wildlife, 1980-88 Personal communication

Schaffer, W. A. and K. Chu 1969 Nonsurvey techniques for constructing regional interindustry models. Papers of the Regional Science Association 23:83-101.

Schallau, Con H. 1986. Preliminary working papers and data on the South and the Pacific Northwest 1985 and 1986. Pacific Northwest Forest and Range Experiment Station, Corvallis, OR.

Schallau, Con H, and Wilbur R. Maki. 1986. Economic impacts of interregional competition in the forest products industry during the 1970's: the South and the Pacific Northwest. USDA Forest Service Research Paper PNW-350. Pacific Northwest Research Station, Portland, OR.

Schuldt, John P. and James O. Howard. 1974. Oregon forest industries, wood consumption and mill characteristics 1972 A joint study by Oregon State University Forestry Extension Service and USDA *Forest Service, Pacific Northwest Forest and Range Experiment Station*

Smith, David Martyn. 1962 The practice of silviculture. 7th Edition John Wiley & Sons. 578 p.

Smith, J. P. Jr. and R. York. 1984. Inventory of rare and endangered vascular plants of California California Native Plant Society. Berkeley, CA 174 p.

Snyder, G. G., H F. Haupt, and G. H. Belt, Jr. 1975. Clearcutting and burning slash alter quality of stream water in northern Idaho. USDA Forest Service Research Paper INT-168. Intermountain Forest and Range Experiment Station, Odgen, UT.

Spurr, Stephen H. and Burton V. Barnes. 1973 Forest ecology. The Ronald Press Company, New York, NY. 571 p.

Stankey, George H., David N Cole, Robert C. Lucas, Margaret E Peterson, Sidney S. Frissell. 1985. The limits of acceptable change (LAC) system for wilderness planning. USDA Forest Service General Technical Report INT-176 Intermountain Forest and Range Experiment Station, Ogden, UT.

State of Oregon, Employment Division. 1980. Revision of occupational employment trends in the Governor's administrative planning districts 7 and 8 State of Oregon, Employment Division.

State of Oregon. Oregon covered employment and payrolls, by industry and county. 1970-78. Employment Division, Department of Human Resources, Research and Statistics Section. State of Oregon.

Strand, R.G. 1964. Geologic map of California weedsheet. California Division of Mines and Geology.

Sullivan, Kathleen, Thomas E. Lisle, C. Andrew Dolloff, Gordon E. Grant, and Leslie M. Reid 1987. Stream channels: the link between forests and fishes. In: Symposium on Streamside Management: Forestry and Fishery Interactions, February 12-14, 1986. University of Washington, Seattle, WA.

SWRB. 1963. South Coast Basin. State Water Resources Board. Water Resources Department of Oregon, Salem, OR

Tangren, Charles D., and others. 1976 Contents and effects of forest fire smoke. In. Southern Forestry Smoke Management Guidebook. USDA Forest Service General Technical Report SE-10. Southeastern Forest Experiment Station, Asheville, NC. 140 p

Tesch, Steven D 1984. Are shelterwoods over prescribed? Paper presented at FIR conference, Reforestation research advances in southwestern Oregon. April 16-17, Grants Pass, OR. 11 p.

Thomas, J. W. (Tech Ed.). 1979. Wildlife habitats in managed forests, the Blue Mountains of Oregon and Washington. USDA Forest Service Agricultural Handbook No 553 512 p.

Thomas, Jack Ward, Glenn L Crouch, Roger S Bumstead, and Larry D. Bryant. 1975 Silvicultural options and habitat values in coniferous forests. In: Proceedings from a symposium on management of forest and range habitats for nongame birds. USDA Forest Service General Technical Report WO-1 p 272-287.

Tiedemann, Arthur R. 1979 Effects of fire on water. USDA Forest Service General Technical Report WO-10 USDA Forest Service, Washington, DC. 28 p

University of Oregon 1979. Revenue sources of Oregon counties, FY-1977-78 Bureau of Governmental Research and Service School of Community Service and Public Affairs. University of Oregon in Cooperation with the Association of Oregon Counties. Information Bulletin 171.

U.S. Department of Agriculture, Forest Service Forest Service Manual. Titles 1500 and 2800.

U.S. Department of Agriculture, Forest Service. Siskiyou National Forest timber sale report forms (2400-17): FY 1975 - Second Quarter FY 1980. Grants Pass, Oregon.

U.S. Department of Agriculture, Forest Service. 1974 National forest landscape management volume 2 (nine chapters) USDA Forest Service Agricultural Handbooks 462 and 559, Washington, DC.

U.S Department of Agriculture, Forest Service. 1975. Forest hydrology - hydrologic effects of vegetation manipulation, part II. USDA Forest Service, Northern Region, Missoula, MT

U.S. Department of Agriculture, Forest Service. 1977. Anatomy of a mine. from prospect to production. USDA Forest Service General Technical Report INT-35. Intermountain Forest and Range Experiment Station, Ogden, UT.

U.S. Department of Agriculture, Forest Service. 1978. A proposal. Illinois Wild and Scenic River. USDA Forest Service, Siskiyou National Forest.

U.S Department of Agriculture, Forest Service 1979a Regional Office analysis of the management situation. Pacific Northwest Region Planning Team. USDA Forest Service, Portland, OR.

U.S. Department of Agriculture, Forest Service. 1979b Glossary of terms for fire management planning USDA Forest Service, Rocky Mountain Region, Denver, CO. 78p.

U.S. Department of Agriculture, Forest Service 1979c. Siskiyou National Forest soil resource inventory Siskiyou National Forest, Grants Pass, OR. 258 p

U.S Department of Agriculture, Forest Service. 1980 A recommended renewable resource program - 1980 update. USDA Forest Service FS-346.

U.S Department of Agriculture, Forest Service 1982 Methods for evaluating energy effects of forest management. USDA Forest Service.

U.S. Department of Agriculture, Forest Service. 1984a. America's renewable resources: a supplement to the 1979 assessment of the forest and range land situation the United States. USDA Forest Service, RPA Staff, Washington, DC.

U.S. Department of Agriculture, Forest Service. 1984b Regional guide for the Pacific Northwest Region. USDA Forest Service, Pacific Northwest Region, Portland, OR.

U.S. Department of Agriculture, Forest Service 1984c Final environmental impact statement for the Pacific Northwest regional guide. USDA Forest Service, Pacific Northwest Region, Portland, OR.

U.S. Department of Agriculture, Forest Service 1985a Fisheries Habitat Evaluation Handbook (Monitoring) - 140 USDA Forest Service, Pacific Northwest Region.

U.S. Department of Agriculture, Forest Service and Oregon Department of Fish and Wildlife 1985b Memorandum of understanding between Forest Service and Oregon Department of Fish and Wildlife.

U S Department of Agriculture, Forest Service. 1986a. Recreation opportunity spectrum (ROS) users guide. USDA Forest Service

U.S Department of Agriculture, Forest Service. 1986b. A report on minimum management requirements for forest planning on the national forests of the Pacific Northwest Region USDA Forest Service

U.S Department of Agriculture, Forest Service 1987 Siskiyou National Forest position statement. Unpublished report Forest Management Team notes of May 27, 1987 on file at the Forest Supervisor's Office, Grants Pass, OR

U S Department of Agriculture, Forest Service 1988a Status list of endangered, threatened, sensitive and rare plants on the Siskiyou National Forest. Siskiyou National Forest, Grants Pass, OR.

U.S. Department of Agriculture, Forest Service. 1988b. Final supplement to the environmental impact statement for an amendment to the Pacific Northwest Regional Guide (two volumes). spotted owl guidelines Pacific Northwest Region, Portland, OR.

U.S. Department of Agriculture, Forest Service. 1988c. Final environmental impact statement for managing competing and unwanted vegetation Pacific Northwest Region, Portland, OR.

U.S. Department of Agriculture, Forest Service. 1988d Final environmental impact statement, Silver Fire recovery project Siskiyou National Forest, Grants Pass, OR

U.S Department of Commerce. Advance reports 1960, 1970, and 1980 census of population and housing, Oregon. U.S. Department of Commerce, Bureau of the Census.

U.S. Department of the Interior, Bureau of Land Management. Local socioeconomic trends and public forest land management. a social assessment of the Eugene district. USDI Bureau of Land Management.

U.S. Department of the Interior, Fish and Wildlife Service. 1973. Threatened wildlife of the United States. Resource Publication 114. Washington, D.C.

U S. Department of the Interior, Fish and Wildlife Service. 1977. National survey of hunting, fishing, and *wildlife-associated recreation 1975. Washington, D.C.*

U.S. Department of the Interior, Fish and Wildlife Service. 1982. Pacific coast recovery plan for American peregrine falcon USDI Fish and Wildlife Service

U S Department of the Interior, Fish and Wildlife Service. 1986 Recovery plan for the Pacific bald eagle USDI Fish and Wildlife Service, Portland, OR. 160 p

U S. Department of the Interior, Fish and Wildlife Service and U.S. Department of Commerce, Bureau of the Census. 1982 National survey of fishing, hunting and wildlife associated recreation - 1980.

Vanderheyden, Jon, Lee Johnson, Mike Amaranthus, and Linda Batten. 1988. Watershed and fisheries cumulative effect assessment. Unpublished Siskiyou National Forest Silver Fire Recovery Process Paper. Siskiyou National Forest, Grants Pass, OR. March 60 p

Vogl, Richard J 1971. The future of our forests Ecology Today 1(1).6.

Vogl, R. J. 1974. Effects of fire on grasslands. In: Fire and Ecosystems T. T Kozlowski and C E Ahlgren (editors), Academic Press, New York, NY. p. 139-194

Volland, Leonard A and John D Dell. 1981. Fire effects on Pacific Northwest forest and range vegetation USDA Forest Service, Pacific Northwest Region, Portland, OR. 23 p

Ward, Donald E , Chuck K. McMahon and Ragner W. Johansen. 1976. An update on particulate emissions from forest fires. In: Proceedings of the 69th Annual Meeting of the Air Pollution Control Association, Portland, OR 15 p.

Watkins, Clifford H. 1959. A Study of winds in Curry County, Oregon Oregon State Board of Forestry, Salem OR. 21 p.

Weaver, Harold, 1974 Effects of fire on temperate forests: western United States. In: Fire and Ecosystems T. T. Kozconiski and C E. Ahlgren (editors), Academic Press, New York, NY. 542 p

Webb, L. O. 1988. A guide to sensitive plants of the Siskiyou National Forest. USDA Forest Service Publication Number R6-11-023-86. Siskiyou National Forest, Grants Pass, OR 255 p.

Wells, Carol G 1973. Effects of fire on soil. USDA Forest Service General Technical Report WO-7 USDA Forest Service, Washington, DC. 34 p

Went, F. W. 1960 Organic matter in the atmosphere and its possible relation to petroleum formation National Academy of Science Proceeding 46.212-221.

Werschkul, David F and Otis D. Swisher 1983. Birds and small mammals of southwestern Oregon. Tanoak forest Non-game project, Oregon Department of Fish and Wildlife, Portland, OR.

West, T. and P. Steinfeld 1983. Siskiyou National Forest cultural resources sample survey design. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Western Regional Corridor Study. 1986. Prepared for the Western Utility Group by Michael Clayton and Associates.

Wheeler, D. and T. Atzet. 1985. Guide to common forest plants: Rogue River Siskiyou, and Umpqua National Forests. Siskiyou National Forest Publication No R6-11-021-85. USDA Forest Service, Grants Pass, OR. 96 p.

Whittaker, R. H. 1960 Vegetation of the Siskiyou Mountains, Oregon and California. Ecological Monographs 30 279-338.

Wilson, Carl C. and John D Dell. 1971. The Fuels buildup in American forests: a plan of action and research. Journal of Forestry 69(8).471-476.

Windfarms Northwest. 1985 Land use impact assessment of the Cape Blanco wind farm, draft preliminary report. Windfarms Northwest, Inc

Witmer, Gary W., and others. 1985 Deer and elk. In: Management of wildlife and fish habitats in forests of western Oregon and Washington E Reade Brown, (tech. ed) USDA Forest Service, Pacific Northwest Region, Portland, OR. 332 p.

Wright, Henry A and Arthur W. Bailey. 1982. Fire ecology - United States and Southern Canada. John Wiley and Sons, New York, NY 501 p.

Wright, Kenneth A. 1985. Changes in storm hydrographs after road building and selective logging on a coastal watershed in northern California. M.S Thesis. Humboldt State University, Arcata, CA. 55 p.

Zarn, M. 1974 Habitat management series for unique or endangered species, report no. 12 osprey USDI Bureau of Land Management Technical Note Denver Service Center, Denver, CO 41 p.

Ziemer, R.R. 1981. Storm flow response to road building and partial cutting in small streams of northern California. Water Resources Research 17(4). 90-917.

Ziesenhenne, F. C. 1936. Stream improvement report and preliminary stream survey of the Siskiyou National Forest in Oregon and California. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Zivnuska, John A 1972. Economic tradeoffs in fire management. In Proceedings Fire in the Environment Symposium. USDA Forest Service, May 1-5, 1976, Denver, CO p. 69-74.

Zobel, Donald B., Lewis F. Roth, and Glenn M Hawk 1985. Ecology, pathology, and management of Port-Orford-cedar (Chamaecyparis lawsoniana). USDA Forest Service General Technical Report PNW-184. Pacific Northwest Forest and Range Experiment Station, Corvallis, OR

ACRONYMS AND GLOSSARY

ACRONYMS AND GLOSSARY

The definitions and abbreviations included herein are most common to Forest Service management and planning terminology. Meanings may differ when used in context other than these documents. The sources of the definitions vary, but the majority were taken from the Regional Guide for the Pacific Northwest, FSM, FSH, the Wildland Planning Glossary, NFMA Regulations (36 CFR 219), and CEQ Regulations (40 CFR 1500-1508). Some definitions have been shortened, paraphrased, or adapted to match usage implied within this document

ABBREVIATIONS AND ACRONYMS

AC	Acres
AQRV	Air Quality Related Value
ASQ	Allowable Sale Quantity *
ATV	All-Terrain Vehicle
AUM	Animal Unit Month *
BD	Brush Disposal
BLM	USDI- Bureau of Land Management
BMP	Best Management Practice *
BTU	British Thermal Unit
CEQ	Council on Environmental Quality
CFL	Commercial Forest Land *
CFR	Code of Federal Regulations *
CFS	Cubic Feet Per Second
CMAI	Culmination of Mean Annual Increment *
CPRC	Center for Population Research and Census
CZMA	Coastal Zone Management Act of 1972
DCC-FC	Departmental Computer Center at Fort Collins, Colorado
DBH	Diameter at Breast Height *
DEIS	Draft Environmental Impact Statement
DEQ	Oregon Department of Environmental Quality
DF	Douglas-fir
DFSIM	Douglas-fir Simulator
DP/DFSIM	Dynamic Programming Douglas-fir Simulator
E.O.	Executive Order
EA	Environmental Assessment *
EEO	Equal Employment Opportunity
EIS	Environmental Impact Statement *
EPA	Environmental Protection Agency
EVC	Existing Visual Condition
F&WL	Fish and Wildlife
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission
FIR	Forestry Intensified Research
FMEI	Fire Management Efficiency Index *
FORPLAN	Forest Planning Model *
FPFO	Forestry Program For Oregon
FS	USDA-Forest Service
FSH	Forest Service Handbook
FSM	Forest Service Manual

FY	Fiscal Year (Oct 1 to Sept. 30, unless otherwise noted)
GNP	Gross National Product *
HCI	Habitat Capability Index
ICO	Issues, Concerns, and Opportunities *
IDT	Interdisciplinary Team
IMPLAN	Forest Service Input-Output Model
JTPA	Job Training Partnership Administration
K-V	Knutson-Vandenberg Act of 1924 *
LAC	Limits of Acceptable Change
LCDC	Oregon Land Conservation and Development Commission
LIM	Land Inventory Mapping *
LRMP	Land and Resource Management Plan
LTSY	Long-Term Sustained Yield *
M	Roman Numeral for 1,000
M $	Thousand Dollars
M RVD	Thousand Recreation Visitor Day
M WFUD	Thousand Wildlife Fish User Day
MBF	Thousand Board Feet
MCF	Thousand Cubic Feet
MM	Million (Thousand Thousand)
MM $	Million Dollars
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MR	Management Requirement *
NEPA	National Environmental Policy Act
NF	National Forest
NFMA	National Forest Management Act
NFS	National Forest System land
NPB	Net Public Benefits *
NPS	National Park Service
O&C	Oregon and California
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ONHDB	Oregon Natural Heritage Data Base
ORV	Off Road Vehicle *
OSGC	Oregon State Game Commission (now ODFW)
OWRD	Oregon Water Resources Department
P L	Public Law (also PL)
PARS	* (See Glossary)
PAOT	People at One Time *
PNV	Present Net Value *
PNW	Pacific Northwest
POC	Port-Orford-cedar
PSW	Pacific Southwest
PVT	Private (Land)

R-5	Forest Service, Pacific Southwest Region
R-6	Forest Service, Pacific Northwest Region
R.D	Ranger District (also RD) *
R2MAP	A grid land inventory mapping system (LIM)
RARE II	Roadless Area Review and Evaluation II *
RIM	Recreation Information Management
RNA	Research Natural Area *
ROS	Recreation Opportunity Spectrum *
RPA	Forest and Rangeland Renewable Resources Planning Act of 1974
RVD	Recreation Visitor Day *
SHPO	State Historic Preservation Officer
SEIS	Supplemental Environmental Impact Statement
SMU	Streamside Management Units *
SOHA	Spotted Owl Habitat Area *
SOMA	Spotted Owl Management Area *
SRI	Soil Resource Inventory
SSC	Separate Suitability Component *
T&E	Threatened and Endangered Species *
TRI	Total Resource Information *
TSI	Timber Stand Improvement *
TSP	Total Suspended Particulates
U.S C	United States Code (also USC)
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	USDA- Forest Service
USFWS	USDI- Fish and Wildlife Service
VQO	Visual Quality Objectives *
WFUD	Wildlife and Fish User Day
WRS	Wilderness Recreation Spectrum *
YUM	Yarding of Unmerchantable Materials

* Term defined in Glossary

GLOSSARY

A

Acre-foot.
A unit of measurement equal to the volume which would cover one acre to a depth of one foot (i.e., 43,560 cubic feet).

Activity
The work processes or management practices that are conducted to produce, enhance, or maintain outputs or achieve administrative and environmental quality objectives An activity can generate multiple outputs

Activity Fuels.
Burnable debris created by various management activities

Affected Environment
The natural, physical, and human-related environment that is sensitive to changes due to proposed actions.

Age Class.
One of the intervals into which the age range of trees is divided for classification or use.

Airshed.
A geographical area that, because of topography, meteorology, and climate, shares the same air

Allowable Cut Effect
An increase in today's permissible timber harvest level that is made by intensive timber management practices applied now or in the future.

Allowable Sale Quantity
The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan Both the time period and utilization standards are specified by the Plan. This is usually expressed on an annual basis as the "average annual allowable sale quantity."

Allocated Funds.
Those funds transferred to the Forest from other agencies (including those from the Land and Water Conservation Fund, the Department of Labor, and the Soil Conservation Service) or provided from the K-V, Brush Disposal, Co-op Road Maintenance, or Purchaser Road Credits accounts

Allocation.
The assignment of management prescriptions to specific land areas to achieve the goals and objectives of an alternative

Alternative
A mix of management prescriptions and land allocations applied to specific land areas to achieve a set of goals and objectives The resulting alternative provides the management direction of the Forest.

Amenity.
Resources or experiences enjoyed on the Forest that do not have established market values, e.g , scenic views, recreational activities, etc.

Anadromous Fish.
Species of fish which mature in the ocean and migrate into streams to spawn, use herein refers to *salmon and steelhead*

Analysis Area
A delineated area of land subject to analysis of (1) responses to proposed management practices in the production, enhancement, or maintenance of Forest outputs and environmental quality objectives, and (2) economic and social impacts.

Animal Community.
Any assemblage of animals which interact and occur in a common area

Animal Unit Month (AUM)
The quantity of forage required by one mature cow and calf, or equivalent, for one month.

Annual Sale Quantity.
See Allowable Sale Quantity

Appropriated Funds.
Monies authorized by Congress which permit Federal agencies to incur obligations and to make payments for specific purposes

Appropriate Suppression Response.
The kind, amount, and timing of suppression action on a wildfire which most efficiently meets fire management direction under current and expected burning conditions.

Area of Influence.
Local area where most of the goods and services produced from the Forest are processed or used, and where the employment, income, and other social impact of Forest policies are felt

Arterial Road.
A major transportation route that accesses and services a large land area; usually connects with public highways or other arterial routes.

Association.
(Plant Ecology) A kind of plant community with a definite species composition and structure, and relatively uniform environment.

Available Land.
Capable land which has not been administratively or legislatively withdrawn from timber production on a permanent basis by the Chief or higher authority.

B

Basal Area
The cross-sectional area, in square feet, of a tree measured at breast height (4 5 feet).

Base Sale Schedule.
A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and that this planned sale and harvest for any decade is not greater than the long-term sustained-yield capacity. This definition expresses the principle of nondeclining flow.

Benchmark.
An analysis reference point of the maximum physical/biological capability to produce a resource output from Forest lands while maintaining minimum legal requirements for production of other resources and maintenance of soil and water productivity. Benchmarks define the area (i e , provide the bounds) within which alternatives can be formulated.

Benefit-Cost Ratio.
Measure of economic efficiency computed by dividing total discounted *primary benefits* by total discounted *economic costs.*

Best Management Practice (BMP)
The method, measure or practice selected by an agency to meet its nonpoint source pollution control needs BMPs include, but are not limited to, structural controls, operations, and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters

Big Game.
Those species of large mammals normally managed for sport hunting Herein, generally refers to Roosevelt elk, black-tail deer, or black bear

Biological Diversity.
The distribution and abundance of different plant and animal communities and species over time and space

Biological Growth Potential
The average net growth attainable in a fully stocked natural forest stand.

Biotic Community.
Any interacting assemblage of animal and plant communities living in a prescribed area or physical habitat.

Board Foot (BF).
A *unit of measurement equal to an unfinished board one foot square by one inch thick.*

Botanical Area.
An area which has been designated by the Forest Service as containing specimens or groups of plants, and plant communities which are significant because of form, color, occurrences, habitat, location, life history, arrangement, ecology, environment, rarity and/or other features (FSM 2360)

C

Calibration.
The process of adjusting modeled fire sizes by fire intensity levels for each Fire Management Analysis Zone against historical occurrence and burn acreage to accurately reflect the "real world " Adjustments are based on modeling the current organization (1978) against historical occurrence (1970-1979) using the same dispatch philosophy and suppression strategies

Canopy.
The uppermost spreading, branchy layer of a forest

Canopy Closure.
The progressive reduction in space between tree crowns as they spread laterally (Ford-Robertson 1971); a measure of the percent of potential open space occupied by the collective tree crowns in a stand

Capability
The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects and disease

Capability Area
A delineated area with a logical combination of biological potential and physical characteristics which are used to estimate responsiveness to various management practices, resource values, output coefficients, and multi-resource or joint production.

Capital Investment
Money spent to provide a facility or product that will be used in the future.

Carrying Capacity
The maximum number of organisms that a particular habitat can support without causing deterioration of the ecosystem

Cavity Nester.
Wildlife species that excavate and/or occupy cavities in trees and snags

Chargeable Volume
All timber volume included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity, based on regional utilization standards

Clearcutting.
The harvesting of an entire stand of trees in one cutting operation, leading to the establishment of an even-aged stand.

Climax.
The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition.

Code of Federal Regulations (CFR)
The listing of various regulations pertaining to management and administration of the National Forests

Collector Road.
A road which collects traffic from Forest local roads or other collector roads. These roads serve smaller land areas than arterial roads and are usually connected to a National Forest arterial or public highway.

Commercial Forest Land (CFL).
See Tentatively Suitable Forest Land.

Commercial Thinning.
Timber sales which call for selective harvest in immature stands designed to improve the quality and growth of the *remaining trees*

Commodity.
A resource product with commercial value; all resource products which are articles of commerce (transportable)

Community Cohesion
The degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them

Community Stability.
A community's capacity to handle change without major hardships or disruptions to component groups or institutions.

Concern.
See Issues, Concerns, and Opportunities

Confine Wildfire Strategy.
To restrict fire within determined boundaries

Constraint.
A limit placed in the FORPLAN model designed to control the functioning of the model to meet specified goals, legal or feasibility requirements

Consumptive Use
Those uses of a resource that reduce its supply

Contain Wildfire Strategy
To surround a fire with control line to check the fire's spread.

Control Wildfire Strategy.
To complete and hold the control line around a fire.

Conversion (Management)
A change from one silvicultural system to another (e.g from hardwood to conifer forest) or from one tree species to another

Cord
A wood stack equivalent to 128 cubic feet (4 x 4 x 8 feet).

Cost Effective.
Achieving specified outputs or objectives under given conditions for the least cost.

Cover
Vegetation used by wildlife for protection from predators, or to ameliorate conditions of weather, or in which to reproduce.

Cover/Forage Ratio.
The ratio, in percent, of the amount of area in forage conditions to that in cover conditions.

Created Opening.
An opening in the forest created as the result of even-aged silviculture through clearcutting, group selection, or shelterwood regeneration timber harvest systems.

Critical Habitat.
That habitat designated by the Secretary, USDI, as critical to the continued survival of threatened or endangered species.

Critical Minerals.
Minerals vital to the National defense, securing these minerals is less serious than those classified as strategic minerals.

Cubic Feet Per Second (cfs).
A unit of measure applied to fluid flow. A rate of discharge

Cubic Foot
A measure of volume equivalent to 1 foot by 1 foot by 1 foot.

Culmination of Mean Annual Increment (CMAI).
The age at which the average annual growth is greatest for a stand of trees Mean annual increment is expressed in cubic feet measure and is based on expected growth according to the management intensities and utilization standards assumed in accordance with 36 CFR 219.16(a)(2)(i) and (ii) Culmination of mean annual increment (CMAI) includes regeneration harvest yields and any additional yields from planned intermediate harvests.

Cultural Resources
Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values

Cumulative Effect
The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Current Direction.
The combination of activities dictated by laws, regulations, the Forest Service Manual, and existing unit plans.

D

Departure.
A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the sale schedule at any time during the planning horizon. A departure is characterized by a temporary increase, usually in the beginning decade(s) of the planning horizon, over the base sale schedule originally established. This increase does not impair the future attainment of the long-term sustained yield capacity.

Designated Habitat Area.
A mature of old-growth habitat area that has been located on a map or in the field, or both. For this document, specific areas identified for spotted owls, pine marten, and pileated woodpeckers

Desired Residue Profile.
The desired level of both living and dead vegetative material that is desired by the land manager for a specific site or prescription. Residue includes slash materials, litter on the forest floor, living brush, tree and standing dead trees and snags.

Developed Recreation.
Outdoor recreation requiring significant capital investment in facilities to handle a concentration of visitors on a relatively small area Examples are ski areas, resorts and campgrounds.

Diameter at Breast Height (DBH)
The diameter of a standing tree measured at a point four feet-six inches from ground level on the uphill side

Direct Attack
A method of fire suppression that treats the fire at its burning edge.

Discounting
The process of estimating the present worth of an anticipated item of income or expenditure by determining the amount of money which, if presently invested and allowed to accumulate at compound interest, will exactly equal the expected item of income or expenditure at the time when it becomes due.

Dispersed Recreation
Outdoor recreation in which visitors are diffused over relatively large areas Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the people

Diversity.
The distribution and abundance of different plant and animal communities and species within an area.

Downward Sloping Demand
A price-quantity demand schedule based on the assumption that the quantity offered inversely affects the price received.

E

Ecosystem.
The complete system formed by the interaction of a group of organisms and their environment

Ecosystem Function.
The manner in which organisms interact with each other and their environments.

Edaphic.
Pertaining to the soil.

Edge.
Where plant communities meet or where successional stages of vegetative conditions within plant communities come together, e.g , field and woodland, forest and meadow.

Edge Effect.
The increased richness of flora and fauna resulting from the mixing of two communities where they join, as at the edge of a meadow

Effects (or Impacts).
Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action Effects may be either *direct*, which are caused by the action and occur at the same time and place, *indirect*, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or *cumulative* (See definition above).

Empirical Yield Table.
A table showing, for one or more given species on a given site, the progressive development of a timber stand at periodic intervals covering the greater part of its useful life This table is prepared for existing stands on the basis of actual average stand conditions.

Endangered Species.
Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range. (Endangered Species Act of 1973)

Endemic Species.
A species whose natural occurrence is confined to a certain region and whose distribution is relatively limited

Environment.
The aggregate of physical, biological, economic, and social factors affecting organisms in an area

Environmental Analysis.
An analysis of alternative actions and their predictable environmental effects, including physical, biological, economic, and social consequences and their interactions, short- and long-term effects, direct, indirect, and cumulative effects

Environmental Assessment (EA)
A concise public document which serves to. (a) Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact, (b) Aid an agency's compliance with NEPA when no EIS is necessary; (c) Facilitate preparation of an EIS when necessary.

Environmental Impact Statement (EIS)
A detailed statement prepared by the responsible official in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed.

Erosion
Detachment or movement of soil or rock fragments by water, wind, ice, or gravity Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of activities of man, animals, or natural catastrophies.

Escaped Fire Situation Analysis.
A study of the factors influencing the suppression of a fire not controlled during initial attack, conducted for the purpose of deciding which suppression strategy will be used.

Even-aged Management.
The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that the stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

Expected Burned Acreage.
The expected annual number of acres burned by fire size class and intensity level for a given program option or budget level, and which must equal or be less than the resource protection objective to be a valid option.

F

Fire Intensity Level (FIL).
A relative measure of fire severity based on flame height, higher flames indicating a more intense fire

Fire Management Analysis Zone (FMAZ).
The geographically delineated areas into which the planning unit is divided for the purpose of analysis based upon common fire-behavior characteristics.

Fire Management Efficiency Index (FMEI).
An index based on the protection costs (less proposed fuels investment), expected annual fire-fighting costs, and expected annual net value change for the next planning period.

FIREPLAN.
The title for a computer system consisting of eight programs which perform data retrieval and processing for the fire management analysis

Fire Program Option
A given program mix funded at a given program level developed in response to specific fire management direction established for the Forest Plan

Fixed Program Management.
The cost of managing Forest programs which is independent of output levels.

Floodplain
The lowland and relatively flat areas adjoining inland and coastal waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Forage
Vegetation used for food by wildlife, particularly ungulate wildlife and domestic livestock

Forb.
Any herbaceous plant species other than those in the Gramineae (grasses), Cyperaceae (sedges), and Juncaceae (rushes) families; fleshy-leaved plants

Forage Areas.
Vegetated areas with less than 60 percent combined canopy closure of tree and tall shrub (greater than seven feet in height). This includes the grass-forb, shrub and open sapling-pole stand conditions and may include some older stands that have been thinned In a managed forest the primary forage areas are those that have had all or most of the forest canopy removed, i e. clearcut or shelterwood units

Forest Fragmentation.
The creation of habitat islands through land development or through natural causes, such as fire.

Forest Land.
Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use. Lands developed for nonforest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, and adjoining road clearing and powerline clearing of any width.

FORPLAN
A linear programming model used for development and analysis of Forest Plan alternatives, and to display long and short-term resource interactions in forest management

Fry.
The life stage of salmonid fish species that refers to the juvenile fish which have either not emerged from the gravel or have recently emerged.

Fuelbreak.
A natural or constructed barrier utilized to stop or control the spread of fire.

Fuel Treatment.
The process of removing and/or modifying natural or human created fuels to reduce fire hazard and achieve other resource objectives

Fuelwood.
Wood that is round, split, or sawn and/or otherwise generally refuse material cut into short lengths or chipped for burning

Full Log Suspension.
The system of transporting logs from the cutting site to the landing without touching the ground.

G

Game Species.
Any species of wildlife or fish for which hunting seasons and bag limits have been established, and which are normally harvested by hunters and fishermen

Goal
A concise statement that describes a desired condition to be achieved sometime in the future Normally expressed in broad, general terms, it is timeless in that it has no specific date by which it is to be completed Goal statements form the basis from which objectives are developed

Gross National Product (GNP).
The sum of final products, such as consumption of goods and gross investment, produced in the Nation in a given year. It is reported in dollars, as a measure of the economic performance of the entire economy.

Guideline.
An indication or outline of policy or conduct.

H

Habitat.
The natural environment of a plant or animal

Habitat Capability Index
An indirect measure of the quality and quantity of habitat for a specific species, or group of species. The index is usually a range that is based on the predicted number of animals that could theoretically occupy the habitat available given a certain set of management prescriptions.

Habitat Diversity.
Distribution and abundance of plant and wildlife habitats.

Habitat Island.
The occurrance of a habitat, such as an old-growth forest, that is physically separated from the next closest habitat of the same type by vegetation that is markedly different in composition and structure

Hard Snag.
A snag composed primarily of sound wood, particularly sound sapwood; generally merchantable

Hardwood
A conventional term for the wood of broadleaf trees. Hardwood areas reference herein are usually the result of past forest fires, and once supported conifer trees in the past See Tentatively Suitable Forest Land.

Hardwood Conversion
The replacement of broadleaf trees or brush with conifer trees

Hazard Reduction.
Any treatment of forest fuels that reduces the threat, ignition, or spread of wildfire.

Hiding Cover
Vegetation capable of hiding 90 percent of a standing adult deer or elk at 200 feet or less. Includes some shrub stands and all forested stand conditions with adequate tree stem density or shrub layer to hide animals. In some cases, topographic features also can provide hiding cover

I

Immature-Poles.
See Tentatively Suitable Forest Land.

Immature-Small Timber
See Tentatively Suitable Forest Land

Impacts.
See Effects

Indicator Species.
Species of fish, wildlife, or plants which reflect ecological changes caused by land management activities See Management Indicator Species

Indirect Attack.
A method of fire suppression in which the control line takes advantage of natural fire breaks, topography, and fuel between the line and the fire

Individual Tree Selection
The selection of trees for harvest based on individual tree characteristics.

Instream Flow
Streamflow required to support instream uses, the flow required varying widely by type of channel, water quality, and time of distribution

Integrated Pest Management.
A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed. The information considered in selecting appropriate strategies includes the impact of the unregulated pest population on various resources values, alternative regulatory tactics and strategies, and benefit and cost estimates for these alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable

Integrated Prescription
A planning prescription in which the Forest ID team identifies and quantifies outputs, effects, benefits, and costs of all forest resources to the extent practical The management emphasis may be single or multiple use

Intensive Management.
A high investment level of timber management that includes precommercial and commercial thinnings, planting with genetically improved stock, control of competing vegetation, and other practices which increase tree growth.

Irretrievable
Applies to losses of production, harvest, or use of renewable natural resources For example, where production is lost, the action is irretrievable, but not irreversible.

Irreversible.
Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long time periods; also includes loss of future options.

Irreversible Soils.
See Unsuitable Forest Lands.

Issue.
See Issues, Concerns, and Opportunities.

Issues, Concerns, and Opportunities (ICO).
A public issue is a subject or question of widespread public interest relating to management of the National Forest resources, as identified through public participation and addressed through the planning process. A management concern is an issue, problem, or condition which constrains the range of management practices identified by the Forest Service in the planning process. Opportunities are those resource uses and development possibilities suggested by both the public and the Forest Service

K

K-V Funds.
Funds collected from timber purchasers for reforestation under the Knutson-Vandenburg (K-V) Act of 1930. National Forest Management Act expanded collection authority to include other resource protection and improvement on the sale area

Knutson-Vandenburg Act of 1930, as amended.
A law which provides for a special fund, derived from the sale of timber, which may be used to fund reforestation and the protection and improvement of the Forest renewable resources on the sale area

L

Land Allocation.
The assignment of a management emphasis to particular land areas with the purpose of achieving the goals and objectives of the alternative.

Land Class.
The topographic relief of a unit of land Land classes are separated by slope, which coincides with the timber inventory process

Land Exchange
The conveyance of non-Federal land or interests to the United States in exchange for National Forest Land or interests

Land Inventory Mapping (LIM)
A grid mapping system with overlay and computational capability to input, store, edit, manipulate, overlay, and display resource information layers in a geographical quadrangle format

Landscape Ecology.
The science of describing and understanding how plant and animal species and communities interact across watershed- and regional-scale areas.

Land Stratification.
Inventory of land according to a set of specific land characteristics, such as the ability to grow timber or the ability to resist erosion

Leasable Minerals
Mineral deposits specifically excepted from the General Mining Law by Congress (principally through the Mineral Lands Leasing Act of 1920, the Mineral Leasing Act of Acquired Lands of 1947, the President's Reorganization Plan No 3 of 1946), and the Geothermal Act of 1970

Linear Programming.
A mathematical process that provides numerical solutions to problems of meeting a certain objective, within given boundaries and constraints Information is expressed in linear, mathematical format.

Local Road.
A road constructed to provide access to specific resource areas. As such, these roads connect terminal facilities with Forest collector or arterial roads or public highways.

Locatable Minerals.
Mineral deposits open to exploration, location, development, and purchase under the General Mining Law of 1972, as amended and interpreted Minerals in sufficient quality and quantity to be a "valuable deposit" (FSM 2810)

Long-term Productivity.
The redistribution of resources within the ecosystem into products used by humans.

Long-term Sustained Yield (LTSY)
The estimated timber harvest that can be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple use objectives.

M

Management Area.
An area composed of aggregate pieces of land (generally several to many analysis areas) to which a given management objective and prescriptions are applied.

Management Concern.
See Issues, Concerns, and Opportunities

Management Direction
A statement of multiple use and other goals and objectives, along with the associated management prescriptions and standards and guidelines to direct resource management

Management Indicator Species.
Management indicator species are animals or plants selected for special attention in the Forest Plan for one or more of three reasons They may be·

(1) *Emphasis species* - species to be managed as key resources on the basis of identified issues, e.g , threatened, endangered, rare, sensitive, harvest, or special interest species;

(2) *Indicate special habitat conditions* - species that require special habitat such as snags, riparian, old-growth forest stands, etc , and/or

(3) *Indicate cumulative forest ecosystem change* - generally species having large home ranges and requiring a diversity of habitats.

Management Intensity.
A management practices or combination of management practices and associated costs designed to obtain different levels of goods and services

Management Practice.
A specific action, measure, course of action, or treatment

Management Prescription
Management practices and intensity designed to attain multiple use benefits and other goals and objectives when applied to a specific land area at a particular point in time

Management Requirements (MR).
Requirements designed to assure compliance with the applicable laws and regulations, specifically 36 CFR 219 27 for resource protection

Mass Failure (also Wasting)
All geologic processes in which earth materials move downslope, either slowly or quickly, by gravitational forces.

Mature.
See Tentatively Suitable Forest Land.

Mean Annual Increment.
The average annual growth of a stand, calculated by dividing the total growth accrued over its life by its age in years at the time of measurement.

Mean Basin Variation (Coefficient of Variation).
The coefficient of variation is a statistical tool used to compare the amount of variation in populations having different means In this case, to compare the variation in accelerated sediment production in a Planning Basin over the first five decades. Lower values indicate a more even distribution of the sediment production, therefore less risk of watershed degradation that might result from concentrations of peak outputs.

Mitigation.
Actions to avoid, minimize, reduce, eliminate, compensate, or rectify the impact of a management practice

Monitoring and Evaluation.
The evaluation, on a sample basis, of Forest Plan management practices to determine how well objectives are being met, as well as the effects of those management practices on the land and environment.

Multiple Use.
Management of all the various renewable surface resources of the National Forest so that they are utilized in the combination that will best meet the needs of the American people The concept also includes making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions. Some of the land will be used for less than all of the resources There should be harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land. Consideration is given to the relative values of the various resources, and not necessarily to the combination of uses that will give the greatest dollar return or the greatest unit output.

N

Native species.
A plant or animal species that occurs indigenously in an area.

Natural Opening
A break in the forest canopy A naturally-occurring area of bare soil, grasses, forbs, or shrubs located in a large area dominated by trees Also included are created openings no longer suitable for timber production.

Naturalized Species.
A non-native species established as if it were a native species.

NEPA Process
An interdisciplinary process, mandated by the NEPA, which concentrates decisionmaking around issues, concerns, alternatives and the effects of alternatives on the environment

Net Public Benefit (NPB).
The total benefits minus costs of all priced and non-priced resource outputs and effects. It is an expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Maximization of NPB's to be derived from management of units of the National Forest system is consistent with the principles of multiple-use and sustained yield

Nonchargeable Timber.
Timber volumes that are not included in calculations of a regulated sale schedule and therefore cannot be included when determining achievement of that timber sale schedule

Nondeclining Flow and **Nondeclining Yield**
See base sale schedule

Nonforest Land
Lands that never have had or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for nonforest use '

Nonvegetative.
Rock and rock outcrops

O

O&C (Oregon and California) **Funds.**
A fund administrated by the Bureau of Land Management accummulated from payments made by timber purchasers when timber is harvested on O&C lands. O&C lands are those which were repossessed by the U S Government from the Oregon and California Railroad Company in 1916 Payments are made to counties by BLM in lieu of taxes from these funds, and a portion of the fund is used for resource mitigation and enhancement projects on those lands

Objective.
Specific statement of measurable planned results to be achieved within a stated time period Reflects alternative mixes of all outputs or achievement which can be attained at a given budget level.

Objective Function
The item to be maximized or minimized, for example, timber or present net value in the solution of a linear programming model

Off-Road Vehicle (ORV)
A vehicle capable of cross-country travel or travel on low-standard roads and trails, e g , motorbikes, ATV's, 4-wheel drive vehicles, snowmobiles

Old Growth.
Any stand of trees 10 acres or greater generally containing the following characteristics: (1) stands contain mature and overmature trees in the overstory and are well into the mature growth stage, (2) stands will usually contain a multi-layered canopy with trees of several age classes, (3) standing dead trees and down material are present, and (4) evidence of human activities may be present, but do not significantly alter the other characteristics and are a subordinate factor in the stand description

Opportunity.
See Issues, Concerns, and Opportunities

Opportunity Cost
The dollar-quantifiable net loss resulting from selecting a less efficient course of action.

Optimal Thermal Cover
A forest stand with: (1) four layers (overstory canopy, sub-canopy, shrub layer, and herbaceous layer), and (2) an overstory canopy which can intercept and hold a substantial amount of snow yet has dispersed, small (less than one-eighth acre) openings. These criteria are generally achieved when the dominant trees average 21 inches Diameter at Breast Height (DBH) or greater crown closure, and are in the large sawtimber or old-growth stand condition

Outputs
The goods, services, and products which are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives. Also goods, end products, or services that are purchased, consumed or utilized directly by people

Overstory.
The portion of trees in a forest which forms the uppermost layer of foliage

P

PARS.
The burned acreage and fire occurrence guidelines which represent the annual average long-term loss; PARS are expressed by forest size classes and intensity levels.

Peak Flow.
The highest value of stream stage or flow attained during a flood

Perennial Streams.
Streams which normally flow throughout the year.

Peridotite.
Plutonic rocks containing olivine, amphibole, pyroxenes, and micas. See Ultramafic.

Permittee.
A holder of a permit to use public land or resources for a specific purpose

Persons At One Time (PAOT).
A recreation capacity measurement indicating the number of people who can use a facility or area at one time.

Pioneer Species.
A plant capable of invading bare sites (newly exposed soil surface) and persisting there, i e , "colonizing" them, until supplanted.

Planning Basins.
Geographical locator areas that approximate major drainages on the Forest Designated for planning purposes.

Planning Horizon.
In the planning process, the overall time period that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions that would influence the planning decisions, in this case, 150 years

Planning Period
The length of time that a Plan is intended to be in effect, in this case, 10 to 15 years

Plant Community.
Any assemblage of plants which occur in the same area and that form a distinct ecological unit.

Pool/Riffle Ratio
The ratio of pools to riffles, expressed as a percentage, used to describe fish habitat rearing quality.

Population.
All interbreeding individuals of a given species living in a particular area.

Population Viability.
The degree to which a population can maintain itself over time; population viability analysis is the process by which this is estimated See also Viable Population.

Precommerical Thinning.
The selective felling or removal of trees in a young stand, conducted to accelerate diameter growth on remaining trees, maintain a specific stocking density, and improve vigor and quality of remaining trees; conducted at an age before the trees are commercially merchantable.

Prescribed Fire
Intentional application of fire, of either planned or unplanned ignitions, to accomplish certain planned objectives.

Prescription.
Management practices selected and scheduled for application on a specific area to attain goals and objectives.

Present Net Value (PNV)
The difference between discounted benefits and discounted costs

Presuppression.
Activities conducted in advance of fire occurrence to insure effective suppression.

Primitive Recreation Opportunities.
See Recreation Opportunity Spectrum

Programmed Harvest.
Timber scheduled for harvest for a specific time period

Public Issue.
See Issues, Concerns, and Opportunities

Purchaser Road Credit
Dollar credits earned by a timber purchaser for constructing or reconstructing roads needed for removal of timber included in a timber sale contract Credits are applied toward the purchase price of the timber

R

Ranger District (R.D.).
Administrative subdivision of the Forest, supervised by a District Ranger who reports to the Forest Supervisor

Rare
Plant or animal species which are uncommon in a specific area. All endangered, threatened, and sensitive species can be considered rare, but the converse is not true.

Rearing Habitat
The river or stream areas where juvenile salmonids must find food and shelter to survive for a period of time

Reconstruction.
Activities performed on an existing road or other facility to restore it to a specified standard.

Recreation Capacity.
The number of peple that can take advantage of the supply of a recreation opportunity during an established use period without substantially diminishing the quality of the recreation experience or the resources.

Recreation Inventory Management (RIM)
The Forest Service system for recording the condition of recreation facilities and use

Recreation Opportunity Spectrum (ROS)
Land delineations that identify possible combinations of recreation activities, settings, and experience opportunities, from Primitive to Urban, arranged along a continuum Classes used herein are:

Primitive - Area is characterized by essentially unmodified natural environment of a size or location that provides the opportunity for isolation from sights and sounds of people. Motorized use within the area is normally not permitted.

Semi-primitive Non-motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people. Motorized use is not normally permitted.

Semi-primitive Motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people except for facilities essential for the use of motorized equipment Motorized use is permitted Limited primitive road construction to enhance recreation opportunity is permissible

Roaded Natural - Area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of people Conventional motorized use is provided for in construction standards and design of facilities.

Rural - Area is characterized by substantially modified natural environment. Facilities for intensified motorized use are available.

Recreation Visitor Day (RVD).
A unit for measuring recreation activities. One unit equals 12 visitor hours and may consist of one person for 12 hours, or 12 persons for one hour, or any equivalent combination

Recreation River
See Wild, Scenic and Recreation Rivers.

Redd
Nest in gravel of stream bottom where fish deposit eggs; herein, refers to salmon spawning redds

Reforestation.
The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding The work is done on National Forests to produce timber and other forest products, protect watershed functioning, prevent erosion, and improve other social and economic values of the forests, such as wildlife, recreation, and natural beauty

Regeneration.
The renewal of a tree crop, whether by natural or artificial means Also the young tree crop (seedlings and saplings) itself

Release
All work done to free desirable trees from competition with other less desirable vegetation

Research Natural Area (RNA)
An area representing the major natural timber types or other plant communities in unmodified condition (FSM 4060). A natural plant community established for research and study of ecosystem and their changes.

Residue (Timber)
The portions of trees left in the forest during timber harvest, i.e., tops, limbs, chunks and other material not usable for manufacturing into timber products.

Resource Allocation.
Designation of specific parcels of land for the production of certain resources; the resources derived may be commodities, amenities, or a combination of each. See Land Allocation

Riparian Areas.
Terrestrial areas where the vegetation and microclimate are influenced by perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics; this habitat is transitional between true bottom land wetlands and upland terrestrial habitats and, while associated with water courses, may extend inland for considerable distance.

Riparian Ecosystems
See Riparian Areas.

Riparian Habitat.
See Riparian Areas.

Riparian Prescription.
As used in this document, a method to provide flexibility for retaining shade, large organic debris, and other inherent features in the riparian areas for long-term input to stream systems Three options are identified (B, C, and M Prescriptions) for management of the riparian vegetation in areas suitable for timber management; they differ in the amount of vegetation that must be retained after management activities

Risk
Different possible outcomes, where a probability can be assigned to each outcome with a degree of accuracy

River Corridor.
A strip of land, ridge top-to-ridge top, which is seen or potentially seen from a river

Road Corridor.
A strip of land between two points used by a road, or some future road whose exact location remains to be determined; usually with an indefinite width

Roadless Area Review and Evaluation II (RARE II)
A comprehensive process (the second) instituted in 1977 to identify roadless and undeveloped land areas containing 5,000 acres or more in the National Forest System for the purpose of determining which of the inventoried areas should be recommended to Congress for inclusion in the National Wilderness Preservation System, which areas should be managed for nonwilderness uses, and which areas required further planning before a reasonable decision on them could be made. This assessment was documented through an FEIS.

Roaded Natural
See Recreation Opportunity Spectrum

Rotation
The planned number of years required to establish (including the regeneration period) and grow timber crops to a specified condition or maturity for regeneration harvest. Selected management prescriptions in the Forest Plan provide the basis for the rotation age

S

Salable Minerals.
Mineral deposits outside the scope of the General Mining Law because of widespread occurrence and "common" nature (disposal under the Materials Act of 1947, as amended)

Salmonid.
Member of the fish family *salmonidae*; includes salmon and trout

Sale Schedule
The quantity of timber planned for sale by time period from the area of suitable land covered by a Forest Plan The first period, usually a decade, of the selected sale schedule provides the allowable sale quantity. Future periods are shown to establish that long-term sustained yield will be achieved and maintained.

Salvage
Removal of recently-dead or dying trees to minimize the loss of wood products.

Sawtimber.
Trees that are nine inch Diameter at Breast Height (DBH) or larger and can be made into timber

Scenic Easement
An interest in the land which allows the holder specified uses or rights without ownership of the land In this case, control of the use of land adjacent to public highways, parks, and rivers. It may provide something attractive to look at within the easement area, an open area to look through to see something attractive beyond the easement itself, or a screen to block out an unsightly view beyond the easement area.

Scenic River
See Wild, Scenic and Recreation Rivers

Scoping
The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action, i e , the range of actions, alternatives, and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

Second Growth (Young Growth)
Timber stands established after natural or human-caused removal of the original stand or previous forest growth

Seed Tree.
A tree selected, and often reserved for seed collection

Seed Tree Cutting.
Similar to clearcutting, except that a few of the better trees of the desired species are left scattered over the area to provide seed for regeneration.

Seedlings and Saplings
See Tentatively Suitable Forest Land.

Selection Cutting
The annual or periodic removal of trees, individually or in small groups, from an uneven-aged forest in order to realize yield and establish a new stand of irregular constitution.

Semi-primitive Motorized.
See Recreation Opportunity Spectrum.

Semi-primitive Non-motorized.
See Recreation Opportunity Spectrum

Sensitive Species
Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution

Separate Suitability Component (SSC).
See Tentatively Suitable Forest Land

Seral Stage
A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage)

Serpentine.
A mineral or rock (serpentinite) consisting essentially of a hydrous magnesium silicate usually having a dull green color and often a mottled appearance Term sometimes used with soil, to indicate environmental conditions found on soils derived from serpentinite or peridotite See Ultramafic

Shelterwood Cutting.
A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings

Significant.
As used in NEPA, requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality. Intensity refers to the severity of impacts (40 CFR 1508 27)

Silviculture
The art and science of growing and tending forest vegetation, i.e., controlling the establishment, composition, and growth of forests, for specific management goals

Silvicultural System.
A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration, and according to the type of forest thereby produced

Site Preparation
Removal of unwanted vegetation, slash, roots, and stones from a site before reforestation

Slash.
Woody material left after logging, pruning, thinning, brush cutting, or other management activities and/or accumulating there as a result of storm, fire, or other damage

Smolt.
Juvenile salmon or steelhead which are ready to leave freshwater for the ocean. They mature in the ocean before returning as adults to rivers and streams to spawn.

Smolt Habitat Capability Index.
An indicator of the quality of rearing habitat for young salmon or steelhead (smolt). It assumes that spawning gravels are adequate to provide sufficient spawning areas to fully seed the existing rearing habitat and that sufficient numbers of adults will escape past fishermen, dams, or natural mortality to return and fully seed the spawning gravels. It is expressed as the number of smolt which could be produced, estimating potential rather than actual production.

Snag.
A standing dead tree.

Spatial.
Referring to the distance, interval, or area between or within things.

Special Use Permit.
A permit issued to an individual, organization, or company for use of National Forest Land for some specified purpose

Species.
Organisms that successfully reproduce among themselves and cannot reproduce successfully with other organisms.

Species Diversity
The distribution and abundance of different plant and animal communities and species

Spotted Owl Habitat Area (SOHA).
A habitat area designated to support one owl pair

Spotted Owl Management Area (SOMA).
A habitat area designated to support more than one owl pair. An outdated phrase, see Spotted Owl Habitat Area.

Stand.
A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and so form a silvicultural or management entity

Standard.
A principle requiring a specific level of attainment; a rule to measure against

Steelhead
A large-sized, silvery anadromous rainbow trout

Stocking.
The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing, compared with a stocking standard; that is, the basal area and/or number of trees required to fully utilize the land's growth potential

Strategic Minerals.
Any mineral neither found or produced in the United States in sufficient quantities to sustain the Nation during a period in which the security and/or economy of the country is threatened by a foreign power.

Stream Class
The classification of streams according to their beneficial uses. Whole streams or parts of streams can be classified. One stream may be divided into several classes.

Class I. Perennial or intermittent streams have one or more of the following characteristics. (1) Is the direct source of water for domestic use (cities, recreation sites, etc.); (2) Are used by large numbers of fish for spawning, rearing, or migration; (3) Flow enough water to have a major influence on water quality of a Class I stream.

Class II. Perennial or intermittent streams have one or both of the following characteristics: (1) Are used by moderate though significant numbers of fish for spawning, rearing, or migration; (2) Flow enough water to have a moderate influence on downstream quality of a Class I or II stream.

Class III All other perennial streams not meeting Class I or Class II definitions.

Class IV. All other intermittent streams not meeting Class I, II, or III definitions.

Streamside Management Unit (SMU).
The stream and an adjacent area of varying width where practices that might affect water quality, fish, and other resources are modified, as necessary, to meet management goals for each class of stream.

Stumpage.
Standing timber or its value.

Successional Stage
A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax

Suitable Forest Land
Land to be managed for timber production on a regulated basis Also, see Tentatively Suitable Forest Land.

Suppression Strategy.
The broad application of plans and tactics to a specific fire situation; basic strategies include confine, contain, and control.

Sustained Yield
The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System, without impairment of the productivity of the land.

T

Talus
The loose accumulation of fragmented rock material on slopes, especially at the base of a cliff.

Temporal.
Referring to time.

Tentatively Suitable Forest Land.
Forest land that is producing or is capable of producing crops of industrial wood and: (a) has not been withdrawn by Congress, the Secretary, or the Chief; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity, or watershed conditions; (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities

Mature - In the context of timber -- trees or stands that have reached rotation age, generally around 100 years. In the context of wildlife -- Mature forest habitat with characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally occurs around age 100) With regard to land type -- Lands with 100-year-old, or older, timber stands available for harvest cutting.

Immature-Small Timber - With regard to land type -- Lands with well stocked timber stands less than rotation age that are suitable for commercial thinning in the next two decades.

Immature-Poles - With regard to land type -- Lands with timber stands less than rotation age that do not have excess stocking available for commercial thinning

Seedlings and Saplings - With regard to land type -- Lands with non-commercial-size young stands, generally plantations.

Hardwoods - With regard to land type -- Lands occupied by hardwood stands with less than 10 MBF per acre stocking of conifer timber.

Separate Suitability Component (SSC) - Lands with timber production potential less than 20 cubic feet per acre per year. The vegetation on these lands was not inventoried in the 1979 timber inventory (they were arbitrarily considered noncommercial at that time).

Terrestrial.
Living on land. distinguished from aquatic (living in water)

Thermal Cover.
Vegetation used by animals to modify the adverse effects of weather. A forest stand that is at least 40 feet in height with tree canopy cover of at least 70 percent These stand conditions are achieved in closed sapling-pole stands and by all older stands unless the canopy cover is reduced below 70 percent. Deciduous stands may serve as thermal cover in summer, but not in winter.

Threatened Species
Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range

Timber Site Index
A measure of site productivity based on the maximum rate of tree height growth It is normally expressed as the height in feet reached by a tree at a given or base age (the site index)

Timber Stand Improvement (TSI).
Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, etc , of unwanted trees with the objective of improving growing conditions of the remaining trees

Tolerance
The forestry term for expressing the relative capacity of a tree to compete under low light and high root competition·

Tolerant Trees - Trees which reproduce and form understories beneath canopies of less tolerant trees or even beneath shade of their own species

Intolerant Trees - Trees which reproduce successfully only in the open or where the canopy is greatly broken.

Total Resource Information (TRI) System
A natural resource data base used on National Forests in the Pacific Northwest Region This multimedia information system was established to provide storage and retrieval of large volumes of in-place resource data

Transportation Corridor
As used in this document, a strip of land of variable width designated to accommodate the clearing and access control of a State or Federal Highway.

Tradeoff.
Foregoing certain options in the decision process to take advantage of others

Travel Corridor.
A road, trail, or waterway used by people; or a strip of land used by wildlife

TRI Compartment.
An area identified on an orthophoto map for indexing and storing data locations Each compartment has a unique name and number.

Turbidity.
The optical property of water as affected by suspension of material such as sediment, i.e , the muddy or cloudy state of water.

U

Ultramafic
Intrusive rocks composed chiefly of mafic minerals such as olivine, pyroxene, and serpentine Also called ultrabasic. See Peridotite and Serpentine

Unavailable Forest Land
Lands which have been legislatively or administratively withdrawn from timber production by law, the Secretary of Agriculture, or the Chief of the Forest Service.

Understory
Vegetation (trees or shrubs) growing under the canopy formed by taller trees

Uneven-age Management.
The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and development

of trees through a range of diameter or age classes to provide a sustained yield of forest products Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes Cutting methods that develop and maintain uneven-aged stands are single-tree and group selection

Unsuitable Land
Forest land withdrawn from timber utilization by statute or administrative regulation, or identified as not appropriate for timber production in the Forest planning process, i e , irreversible soil loss and nonreforestable within five years.

V

Viability.
Capable of living, growing, and developing

Viable Population.
A *population of plants or animals large enough and distributed in such a way as to ensure their* continued existence over a specified period of time, usually on the order of decades to centuries

Viewshed.
A total landscape seen or potentially seen from specific points on a logical part of a travel route or water body.

Visual Corridor.
A series of viewsheds identified for special attention under visual quality management

Visual Resource.
The composite of basic physiographic features and patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors

Visual Quality Objective (VQO)
Measurable standards for visual resource management based on the acceptable degree of alteration of the characteristic landscape The VQO's and their definitions are·

Preservation. Provides for ecological changes only.

Retention Activities are not evident to the casual forest visitor

Partial Retention Activities may be evident but must remain subordinate to the characteristic landscape.

Modification. Activities may dominate, but must utilize naturally-established form, color, and texture. These areas should appear natural when viewed in foreground or middleground situations

Maximum Modification Activities may dominate, but should appear as a natural occurrence in background situations

W

Watershed.
The land area drained by a river system.

Wetlands.
Areas that are inundated by surface or ground water with a frequency sufficient to support, and that, under normal circumstances, do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction Wetlands

generally include swamps, marshes, bogs, wet meadows, river overflows, mud flats and natural ponds

Wild, Scenic, and Recreation Rivers.
Rivers or river segments which have been designated as part of the National Wild and Scenic Rivers System (Public Law 90-542, 1968) Criteria for classification are as follows:

Wild Rivers - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America

Scenic Rivers - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreation Rivers - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past

Wilderness.
All lands included in the National Wilderness Preservation System by public law; generally defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation

Wilderness Recreation Spectrum (WRS).
A further refinement of the *primitive* portion of the Recreation Opportunity Spectrum The following terms deal only with officially designated wilderness

Pristine - The most remote; generally the core area which is least accessible. The area is characterized by no trails. A *most outstanding* opportunity exists for isolation and solitude free from evidence of past human activity.

Primitive - The sights, sounds, and smells relating to human activities outside the wilderness are essentially nonexistent. The area is generally accessible by trail An *extremely high opportunity* exists for exploring and experiencing considerable isolation, tranquility and self-reliance

Semi-primitive - The least remote; generally areas nearest trailheads and major access points or the wilderness periphery. Opportunities for a wilderness-related experience are only *moderate*.

Wildlife Tree.
A snag or a live tree designated for wildlife habitat.

Wild River.
See Wild, Scenic, and Recreation Rivers.

Winter Range.
An area used by deer and elk during the winter months; usually at lower elevation and/or south and west exposures

Withdrawn
Land areas where certain uses are excluded

Y

Yield Table
A table of timber volumes expected to be produced under a specified set of conditions.

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United States
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Forest Service

**Pacific
Northwest
Region**

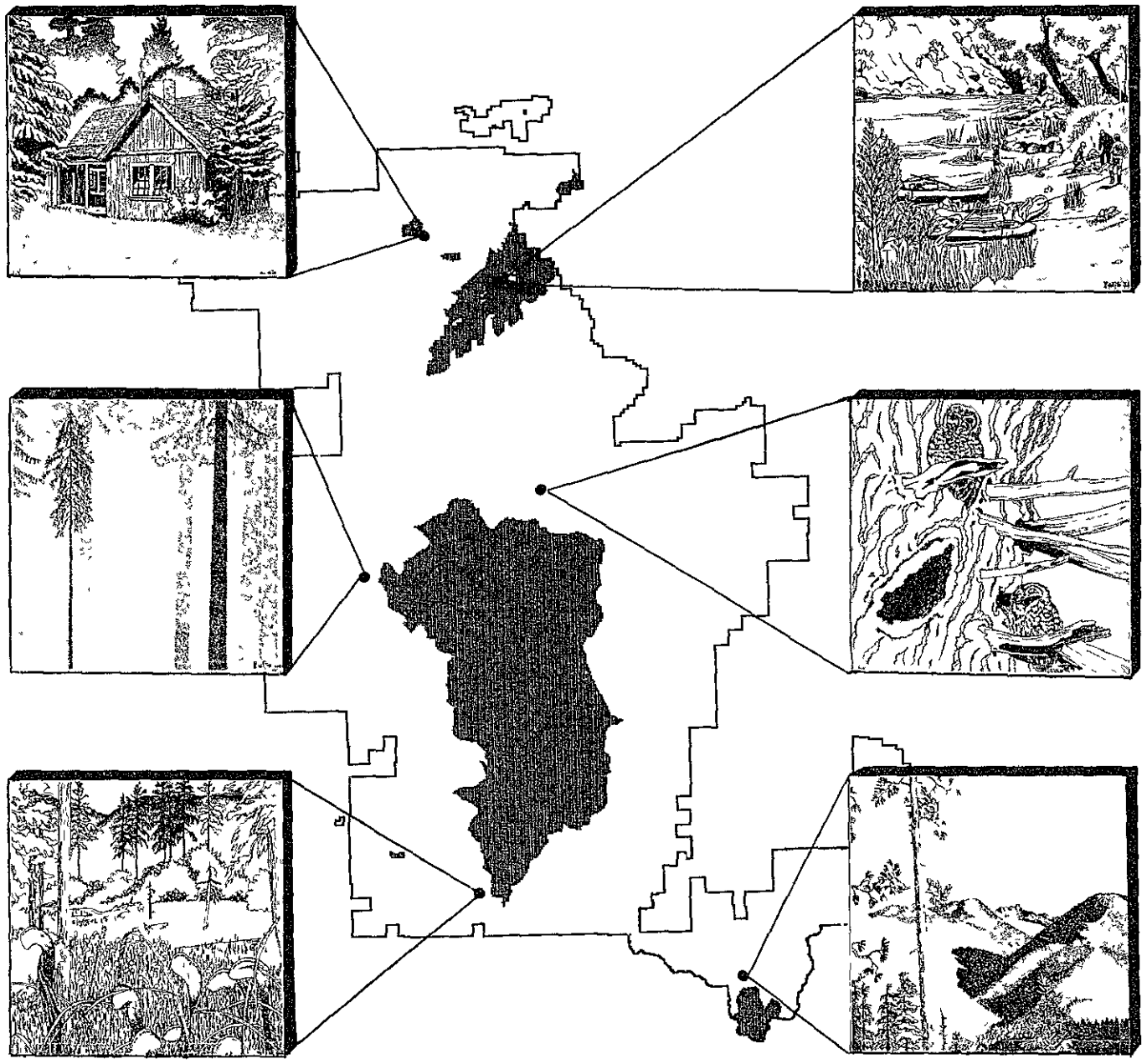
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Appendices – Volume I

Final Environmental Impact Statement

Land and Resource Management Plan

Siskiyou National Forest



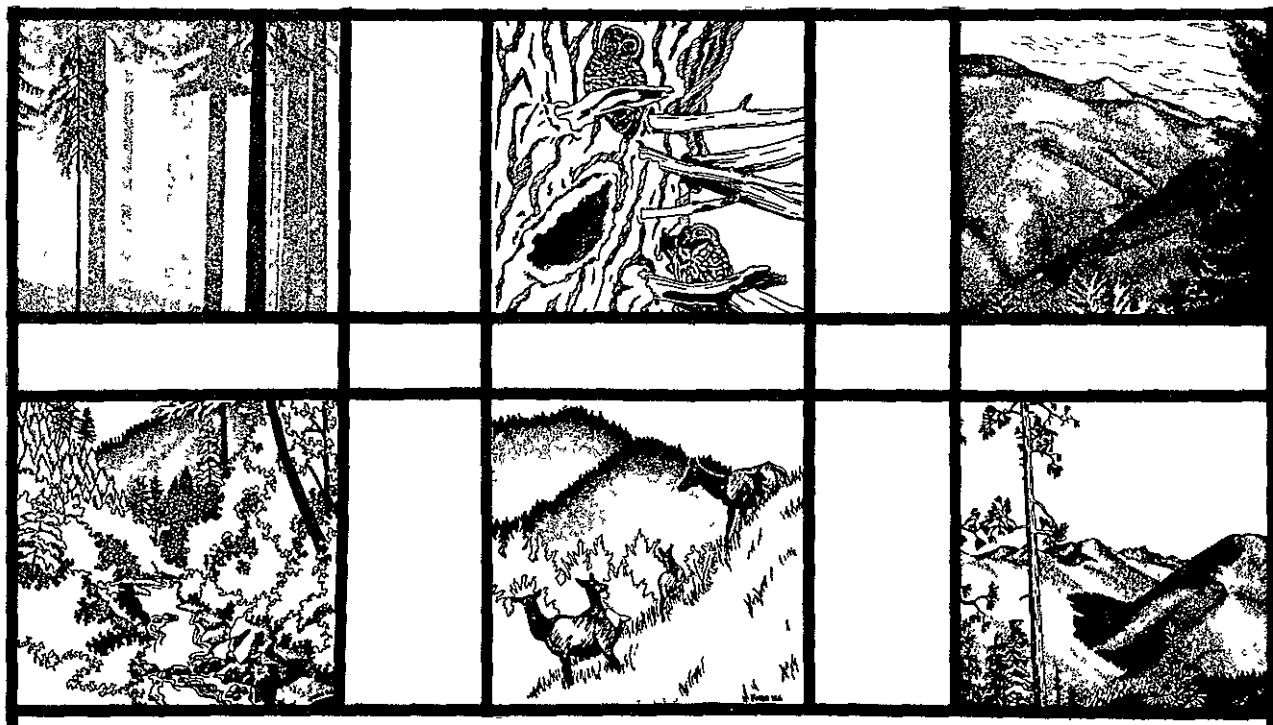
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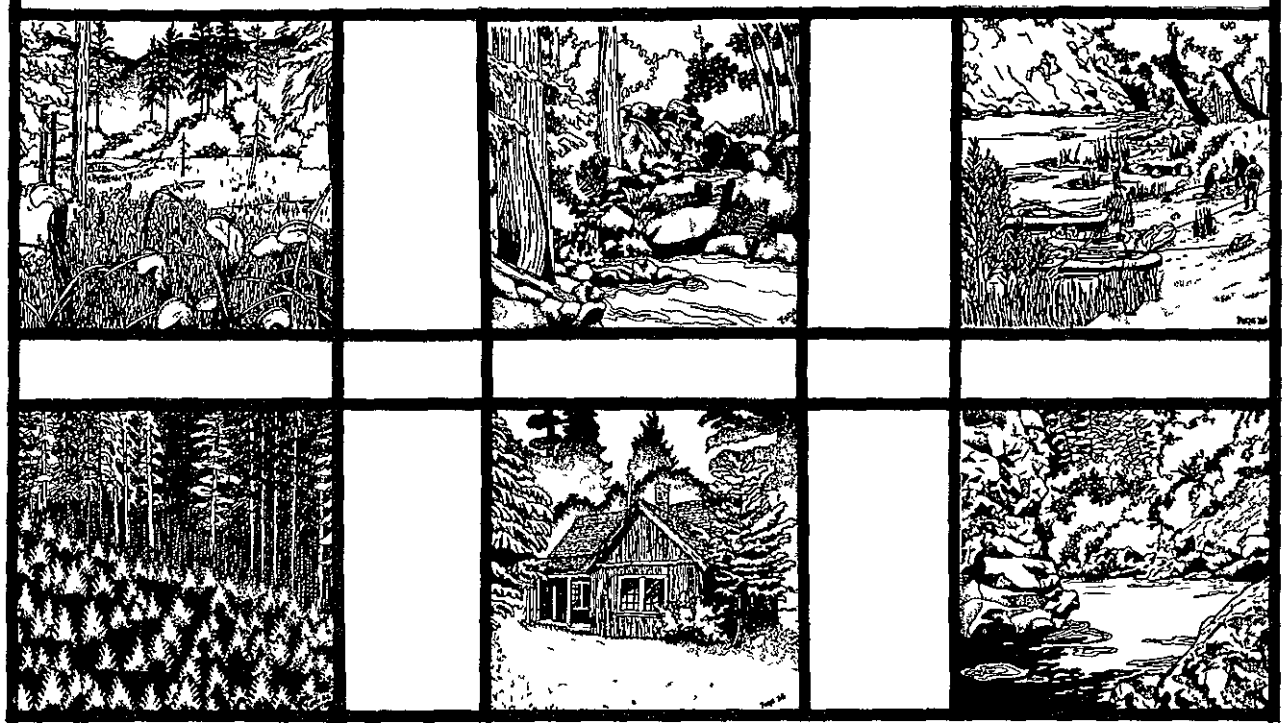
APPENDIX A

ISSUES, CONCERNS, AND OPPORTUNITIES AND PLANNING PROBLEM DEVELOPMENT



APPENDIX A

ISSUES, CONCERNS, AND OPPORTUNITIES AND PLANNING PROBLEM DEVELOPMENT



APPENDIX A

ISSUES, CONCERNS, AND OPPORTUNITIES WITH PLANNING PROBLEM DEVELOPMENT

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INTRODUCTION

This appendix discusses the. (1) process used to identify the issues, concerns, and opportunities (ICO's); (2) list of ICO's identified; (3) development of the Planning Problems addressed in the Draft Environmental Impact Statement (DEIS) which are carried forward into the Final Environmental Impact Statement (FEIS); (4) Forest's ability to resolve the Planning Problems including the indicators used to measure resolution, and (5) the consultation with other agencies, groups, and individuals

The different preferences of individuals and groups, and the physical, biological, and legal limits of Forest management are present in the **issues** and **concerns** which guide the Forest planning process. Resource use and development **opportunities** are the basis of many of the issues and concerns identified. The opportunities to preserve or use the resources of the National Forest are the focus of many of the Agency's programs, and are the principal focus of the management alternatives presented in the FEIS.

The ICO's have been further analyzed and grouped or restated in the Planning Problems, posed as questions relating to resource outputs or conditions that can be used to guide the development and evaluation of alternatives The Forest's ability to resolve the Planning Problems depends on the relationships of the outputs and conditions and responses to various management options Measurable outputs or conditions have been identified for use as key indicators of the Forest's potential, and of the degree of problem resolution under each alternative.

Appendix A reviews the development of ICO's and Planning Problems up to the time the DEIS was released (August, 1987). Any changes to the aspects of certain ICO's or Planning Problems as a result of the public response to the DEIS, Congressional Acts, or other reasons are discussed in Chapter I of the FEIS

IDENTIFICATION PROCESS

The information needed to identify the ICO's was collected and refined throughout the entire planning effort. The process started in the spring of 1979 when a list of potential ICO's was developed from previous public comments on Forest management problems. Several meetings with Forest Service employees and the public contributed to the further development of these ICO's. These meetings took place in various Oregon communities On January 15, 1980, the ICO's were published as a Forest Plan Report and sent to a wide variety of interested citizens and groups; and state, county, and Federal agencies in Oregon and California.

Following the distribution of this list of ICO's, additional meetings were held and contacts made to allow for review and discussion Using all of the information gathered, the ICO's were modified and semi-finalized in June 1980. Starting with this tentative list, all of the potential ICO's and modifications were screened to determine their appropriateness during the Forest planning process The following criteria was used in this screening:

1 Is the potential ICO within the authority of the Forest Service to resolve, or does it belong to another agency?

2. Is the potential ICO covered by laws and regulations which block Forest Service action?

3. Is the potential ICO of such a nature that changing Forest Service Management Direction will affect it?

4. Is the potential ICO of a nature that it should be addressed in a separate Environmental Impact Statement (EIS) or Environmental Assessment (EA)?

5 Is the potential ICO of a short-term nature that will be resolved through normal management and, therefore, does not need to be addressed in the Forest planning process?

On December 1, 1980, a slightly modified list of ICO's was adopted for Forest planning purposes and released to the public

The ICO's have changed somewhat with time. As new events occurred and local, regional, and National goals and policies changed, the ICO's were modified accordingly This confirmation was essential in order to keep the lengthy planning process updated and the analysis tracking with current conditions and views.

Following the pause in Forest planning, the ICO's were reanalyzed in October 1983 Two new issues were subsequently added One is the issue concerning Wilderness and the management of unroaded areas which resurfaced following the Court decision that the RARE II analysis was inadequate. The other deals with the conversion of hardwood stands to conifers which received more attention due to the energy shortage and recognition of the potential to utilize the hardwood volume under future markets and technology. Only minor revision and editing has occurred since that time.

The ICO's for Forest planning were ratified again through extensive public comment received after publication of the DEIS and proposed Forest plan. The Forest received a total of 16,983 responses (with 17,277 signatures) during the 150-day review period The normal 90-day public review period was extended twice, the first time was related to the impacts of the fires on the Forest's ability to meet with all the public The second extension came in response to local officials' requests.

Several issues or aspects of ICO's received fresh emphasis after the issuance of the DEIS in 1987 as described in Chapter I of the FEIS Numerous meetings with interested agency officials, groups and individuals since that point have continued to clarify ICO's Appendix K describes the public involvement process between the DEIS and FEIS; it also displays public comments received and responses to the comments

ISSUES, CONCERNS, AND OPPORTUNITIES

PUBLIC ISSUES

TIMBER MANAGEMENT

The **issues** of widespread public interest related to management of the Siskiyou National Forest include the following:

1. How should the Forest manage its timber lands? Should current management practices be intensified, relaxed, or maintained?

Many individuals and several interest groups feel that the Forest has an obligation to sustain regional and local economies by.

1. maintaining or increasing annual Forest timber harvests;

2. conserving the forest land base suitable for the production of timber, and

3. using intensive timber management practices to maximize timber yields.

Conversely, there are concerns about the potential effects of intensive timber management on other resources and the ability of the Forest to maintain plant and animal species diversity, reforest harvested areas, and reach predicted timber harvest levels in the future. To benefit wildlife and recreation, many feel

that the Forest should reduce the amount of timber harvested each year and thereby reduce the rate of forest change

Associated concerns are (1) that lands with relatively low productivity should not be included in the land base suitable for the production of timber, and (2) that economic criteria and analysis should be incorporated in the evaluation of timber harvest and other management options.

The economic feasibility of using optimum silvicultural methods and requiring superior logging systems has also been questioned.

USE OF HERBICIDES ON FOREST LANDS

2. Should herbicides continue to be used on the Siskiyou National Forest?

Some people are concerned about the entry of herbicides into the forest environment and potential effects on human health. There is demand for consideration of alternative methods of vegetation management There are also potential social and economic impacts to consider that would result from possible reductions in yields in the absence of herbicide use. The debate includes numerous other variables which are addressed in Regional and Forest vegetation management program documents

OLD-GROWTH FOREST

3. How much old-growth acreage should be preserved?

Controversy over harvesting old-growth trees has risen sharply over the last few years. The reduction in old-growth acreage affects the suitable habitat for old-growth-dependent wildlife and plant species, opportunities for recreational enjoyment, and the ecological diversity associated with old-growth stands.

Protecting old-growth would reduce the volume available for timber harvest. There is also concern that potential volume production is lost due to slow growth or decay and mortality in the mature or old-growth stands. Some people suggest that these stands should be regenerated at an even faster rate to avoid these losses

RESIDUE MANAGEMENT

4. What are the acceptable limits of residue abatement? What are the methods of disposal of timber harvest residues to meet these limits economically, without damaging other resources or exceeding air and water quality constraints?

The large amount of residue remaining after timber harvest has many potential uses. Many people prefer to more fully utilize this material through providing firewood or other products. Disposal of these harvest residues can impact other resources and affect land productivity.

Some people feel that the hazard of a catastrophic fire may be greatly increased if forest managers do not sufficiently treat residues because of difficulties in complying with economic and environmental guidelines. Others believe that the risks associated with the activity fuels do not pose as serious a risk in many instances as has been suggested.

DEPARTURE FROM NONDECLINING FLOW

5. Should the Siskiyou National Forest depart from a nondeclining flow harvest schedule? If so, how much, and what would be the effects of such a departure on Forest resources and on local communities now and in the future?

State and local industry projections indicate approximately a two decade period when harvestable timber volume available on private forest lands will be at a low level. Departure on Federal land has been suggested as a means to fill this void. Secondly, departure could be used to maintain historic Forest harvest levels for the next two decades, even though additions to the Wilderness System within the last ten years have reduced the land base available for timber management (departure could be used similarly for alternatives that allocate additional land to other uses). There is also the opportunity to increase the level of timber production by regenerating the mature stands at a faster rate

Departing from nondeclining flow would set up an inevitable decline in harvest levels in the future. Many feel that the Forest should not be managed to provide present benefits at the expense of the future. There is also concern that second growth stands will not be available for harvest as early as projected and the falldown in the future could be greater than expected. Some also feel that accelerating the harvest schedule by departure would increase the risk of adverse environmental impacts

WILDLIFE HABITAT

6. The issue of management of wildlife habitat on the Siskiyou National Forest is two-fold: (1) How to preserve and manage a diversity of wildlife habitats to maintain self-sustaining populations of all native animal species (endangered, threatened, or sensitive species being especially important); and, (2) How to manage big-game habitat to provide quality experiences for an increasing number of big-game hunters.

There is particular concern for species, such as the spotted owl, which are dependent on specific seral stages Management of lands for timber production has the potential to reduce some seral stages or create an imbalance of habitats that would be detrimental to some species. There is also concern for species with specific habitat requirements such as snags, meadows, and rock cliffs or talus

There is also interest in providing habitat for big game species to support populations capable of supplying the demand for hunting opportunities. Considerations are for maintaining a balance of forage and cover habitats through time as various management activities are carried out.

SOILS

7. What are the potential impacts of management activities on Forest soils?

The soils on the Siskiyou National Forest are developed from complex geologic material of the Klamath Mountain and Coast Range Provinces Many highly unstable geologic formations and steep, rugged topography typifies this mountainous area. Management activities can affect soils through compaction, displacement, disruption of nutrient cycles, movement of unstable or high rock fragment soils, reduction of organic matter, and increased erosion and sedimentation

A considerable portion of the timber land base has been classified as unsuitable due to extremes of the above conditions. Intensive inventory and evaluation by specialists in project activity and application of numerous Best Management Practices (BMP's), accompanied by various constraints in planning, layout, and design, have added to the cost of managing these sensitive lands.

WILD AND SCENIC RIVERS

8. How can conflicts between users on the Rogue and Illinois Wild and Scenic Rivers be minimized? Should the inventoried Chetco and North Fork Smith rivers be recommended for additions to the National Wild and Scenic River System?

The Wild and Scenic Rivers Act sets management direction and may limit some previously unregulated uses. Concerns of users include (1) the levels of recreation use; (2) the allocations of use; (3) power boats

in the "Wild" segment, (4) need for use regulations on other segments, (5) allocation of viewsheds outside the corridor to meet Visual Quality Objectives; and (6) management of the tributary watersheds to meet water quality standards.

The second part of this issue deals with the two inventoried rivers in the extreme southwestern part of Oregon. The North Fork Smith River is a Wild and Scenic River in California; but upriver, the Siskiyou National Forest segment of this river has not been designated The Chetco River is also included in the Nationwide River Inventory Both rivers require a suitability evaluation to determine whether they should be recommended for addition to the National Wild and Scenic River System.

SENSITIVE PLANTS

9. How can the habitat of sensitive plants be protected from damage or loss resulting from management activities, such as timber harvest and road building?

The unique geologic and climatic history of the Siskiyou Mountains of southwest Oregon and northwest California has resulted in the evolution of a number of unusual plants, either not found elsewhere or occurring here at the limits of their range. Many sensitive plants occur within the Siskiyou National Forest boundary. The range of some of these plants lies almost entirely within the Forest. Many of these plants occupy fragile ecosystems which may not be restorable once altered by Forest activities.

FISHERIES

10. How can the Forest prevent or minimize fish habitat degradation resulting from management activities and maintain or improve current fish production levels?

Fish habitat on the Siskiyou supports one of the most economically valuable fisheries in the United States. Segments of the public, including sport and commercial fishermen, are worried that spawning, rearing, and migration habitat is being adversely affected by timber harvest and road building, and fear that fish production from the Forest will decline as a result of these activities.

VISUAL RESOURCES

11. How should Forest scenic values be protected, and to what degree? What costs and impacts to other Forest management activities are acceptable to protect these values?

As timber harvest and road construction activities enter new areas, changes in the scenic resource become more apparent. The visual resource management issue revolves around the degree of protection scenic values should be given and the costs and impacts of visual resource management on other Forest activities, in particular, reductions in the annual timber harvest and associated costs of implementing visual management activities.

ROADS

12. There is little public understanding and support of road management objectives of the Forest road system, the economic rationale behind Forest road construction, and the diversity of road standards and the purposes of each.

The array of road management objectives may be confusing to the public. Some users see all roads leading to, or within, the Forest as "forest roads" available for their use at their convenience. The differences in standards of width, surfacing, grades, safety, and comfort are confusing. Road closures may protect one resource, while conflicting with or restricting use of another. Logging traffic may create hazards for recreation traffic, and vice versa. The economics of road construction often appear unreasonable. Some

road users see the standards of the roads as either too high or not sophisticated enough for their particular purposes

As management of the road system is intensified and some roads are closed to meet specific objectives or reduce maintenance costs, public concern will increase.

MINERALS

13. How should Forest lands with mineral potential be allocated? How should the environmental impacts of mining on other Forest resources be mitigated?

Utilization of mineral resources is increasing in importance. The issue raised by the mining industry is the allocation of lands with mineral potential to uses which prohibit or severely limit mining They also fear environmental constraints imposed by work and restoration plans.

To other segments of the public, the environmental impact associated with mineral extraction, processing, and reclamation is the issue. Some groups are apprehensive about the potential social change in communities as the mining industry grows, and of the potential for degradation of air and water quality.

RECREATION

14. How should the Forest provide a wide spectrum of recreation opportunities ranging from developed facilities to primitive experiences?

The public is concerned about the impacts of other management activities on recreational opportunities. There is particular interest in maintaining, restoring, and expanding the trail system; this includes both day-loop trails close to population centers, and trails with more primitive settings in the Wilderness or unroaded areas.

Availability of land contributing to the primitive spectrum of recreation experience is limited in Oregon While the Forest has a sizeable block of land offering a very primitive experience, some of this area is subject to change from timber harvest and roading activity Concern has been expressed as to the uniqueness of this type of remote experience and the essentially irreversible nature of the decision once development has occurred.

WATER

15. How should the Forest maintain a sufficient quantity of clean, cool water for domestic use and fish needs?

The development, management, and use of other resources may degrade water quality through increased siltation, water temperature, and potential for other pollutants Activities with site disturbance have the potential to adversely affect water quality.

Forest management practices can also affect the quantity and timing of water leaving the Forest through alterations in vegetative cover and subsequent changes in ground water recharge and release. Some people dependent on water supply or residing within floodplains affected by upslope activities are concerned about both flow being diminished during critical low flow periods and the potential for increased flooding during winter storms.

WILDERNESS AND UNROADED AREAS

16. How much Wilderness should be preserved on the Siskiyou? What should be the degree of development (such as trails and campsites), and how should wilderness values be protected? How

should the presently unroaded areas outside of the Wildernesses be managed; how much and which parts of these areas should be developed for timber or mineral production?

Some people feel that additions should be made to the existing Wilderness System Even though the Oregon and California Wilderness Acts of 1984 preclude designation of additional Wilderness during this planning period, the issue still remains as to the appropriate management direction for the unroaded areas. Many people feel that all or part of the areas should be allocated to uses that would preclude development, thus preserving their primitive nature Others are concerned with the effects that such designations might have on the Forest's ability to provide other resources and sustain timber harvest levels.

The public also wants the Forest Plan to address management of the existing Wildernesses. There is concern for the management of recreation opportunities through trail construction and reconstruction. Concerns over the role of fire in these protected ecosystems has also been expressed.

HARDWOOD CONVERSION

17. Should the Forest convert areas suitable for the production of timber that are currently occupied by hardwoods (primarily tanoak) to conifer production?

This issue has surfaced because many people are concerned with the amount of hardwood volume that is lost in the conversion process. They feel that this material could provide a useful product in the future, and that it is wasteful to convert the acres to conifer production Others disagree, feeling that the current and future economic benefits resulting from increased commercial conifer production are important enough to warrant conversion of these stands, even though much of the hardwood material may not be utilized

Many people are also concerned about the role of hardwoods in the ecosystem through providing vegetation diversity, wildlife habitat, and aesthetic variety. The value of these areas for wildlife has received increasingly more attention. There is also concern about soil and watershed impacts resulting from disposing of the heavy fuels created by the conversion projects.

MANAGEMENT CONCERNS

The identified management **concerns** are as follows·

1. Provide goods and services efficiently.

2 Produce a sustained timber and wood fiber output.

3. Manage and utilize range resources and improve range grazing.

4. Manage fire to improve and protect resources.

5. Protect resources from disease, pests, and similar threats. Of special concern is *Phytophthora lateralis* root rot in Port-Orford-cedar.

6. Enhance water quality and quantity, soil productivity, and restore watershed conditions where degradation has occurred

7 Adjust land ownership as needed to support resource management goals.

8. Provide a variety of recreation opportunities

9. Maintain or improve fish and wildlife habitat

10. Maintain or improve critical and essential habitats of endangered, threatened, or sensitive plant and animal species

11. Assess probabilities of mineral exploration and development for immediate and future needs, and consider nonrenewable resources in the management of renewable natural resources.

12. Construct, operate, and maintain transportation facilities in a cost effective way while minimizing impacts on other resources.

13 Identify, maintain, and enhance visual quality.

14 Require corridors, to the extent practicable, to minimize adverse impacts caused by the proliferation of separate rights-of-way.

15 Discover, manage, protect, and interpret cultural sites that are in, or may qualify for inclusion in, the National Register of Historic Places.

16. Identify typical examples of important botanical, aquatic, and geologic types; and protect them through establishment of special area designations or through management prescriptions, accompanied by standards and guidelines.

17. Provide for various Wilderness management options.

OPPORTUNITIES

The following resource use and development **opportunities** have also been identified.

1. The Forest has the ability to increase tree growth and harvest levels through intensive management and timber harvest scheduling

   Through intensive timber management, the Forest has the opportunity to improve visual quality in specific areas and improve habitat and distribution of some kinds of wildlife.

   Integrated pest management methods could be used to minimize the impact of dwarf mistletoe, root rot, and other diseases on trees, and thereby extend the available timber supply

2. Through the use of herbicides, the Forest could maintain and increase tree growth and harvest levels at least cost.

   Through development and use of other than chemical treatments in vegetation management, the Forest may be able to reduce herbicide use and create more employment where costs and effectiveness are comparable

3 Forest managers have the opportunity to maintain adequate habitat for old-growth-dependent wildlife and for recreational enjoyment of old-growth stands Opportunities exist for preservation of old-growth stands near roads for public enjoyment.

4. Forest residues which remain after harvesting and hardwood conversion projects may provide an energy source for either private or commercial use. Increasing firewood demands should improve utilization while reducing dependency on fossil fuel sources

   The use of advanced logging techniques, such as directional felling and lining of trees, is an opportunity to improve the utilization of the standing timber. Reductions in the amount of residue created and better utilization of that residue could result in less need to dispose of residues by burning, and consequently reduce air quality impacts

5. Increased timber harvests might simultaneously help supply the Nation and world market needs while increasing annual growth through conversions to managed stand conditions Increased timber harvest might increase local employment and improve local economic stability at a time when the timber supply from private lands is declining.

6. The opportunity exists to work more closely with the Oregon Department of Fish and Wildlife to improve management of fish and wildlife habitat on the Forest

   Management can increase opportunities for viewing wildlife through projects such as nature trails, habitat manipulation, and nest boxes.

   Within available budgets, maintenance and/or development of new improvements for wildlife habitat can be more actively pursued, including the following:

   a. Specific habitat improvement practices can be further evaluated and implemented, i.e., topping live wildlife trees to prevent blowdown, leaving some brush piles in areas where harvest residues are handpiled.

   b. With planning, maintaining or improving some wildlife habitat can be maintained or improved through timber harvest, reforestation, and hardwood conversion projects.

   c. Special areas can be managed for specific wildlife needs.

   d. Temporary or permanent road closures can be used to minimize wildlife disturbance by timber harvest, reforestation, and hardwood conversion projects.

   e With planning, future shortfalls of specific seral stages/habitat types, such as brushfields, can be avoided

   f. The opportunity exists to cooperate with Oregon Department of Fish and Wildlife and private landowners in managing elk habitat

   g Low intensity wildfires can be allowed to burn under controlled conditions in key wildlife habitat areas to increase grass, forb, and shrub production.

   h. Undisturbed areas can be connected by corridors of suitable habitat that is needed for species that are dependent on mature and old-growth timber

   i Range management and range rehabilitation practices can be implemented to better balance livestock-use and wildlife-use range areas

   j Habitat improvement projects can be implemented in Wildernesses providing they maintain the natural character of the area and meet Wilderness requirements

7 Fertilizers can be used to improve the nutrient status and productivity of soils. Additionally, nitrogen-fixing plants can be interplanted with timber species to increase site fertility.

Bare soil areas can be revegetated with native plant species to decrease erosion. Logging slash could be chipped and used as a soil mulch to cover bare soil areas

8. While river management opportunities are limited to those allowable under direction of the Wild and Scenic Rivers Act, management plans may establish varying degrees of protection and development based on special attributes of the area The Forest could nominate other rivers for possible addition to the National Wild and Scenic Rivers System

9 In cooperation with acknowledged scientific and research groups, a long-range plan can be developed to inventory endangered, threatened, and sensitive plants on Federal and state lists. On a continuing basis with the same groups, the Forest can assess the threats to endangered, threatened, or sensitive species in areas proposed for timber harvesting, other developments, chemical use, or mining.

The Forest can develop programs which inform the public about the values and needs of endangered, threatened, or sensitive plants. These plants can be further protected from collectors. In some cases, this may be accomplished by restricting vehicle access.

The Forest has the opportunity to identify critical areas of endangered, threatened, and sensitive plants, and set aside additional Botanical areas or Research Natural Areas for these species. Training of Forest personnel can aid in protecting these plants through being alert for certain indicator species and habitat types, and in prescribing appropriate measures to provide protection

10. Fisheries habitat enhancement opportunities involve: (1) supporting efforts to augment water supply during low flow periods; (2) managing further water withdrawal from Forest lands; and (3) removing or modifying existing stream crossings that obstruct upstream fish passage or have created unacceptable alterations of the riparian habitat

Habitat improvement opportunities exist for spawning, rearing, and migration.

Habitat assessment opportunities exist for (1) completion or updating of Forest stream surveys for determination of fishery potentials, and (2) working with state fish and wildlife agencies and local sportsmen during establishment of instream-flow needs for salmonid fish species and development of long-range fish habitat improvement plans.

11 The Forest can maintain and/or rehabilitate the scenery in selected areas. Visual impacts determined unacceptable can be rehabilitated to meet resource objectives

The opportunity exists to enhance landscapes, where warranted, by creating or retaining variety

12 Informing the public of Forest Service road management objectives and implementation can reduce user conflicts and gain an appreciation for the services provided by a well planned system

The Forest can identify, develop, and implement alternatives to minimize the need for construction of more roads by careful integration of logging and transportation systems.

13 Rehabilitation of mining areas for other resource purposes, such as wildlife and recreation, is an opportunity. Mining spoils can be used for road construction and maintenance needs. Administrative withdrawals can be actively pursued when needed to protect sensitive areas or resources.

14 More trails could be nominated to the National Recreation Trail System

More information on possible recreation opportunities can be made available through various means. A trail guide or directory could be provided. Self-guided tour routes, development of water-oriented recreation sites, and developing recreation facilities for the handicapped provide other avenues for dealing with increased recreation demands. Information can be coordinated with other state and Federal agencies Additional recreation sites can be developed

Trails within the Wildernesses can be proposed, many can be upgraded Local interest groups can be utilized in proposing trail projects and priorities Timber Sale Area Improvement funds can be used to relocate and rehabilitate trails impacted by harvest activities The trail system can be expanded, including day-use trails.

15. For improving the overall recreation industry, seek cooperative funding and development of facilities through local, state, and Federal initiatives

16. Increasing demand for clean water of sufficient quantities presents opportunities to

    a. Assess feasibility of developing upstream reservoirs to meet low-flow and temperature regulation demands

    b Increase efforts to stabilize and revegetate slides, eroding streambanks, and roads.

    c. Purchase older water rights to augment streamflow during low-flow periods

    d Develop guidelines to regulate the rate of cutting in a given watershed in order to reduce potential cumulative impacts on water quality and quantity.

    e. Develop water yield improvement goals for specific drainages to lessen impacts of water withdrawals on instream flows and aquatic life.

17. The continued support of research efforts, such as FIR, COPE, and university sponsored studies, should contribute to an increased understanding of terrestrial and aquatic processes and provide findings that can be applied to improving management practices.

18. Using forest genetics in conjunction with the Tree Improvement Program may further increase yields and possibly develop strains of trees resistant to various insect and disease organisms

DEVELOPMENT OF THE PLANNING PROBLEMS

The ICO's and their different elements described above were analyzed to determine how they could best be addressed in the planning process, or if they should be deferred for resolution elsewhere. Three possible approaches to the resolution of each element are:

1. Deferring resolution to a separate environmental analyses, document, and decision,

2. Developing appropriate Standards and Guidelines that would satisfy the concerns and resolve the issue through implementation of any alternative; or

3. Treating the element differently in various alternatives and measuring the effects to provide the basis for identifying the alternative which best resolves the issue

The first method is appropriate for issues that are, or will be, dealt with in separate environmental (NEPA) documents and subsequent decisions The second method is appropriate for ICO's that do not involve land allocation or scheduling decisions, or where choices do not exist. Where this is not the case, the ICO's are best addressed by using the third method, i e., developing various alternatives which provide choices about the provision of various quantities of each resource over time Often, resolution can best be reached by using both methods two and three.

Many of the elements in the ICO's are closely related. To facilitate addressing these items, they have been grouped or restated in the following Planning Problems, posed as questions regarding resource management options These questions can be used to guide the development and evaluation of alternatives, and to aid in the establishment of Standards and Guidelines.

PLANNING PROBLEMS

1. How Much Timber Should the Forest Produce? (addresses Issues 1, 4, 5, and 17)

This Planning Problem involves allocation of forest land to timber production, and the selection of management intensities including harvest schedules and treatments such as commercial thinning and site preparation. Potential timber production of lands allocated to management that emphasizes other uses is also considered

This problem encompasses the question of whether the Forest should harvest timber on a nondeclining flow schedule. An option is to harvest at a higher level in the near future and plan for a decline in harvest volume in future decades.

Resolution of this problem also involves the consideration of opportunities to convert shrub and hardwood stands to timber producing conifer stands

Another element in this Planning Problem is the cost, hazards, utilization factors, and environmental impacts of treating residues created by timber harvest or stand conversion.

2. How Much Old-Growth Forest Should be Preserved? (addresses Issue 3)

This problem deals with the amount and location of old growth to preserve for various reasons including providing habitat for certain species of wildlife, maintaining the aesthetic quality of large old trees and forests, and retaining portions of the Forest in these older stages as part of the natural biological diversity of the area

3. How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved? (addresses Issues 7, 10, and 15)

Fish habitat is highly dependent on water quality. Water temperature and sedimentation are critical to maintenance and protection of the fisheries habitat Soil erosion and vegetative cover along streams are extremely important aspects in providing for fisheries and other riparian values. Management of the soil and water resources (termed "watershed management") are closely tied with fisheries management on this Forest. These interrelated resources are considered in the same Planning Problem

This problem deals with the potential impacts of timber harvesting, mining, and roading activities on fish habitat, soil, and water resources. In addition to management practices to avoid sedimentation and provide high quality water, there is also concern for maintaining or enhancing soil productivity.

Capital expenditures for fish habitat improvement (principally rearing pools) are also considered Soil and water resource improvements are oriented to both restoration of degraded sites and enhancement projects.

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors Be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes? (addresses Issue 8)

Parts of two rivers that flow through the Forest have received designation as National Wild and Scenic Rivers Two other rivers included in the inventory of Wild and Scenic River candidates will be studied and a recommendation will be made for management.

This Planning Problem includes three elements: (1) What management direction for the Recreation, Scenic, and Wild sections of the two National Wild and Scenic Rivers, the Rogue and Illinois, needs to be established or reaffirmed?, (2) Will the Forest recommend designation of either of the inventoried rivers, the North Fork Smith or Chetco as Wild and Scenic?; and (3) What should land management direction be for lands adjacent to the corridors of the eligible and classified Wild and Scenic Rivers?

This problem considers what effects activities such as timber harvest and road construction could have on the recreational setting if these practices occur within sight and sound of the rivers Land management decisions for areas within the viewshed of, or directly adjacent to, the eligible and Congressionally designated rivers must take into account possible repercussions on the values for which each river segment is classified. The impact of river designation on management activities also has to be addressed due to changes in state water quality standards.

Levels of permissible use and the distribution among various user groups will not be addressed in this analysis. A five-agency management group, including the Forest Service, is responsible for determining use capacities on the Rogue to sustain the values for which it was nominated. Capacities, and distribution among users, for the Illinois River were determined through the development of a River Management Plan completed in 1985.

For this analysis, land management decisions within the actual river corridors are limited to the assignment of visual management objectives for site-disturbing activities, trail development schedules, and the specification of standards and guidelines.

Determination of suitability is the final step in the river assessment process. It provides the basis for the recommendation of designation or nondesignation of each river. If the preferred alternative contains a recommendation for National designation, a Water Resource Council's Principles and Standards analysis will be prepared for the legislative EIS to be sent to Congress.

5. How Should Sensitive Plant Resources be Managed? (addresses Issue 9)

This Planning Problem involves the consideration of designating various sites as Botanical areas or Research Natural Areas. Sensitive plants and their habitat will also be addressed though standards to guide project design.

6. How, and To What Degree, Should Forest Scenic Values Be Protected Through Visual Resource Management? (addresses Issue 11)

This Planning Problem considers the degree of protection scenic values are given and the costs and impacts of visual resource management on other activities. The Forest has been inventoried according to the visual management system and stratified by potential Visual Quality Objectives (VQO's) based on the character and variety of the landscape, viewer sensitivity, and distance from the viewer. The inventoried VQO's are used as a guideline for current management This planning analysis considers options for

adopting these inventoried objectives as standards for management on all or part of the Forest. The Forest has been stratified into viewsheds of contiguous areas that are viewed from specific travelways or viewpoints and would be logically managed to meet consistent objectives. This problem involves the question of how many and which viewsheds should be allocated to meet the inventoried VQO's.

7. How Should Wildlife Habitats on the Forest be Managed? (addresses Issue 6)

The controversy in the wildlife question is not found in the desirability of maintaining diverse and healthy populations, but in the management actions needed to accomplish this objective Vegetation altering activities change the character of the habitat and its ability to provide for various species Activities are often beneficial for some species and detrimental for others. Populations, such as big game, benefit from increased forage produced in harvest units; while populations of species dependent on mature or old-growth forest may decline. Cavity nesting species are also impacted by the removal of snags and hollow trees.

Several wildlife species groups have been identified to address their habitat needs. These groups include. (1) species dependent on specialized habitat conditions, such as cavity nesting bird populations, (2) species requiring a particular seral stage, such as grass/forb or old growth, (3) Popular game species, and (4) Endangered, threatened, and sensitive species. Eight indicator species have been selected to represent critical habitat needs The problem is to identify the appropriate balance of habitats that should be maintained, and the acceptable level of effect on timber production resulting from wildlife management prescriptions

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded areas? (addresses Issues 14, and 16)

This Planning Problem deals with management of the existing Wildernesses, and with the allocation and management of remaining unroaded areas.

Wilderness and unroaded areas provide the only Primitive and Semi-primitive Non-motorized recreation experiences on the Forest Under current management direction, all presently unroaded areas are expected to be developed within the next two decades leaving existing Wildernesses to supply Primitive and Semi-primitive Non-motorized recreation. Based on projected increases in use, by the year 2020 demand is expected to exceed the capacity of the Wildernesses to provide these forms of recreational experience.

Management options in Wildernesses range from closure of existing trails and campsites to actions that increase capacity and disperse users. Trail development, maintenance, or improvement; and the use of fire as a management tool are the principal mechanisms for changing the use and capacity while maintaining opportunities for quality experiences

This problem considers the management direction and capital investment schedules for Wildernesses. It also considers the location and number of acres of unroaded areas allocated to management that would maintain their undeveloped status

9. How Should Mineral Resources of the Forest be Developed In Coordination with Management of Other Resources? (addresses Issue 13)

This problem deals primarily with the amount of acres allocated to uses that include, or preclude, road access that would affect the efficiency of mineral exploration or extraction Future options could be limited by the amount of the Forest remaining unroaded, and by the areas allocated to other uses that would not be complementary to mineral development

ISSUES NOT ADDRESSED BY THE PLANNING PROBLEMS

2. Herbicide Use.

This issue will not be considered for resolution in this analysis. It has been and will continue to be dealt with in separate NEPA documents at the Regional and Forest level. Any additional consideration of this issue would be through similar processes at the Regional level, or through site-specific Forest environmental analyses tiering to the Regional document. The estimated timber outputs with or without the availability of chemical release will be calculated and the harvest level adjusted appropriately during implementation and monitoring

12. Roads.

This issue is not dealt with as a Planning Problem General direction for road standards and road closures are incorporated in each alternative to be consistent with the theme of that alternative. The Forest will continue to strive to build and maintain roads at the lowest cost, subject to meeting the management objectives for the particular road. Management direction, including closures, for specific roads will be determined at the project implementation level.

ABILITY TO RESOLVE PLANNING PROBLEMS AND KEY INDICATORS OF RESOLUTION

The following sections describe, by Planning Problem, the Forest's ability to respond to the problem identified. The outputs, uses, or conditions that can be measured or described to gauge the response of the various alternatives are identified here. These are referred to as the Key Indicators.

The Key Indicators are displayed in Table A-1 along with the minimum and maximum values that could be achieved as identified in the Benchmarks, the alternatives considered in this analysis, and associated outputs and effects. Table A-1 follows this section

PLANNING PROBLEM 1

How Much Timber Should the Forest Produce?

This Planning Problem involves the questions of (1) allocation of forest land to timber production, and (2) the selection of management intensities including harvest schedules and treatments such as commercial thinning and site preparation. An associated issue involves timber management policies that depart from the current nondeclining evenflow policy.

ABILITY TO RESOLVE

Land allocations provide the primary means of resolving this issue. From zero to 570,000 acres are suitable for timber production when Management Requirements (MR's) are installed. Running the Forest Plan model (FORPLAN) with a timber objective function can increase initial timber output by as much as 3 percent with minor reductions in economic efficiency. Departures from nondeclining flow harvest schedules can substantially increase timber outputs in early decades, but make reductions in later decades inevitable.

Shortening the rotations to less than 95 percent of culmination of mean annual increment (CMAI) could also substantially increase timber outputs, but may not meet National Forest Management Act (NFMA) requirements. Minor increases in annual harvest can also be realized by converting hardwood stands to conifers, or by intensifying management on lower site class lands. Maximum first decade allowable sale

quantity (ASQ) is 33.4 million cubic feet (MMCF) with the nondeclining flow and CMAI constraints, or 56 4 MMCF without these constraints.

KEY INDICATORS

Selected Suitable Area. This is the total number of acres allocated to management emphases that include timber production as part of the prescription.

First Decade Volume. The programmed ASQ for the first decade of the planning horizon displayed in MMCF.

Fifth Decade Volume. The programmed ASQ for the fifth decade displayed in MMCF This differs only from the first decade output in departure alternatives, but shows the lower level of outputs that would be achieved in future decades under each departure.

Long-Term Sustained Yield. The long-term average annual timber production, in MMCF, is achieved by the combination of all the land allocations and management intensities This level of outputs would generally not be achieved until the tenth decade or beyond.

PLANNING PROBLEM 2

How Much Old Growth Should be Preserved?

The Siskiyou contains 443,000 acres of mature and old-growth forest. Approximately 137,000 acres are protected in areas unavailable or unsuitable for timber harvest. Other areas of mature and old growth can be allocated under any management alternative considered.

ABILITY TO RESOLVE

Land allocations are the primary tool for resolving this Planning Problem. Classified areas such as Wildernesses, Wild and Scenic Rivers, Research Natural Areas, and Botanical, contain old-growth trees and provide old-growth habitat A factor that complicates this issue is that the current inventory information does not have the resolution to stratify stands with old-growth characteristics from other mature stands This results in some acres classed as mature and old growth that do not exhibit old-growth characteristics (although the majority do exhibit old-growth characteristics). Small inclusions of other classes do not render these mature and old-growth acreages as unsuitable as old-growth wildlife habitat.

Designated Wildlife Habitat, serving as specific set asides of mature and old-growth habitat for indicator species, provides for size and distribution of habitat as a Management Requirement.

Alternative allocations considered in this analysis such as Backcountry Recreation, Research Natural Areas, Botanical, Supplemental Resource, Special Wildlife Sites, Riparian, Retention, Partial Retention Management Areas provide varying degrees of old-growth habitat.

General Forest areas deemed unsuitable for the production of timber also contain old-growth.

Standards and Guidelines Activities can be constrained to meet wildlife objectives and protect old-growth stands to meet wildlife needs. An example of this would be road closures.

KEY INDICATORS

Reserved Area. Total number of mature and old-growth acres allocated to Management Areas with no programmed timber harvest, and lands classified as unsuitable for the production of timber in areas subject to programmed harvest.

Available at Fifth Decade. Total number of old-growth acres remaining after the fifth decade.

PLANNING PROBLEM 3

How Can The Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

FISH HABITAT

Major aspects of concern include riparian and up-slope activities, such as timber harvesting, road management, and mineral development, as they affect water temperature and sedimentation Off-Forest water withdrawal and its impact upon Forest fish habitat is also a major concern

The Siskiyou National Forest ranks highest in the production of wild (nonhatchery) salmonids within Region Six (Oregon and Washington). Presently, more than 1,150 miles of river and streams habitat are utilized by salmonids, with at least 600 miles used by both resident and anadromous species. The health and productivity of this fish habitat depend on good watershed management. The quantity and quality of rearing habitat are the most critical habitat factors for juvenile salmonid survival, as well as maintenance of carrying capacity in each stream Naturally low flows, combined with off-Forest water withdrawal, currently limit salmonid capability in several Forest basins.

Current Forest stream temperatures are at or near the tolerance limits of salmonids This situation greatly limits options for reducing streamside vegetative shade if salmonid habitat capability is to be maintained or improved.

ABILITY TO RESOLVE - FISH HABITAT

Water quality and salmonid fish habitat are protected and enhanced in a variety of ways. The following offer opportunities which meet or exceed Management Requirements (MR's) water quality.

Riparian Areas. Riparian Management Area prescriptions can measurably affect salmonid fish habitat capability by its influence on water temperature Through streamside management options, salmonid habitat capability could be maintained or improved by approximately 10 percent Management that would increase stream temperatures and degrade fish habitat would not meet the MR's for water quality. Riparian prescriptions considered viable in this analysis are: *Prescription B,* which is designed to maintain the present quality of fish habitat; *Prescription C*, designed to decrease water temperatures and improve fish habitat; and *Prescription M* (or Minimum Level), which would prevent most vegetative disturbances in streamside areas.

Supplemental Resource Management Areas. Numerous candidate Supplemental Resource areas have been identified. Of these, many are capable of maintaining the productive capability of the Forest's major salmonid producing streams. The Supplemental Resource areas are characterized by an "inner gorge" riverine environment containing high fisheries, recreation, and wildlife values Much of the adjacent slopes associated with this inner gorge setting contain areas where the risk of adverse soil impacts is high when disturbed. The option exists to allocate some or all of these areas to provide additional protection to the salmonid habitat This Management Area has no programmed timber harvest.

Other Land Allocations Management Areas 1 through 9, which have no programmed harvest, and Management Areas 10 through 13, which constrain resource activities associated with ground or vegetative disturbance, play a significant role in protection of various resources and multiple uses. The consequences associated with the level of these allocations will vary greatly by alternative

Standards and Guidelines. The Forest has adopted standards that are intended to minimize soil, water, and vegetative impacts These standards equally apply to the protection of fisheries habitat through mitigating both on-site and off-site impacts.

Capital Investments. Through capital investments, salmonid habitat capability could be improved or enhanced Improvements would consist primarily of installing structures to develop rearing pools, and removing barriers to migration routes.

Basin Harvest Constraints. Constraints on the amount of timber harvest allowed per decade from each Planning Basin could reduce the potential risk of adverse impacts to fish habitat from landslides, sedimentation, and water temperature.

WATER

A central public issue is the maintenance of a sufficient quantity of cool, clear water for the beneficial uses of water which include domestic, fish, recreation, and other uses.

Water Quantity. The Siskiyou yields about 8 2 million acre-feet of water annually. This yield, however, is unevenly distributed throughout the year As much as 80 percent of the total runs off during the winter (December - March). A seasonal drought occurs during the summer. Water on the eastside of the Forest is heavily withdrawn for irrigation and domestic use during this period. Summer flows on the westside are generally adequate to maintain suitable fish habitat and meet domestic needs.

Water Quality. Water flowing from the Siskiyou is generally of exceptional quality Of all Forest activities, timber harvesting and road construction have the greatest potential to degrade water quality. Water temperatures increases may result from harvesting conifers which shade the streams. Soil-disturbing activities may cause an increase in erosion and sedimentation.

ABILITY TO RESOLVE - WATER

Water Quantity. Limited opportunity exists to measurably increase water yield vegetative manipulation. The Forest Service could, however, promote the development of reservoirs, purchase water rights, and support the establishment of minimum instream flows in response to enhancing summer low flows.

Water Quality. Water quality can be maintained or enhanced by application of Riparian Management Area prescriptions and through application of basin or watershed activity constraints (i.e., area disturbance constraints which distribute impacts over both space and time). Riparian Prescription B and the 20 percent basin disturbance per decade are Management Requirements (MR's). The potential impacts of timber harvest and other activities can be further mitigated by applying even tighter basin constraints.

The discussion accompanying FISH HABITAT applies equally to water quality Standards and Guidelines (including Best Management Practices), specific land allocations, and soil and water capital investments all contribute to achieving the Forest water quality goals and state standards

SOIL PRODUCTIVITY

A primary concern for the soil resource is the maintenance of long-term soil productivity Steep slopes, limited surface organic layers, and a high rainfall place the naturally fragile soils at risk. Management activities which expose bare mineral soil with these characteristics can greatly increase erosion and decrease the ability of the soil to absorb and store water Other threats to the soil resource include:

1 Intense slash fires which detrimentally affect the soil nutrient status and biological potential;

2 Use of heavy equipment on fragile soils which increases soil density and reduces soil porosity and root growth, and

3 Logging and road building on unstable soils which increase the potential for mass wasting.

ABILITY TO RESOLVE - SOIL PRODUCTIVITY

Most mitigative measures employed to protect water quality and fish habitat will concurrently maintain soil productivity. The retention of organic matter on and within the soil, and minimizing soil chemical, biological, and physical changes will benefit the protection of site productivity and soil-water functioning, as well as reduce off-site water quality impacts.

Numerous opportunities exist for improving or enhancing soil properties on both disturbed and undisturbed site conditions. Management efforts should focus on avoiding disturbance, thereby eliminating the need for later restoration Numerous measures are currently exercised to prevent soil alteration or loss. Specific measures are provided in Standards and Guidelines, including Best Management Practices designed for protection of water quality. Examples include one-end suspension of logs during harvest, the use of low-ground-pressure skidding equipment, and excluding landslide-prone areas from harvest and road construction.

An inventory of sites in need of restoration is maintained and updated annually. Restoration work is a capital investment item.

The other means of resolution covered in FISH HABITAT and WATER also complement the Forest's ability to manage the soil resource in a quality manner.

KEY INDICATORS

Riparian Prescriptions. Allocation of Planning Basins to Riparian Prescription C and M (Minimum Level) which exceed the MR represented through Prescription B.

Management Areas. Allocation to Management Areas 1 through 9 prescribes no programmed harvest. Minimal disturbance accompanies these allocations.

Capital Investments. The level of capital investments scheduled for fish habitat, and soil and water resource improvements provides varying levels of enhancement and mitigation.

Harvest Dispersion. Basins with specific constraints on maximum acres of timber harvested per decade is another potential mitigation through dispersion of impacts over space and time. The indicator here would be constraints exceeding the MR level of 20 percent

Anadromous Sport Fish. Number of anadromous sport fishing recreation visitor days (RVD's) displayed in thousands of wildlife and fish user days (M WFUD's)

Commercial Fish. Commercial fish catch attributable to Forest production displayed in thousands of pounds.

Sediment. Total average annual sediment output displayed in thousands of tons. This figure includes background natural plus existing road loss rates, along with accelerated rates accounted for in the alternatives, the calculation does not include prior disturbances (harvest units and old burns)

PLANNING PROBLEM 4

How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

Public concerns range from the desire for the application of a full level of protection within the designated Rogue and Illinois Wild and Scenic River corridors and on lands affecting these rivers, to the impression that management policies are too restrictive. Visuals, timber harvest, mining, water quality standards, and permitted uses are just a few of the concerns surrounding this problem

Both the Chetco and the North Fork Smith Rivers meet the preliminary requirements for Wild and Scenic designation. The question now is whether these rivers should be recommended for National designation or managed under a different option.

Several other rivers were evaluated for their eligibility in a 1988 study. The eligibility of all rivers evaluated is subject to a decision.

ABILITY TO RESOLVE

Tools of resolution include: (1) Land allocation decisions with varying resource emphasis on lands adjacent to the Wild and Scenic Rivers; (2) the use of VQO's to maintain the character of the landscapes adjacent to the river corridors, and (3) decisions affecting vegetative management within corridors of the Recreation and Scenic sections of the designated and eligible rivers

Part of the analysis will also include the suitability evaluation to provide the basis for a recommendation on the North Fork Smith and Chetco Rivers.

KEY INDICATORS

Rivers Recommended. Inventoried and/or "eligible" rivers recommended to either designation or further study as part of the National Wild and Scenic River System

Adjacent Area Meeting VQO's The area adjacent to (as seen from) existing or potential Wild and Scenic Rivers that meet or exceed their inventoried VQO's

PLANNING PROBLEM 5

How Should Sensitive Plant Resources be Managed?

The Siskiyou provides habitat for many sensitive plant species Of the 24 potential Botanical areas identified, five are old-growth sites and 19 are sensitive plant sites. There are three existing Botanical areas and three Research Natural Areas (RNA's). At least three of the four proposed Research Natural Areas contain sensitive plant species.

ABILITY TO RESOLVE

Three ways of resolving the Planning Problem include:

Land Allocations. Allocating land to Botanical areas, or RNA's would protect habitat for sensitive plants and help fill identified cells needs for the RNA system

Standards and Guidelines Standards can be designed to either protect small areas of sensitive plant habitat in nondedicated areas, or to mitigate the impacts of timber management, road building, cattle grazing, or mining activities.

Management direction for protection of sensitive plants is contained in the Forest Service Manual (FSM 2670). The Endangered Species Act provides further guidance. Information on sensitive plants is stored and protected in the Forest's Total Resource Information (TRI) system.

Capital Investment Some opportunities exist to rehabilitate or protect sensitive plant habitat through capital investment projects.

KEY INDICATORS

Botanical Area. The area allocated to Botanical areas displayed in thousands of acres.

Research Natural Area. Area allocated to Research Natural Areas displayed in thousands of acres.

PLANNING PROBLEM 6

How, and To What Degree, Should Forest Scenic Values be Protected Through Visual Resource Management?

VQO's have been identified and delineated for all lands within the Forest boundary. These inventoried objectives identify the apparent aesthetic quality of Forest lands and provide a level of protection necessary to maintain the inventoried level of visual quality. In some cases, the objectives seek to restore an area of past activity not at a desired level to a specified level of visual quality over time. In all cases, VQO's seek to maintain a defined quality level, from natural to highly modified, throughout the Forest.

ABILITY TO RESOLVE

A full scale of visual resource management possibilities exist. Opportunities range from maintenance of the Forest in its existing state, or rehabilitating some areas, to the conversion of considerable area to an intensive timber management scheme (with the exception of those areas designated for other uses such as Wilderness or Wild and Scenic Rivers) Note, however, that the conversion of large tracts of the Forest to timber production would not mean the loss of the visual resource; rather, it would imply the maintenance of the resource at a minimum level for some areas and at inventoried levels for much of the remainder

The Forest has several methods, or "tools," with which to resolve this issue The most effective tool is the allocation of appropriate Forest viewsheds to the inventoried VQO's. Another effective tool is the development of management standards and guidelines designed to meet these objectives Other tools include: (1) corridor studies, including extensive analyses of impacts of harvest activities of other ownerships on the Forest visual resources; (2) extended harvest rotations, (3) harvest dispersal techniques; and (4) capital investments for mitigation

KEY INDICATORS

Allocated Viewsheds. The number of viewsheds which meet or exceed the inventoried VQO's

Area Meeting or Exceeding Partial Retention. Acres which meet Preservation, Retention, and Partial Retention VQO's.

PLANNING PROBLEM 7

How Should Wildlife Habitats on the Forest be Managed?

This Planning Problem encompasses habitat management for all Forest wildlife, including endangered, threatened, or sensitive species Management of habitat (including its change over time) for big-game animals, primarily black-tail deer and Roosevelt elk, is important to the public and to state fish and wildlife agencies (Also see **PLANNING PROBLEM 2**).

Maintenance of long-term habitat diversity on the Siskiyou can be achieved under any management alternative that meets MR's for wildlife. Habitat capability for many wildlife species would vary through time by alternative. Consequences for each indicator species are used to assess the effect an alternative would have on the species group

ABILITY TO RESOLVE

There are three approaches to addressing the distribution of habitats.

Land Allocations Management Areas such as Wilderness, Wild and Scenic Rivers, Research Natural Areas, Botanical, Supplemental Resource, Designated Wildlife Habitat, Special Wildlife Sites, Riparian, Retention, and Partial Retention Management Areas provide mature and old-growth habitat Old-growth timber is also contained in a significant number of areas deemed unsuitable for timber management (irreversible soil damage or nonreforestable five years after harvest).

Areas managed for timber provide forage for big-game animals, as well as habitat for other wildlife species which inhabit early seral stages.

Standards and Guidelines. Many techniques are used to manage wildlife habitat. Size, shape, and scheduling of timber harvest units are manipulated to insure that vegetative stages are well distributed throughout the Forest. Habitat standards have been established for deer and elk, and cavity nesting or denning animals inhabiting old-growth stands (Westside Deer and Elk Standards and Siskiyou Snag Standards, respectively)

Road building activities can be constrained to meet wildlife objectives. Roads can be closed to meet wildlife needs.

A prescription has been developed to insure the rehabilitation and perpetuation of meadow habitat.

Capital Investment Habitat capability can be enhanced through funding of habitat improvement projects.

KEY INDICATORS

Spotted Owl Capability. Potential habitat capability to support spotted owl pairs over time (long term)

Woodpecker Habitat Capability Potential habitat capable of supporting a given percentage of woodpecker populations over time.

Wildlife Wildlife user days displayed as M WFUD's.

Capital Investments. Capital investment dollars for wildlife improvement projects.

Special Wildlife Sites Special wildlife areas (Management Area 9) allocated in thousands of acres.

PLANNING PROBLEM 8

How Will Management Direction Affect Recreation Opportunities in the Wilderness and unroaded areas?

WILDERNESS

The questions related to Wilderness management center on the level of development (such as trail construction), and the methods utilized to protect Wilderness values. Management options for each of the five Wildernesses will be examined during this planning effort.

ABILITY TO RESOLVE - WILDERNESS

The "tools" of resolution relating to Wilderness management include capital investments for trail development, closure, and maintenance; Standards and Guidelines, and use of prescribed fire

UNROADED AREAS

Disposition of the Forest's roadless areas continues as a very polarized problem The continued availability of non-motorized recreation opportunities outside of the designated Wildernesses is served by nondevelopment. On the other hand, the continued availability of much of these unroaded areas in the suitable land base for calculation of annual harvest is likewise crucial to industry and local economic interests.

ABILITY TO RESOLVE - UNROADED AREAS

The most effective tool of resolution is the allocation of land to a prescription that prevents timber harvest and road construction. Other options include capital investment for trail construction; mitigation of any past human-related impacts to these areas; and Standards and Guidelines that enable the Forest manager to maintain the primitive character of the area and associated recreation opportunities

KEY INDICATORS

Unroaded Condition Area allocated to Management Areas 1 through 9 where little or no roading exists, and management objectives are highly oriented to nondevelopment.

ROS Primitive and Semi-primitive Area remaining in the ROS inventory as Primitive and Semi-primitive.

PLANNING PROBLEM 9

How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

The minerals issue has been restated as a Planning Problem which focuses on what the Forest Service can do to resolve resource coordination needs

ABILITY TO RESOLVE

The potential to resolve the various facets of the minerals issue involves two options One is the allocation of mineral lands in a way that emphasizes the differences between accessibility to mineral lands and other resource values. The second option involves changing management direction and guidelines

Land Allocations. Land allocations could affect the efficiency of mineral exploration or extraction, or even preclude mineral development. Prescriptions for these land allocations, however, could be designed to complement the existing mining laws through reducing management constraints.

Standards and Guidelines. The Forest Service can initiate some form of protection for the resources associated with mineral lands. Options available to the Forest Service include: (1) the application of surface resource use regulations; (2) the identification of special considerations needed in operating plans and permits; and (3) requesting withdrawal of land from the mining and leasing laws.

KEY INDICATORS

Area Accessible with Limited Restrictions. Area accessible to mineral exploration, development, and extraction with limited (low to moderate) restrictions imposed by other resource protection needs or standards

Table A-1 Key Indicators of Planning Problem Resolution

PLANNING PROBLEMS/ *Key Indicators*	Unit of *Measure*	Range *Maximum*	*Minimum*
1 TIMBER PRODUCTION			
Selected Suitable Area	M Acres	576 0	0
First Decade Volume	MMCF	56 4	0
Fifth Decade Volume	MMCF	33 4	0
Long-Term Sustained Yield	MMCF	58 5	0
2 OLD-GROWTH FOREST			
Reserved Area 1/	M Acres	443	151
Available at End of Fifth Decade	M Acres	443 +	173
3 SOIL, WATER, AND FISHERIES			
Management Areas 1 through 9	M Acres	1,062	176
Riparian Prescriptions C and M 2/	M Acres	176	29
Capital Investments 3/	M $	665	0
Harvest Dispersion Constraint 4/	Number of Basin	18	0
Anadromous Sport Fish User Days	M WFUD's	77	59
Commercial Fish	M Pounds	1,084	880
Average Annual Sediment 5/	M Tons	749	635
4 WILD AND SCENIC RIVERS			
Adjacent Area Meeting VQO 6/	M Acres	184	27
5. SENSITIVE PLANTS			
Research Natural Area	M Acres	5	2
Botanical Area	M Acres	41	4
6 VISUAL RESOURCES			
Viewsheds Meeting VQO 7/	Number	44	5
Meets or Exceeds Partial Retention 8/	M Acres	858	238
7 WILDLIFE HABITAT			
Spotted Owl Capability 9/	Pairs	153	32
Woodpecker Habitat Capability 10/	Percent	60	20
Wildlife User Days	M WFUD's	97	46
Capital Investments	M $	123	0
Special Wildlife Sites	M Acres	45	0
8 WILDERNESS AND UNROADED			
Unroaded Condition - MA 1 through 9 11/	M Acres	552	238
ROS-Primitive and Semi-primitive	M Acres	348	262
9 MINERALS			
Area Accessible with Limited Restriction 12/	M Acres	810	732

1/ Mature and old-growth forest reserved (protected) in Management Areas 1 through 9 (MA 1-9) plus unsuitable acres in Management Areas 10 through 14 (MA 10-14); from 5 3 acre cells

2/ Riparian Prescriptions M (Minimum Level) and C, both exceed the Management Requirement (MR) level for water quality as reflected in Prescription B.

3/ The combination of capital investments from fisheries habitat and soil/water resource improvement projects, includes *appropriated and K-V funds, both enhancement and mitigation work represented*

4/ Timber harvest dispersion ("basin") constraints are applied to planning basins, they are individually tailored based on basin values, characteristics, and activity level, they constrain activity more than the MR of 20 percent

5/ Total average annual sediment output, includes background natural plus existing road loss rates, along with accelerated rates accounted for in the alternatives, calculation does not include other prior disturbances (harvest units or old burns)

6/ Area adjacent to (as seen from) existing or potential Wild and Scenic Rivers that meet or exceed their inventoried VQO

7/ Viewsheds which meet or exceed the inventoried VQO

8/ Area meeting or exceeding Partial Retention (Partial Retention plus Retention plus Preservation)

9/ Potential habitat capability to support spotted owl pairs over time (long term)

10/ *Potential habitat capable of supporting a given percentage of woodpecker populations over time (long term)*

11/ Inventoried unroaded area allocated to Management Areas 1 through 9 (MA 1-9) where little or no roading exists and management objectives are highly oriented to nondevelopment

12/ Area accessible to mineral exploration, development, and extraction with limited (low to moderate) restrictions imposed by other resource protection needs or standards

RELATIONSHIP BETWEEN PLANNING PROBLEMS

Resolution of one Planning Problem often means intensifying another. The greatest conflict or tradeoff occurs between the Planning Problem of timber and Planning Problems dealing with old growth, scenic values, and unroaded areas. To a lesser degree, there are also tradeoffs between the Planning Problem of timber with those of wildlife and fish/soil/water, although impacts can be somewhat offset by increased capital investments, Standards and Guidelines, and other mitigations. There is a moderate direct tradeoff between timber and Wild and Scenic Rivers, and between minerals and sensitive plants These competitive relationships are addressed through the tradeoff analysis presented in the FEIS, Chapter II. The potential degree of conflict expressed between Planning Problems is displayed in Table A-2

Table A-2. Interrelationship of Planning Problems - Degree of Potential Conflict.

Relationship	Timber	Old Growth	Fish/ Water/ Soil	W&S Rivers	Sensitive Plants	Scenic Values	Wildlife Habitat	Unroaded Areas	Minerals
Timber	N/A	# # #	X X X	X X X	* * *	# # #	X X X	# # #	
Old Growth	# # #	N/A							* * *
Fish/Water/Soil	X X X		N/A						* * *
Wild and Scenic Rivers	X X X			N/A					* * *
Sensitive Plants	* * *				N/A				X X X
Scenic Values	# # #					N/A			* * *
Wildlife Habitat	X X X						N/A		
Unroaded Areas	# # #							N/A	X X X
Minerals		* * *	* * *	* * *	X X X	* * *	* * *	X X X	N/A

Legend

###	Strong	XXX	Moderate	***	Minor, or Limited to Specific Item		None or Negligible

CONSULTATION WITH OTHERS

Consultation with other agencies, local government, interest groups, and individuals has been constant throughout the planning process. The consultation here covers contacts from the initiation of the Forest planning effort in 1979 to issuance of the DEIS and proposed Forest Plan in 1987. Please reference Appendix K for consultations made between the release of the DEIS and issuance of the FEIS.

In addition to numerous individual contacts, the Forest held a number of public meetings and workshops to discuss various aspects of the Plan's development. These took place in Grants Pass, Medford, Cave Junction, Powers, Brookings, Gold Beach, Port Orford, and other locations. Contacts were so frequent that several interest groups tracked our progress on a monthly basis; some individuals communicated at even a far greater frequency.

Specific contacts were made with county officials and planners in Del Norte County, California, and Josephine, Curry, and Coos Counties, Oregon. The development of ICO's and other planning particulars were also discussed with Oregon and California state agencies, the Bureau of Land Management, National Park Service, Environmental Protection Agency, adjacent Forests, and many other Federal agencies. In addition, many Oregon and U.S. legislators have either made inquiries or been given briefings.

Contacts with special interest groups included timber industry representatives, environmental organizations, commercial and sports fishing interests, major private landowners adjacent to the Forest, representatives of the Klamath Indian Tribe, and members of the Rogue (Takelma) Indian Tribe from the reservation lands at Siletz, Oregon

Several meetings were held to discuss specific questions about technical aspects of planning Representatives from several Oregon State agencies, local environmental organizations, and local timber industry most frequently attended these technical sessions.

Specific information on meeting dates and places, those in attendance, and the topics discussed can be found in the Planning Records. Please reference these Planning Records for further details. The records for meetings, conversations, etc., are on file at the Supervisor's Office in Grants Pass, Oregon.

The following list details contacts made with other agencies, Indian Tribes, and interest groups; and the elements reviewed. In addition to those listed, there have been numerable contacts through phone conversations and visits

OTHER AGENCIES AND INDIAN TRIBES

Bonneville Power Administration
- Power Sales Contract EIS

Bureau of Indian Affairs
- Tribal contacts

Bureau of Land Management, Medford and Coos Bay
- Eight Dollar Mountain
- Understanding of Forest planning process
- Agency areas and topics of concern

- Planning strengths and weaknesses
- Fish, wildlife, and riparian concerns
- Management prescriptions

California Department of Fish and Game, Department of Conservation, Department of Water Resources, Boating and Water Resources Agency, Energy Commission, Regional Water Quality Control Board, Air Resources Board, Department of of Forestry, Office of Planning and Research, and Cal-Trans District 1
- Interstate concerns

Coos County Planning Department
- Areas and topics of concern for Forest planning
- Comprehensive Plan

Coos County Roadmaster
- Areas and topics of concern

Coos-Curry Council of Governments
- North Bend Comprehensive Plan

Corps of Engineers
- Draft Timber Resource Management Plan

Curry County Commissioners
- Land allocations
- Impacts on private lands; impacts on cities
- Wilderness and roadless areas
- Recreation and fisheries
- Numerous information requests concerning Siskiyou planning

Curry County Planning Department
- Curry County Land Use Plan
- Areas and topics of concern for Siskiyou planning

Curry County Roadmaster
- Areas and topics of concern

Del Norte County Engineering Department
- Areas and topics of concern

Del Norte County Planning Department
- Agreement to work together on the planning process
- Areas and topics of concern for Siskiyou planning

Intergovernmental Relations Division
- Land use Plans

Josephine County Planning Commission and Planning Department
- Establishment of communication process
- Draft goals and policy statement for County
- Implementation chapter of Draft Comprehensive Plan
- Areas and topics of concern for Forest Plan
- Information sharing

- Eight Dollar Mountain coordination
- County land allocation map
- Zoning ordinances
- Openspace Reserve Zoning District

Josephine County Roadmaster
- Areas and topics of concern

Office of Federal Highway Projects
- Forest plan

Office of Governor, State of California
- Issues for Forest planning

Office of Governor, State of Oregon
- Establishment of communication process and designated contacts

Oregon Department of Energy
- Pacific Northwest Rivers Study

Oregon Department of Fish and Wildlife
- Forest Plan; share information
- Areas and topics of concern for Forest planning
- Forest planning process
- Identification of planning strengths and weaknesses
- Project planning process

Oregon Department of Forestry and Office of State Forester
- Alternative development
- Local areas and planning topics of concern
- Assessment of the management situation
- Status of planning process
- Forestry Program for Oregon
- Current management direction, MR's
- Land suitability; Roadless areas, Cumulative effects
- Prescriptions; Monitoring
- State forest economy
- MR's, land allocations, land suitability
- Rotation ages; age class gaps; other technical aspects
- Ongoing research and research needs

Oregon Department of Land Conservation and Development
- Plan Reviewers
- Areas and topics of concern with Curry County Comprehensive Plan
- County Planning on federal Forest lands
- Report on Josephine County's acknowledgement of compliance
- Need for zoning permits

Oregon State Division of Highways
- Areas and topics of concern

Oregon State Marine Board
- Management prescriptions

Oregon State Project Notification and Review System (Clearinghouse)
- DEIS/Forest Plan (previous draft)

Oregon State Historic Preservation Office
- Analysis of the management situation

Oregon State Joint Legislative Committee-Trade and Economic Development
- Planning process

Rogue River, Six Rivers, Umpqua, and Klamath National Forests
- Planning areas needing coordination

U.S. Departments of Commerce, Interior, and Transportation
- Forest Plan

U.S. Environmental Protection Agency
- Plan and processes
- Treatment of Riparian areas, water quality, etc.

U S. Fish and Wildlife Service
- Planning involvement; names of contacts
- Threatened and endangered species

U.S. Geology Service
- Areas and topics of concern, particularly minerals

U.S Heritage Conservation and Recreation Service
- Decision criteria for Forest planning

U.S. House of Representatives: Jim Weaver, Tom Foley, Robert Smith, and Peter DeFazio, and aides.
- Areas and topics of concern for Forest planning
- Minerals exploration and production

U.S. Senators: Mark Hatfield and Bob Packwood; and aides.
- Areas and topics of concern for Forest planning

OTHER INTEREST GROUPS

(Interest or affiliation was determined by statements in the communication or by the letterheads.)

Adjacent property owners
- Status of planning process
- Alternative development
- Wild and Scenic Rivers process

Conservation and Environmental
- Forest Plan appeal procedure
- *Desire to be informed and involved*
- Plan information
- Concern with herbicides, old growth, Wilderness, roadless areas, recreation, clean water, visuals, and air
- Cultural resources
- Eight Dollar Mountain
- Planning process, RPA and NFMA
- Alternative review and development
- Standards and guidelines
- Special and Botanical areas; Wild and Scenic rivers
- Port-Orford-cedar management
- Assessment of the management situation
- Concern for timber projects in Roadless areas

Economic Development
- Status of planning process
- Alternative review and development

Forest Industries
- Concern for lack of time for in-depth review
- Forest planning process
- Desire to be informed and involved
- Plan information
- NFMA as it pertains to wildlife
- Concern for southwestern Oregon forest industry and economic situation
- Concern for riparian management
- Cost-study data
- Concern for status of planning progress
- Alternative review and development
- Visual objectives
- Assessment of the management situation

Handicapped
- Need to provide access for handicapped

Mining
- *Desire to be informed and involved*
- Eight Dollar Mountain
- Known mineral locations

Minorities
- *Need to be involved in Forest planning process*
- Coos tribe territory in Coos County
- Tolowa Tribe territory near Chetco
- Planning documents
- Concerns for rivers, fish and habitat, game, Wilderness, and Roadless Areas

News Media
- Need to increase public awareness of Forest planning effort
- Establish contacts

No identified Membership or Affiliation
- Forest practices
- Reviews of plans
- Concerns with herbicides
- Eight Dollar Mountain
- Desire to be informed and involved
- Mining opportunities
- Need for more Wilderness; roadless areas; old growth
- Suitability determination
- Soils, visuals, air quality and slash burning
- Special and Botanical areas
- Alternative review and development
- Concern about timber projects going on in Roadless areas
- Port-Orford-cedar management

Petitions (3) - Signatures: (1) 4096; (2) 35, and (3) 21 Concerns for:
- Research Natural Areas, Botanical, and Special areas
- Retention of old growth
- Riparian, fisheries and other wildlife habitat
- Roadless areas
- Visual quality
- Wild and Scenic Rivers

Petroleum
- Restrictions on oil and gas exploration and development
- Roadless areas and Wilderness

Ranching or farming
- Botanical areas
- Control of public access

Recreation
- Government restrictions, permits and economic well-being
- Riparian management
- Provide for adequate off-road opportunities
- Wilderness, Wild and Scenic rivers
- Roadless areas
- Desire to be informed and involved

Scientific and Education
- Offer to be involved by conducting interviews
- Desire to be informed and involved
- Old growth situation
- Eight Dollar Mountain and other Research Natural Areas
- Desire to follow the dynamics of the planning process

Utilities
- Oregon 21 Coos Borrowers Environmental Report
- Transmission corridors and substations
- VQO's
- Cultural locations

APPENDIX B

DESCRIPTION OF THE ANALYSIS PROCESS



APPENDIX B

DESCRIPTION OF THE ANALYSIS PROCESS

APPENDIX B

DESCRIPTION OF THE ANALYSIS PROCESS

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INTRODUCTION

PLANNING SITUATION

One of the primary responsibilities of the Forest Service is to decide how best to manage National Forest lands to produce the goods and services the public desires. These lands must be managed to provide *adequate levels of resources and services for both current and future uses* Because National Forest lands and the natural resources they contain are valuable to society, commitments to various uses represent significant and far-reaching decisions.

The Siskiyou National Forest is located in southwestern Oregon and contains 1,092,302 acres of diverse land forms and vegetation. The wide variety of seral and climax-type vegetation communities that exist support a rich and varied wildlife community. The timber industry is important to the local economy In addition, the Forest provides an attractive setting for recreationists who spend money for supplies and services.

Planning under the National Forest Management Act (NFMA) (36 CFR 219) responds to the increasing complexity and social significance of the Forest and magnitude of the analysis and management decisions. The Forest's major planning goal is to provide enough information to help decisionmakers determine which combination of goods, services, and land allocations will maximize Net Public Benefit (NPB) (discussed later in this appendix). The regulations (36 CFR 219) developed under NFMA provide the analytical framework within which these decisions are made.

The NFMA and its regulations also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in this analysis process. The NEPA regulations require that the environmental effects of a proposed action and alternatives to that proposed action must be disclosed in an Environmental Impact Statement (EIS).

CHANGES BETWEEN DRAFT AND FINAL

Several changes have occurred in the analysis process as a result of public and agency comments. Minor changes have also resulted from the 1987 fires and other events of the past year.

The analytical procedures used to project nongame wildlife WFUD's have been modified in response to public input. In the Draft, the nongame wildlife use was assumed to be equal to the game use and was projected based on expected changes in deer habitat. For the alternatives in the Final, the nongame use is projected similar to the demand for recreation assuming that the change in the amount of the wildlife viewing is a function of the change in the human population - not the change in wildlife habitat (values for benchmarks were not recalculated).

An error was identified in in the calculation of deer habitat capability. Habitat capability was underestimated by about 25 percent. This has been corrected and all affected tables and text have been revised This error was consistent in all alternatives and benchmarks so relative differences remain the same.

Timber volumes displayed in board foot measure have been adjusted to more closely reflect the volume expected to be harvested in the first decade.

The volume of salvageable dead timber has been calculated from the inventory and included as a component of timber harvest projections.

Management Area 6, "Custodial (Roadless)," has been modified and renamed "Backcountry Recreation."

Alternatives K-Departure and L of the Draft have been dropped from detailed study. A new alternative (S) has been developed and is the Preferred Alternative in the Final EIS.

The Final Supplement to the Environmental Impact Statement (FSEIS) for an Amendment to the Pacific Northwest Regional Guide was completed in 1988. This amends the Spotted Owl Guidelines used by the Forest to define habitat needs to achieve Management Requirements (MR's) The changes do not substantially affect the habitat proposed for designation on the Siskiyou; there are some minor changes in the location of habitat areas.

A number of changes have implications for minor inventory adjustments. The 1987 Fires changed the vegetation in the burned areas; the intensive field work done in association with the Silver Fire Recovery Project identified additional areas unsuitable for timber management; there are new Wild and Scenic Rivers; and the revised spotted owl habitat guidelines result in an adjustment of the habitat needed for MR's. The Alternatives in the EIS have not been adjusted for these minor changes; they have been kept on the same comparative basis by continuing to run new analyses (including the new alternative) on the same inventory base. These "fine tuning" adjustments are incorporated in the Forest Plan for implementation.

PLANNING PROCESS

The planning and environmental analysis process brings a new outlook and a new technology to National Forest land management, principally: (1) land management planning requires that processes formerly used to make individual resource decisions must be combined into integrated management decisions, and (2) new mathematical modeling techniques are used to represent the elements of the land allocation problem and to help identify the most efficient pattern of land management. This is discussed in the NFMA regulations and Chapter I of the Final Environmental Impact Statement (FEIS) as a 10-element planning process. This appendix is concerned with describing the analysis phase of this process which are elements 3, 4, 5, and 6. The judgement phases, elements 1, 2, 7, and 8, are described in Chapter's I and II and in Appendix A of the FEIS. The execution phases, elements 9 and 10, are presented in the Land and Resource Management Plan (LRMP).

The analytical elements are as follows:

INVENTORY DATA AND INFORMATION COLLECTION (STEP 3)

The interdisciplinary team (IDT) determined what data was necessary, based on the issues and concerns. Data collection is part of normal Forest operations. Existing data were used whenever possible and supplemented with new data where required to help resolve sensitive issues or management concerns. Data, including information on resource capability areas and acreages; resource supply and demand; and expected outputs, values, and costs resulting from management prescriptions, are needed for formulation of the models used in the analysis of the management situation, formulation of alternatives, monitoring, and other phases of the planning process Much of the data and background documentation are on file in the Planning Records.

ANALYSIS OF THE MANAGEMENT SITUATION (STEP 4)

This analysis brings existing information together, puts it into a total Forest perspective, and examines the range of possible solutions to resource issues. It examines supply potentials, market assessments for Forest outputs, and determines suitability and feasibility for meeting needs. A model (FORPLAN) was built to represent Forest resources and assist in allocation and scheduling to address a number of questions regarding potential outputs of goods and services and Forest conditions. This part of the analysis includes the development of benchmarks designed to establish the outputs and conditions that could be expected from specific management scenarios. They include a) the projection of the Forest's current management

program, b) determining the Forest's ability to produce a range of goods and services, from minimum management to maximum production, c) evaluating the feasibility of reaching the national production goals Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA) targets and social demands identified as issues and concerns, and d) monetary benchmarks which estimate the output mix which maximizes Present Net Value (PNV) of resources having an established market value or an assigned value. This analysis provides the information necessary to formulate a range of reasonable alternatives.

FORMULATION OF ALTERNATIVES (STEP 5)

The information gathered during the first four planning action elements is combined and analyzed to formulate alternative plans suitable for evaluation and presentation in the FEIS. The alternatives reflect a range of resource management direction. Each identified major public issue and management concern was addressed in one or more alternatives. The programs formulated represent the most cost-efficient way of attaining the objective set forth for each alternative. This process provides a basis for identifying the alternative that comes nearest to maximizing the priced component of NPB, consistent with the resource integration and Management Requirements (MR's). This is then considered along with the subjective value of nonpriced outputs to determine NPB.

ESTIMATION OF EFFECTS OF ALTERNATIVES (STEP 6)

The physical, biological, economic and social effects of each alternative were estimated including how each responds to the range of goals and objectives assigned by the RPA Program. The FORPLAN model estimates many of the anticipated consequences of changes in the flow of goods and services from the Forest in terms of resource output levels. Other effects examined outside the model include ecological and social considerations. Specifically, the analysis includes: 1) direct effects, 2) indirect effects, 3) coordination with other Federal, State, and local land use plans, 4) other environmental effects, 5) energy requirements and conservation potential, 6) natural or depletable resource requirements and conservation potential, 7) urban quality, historic and cultural resources and, 8) means of mitigation.



INVENTORY DATA AND INFORMATION COLLECTION

RESOURCE DEVELOPMENT

CAPABILITY AREAS

This is the first step in the analysis phase of the planning process. Inventory data are needed for developing the planning model used in the analysis of the management situation, the formulation and evaluation of alternatives, and monitoring of accomplishments. The IDT collected and assembled the data necessary for making management decisions. Some data existed prior to initiation of the NFMA Forest planning effort while other data were collected to supplement information needed to resolve management issues and concerns. The land base was stratified into capability areas defined by physical and biological attributes, and further delineated by political boundaries. Capability areas represent lands delineated to estimate responsiveness to various management practices, resource values, output coefficients, and multi-resource or joint production functions.

The compilation of the various inventories into the mapping system resulted in more than 40 layers of land attribute and management opportunity delineations. These include:

Ownership
Soil Resource Inventory (SRI)
Ecoclass
Geology
Special Resource Areas
Slope
Aspect
Elevation Zones
Stream Class
River Basin
Visual Quality Objective (VQO)
Recreation Opportunity Spectrum (ROS)
Unroaded
Lands Unsuitable for Timber Production
Wildlife Habitat Areas

ANALYSIS AREAS

Overlaying all of the identified layers would result in thousands of unique strata. Grouping and stepwise analyses were used to aggregate and condense these into the minimum number of areas that still retain sufficient site specificity to analyze resource allocation and scheduling options along with issues and concerns related to specific resources. The result is the stratification of the Forest into 317 analysis areas. The land represented in an analysis area need not be contiguous and generally is not. Each analysis area is composed of similar sites, with similar vegetation, representing similar opportunities; and can be expected to respond in similar ways and amounts to various management activities.

PRODUCTION COEFFICIENTS

Specific resource outputs and uses such as timber harvest and wildlife are analyzed in the planning process in response to the issues and concerns. The resource data for each capability area in the analysis area was combined to form the basis for a number (production coefficient) that serves as a measure of a physical property.

Major production coefficients used on the Siskiyou are expressed in the following units:

Thousand Cubic Feet (MCF) of timber per acre
Miles of Road per acre
Tons of Sediment per acre
Sport Fishing - Fish and Wildlife User Day (WFUD) per basin
Thousand Pounds Commercial Fish per basin
Wildlife - WFUD per acre
Acres of Seral Stages
Recreation Visitor Days (RVD's)

SUITABILITY ANALYSIS

The Forest used empirical data to determine the acres that are tentatively suitable for management practices. All areas are considered available for some form of recreation and some type of wildlife use

Lands were considered through the following step-wise analysis to determine if they would be included in the inventory of land tentatively suitable for timber production.

1. Lands withdrawn from timber production by law or regulation were identified as unavailable.

2. Lands with less than ten percent conifer stocking were identified as nonforest

3. Lands where the technology is not available to prevent irreversible resource damage were identified as unsuitable.

4. Lands where there is not reasonable assurance that adequate restocking can be attained within five years after final harvest were identified as unsuitable (regeneration difficulty).

To complete this analysis, several sources of data were utilized in concert. The SRI, Timber Inventory, reforestation records, and available stand examinations were compiled and evaluated by ranger district personnel most familiar with the land and resources. Unsuitable lands were mapped based on the interpretation of this data with the aid of aerial photographs and with the benefit of first hand knowledge and experience. This was followed up with additional field reconnaissance and review by Forest and Regional Staff, as well as interested members of the public. Maps and rationale for the classification of specific areas are available in the Planning Records. The results of the land suitability classification are displayed in Table III-16 in the FEIS.

Minor inventory adjustments have been made since the DEIS was prepared. The field inventory work done in conjunction with the Silver Recovery Project identified an additional 3,937 acres unsuitable do the risk of irreversible soil damage, and 3,681 acres unsuitable due to reforestation difficulty. The Oregon Omnibus Wild and Scenic Rivers Act of 1988 also withdrew 1,684 acres from the tentatively suitable base These adjustments are not included here and have not been made in the alternatives in the FEIS. The inventory information has been held static for the purpose of alternative comparison. The changes will be incorporated into the alternative selected for development of the Forest Plan. The revised land suitability classification is displayed in Table II-1 of the LRMP.

The monitoring plan and standards and guidelines in the LRMP provide for continual refinement and updating of inventory information. The Plan may be amended or revised if inventory adjustments indicate that outputs or environmental conditions are substantially different.

ALLOCATION AND SCHEDULING

With the economic values and relationships used in this analysis, allocations of land to other resource uses could not compete with allocations to timber management. To evaluate the effects of specific resource needs and to examine a full range of alternatives, land allocations were developed to meet resource objectives or to follow the theme of a particular alternative, and then the FORPLAN model was used for scheduling and estimating the outputs and effects. Productivity Class and Condition class (existing vegetation) data were used along with yield and economic coefficients within the model for scheduling of management activities over time.

MONITORING

Forest planning data used to develop the key production coefficients will also be used to help monitor implementation activities. Forest planning data provides a base or standard from which changes that result from implementation of the LRMP can be measured.

PLAN IMPLEMENTATION SPECIFICATIONS

The Forest planning data base (in planning records) provides biological and physical data that will help develop subsequent programs for plan implementation. As more information is available, the data base will be updated and improved.

SOURCES OF DATA

Siskiyou National Forest Cultural Sample Survey Design, 1983

Siskiyou National Forest Cultural Resource Overview, 1978

Siskiyou National Forest Cultural Site Inventory, 1980 to present

Siskiyou National Forest Cultural Resource Management Annual Accomplishment Reports, 1981 to present

Region Six Cultural Resource Management Guidebook, 1983

Fuelwood Volumes in the the FEIS, Chapter IV, Energy section from Annual Accomplishment Reports, Siskiyou National Forest

Siskiyou National Forest Water Rights Inventory [2541.11], 1983

Siskiyou National Forest Nonpoint Source Water Quality Monitoring Plan [2532.5], 1986

Siskiyou National Forest Water Quality Monitoring for Pesticides [2532.5]

Siskiyou National Forest Elk-Sixes Watershed Study [2531]

Siskiyou National Forest Streamside Management Unit (SMU) Inventory [2526.1]

Siskiyou National Forest water quality data stored in the Environmental Protection Agency's STORET system [2531.11]

Siskiyou National Forest Soil Resource Inventory (SRI) [2531.11], 1979

Soil Conservation Service Erosion Inventory [2512.1]

Siskiyou National Forest Soil Monitoring [2554]

Siskiyou National Forest Watershed Improvement Needs (WIN) Inventory [2522.21], 1983

Siskiyou National Forest Hydrometeorological Monitoring [2531.11]

Siskiyou National Forest Remote Automatic Weather Station (RAWS) data

Cooperative Snow Surveys [2534.5]

United States Geological Survey, Water Resources Data, published annually.

Water, Land, and Related Resources, North Coastal Area of California and Portions of Southern Oregon. *Appendix No. 2. Sediment Yield and Land Treatment. June 1972. Prepared by the United States* Department of Agriculture River Basin Planning Staff, and Soil Conservation Service, in Cooperation with the California Department of Water Resources.

State of Oregon Water Resources Department Drainage Basin Reports

Oregon's Statewide Assessment of Nonpoint Source Problems, August 1978, State of Oregon Department of Environmental Quality, Water Quality Program

The streams and rivers were inventoried using the Region Six, USDA, Forest Service, Stream Classes I-IV

Timber data regarding stand locations, volumes and growth were based on the Siskiyou National Forest Timber Inventory, 1979

Road construction and reconstruction costs were developed from the Forest cost records for the period 1975 through 1984 on 305 timber sales. Some adjustments were made to the costs to reflect current conditions. Road reconstruction mileage factors were developed using timber sales programmed from Fiscal Year 1978 through Fiscal Year 1984.

Road Maintenance costs were determined from timber sales appraised in 1981 and 1982 and checked against 1983. Allocated road maintenance were based on 1982 and 1983 program averages with some adjustments for inflation and the addition of new mileage to the road system.

Capital Investment costs for roads were based on timber harvest volumes with adjustments to meet the themes of the alternatives or other mitigation needs.

Road density factors for road construction were developed by modeling four representative planning basins with logical road systems and then applying these factors the other basins with some allowance to compensate for known differences.

Timber stand data from the Forest Total Resource Information (TRI) system, 1972-1985

Preliminary Plant Associations of the Siskiyou Mountain Province, Atzet and Wheeler, 1984

Managed Yield Tables for the Siskiyou National Forest, Craig, 1984

Timber Sale Information, Siskiyou National Forest; Departmental Computer Center, Fort Collins (DCC-FC), National Timber Sale Accounting Program (NTSA)

R2MAP-Land Inventory Mapping (LIM) layers, Departmental Computer Center, Fort Collins (DCC-FC)

The Forest's recreation potential was identified through the Recreation Opportunity Spectrum (ROS) inventory completed in 1981

Recreation Information Management (RIM) data

The visual resources of the Siskiyou were inventoried prior to starting the planning process and was updated in 1978

Information was available on Wild and Scenic Rivers based on an inventory published by the Park Service, United States Department of the Interior (USDI), in 1982

Fish habitat inventory from existing stream survey records as collected by Siskiyou National Forest and Oregon Department of Fish and Wildlife (ODFW) personnel, 1939-1986

Fish harvest data derived from ODFW salmon-steelhead catch statistics, 1972-1982
Habitat requirements of salmonids taken from General Tech Report-96, Influence of Forest and Rangeland Management on Anadromous Fish Habitat In Western North America, United States Forest Service ,1979

Documentation of Existing Sport and Commercial Fish Harvest Attributable to Siskiyou Forest Streams and River Habitat, King, 1985

Fisheries Habitat Evaluation Handbook, FSH 2609.23 (Monitoring), July 1985, Amendment 1, Region Six

Manual for Fish Management, ODFW, August, 1977

Winchuck Basin Fish Habitat Enhancement Plan, Johnson, 1985

Regional Guide for the Pacific Northwest Region was used to calculate demand (hunting)

Hunting use figures from ODFW Annual Wildlife Reports

Inventory of wildlife and sensitive habitat from Forest TRI System

FOREST PLANNING MODEL

The planning model consists of information and various analytic techniques combined to address planning questions and issues. The major analytic model is called FORPLAN. An explanation of the FORPLAN model can be found in "FORPLAN Version 2: An Overview" (Johnson and others 1986), and a more general discussion of the use of analysis and models in forest management can be found in "Forest Management" (Davis and Johnson 1987).

OVERVIEW

FORPLAN is a linear program that assigns unique sets of management activities to specific areas of the Forest to compare the productivity of measurable goods and services towards a specific goal called an "objective function." The management activities are combined into compatible sets representative of the multiple uses that could apply to the analysis areas. These sets of management activities are called "management prescriptions."

FORPLAN assigns only those management prescriptions to the analysis areas which produce the goods and services that achieve the objective function in an optimal way given the objective function and constraints used. It also schedules the production of the goods and services over time.

Alternatives are generated by applying constraints to produce a specified range of goods and services, to allow only a specified range of goods and services, or to allow only a specified set of management prescriptions to be assigned to specific analysis areas. These constraints are designed to achieve or maintain a situation considered necessary to meet the overall goal of the alternative. The conditions set by the constraints are satisfied before the objective function is optimized. The final solution of all alternatives had the objective function to maximize PNV. In other words, after meeting all constraints, the FORPLAN model allocated remaining economic choices to maximize PNV.

THE ANALYSIS PROCESS AND ANALYTICAL TOOLS USED

Preliminary analyses leading to the use of FORPLAN included predictions of resource production (timber, wildlife, fish, recreation, and sediment). A social impact assessment study and the identification of base line socio-economic conditions were also used.

Analysis leading up to FORPLAN included designing management prescriptions, assigning practices to prescriptions, developing management costs for each practice and predicting resource outputs, and benefits. Outputs predicted include timber yield, big game forage, sediment, roads, fisheries, costs, and benefits.

FORPLAN was then used to determine optimal allocations and scheduling of management prescriptions for each analysis area. This overall process is key to cost efficient resource allocation. Cost efficiency was considered by the IDT while they were developing a realistic and flexible set of management prescriptions. This combination of identifying cost efficient prescriptions, and then using FORPLAN to identify the mix of prescriptions and scheduling that will produce the highest PNV, provides a method by which the alternative results portrayed represent economically efficient ways of achieving the goals for that alternative.

Decisions that resulted from the preliminary analysis include the following that apply to all prescriptions:

1. All roads will be built and maintained to Forest-wide Standards and Guidelines at the level appropriate to the goals of the alternative. Road construction design standards were developed to minimize impacts on soil and water resources and anadromous fisheries habitat.

2 Timber sales are planned and will be administered according to Standards and Guidelines, including coordination with cultural, visual, wildlife, fisheries, soil, and water resources All harvesting is planned to ensure meeting prescription objectives, including MR's

3 Timber slash disposal and reforestation activities will take place in all prescriptions which include timber harvesting

4. Wildlife habitat management includes practices to ensure adequate browse production and habitat dispersion for big game, the production and protection of habitat for woodpeckers and other cavity nesting birds, and the protection and enhancement of wildlife niches.

5. Baseline socio-economic conditions were identified for the local area In addition, economic (cost) efficiency analysis was used to determine the benefits, costs, and tradeoffs associated with varying levels of goods and services produced on the Forest These are discussed in future sections of this appendix

IDENTIFICATION OF THE ANALYSIS AREAS

The rationale for delineating the analysis areas follows:

Analysis Area Level	Identifier	Reason for Delineation
Basin	1	The Forest was divided into Planning Basins that coincide with the major watersheds to allow analysis of effects by watershed for various resources, water and fisheries in particular Predictions for roads are basin specific
Development Status	2	Identification of unroaded areas and separate unavailable/unsuitable lands Predictions for roads Recreation opportunity analysis
Timber Productivity	4	Predict timber outputs over the long term
Plantation Age	5	Stratify plantations by age for timber output predictions
Condition Class	6	Condition of existing vegetation for predicting timber outputs on the short term

FOREST PLANNING MODEL

LEVEL 1 CRITERIA - BASINS

The Forest was divided into twenty (later reduced to 19) major watershed areas for the purposes of planning These planning basins serve as geographic locators in the model to predict fish and water production, schedule timber harvest and estimate road construction costs. The boundaries were usually placed along major watershed divides. The current total of 19 basins resulted from the split of the old Basin 18 into Basins 15 and 19 A small area of suitable land was remapped from Basin 14 and included in Basin 13 Basin 14 is now entirely Kalmiopsis Wilderness and classified as unavailable for timber production Utilization of watershed areas in the FORPLAN model is more responsive to the issues of fisheries, soil and water resources, and the effects of timber harvest and road construction on these resources.

The following data lists the basin label, the Level 1 identifier and the total acreage.

Identifier	Label	Description	Acreage
01	ELKSIX	Elk and Sixes Rivers	68,043
02	COQUIL	South Fork Coquille River	70,743
03	LOBSTR	Lobster Creek	29,228
04	UP-ROG	Upper Rogue River	78,852
05	LO-ROG	Lower Rogue River	44,843
06	INDIGO	Indigo Creek	49,326
07	SILVER	Silver Creek	42,446
08	GALSLA	Galice and Slate Creeks	41,724
09	LO-ILL	Lower Illinois River	67,382
10	UP-ILL	Upper Illinois River	84,549
11	BRIGGS	Briggs Creek	41,319
12	PISTOL	Pistol River	42,229
13	L-CHET	Lower Chetco River	78,416
14	U-CHET	Upper Chetco River	93,802
15	R&R-JO	Rough & Ready-Josephine Creeks	62,141
16	WNCHUC	Winchuck River	32,481
17	SMITH	North Fork Smith River	57,429
19	EF-ILL	East Fork Illinois River	45,557
20	SUCKER	Sucker Creek	61,791

LEVEL 2 CRITERIA - DEVELOPMENT STATUS

This criteria was used to delineate between roaded (RD) and unroaded (UR) areas on the Forest This classification was necessary to aid in predicting resource outputs for dispersed recreation, road construction, and management costs It is responsive to issues regarding the development of roadless areas on the Forest, the types of recreation opportunities that will be available, and the degree of timber development that is responsive to local, regional, and national needs Unavailable and unsuitable lands (NA) are also identified in this level.

LEVEL 3

(Not Used)

LEVEL 4 CRITERIA - PRODUCTIVITY CLASSES

This criteria was used to define the biological potential of varying land groupings on the Forest, and to link this potential to the response coefficients for timber as a result of treatments performed in the prescriptions. This criteria is responsive to issues concerning levels of timber harvest and future potential The following Level 4 identifiers were used.

Identifier	Label	Description
MN	MIN	Minimum Site 1/
LS	LOW	Low Site
MS	MED	Medium Site
HS	HIGH	High Site

1/ Lands capable of producing less than 20 cubic feet per acre per year

LEVEL 5 CRITERIA - PLANTATION AGE

This level was used to define the ages of the existing plantations Identifiers are P1 through P4 to indicate ages 10, 20, 30, or 40 at the midpoint of the first FORPLAN period This could have been incorporated in Level 6, but it was not included in the original inventory and it was more convenient to insert it here.

LEVEL 6 CRITERIA - CONDITION CLASS

This criteria was used to identify existing vegetation conditions on the Forest. This information was used to predict response coefficients for timber, wildlife habitat, old growth, management costs. It is responsive to timber, and wildlife issues Condition, size, and stocking classes were aggregated into the condition classes shown below:

Identifier	Label	Description
MT	MATURE	Mature Conifer Stands
IE	I/MS/E	Immature Medium Size Sawtimber - Excess Stocking
IP	I/MS/P	Immature Medium Size Sawtimber and Poles
IS	I/S&S	Seedlings and Saplings (primarily plantations)
HD	HRDWDS	Brush and Hardwood Areas Nonstocked With Conifers
SS	SSC	SSC Land (MIN Site from Level 4)
PR	PVTLND	Private and Other Government Lands

IDENTIFICATION OF PRESCRIPTIONS

The NFMA regulations define management prescriptions as "management practices selected and scheduled for applications on a specific area to attain multiple use and other goals and objectives" (36 CFR 219.3). Generally, a multiple use or dominant use management prescription is a set of practices to conserve or preserve resource outputs on any one Management Area.

The Forest IDT constructed the prescriptions by reviewing legal direction, researching appropriate questions, and consulting existing policy direction. The IDT then applied professional judgement to develop multiple-use resource management prescriptions.

These prescriptions represent a range of management direction, intensity, practices, standards, and guidelines The IDT included the necessary mitigation measures and resource coordination measures that are required to satisfy economic, legal, and social constraints when implementing these prescriptions The documentation of these measures are found in the management Standards and Guidelines of the Forest Plan.

Completed prescriptions received full review, discussion, and revision by the IDT Each IDT member evaluated the prescriptions to ensure management direction could be implemented, and that the planning issues, concerns, and opportunities were adequately addressed.

Fourteen different Management Area themes were considered in the planning process The following fourteen Management Areas are represented by a unique management prescription emphasis

No	Name
1	Wilderness
2	Wild River
3	Research Natural Area
4	Botanical
5	Unique Interest
6	Backcountry Recreation
7	Supplemental Resource
8	Designated Wildlife Habitat
9	Special Wildlife Site
10	Scenic/Recreation River
11	Riparian
12	Retention Visual
13	Partial Retention Visual
14	General Forest

The IDT then assigned different prescriptions to different areas of the Forest based on the following criteria

1 Legal obligations such as wilderness designation
2. Ecological characteristics such as riparian zones, unique plant associations, meadows, and old growth timber.
3 Administrative and social obligations such as Research Natural Areas and cultural interest areas
4. Biological capacity for production such as supplemental resource areas and timberland.
5. Need for wide range of alternatives
6. Need for cost efficiency.

Three different groupings of prescriptions were formulated to (1) explore the biological and economic limits of different management strategies (benchmarks), (2) compare with current management (current direction), and (3) implement feasible multiple use applications These groupings permitted the study of the production limits of each resource prescription given minimal attention to other resources, significant changes from current outputs, and cost efficiency of any one alternative compared to maximum outputs or to another alternative.

The IDT then formulated three different hierarchies of prescriptions to further ensure cost efficient solutions. Some areas were designated for simultaneous use with compatible resources, some areas had a single emphasis output, and some areas of land had a minimal level of management. Different alternatives had different amounts of these allocations. This process provided a wide range of prescriptions and cost efficient solutions pursuant to the intent of 36 CFR 219.14(b) and (c)

Subsequent use of the FORPLAN model ensured cost efficient prescriptions by providing solutions to maximize the PNV within given constraints.

A brief discussion of the prescription categories follows. A more detailed explanation is presented in the LRMP.

Each prescription emphasis has driving issues, concerns, or opportunities that provide its purpose, criteria, and assumptions

PURPOSE, CRITERIA, AND ASSUMPTIONS FOR PRESCRIPTIONS

Wilderness

PURPOSE To preserve wilderness

CRITERIA Any activity will provide an environment essentially unaltered and undisturbed by humans

ASSUMPTIONS. Recreational demand will increase, but use will remain within the carrying capacity for the first five decades

COST EFFICIENCY· Different management plans for wilderness were assessed to determine meeting recreational demand at least cost

POTENTIAL ACTIVITIES· Trail construction, trail maintenance, and natural fuels treatment

Wild River

PURPOSE: To maintain the river environment in a natural state while providing for recreational opportunities

CRITERIA. Any activity will provide an experience of a free flowing, free of impoundments river with high quality water inaccessible except by trail.

ASSUMPTIONS· Recreational use will increase over time with potential impacts.

COST EFFICIENCY: Different management strategies were assessed to meet demand at different levels with different costs

POTENTIAL ACTIVITIES· Trail construction, trail maintenance, and natural fuels treatment.

Research Natural Area

PURPOSE: To preserve examples of naturally occurring ecosystems for research and education

CRITERIA: Any activity will ensure the baseline conditions, gene pool preservation, and natural processes in relatively undisturbed environments will not be altered.

ASSUMPTIONS: The experiment station and universities associated with the RNA's will continue to provide direction The need for lands in a natural state will remain constant over the planning period.

COST EFFICIENCY· Other values, such as minerals, which are foregone in this management prescription, are minimized in the site selection. RNA values are assumed to exceed opportunity costs

POTENTIAL ACTIVITIES: Research projects and educational projects

Botanical

PURPOSE. To protect unusual botanical features of the Forest

CRITERIA. Any activity will ensure that endangered, threatened, or sensitive plant species, and other unique biological features will not be adversely affected.

ASSUMPTIONS· The demand for protecting rare plants from disturbance and value of those plants will not decrease within the planning period.

COST EFFICIENCY: Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives.

POTENTIAL ACTIVITIES Natural fuels treatment, road maintenance, and road construction

Unique Interest

PURPOSE. Protect significant cultural sites and outstanding geologic features of the Forest

CRITERIA Any activity in this category of land will maintain or protect historic structures or locations of historically significant events, and prominent or unusual rock buttes or waterfalls.

ASSUMPTIONS: Other uses such as recreation, range, minerals, lands, and facilities may occur if they are subordinate to the purpose of this area. The values of these features will not decrease in time.

COST EFFICIENCY: Different alternatives have different allocations of this Management Area providing for examination of economic efficiency.

POTENTIAL ACTIVITIES: Road maintenance, road construction, natural fuels treatment, and activity fuels treatment.

Backcountry Recreation

PURPOSE Maintain areas in an undeveloped condition and provide Primitive and Semi-primitive recreation opportunities. Specific areas may be designated to provide Motorized or Non-motorized recreation

CRITERIA: Any activity will retain the natural or near-natural state of land in this classification

ASSUMPTIONS: Semi-primitive Motorized recreation will be compatible with mineral exploration and development Trail construction and maintenance will also be compatible.

COST EFFICIENCY: Different alternatives had different land allocations for this area providing a wide range of alternatives and a basis for comparing economic efficiency.

POTENTIAL ACTIVITIES· Trail construction, trail maintenance, and natural fuels treatment In Motorized areas, construction or maintenance of primitve roads as ORV or jeep trails.

Supplemental Resource

PURPOSE To protect or enhance critical wildlife and fisheries habitat

CRITERIA: Any activity will maintain high quality watershed conditions, and maintain or improve water quality.

ASSUMPTIONS. Recreation, wildlife and fish habitat improvements, soil and water restoration projects, mineral extractions, and facility construction may occur provided the area's purpose is met.

COST EFFICIENCY· Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives

POTENTIAL ACTIVITY: Trail construction, trail maintenance, wildlife habitat improvements, fish habitat improvements, watershed improvements, road maintenance, road construction, and natural fuels treatment

Designated Wildlife Habitat

PURPOSE. To preserve old-growth habitat to maintain populations of old-growth-dependent species

CRITERIA All activities will protect mature and old growth habitat in sufficient amounts to maintain viable populations of indicator species (spotted owls, pine martens, and pileated woodpeckers).

ASSUMPTIONS: The amount and distribution of old growth habitat in this category is sufficient to maintain viable populations of indicator species.

COST EFFICIENCY: Two different options of providing the mature and old growth habitat were examined for economic efficiency. The first option provided for rotating areas and rotation lengths to obtain the desired habitat The second option set aside areas to maintain the desired habitat

POTENTIAL ACTIVITIES. Wildlife habitat improvements, fish habitat improvements, trail construction, trail maintenance, road maintenance, road construction, and natural fuels treatment

Special Wildlife Site

PURPOSE Protect or enhance unique wildlife habitat.

CRITERIA: Designated meadows, wet sites, lakes, tanoak sites, hardwood sites, Roosevelt elk sites, band-tailed pigeon sites, osprey nest sites, rock sites, dispersed old-growth sites, and small wildlife areas and botanical sites will have only activities that maintain or enhance their value for wildlife habitat

ASSUMPTIONS: Other uses may be compatible in this area if the area's purpose is met. Timber harvest would not be programmed

COST EFFICIENCY. Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives

POTENTIAL ACTIVITIES: Wildlife habitat improvements, fish habitat improvements, trail construction, trail maintenance, natural fuels treatment, activity fuels treatment, road maintenance, and limited road construction

Scenic and Recreation River

PURPOSE: To provide high quality scenery along a largely undeveloped shoreline and to provide a wide range of river oriented recreation.

CRITERIA All activities will provide or maintain the aesthetic, scenic, archeologic, recreational, and water quality attributes of these areas.

ASSUMPTIONS: Coordination with the five agency group for river management will allocate uses for these areas.

COST EFFICIENCY: Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives.

POTENTIAL ACTIVITIES: Wildlife habitat improvements, fish habitat improvements, recreational improvements, trail construction, trail maintenance , road maintenance, road construction, timber sale preparation, timber harvest, reforestation, and timber stand improvements.

Riparian

PURPOSE Maintain integrity and water quality of the riparian ecosystem

CRITERIA. All activities will maintain the vegetative, terrestrial, and aquatic habitats associated with riparian areas. Other objectives such as timber harvest will be secondary to the primary criteria

ASSUMPTIONS: If unresolvable conflict occurs, preferential consideration is given to riparian values

COST EFFICIENCY: Different prescriptions for managing riparian areas are examined to determine economic efficiency and a range of biological responses. Opportunity costs of forgoing secondary benefits are examined.

POTENTIAL ACTIVITIES: Wildlife habitat improvements, fish habitat improvements, timber sale preparation, timber harvest, reforestation, timber stand improvements, trail construction, trail maintenance, watershed improvements, natural fuels treatment, activity fuels treatment, road maintenance, and road construction

There are three options for management of the riparian vegetation in areas available and suitable for timber management. These are referred to as riparian management option B, riparian management option C, and minimum level (M) (There was originally a management option A, but it was dropped when it was determined that MR's could not be achieved under this option.) These prescriptions differ in the amount of vegetation that can be removed in management activities. Application of any of the prescription options will provide flexibility to retain large organic debris in the riparian areas for long-term input to stream systems.

PRESCRIPTION OPTION B allows a moderate level of vegetation removal from the riparian area. A maximum of 70 percent and 30 percent removal of the basal area from Class III, and Class I and II streams are allowed. The actual average harvest used for the FORPLAN model was 50 percent and 20 percent removal because the maximum amount of wood could not be removed in all cases. The prescription is designed to maintain existing water temperatures within the Planning Basin as regrowth of shade in past activity units balances removal associated with new projects. It must be remembered that these prescriptions are applied to a basin as a whole and the expected results are viewed as net change over time. Prescription option B provides the basic level of protection necessary to accomplish the MR for riparian area management because any net increase in the critical summer water temperature would cause an unacceptable adverse impact to the fisheries resource.

PRESCRIPTION OPTION C allows minimal removal of the shade providing vegetation and is estimated to have a net effect of a two degrees Fahrenheit reduction in the summer water temperature over time. The *maximum amount of basal area removed for Class I and II, and Class III streams are 20 percent and 40* percent respectively. The average harvest used in the FORPLAN model are 10 percent and 20 percent since the maximum amount of wood could not be removed each time. This prescription would improve the quality of the habitat for salmonids over the present condition in the basin taken as a whole. Prescription C reduces risk of activity impacts on Class III streams and may offer greater long-term protection of the riparian ecosystem. Greater availability of woody debris and density of overhead canopy would be provided.

PRESCRIPTION OPTION M, the minimum level option, does not allow removal of shade providing vegetation through timber harvest. Improvement in stream temperatures beyond option C are not projected, but this option would provide additional security by minimizing risks of impacts in the riparian areas.

Retention Visual

PURPOSE. To maintain area in near natural condition.

CRITERIA Any management activity will be subordinate to the landscape character and not evident to the casual visitor

ASSUMPTIONS. The value of high quality scenery will not decrease over the planning period

COST EFFICIENCY. Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives This allows the examination of forgone benefits.

POTENTIAL ACTIVITIES: Wildlife habitat improvements, fish habitat improvements, timber sale preparation, timber harvest, reforestation, timber stand improvements, watershed resource improvements, natural and activity fuels treatment, recreation improvements, trail construction, road construction, trail maintenance, and road maintenance.

Partial Retention Visual

PURPOSE To maintain area in a near natural state such that human activities are subordinate to the landscape character

CRITERIA Activities may be evident to the casual visitor, but such activities blend with the landscape

ASSUMPTIONS The values of high quality scenery will not decrease over the planning period.

COST EFFICIENCY: Different alternatives have different areas allocated to this Management Area for providing an economic comparison and a wide range of alternatives with different opportunities.

POTENTIAL ACTIVITIES: Refer to the potential activities permitted in the Retention Visual Management Area

General Forest

PURPOSE. To provide a full range of activity with conservation of renewable resources.

CRITERIA. To produce timber within the reasonable constraints of other resources and the capability of the land.

ASSUMPTIONS: Many uses of these areas are compatible.

COST EFFICIENCY: Different timber management options were examined (intensive, moderate, and extensive) to obtain economic efficiency and a full choice of activities. The projected yields for these options were obtained from analysis using DP-DFSIM to choose rotation lengths, thinning regimes, and other silvicultural practices. The FORPLAN model then was used to allocate these options on high, moderate, and low sites using economic criteria.

POTENTIAL ACTIVITIES: Refer to the potential activities permitted in the Retention Visual Management Area.

DEVELOPMENT OF TIMBER HARVEST OPTION INTENSITIES

The site specific selections of silvicultural systems and harvest methods are discussed in FEIS Appendix G. The FORPLAN modeling with the exception of Riparian Management Areas, is based on evenaged systems and the clearcut harvest method This is the predominant system currently in use, and has available yield models Following the analysis process of Appendix G for site specific conditions of the Siskiyou, the evenaged system is expected to be the most common used in the implementation of the Forest LRMP. Application of other systems in some site specific cases is not expected to significantly affect the ability to produce Forest-wide outputs.

Timber harvest options and management intensities were developed to portray a range of investment levels and management practices, and to evaluate the yield and economic consequences. The management practices outlined in Standards and Guidelines 4-1 of the Regional Guide are used in various combinations to derive silviculturally sound management regimes for the Siskiyou National Forest.

Regimes that are not feasible on a broad scale are; those that plan for reforestation to be accomplished by natural regeneration, and those that would program commercial thinning without planning precommercial thinning to achieve stocking control. These regimes are rejected due to the uncertainty of natural regeneration, and the unpredictable nature of natural fill in following planting Both of these factors are complicated by vegetative competition

The intensities developed evolve from three basic schemes· extensive, moderate, and intensive All of the management intensities plan for artificial regeneration of cut over acres and include all management practices necessary to establish future stands, i.e., site preparation, animal control, and release Variations of the three basic intensities include reforestation with or without genetically improved stock; and for intensive and moderate, the option of fertilization. The basic intensities are described as follows·

Extensive.	Following satisfactory reforestation, no further treatment would be planned until final harvest.
Moderate Intensity:	Following satisfactory reforestation, stands would be precommercially thinned as needed to achieve early stocking level control, then no further treatment would be planned until final harvest.
Intensive.	Management practices would include all reforestation treatments, precommercial thinning, and commercial thinnings as needed to cost efficiently optimize timber production.

Allowable entry dates (minimum rotation length) for timber stands not constrained by other resource requirements are set at the age when the yield prediction for that particular regime reaches 95 percent of Culmination of Mean Annual Increment (CMAI). All existing stands classified as sawtimber are at or beyond the minimum rotation ages and are considered available for entry beginning in the first decade Existing seedling and sapling stands are assigned to the managed yield tables depending on productivity class and management intensity; the timing is then dependent on the starting ages of the young stands.

As part of the benchmark analysis, rotations were also identified at the ages when stands first reach the minimum merchantability standards. These rotations are used for analyses where the 95 percent of CMAI constraint is dropped

MOST EFFICIENT INTENSITIES

Analysis of the individual management intensities has identified the intensity and timing of harvest with the highest PNV for each category of land as required by 36 CFR 219.14(b). This is known to some as the

"Stage II suitability analysis." Extensive management produces the highest PNV for Low Site and Moderate Intensity produces the highest for Medium and High Sites. Harvest of existing available stands at the present time (year 0), and harvest of young managed stands at the earliest available age, would yield the highest PNV. The timing of harvests and the PNV's are displayed in the following table These management intensities along with the other combinations described in the section above, and many timing choices, have been allowed as options in the FORPLAN model. Providing numerous options to the model assures that the most efficient combination of intensities and timing of treatments, when taken in context of the entire Forest, can be identified for each alternative.

Economically Efficient Management Intensities By Land Category

Land Productivity Class	Condition Class	Existing Inventory		Managed Rotation		Total PNV ($/Acre)
		Year of Harvest	PNV ($/Acre)	Harvest Year	PNV ($/Acre)	
LOW SITE	Mature	0	2,056	140	-818	1,238
	Existing Plantation	-	-	125	45	45
	Hardwoods	0	-388	140	-818	-1,206
MEDIUM SITE	Mature	0	6,217	85	-20	6,197
	Immature Fully Stocked	0	6,516	85	-20	6,496
	Immature, Not Fully Stocked	0	1,634	85	-20	1,614
	Existing Plantation	-	-	60	1,482	1,482
	Hardwoods	0	-388	85	-20	-408
HIGH SITE	Mature	0	12,373	75	166	12,539
	Immature Fully Stocked	0	6,516	75	166	6,682
	Immature, Not Fully Stocked	0	1,634	75	166	1,800
	Existing Plantation	-	-	50	1,817	1,817
	Hardwoods	0	-388	75	166	-22

SEPARATE SUITABILITY COMPONENT (SSC)

The SSC lands are lands previously delineated which produce less than 20 cubic feet per acre per year This category contains 18,713 acres for which inventory data is not available. Assignment of these acres to Low Site yield tables would greatly misrepresent yield capabilities from the SSC. The average growth potential is estimated to be 14 cubic feet per acre per year. Considering the extraction and reforestation costs, on the average all entries in this component would have negative PNV's Since this component is not allowed to interact with other lands, there could not be allowable cut effects, or scheduling advantages associated with these lands. Modeling any harvest on these lands would reduce the Forest-wide PNV; they would not be selected by FORPLAN Given this plus the projection that their maximum output would be less than one percent of the timber output of any benchmark or alternative, timber harvest prescriptions for the SSC lands were not entered in the FORPLAN model.

DEVELOPMENT OF YIELD COEFFICIENTS

This section describes how the yields of each resource were calculated Additional information regarding each resource can be found in the respective background papers on file in the Forest planning records.

RECREATION

The recreation yield coefficients for the Siskiyou National Forest express potential capacity in RVD's per acre. Capacity coefficients were derived directly in RVD's by considering the specific activity mixes occurring on the Forest. This process requires the application of capacity standards for each activity by ROS class, such as hikers per mile of trail per hour, and summing the individual capacities to obtain one total maximum capacity for an area. The process for determining capacities was derived from the USDA publication, ROS Users Guide.

In general the process worked as follows:

Activities and outputs were determined for each ROS class. The physical characteristics of land were identified that would affect its capacity to support recreation use. Factors were identified that would affect recreation use, such as useable days per year, length of stay, numbers of people per mile of trail, etc. Finally total capacities were determined for each activity and these were combined to reflect the capacity coefficient for each ROS class on the Forest. The final coefficients fell within the range suggested for Region Six for each ROS class.

The capacities arrived at by applying the coefficients do not reflect use or demand. They are gross averages and are useful primarily for comparing the potential capacity to provide recreation outputs in a relative sense under different management emphasis.

Complete documentation for all capacity coefficients is on file at the Supervisors Office, Siskiyou National Forest, Grants Pass, Oregon.

Projected Use

DEVELOPED RECREATION. Developed recreation was not an issue in this analysis; capacity exceeds use and potential capacity far exceeds projected demand. Developed recreation outputs were expressed as current use and a projected demand based on current use. It was assumed that once projected demand reached or exceeded supply, developed sites would be constructed or existing sites expanded to accommodate the demand.

Demand was projected by applying a one-half percent per year increase to the 1980 RIM use data.

Current supply was based on 1980 RIM data and is expressed as maximum optimal capacity or approximately 30 to 40 percent of theoretical capacity.

DISPERSED RECREATION. Dispersed recreation includes Wilderness and general Forest on the assessment output tables. Use was evaluated by ROS class and is based on 1980 RIM data. For all ROS categories, use was projected at the rate one-half percent increase per year over the planning horizon Capacity coefficients were applied to inventoried acreage to identify the apparent capacity.

It was assumed that all Primitive or Semi-primitive Non-motorized acres in areas allocated to management that included timber harvest would shift to the roaded natural end of the spectrum by the end of the first decade.

It was assumed that administrative restrictions on motorized use could be placed on appropriate trail systems in roadless areas and ROS classifications changed accordingly.

VISUAL RESOURCES

The yield coefficients developed for the VQO's on the Siskiyou National Forest are expressed in terms of the percentage of the landscape in disturbed openings at any one time. The coefficients were developed

with consensus among Region Six Landscape Architects and were based on the study, Scheduling Timber Harvest to Meet Visual Objectives, (DeWerff et al, 1981)

Basically, the study process involved the following:

Definition: A visual coefficient as applied to this Forest can be defined as the percentage of commercial Forest land that can be harvested over a given period and still allow the attainment of the Retention, Partial Retention, and Modification/Maximum Modification VQO's

Two methods were used to generate the visual coefficients. The first utilized the Existing Visual Condition (EVC) inventory that was completed in 1981 on the Forest. The second utilized the HP 9845 perspective plot computer system and allowed the graphic assessment of visual impacts of timber harvest over time with the ability to adjust harvest percentages up or down and evaluate the results graphically.

The study resulted in the definition of the following coefficients by VQO.

Retention Visual

0-4 percent Harvested each decade
250-300 year rotation
1-5 acre openings
8 percent of the total area disturbed at anyone time

Partial Retention Visual

5-8 percent harvested each decade
130 year rotation
5-10 acre openings
16 percent of the total area disturbed at anyone time

Other Visual-Modification/Maximum Modification

9-13 percent harvested each decade
80 year rotation
10-60 acre openings
27 percent of the total area disturbed at any one time

For Forest-wide modeling, the percent harvested per decade and the rotation length were used as constraints on the timber harvest schedule, when and where VQO's were assigned

WILDLIFE

Woodpeckers (Snags). Coefficients for wildlife trees (snags) are described in Managed Yield Tables for Siskiyou National Forest (Craig 1984). The following discussion is excerpted from this publication. Production of wildlife trees is planned to provide foraging and nesting habitat in future rotations for species dependent on snags. The basal areas of snags required to sustain various population levels are shown in the table below. The mortality projected by DFSIM would supply the needed snags during the older ages of the stands, however, allowances need to be made for the period between final harvest and the time when regenerated stands begin to produce mortality, and also for periods following commercial thinning The period following final harvest until the future stand will produce snags is approximately twice the length of the average snag life The basal area representing two sets of wildlife trees will be subtracted from the final harvest to provide snags during this period For example, to provide for the 40 percent population level, 1.54 square feet of basal area (.77 x 2) would be subtracted from the final harvest To provide for snags

following commercial thinning, the basal area equivalent to one set of snags would be subtracted for the thinning harvest The table below displays snags required to sustain woodpecker populations

Diameter Breast Height (DBH) in Inches	Trees per Acre	Basal Area per Acre in Square Feet	Snag Life (Years)
20 Percent Population Level			
10	06	03	20
12	38	30	25
		.33	
40 Percent Population Level			
10	50	27	20
12	24	19	25
20	14	31	35
		77	
60 Percent Population Level			
10	93	51	20
12	24	19	25
20	14	31	35
		1 00	

Black-tailed Deer/Roosevelt Elk. Yield coefficients developed for deer also represent elk Coefficients were not developed specifically for elk because this species continues to expand its range on the Forest and changes in population size would be difficult to attribute to environmental changes caused by Forest management practices. Fluctuations in deer herd size should mirror habitat capability for elk (but not necessarily the number of animals) Acre per deer constants were assigned to various seral stages and habitat types. These constants were multiplied by the total acres within each habitat grouping to produce population figures, which were then added together This resulted in a potential Forest-wide winter (April) deer population of approximately 28,300 (present situation) A more detailed description of deer yield coefficients is on file at Siskiyou National Forest headquarters.

Wildlife-related Recreation WFUD's (Wildlife [Fish] User Days) are derived from two sources game (hunting) and non-game (viewing) ODFW and Forest data indicate hunters annually contribute 40,450 WFUD's to the Siskiyou (40,450 x 2 = 80. The Siskiyou assumes game WFUD's are tied to deer habitat capability; when habitat capability goes up or down in response to timber harvest levels, so do the "attached" game WFUD's.9 M WFUD's). This assumption is based on the contention that people will continue to hunt only if their opportunity for success does not diminish. This modeling assumption would not be quite correct if hunters are willing to accept lower success rates, but it provides a fair method for comparing the alternatives at a constant quality level (success rate)

It is also assumed that non-game WFUD's are not tied to timber harvest and will increase by 0 5 percent per year (predicted increase in demand for SW Oregon - OSU Research Bulletin # 28, 1979) Because no data are available for the number of WFUD's attributable to nonconsumptive use of wildlife resources on the Siskiyou, nonconsumptive WFUD's are assumed to be equal to the number generated by hunting

FISHERIES

Fish Distribution. The determination was made in cooperation with ODFW biologists through review of State and Forest stream survey records From these records, existing distribution of salmonids on the Forest was placed at 609 miles from anadromous salmonids (salmon, steelhead sea-run cutthroat trout), and 1,147 miles from resident rainbow and cutthroat trout

Habitat Quality and Capability The following basic assumptions were arrived at by the Forest Biologist and Region Six Fisheries Biologist, Gordon Haugen for the Siskiyou National Forest.

1 Each of the Forest drainages has an adequate escapement potential for adult fish
2 Spawning gravel quantity and quality are sufficient to provide for incubation and emergence of enough fry to fully stock existing rearing habitat.
3 The quantity and quality of rearing habitat are the most critical components for the survival of juvenile salmonids.

Known limiting habitat factors on the Siskiyou consist of high summer water temperatures, lack of summer rearing pool depths, lack of sufficient instream fish cover, and low summer stream flows. Existing habitat condition was evaluated against limiting factor ranges for salmonids at various life stages as described in the following literature

Reiser, D W. and T C. Bjornn, 1979 Influence of Forest and Rangeland Management on Anadromous Fish Habitat in North America· Habitat Requirements of Anadromous Salmonids USDA.

Forest Service Pacific Northwest Forest and Range Experiment Station. 54 pp.

ODFW, 1977 Manual of Fish Management 218 pp.

State of Oregon, 1977. Regulations Relating to Water Quality Control in Oregon Sections from Oregon Administrative Rules, Chapter 340 Department of Environmental Quality. pp 1-22, 155-296, 455-456

Coefficients for projecting pounds and WFUD's from capability value for anadromous fish. Coefficients were developed by a three-Forest Coastal Zone Group consisting of the Siskiyou, Siuslaw and Umpqua National Forests. Factors used by the Siskiyou Forest from this effort included; smolt to adult survival, catch to escapement ratios, average weight of adult fish, etc

Salmonid Harvest Determination Process. Working with biologists of the ODFW, determination of existing Forest fisheries output was made This process involved review of annual salmon catch statistics in the offshore commercial fishery for Oregon, Washington and California, plus inland and offshore sport fisheries success for the three States.

DIVISION OF CATCH (COMMERCIAL, OFFSHORE SPORT, INLAND SPORT) For those salmon attributed to Siskiyou National Forest habitat production, a catch division of 66 percent commercial, 27 percent offshore sport, and 7 percent inland sport was made after review of Oregon catch records and information compiled by Pacific Fisheries Marine Council.

SPORT HARVEST RATE (ANGLER DAYS/WFUD's) Sport harvest records as reported by the ODFW are expressed in Angler Days while the Forest Service reports angler effort in terms of WFUD's Relationship of these two terms is shown in Documentation of Existing Sport and Commercial Fish Harvest Attributable to Siskiyou Forest Stream and River Habitat, January 1985 This document is on file at the Siskiyou Forest Supervisor's Office

Salmonid Harvest Attributable to Forest. Average inland sport catch records for 1972-1982 were used as a basis for determination of Forest habitat contribution for each of the 19 Planning Basins Percent of wild fish attributable to Forest habitat was assigned for each major river system involving Forest administered habitat This work was done in cooperation with the ODFW.

Average annual sport and commercial harvest attributable to Siskiyou Forest habitat, under present situations, was determined as shown in the following:

Species	Pounds	WFUD's
Total Anadromous		
Adult Steelhead (Winter and Summer)	-	16,430
1/2 lb Summer Steelhead	-	10,345
Fall Chinook	375,075	11,250
Spring Chinook	484,950	18,954
Coho	19,888	843
Sea-run Cutthroat		1,024
Total Forest Contribution	879,913	58,946
Total Resident		
Rivers and Streams	-	4,984
Lakes and Ponds	-	1,132
Total Forest Contribution	-	6,116
Total Forest Average Annual	879,913	65,062

Fishery Value	Dollars
Average Annual Fishery Value	
Anadromous (WFUD's)	1,945,218
Anadromous (lbs)	923,908
Resident Trout (WFUD's)	91,740
Total Annual Average	2,960,866

Water Temperature The water temperature of streams on the Siskiyou National Forest is an important element of overall water quality. A water temperature model was developed on the Siskiyou National Forest to estimate the potential cumulative effect of different harvesting intensities in streamside areas on downstream water temperature.

During the Forest Planning process, the Siskiyou National Forest was divided into 19 Planning Basins that are in most cases major watershed divisions. For example, the Silver and Indigo Creek watersheds are each distinct Planning Basins Certain basins, 7 in all, were selected to be used in the water temperature model using the following criteria:

1. Planning Basins should have historical data on minimum flow discharge and temperature for major tributaries.
2. Planning Basins should be selected so as to represent the wide range of geomorphological and climatic features present on the Siskiyou National Forest

A formula, based on Brown's equation, was used to estimate the cumulative changes in water temperatures within selected Planning Basins. Key factors considered in the formula are the increase in direct solar radiation due to vegetation removal and the decrease in direct solar radiation from the regrowth of riparian vegetation in previously harvested areas.

The change in stream temperature for the end of the next decade was predicted at the mouth of each main tributary and at the confluence of each main tributary and main stem for each streamside vegetation

management intensity within the selected basins. A mixing formula was used to estimate and track cumulative stream temperature values downstream in the basins

The information from the stream temperature modeling was one of the criteria used to select Riparian Prescriptions B and C for managing the riparian areas on the Siskiyou National Forest The **FISH** section of Chapter IV of the FEIS and the Management Area 11 (Riparian) section in Chapter IV of the Forest Plan describe the riparian prescriptions Table II-3 of the FEIS shows which riparian prescription is applied to each Planning Basin for each alternative.

More information on the stream temperature modeling is contained in the Forest Planning Process Records

Fisheries Yield Projections. Fisheries output projections were developed based on application of the A, B or C management prescription to Riparian areas (average width of riparian area was modeled at 150 feet on each side of Class I and II streams, and 100 feet on each side of Class III). The minimum level prescription is not expected to produce a substantially greater improvement in stream temperature over Prescription C and uses the same yield projection. Considering present stream temperatures and salmonid tolerance limits, projections were made and modeled as follows.

1. Application of the A prescription was modeled as raising existing temperature of Class I and II streams by an average of two degrees Fahrenheit by the end of the third decade Based on salmonid temperature tolerances, anticipated competition from nongame fish, existing high water temperatures, and loss of long term large woody debris input to stream channels, application of the A management prescription was modeled to decrease salmonid habitat capability by 50 percent in Class I and II streams It was determined that this prescription did not meet minimum legal requirements and it was dropped from further consideration
2 Application of the B prescription was modeled to maintain current habitat conditions and fisheries outputs of Class I and II streams
3 Application of the C prescription was modeled to decrease existing water temperatures by two degrees Fahrenheit within Class I and II streams and improve salmonid habitat capability an average of ten percent by the end of the third decade

TIMBER

Yield tables for existing timber stands were developed through statistical analysis of inventory data. Stand volume and growth were projected for each combination of Productivity Class and Condition Class

Yield tables for future stands and existing plantations under management were developed using the stand simulation model for Douglas-fir, DFSIM. Yield projections were made for the various combinations of Productivity Class, Prescription Emphasis, and Management Intensity Additional analysis of thinning and fertilization regimes was done with the aid of the dynamic programing - DFSIM model (DP/DFSIM)

Yield tables for existing and managed stands, and the supporting data and processes used in their development, are part of the Planning Record Development of future yield projections are documented in Managed Yield Tables for Siskiyou National Forest (Craig 1984)

The estimates and analysis of future timber yields uses cubic foot volume measure. Many people are not familiar with cubic measure and it is difficult to relate to the volume amounts displayed in million cubic feet (MMCF) (sort of like going to the metric system cold turkey) To provide information in a measure familiar to many reviewers, the selected volume estimates for the first decade are displayed in million board foot (MMBF) measure This provides a convenient reference for alternative comparisons The board foot values are computed by applying a board foot/cubic foot conversion ratio to the cubic foot volumes A conversion ratio of 5 41 representing the weighted average of all standing timber volume was used to estimate board

foot values for the alternatives in the DEIS. Comments by interested publics and the State of Oregon suggested that a more refined estimate of board foot measure for first decade timber outputs should be used A conversion ratio of 5 58 was calculated as the weighted average of the mature stands that will provide the harvest volume in the first decade This conversion ratio is used to compute the first decade board foot projections in the FEIS.

Another change between the draft and final relates to the salvageable dead volume The volume in salvageable dead trees measured in the inventory is equivalent to two percent of the volume on a per acre basis The ID Team estimates that approximately one-half of this volume will be needed to meet the requirements for large woody material to be left on site for wildlife habitat, long-term nutrient cycling, and other resource considerations From this analysis it follows that, on the average, each acre harvested will yield an additional one percent volume from the dead trees that were not included in calculation of the yield tables An amount equivalent to one percent of the sawtimber ASQ for any alternative has been included as a salvage component of the projected timber outputs that would be expected from that alternative

SEDIMENT

A sediment yield model was developed to predict sediment production by management activity (harvest, thinning, road building), by soil type and eventually by alternative and Planning Basin The following table presents the methods and data sources used in the development of the model.

Source/Activity	Natural Undisturbed	Roads	Accelerated Harvest	Burning
Mass Movement	Landslide Inventory	Landslide Inventory	Landslide Inventory	Landslide Inventory
Surface-Channel	Geomorphic Indices	Literature Values	Literature Values	Literature Values

Natural sediment rates for surface and channel erosion were predicted by geomorphic indices (Maxwell and Marston 1980), while natural landslide activity was predicted from an actual inventory of Siskiyou National Forest landslides (Amaranthus and others 1985) Accelerated surface and channel erosion was predicted by literature values reported from western Oregon and California, northern Rockies, and the Idaho Batholith (Megahan 1974, 1975; Megahan and Kidd 1972; Megahan and Molitor 1975, Rice, Rothacher and Megahan 1972; Platts and Megahan 1975, Anderson 1975; Andre and Anderson 1961, Wischmeier and Smith 1958, 1965, 1968), and local data (Hansen and Amaranthus 1979). The literature was used to document the magnitude of impact and its consequences rather than directly applying a numerical value. Accelerated landslide activity was estimated by the actual Forest-wide inventory

A set of 53 sediment yield tables was compiled to represent the various soil types on the Forest in the FORPLAN sediment yield model. Coefficients that comprise the yield tables were prepared to numerically simulate the erosional processes of mass movement and surface-channel erosion. Estimates were made for these erosional processes under natural conditions and also as the result of forest management

Coefficients for sediment yield key on acres clearcut, but include a weighted average for anticipated road building For each alternative, by Planning Basin, the estimated accelerated sediment yield (index value) above background (natural plus existing road system) is displayed in Chapter IV (**SOIL AND WATER**) of the FEIS The total sediment yields (natural plus existing plus accelerated) are displayed in Chapter II (**SOIL AND WATER**) of the FEIS These data are used to make relative comparisons and indicate trends between alternatives.

Management Requirements will be met by implementing the Forest-wide Standards and Guidelines, Best Management Practices (BMP's) (Standard and Guideline 7-14 and Appendix F of the Forest Plan), the Riparian Management Prescriptions; and the harvest dispersion constraints.

ROADS

Main Access Roads (Arterial and Collector Roads). The arterial road system is considered to be in place with no additions expected If there are arterial additions in the future, it is expected that they will be designated from collector roads with reconstruction to upgrade the road standard at that time.

Most of the collector road system is in place Eighty-seven miles are varied in alternatives to represent collector road additions to the system. This mileage was determined from estimated needs with the completed road system. These collector road additions consists of ten miles of existing private road to be acquired, forty-four miles of new timber sale roads to access primarily the remaining unroaded lands, and thirty-three miles of existing local roads which could change to collectors. The existing local roads extend existing collector roads to new collector roads or join two collectors together to form new loop systems. The additional collectors are added to the system by the end of the fifth decade at rates which correspond generally with timber harvest levels in the alternatives. All costs for the collector roads were placed in the FORPLAN model at the same rate as the local roads. Where the model did not cost the collector construction adequately, a preroading or supplemental amount is added in the capital investment program for each alternative in the decade estimated to be needed. This supplemental funding affected three roads which are included if the area is accessed for timber harvest in the alternative. The primary intent of using supplemental funds was to assure that costs for these three roads were adequately represented in the road costs

Local Road Construction

The density coefficients for all roads were determined by modeling four representative basins with a logical road system and applying these models to the other fourteen basins with roads These basins represented four different Ranger Districts, four different basin sizes, two essentially westside and two eastside basins, and all are approximately equal distance from each other. On maps, the basin boundaries were identified, the roaded area was separated from the unroaded area, the commercially unharvested areas were identified, and helicopter logging areas were identified A map wheel was used to measure the mileage After comparing the outcome with other data previously determined, it was felt that this data best represented the roading for each of the four basins. The other fourteen basins with roads were then grouped with one of the four basins most like it, and a factor used to compensate for known differences Using the acres in each basin of mature, immature, and pole timber (these timber stands are the ones that will develop the road system), the miles per acre for new development in each basin were determined, assuming each acre planned for first time timber harvest would contribute to the construction of some road These coefficients were used in the FORPLAN model to determine the *new* road construction on timber sales at the time an acre is cut. When the "roaded area" new road coefficients are incorporated with the existing road system in each planning basin, the resultant factors exceed the "unroaded area" factors by from one to four miles per square mile.

The coefficients used are

Basin	Roaded Area (New Roads) Harvestable 1/ Acres	Miles/ Acre	Miles/ Square Mile	Unroaded Area Harvestable 1/ Acres	Miles/ Acre	Miles/ Square Mile
1	21,249	00255	1 63	10,912	00491	3 14
2	44,740	00268	1 72	1,355	00517	3 31
3	15,089	00255	1 63	2/		
4	20,013	00241	1 54	15,248	00465	2 98
5	16,925	00330	2 11	6,811	00456	2 92
6	9,664	00324	2 07	22,459	00648	4 15
7	2,190	00378	2 42	19,200	00756	4 84
8	18,136	00360	2 30	2/		
9	10,868	00363	2 32	13,115	00502	3 21
10	6,182	00396	2 53	11,120	00792	5 07
11	14,780	00360	2 30	4,480	00720	4 61
12	19,520	00330	2 11	4,139	00456	2 92
13	19,722	00330	2 11	11,189	00456	2 92
14 3/						
15	2,019	00340	2 18	3,696	00713	4 56
16	13,600	00330	2 11	6,000	00456	2 92
17	2,985	00340	2 18	5,259	00713	4 56
19	17,310	00347	2 22	859	00680	4 35
20	25,259	00309	1 98	3,856	00648	4 15

1/ Acres mature, immature, and pole timber in the planning basin
2/ Basin contains no designated unroaded area
3/ Basin contains all wilderness acres

The economic objective of the FORPLAN model tended to set back the higher cost road construction into later decades by selecting acres with high timber volume in relation to the volume per acre This did not represent feasible solutions due to the spatial limitations that are not represented in the model. A constraint on the Purchaser Credit funding was placed on the first six decades to provide a more realistic distribution of the road construction in this period. This constraint did not permit these funds to increase over the previous decade amount, thus forcing the model to distribute the road costs and harvest of some low site land into earlier decades

Another situation with the FORPLAN model is that miles per acre or timber volume harvested tended to not fully recognize construction miles needed to reach the initial stands The harvesting of the later stands can often be accomplished on roads previously built to enter the area The result is to underestimate the new construction in the early decades and overstate the mileage needed in later decades. The total miles of new roads would be accounted for once the stands are all initially harvested No logical means was determined to adjust the miles and costs either in the FORPLAN model or outside the model.

The road construction costs were developed from actual Forest cost records for the period of fiscal year 1975 to 1984 on 305 timber sales. A study was then made to assess the accuracy of the costs to meet current design and construction methods resulting in lower cost roads On the basis of this study, adjustments were made on the costs for most basins to represent current costs expected to be used in the coming years Costs were adjusted for inflation to the base year of 1982 and then increased 2 4 percent for contract changes based on 89 recently completed timber sales The following are the road construction costs used in the FORPLAN model

The following data displays timber sale new road construction:

Planning Basin	$/Mile Roaded	$/Mile Unroaded
1	115,668	133,000
2	86,199	94,800
3	78,317	NA
4	78,342	82,300
5	72,802	80,100
6	83,078	87,200
7	52,473	73,500
8	52,107	NA
9	74,873	86,100
10	54,153	65,000
11	45,856	45,900
12	71,506	71,500
13	69,825	76,800
15	48,580	55,900
16	77,601	81,500
17	87,040	87,040
19	50,953	63,700
20	65,040	74,800

ROAD RECONSTRUCTION - Reconstruction densities for all roads were developed from all timber sales programmed from fiscal years 1978 through 1984. The miles of road reconstructed and the acres of harvest were compared by basin to determine the miles per acre resulting in the following data displayed along with dollars per mile of reconstruction and miles per MCF of commercial thinnings discussed below

Planning Basin	Mile/Acre	$/Mile	(Commercial Thinning) Mile/MCF
1	0 03773	39,515	004339
2	0 03417	29,105	004339
3	0 02079	38,750	003792
4	0 03696	36,683	003792
5	0 01888	18,717	003792
6	0 01145	22,660	002310
7	0 00744	31,794	002310
8	0 01209	20,561	002310
9	0 04775	21,930	003792
10	0 00800	27,644	002526
11	0 00800	38,877	002310
12	0 03556	21,010	003792
13	0 03270	21,604	005653
15	0 04962	10,407	002526
16	0 02559	37,896	005653
17	0 00904	36,526	005653
19	0 00827	20,708	002526
20	0 00966	19,783	002526

The cost for road reconstruction was determined on the same basis as the cost for road construction, using the same timber sales The costs were adjusted to the 1982 base year and increased 2 4 percent for contract changes

Two additional corrections were made which affected the reconstruction costs The benchmark runs identified sufficient reconstruction mileage in commercial thinning which could affect cost data Since commercial thinning harvests tend to have a much smaller per acre volume, a new set of criteria was set

up to better represent these reconstruction costs Using Forest data on sales sold from Fiscal Year 1977 through Fiscal Year 1984, the volume per acre was determined by District and correlated to thousand cubic feet per acre by basin The new figures were used to determine the miles per thousand cubic feet of harvest for use with commercial thinnings.

The second correction came about when the percent of road miles closed was varied by alternative The reconstruction costs from past sales included work required on some closed roads, but significant increases in road closures would not be adequately represented in the costs Normally a closed road would have higher reconstruction costs to open, brush and log out, and shape the surface To use the same costs when large mileages of roads were considered closed was in effect no expense if not adjusted To account for added reconstruction costs where needed for increased road closures, the amount of closures were considered for each alternative in choosing a multiplying factor of 1 00, 1 05, or 1 08 The factor chosen for each alternative was used in the FORPLAN model as shown

Alternative	Factor
NC	1 00
A	1 00
A-Departure	1 00
B	1 00
C	1 00
D	1 00
D1	1 00
E	1 08
G	1 05
K	1 08
M	1 00
S	1 08

ROAD MAINTENANCE - Road maintenance mileage considered in Forest planning is based on the Forest inventory as of 1982 and adjusted to March 1984 for total miles and maintenance level of the roads The costs for maintenance were determined and modeled separately for timber sales and for allocated funds

The timber sale road maintenance was determined from sales appraised in the period 1973 through 1982 The total road maintenance allowed in the appraisal was divided by the sale volume for a cost per unit volume. It was noted that the last two years differed significantly from the other years, due largely to an updating of maintenance costs to better reflect actual experienced costs These updated timber sale road maintenance costs better represented the expenses expected for the future, so they were used As a check, the timber sale maintenance costs for all sales in 1983 were compared with the first FORPLAN benchmark runs and found to be in close agreement The following are the timber sale road maintenance costs used in FORPLAN.

The following data display timber sale road maintenance cost:

Planning Basin	$/MBF
1	13 00
2	13 00
3	21 50
4	21 50
5	21 50
6	21 50
7	17 00
8	17 00
9	21 50
10	17 00
11	17 00
12	13 00
13	13 00
15	13 00
16	13 00
17	13 00
19	13 00
20	13 00

The budget for allocated maintenance funds were based on the 1982 to 1984 program average adjusted for inflation. These cost figures were used to calculate the constrained funding base and a sequential cost of each mile of road added to the system by alternative for use in the FORPLAN model The base cost was determined by the percent of miles in each maintenance level at the start of decade one for each alternative The sequential cost was determined by the percent of new miles added by maintenance level A higher allocated maintenance of about 125 percent of the current budget was used for an unconstrained funding base and the sequential cost of each mile added to the system by alternative. The following is the allocated road maintenance funding by alternative

The following data display allocated road maintenance funding:

Alternative	$ Base Amount	$/Mile Sequential
NC	984,000	269
A	984,000	269
A-Departure	984,000	269
B	1,152,000	269
C	1,012,000	214
D	1,019,000	296
D1	1,019,000	296
E	1,125,000	273
G	864,000	115
K	1,064,000	253
M	981,000	0
S	1,064,000	253

ROAD CAPITAL INVESTMENT - A study of the Forest past capital investment program could find no rational method on which to base a funding level After several efforts, the decision was made to base the funding primarily on timber harvest volumes with additions as needed to meet the theme of alternatives This decision was made on the concept that about 80 percent of the Forest capital investment funding is timber haul related. The funding level does not include repairs to the road system caused by catastrophic events from major floods and wind storms Even though the Siskiyou National Forest has a history of major floods and storms, these events are too difficult to determine with any accuracy

The capital investment program funds were originally calculated on only timber harvest volumes prior to the FORPLAN runs based on data from the benchmark runs. The formula used in the benchmark runs was

$$CI = \$225{,}000 + \$10{,}000/MMBF$$

The figures from this formula reasonably agreed with past Capital Investment funding except when the Forest timber cut increased significantly from the second growth stands Various methods were tried to keep the funding from increasing to an unreasonably high figure By graphing the results from methods which best represented Forest funding, the following formula resulted in representative funding levels.

$$\$/Decade = \$4{,}000(Decade\ MMBF) - \$2{,}000{,}000$$

with a minimum funding of $250,000/decade since the formula could give a negative value This formula gave values close to the Fiscal Year's 83 and 84 average and assured that any given harvest volume would always have the same value

Since most alternatives are on the basis of no budget constraint, another method was used to increase funding from the constrained budget. The benchmark FORPLAN runs resulted in funding levels for the latter decades which were unreasonably high. After several attempts to find a method which represented a reasonable unconstrained funding level, the following formula was used:

($/Decade = $5,000 x Decade MMBF).

This formula had a reasonable increase from the constrained budget figure and represented funding amounts the Forest would properly invest for support of the timber harvest activities.

Additions to the above capital investment program figures based on harvest volumes were used to represent mitigation or increased efforts on improving water quality and fish habitat impacted by roads, to increase the miles of road open to passenger cars for roaded recreational use and keep these roads repaired to standards, and for accessing three unroaded areas in which the FORPLAN model did not adequately cover the costs. The funding added was based on the alternative theme and on how roads open to the public were varied. Mitigating efforts and increasing roads open to passenger cars were varied on estimates which represented levels of high, medium, low, or no additional funding to meet the alternative theme. The unroaded area access funds varied by alternative and by decade to represent areas entered for timber harvest in the alternative and the timing of the entry.

ANALYSIS DONE OUTSIDE FORPLAN

This section describes how the yields for resources were adjusted, modified, and calculated outside of the FORPLAN model. Additional information regarding these analyses can be found in the respective background papers on file in the Forest planning records.

WATER YIELD

The average annual water yield from the Forest was computed using a linear regression between mean annual basin precipitation and streamflow. Streamflow gauging stations are operated on seven rivers draining the Siskiyou National Forest by the U.S. Geological Survey and the Oregon Watermaster's Office Therefore, actual runoff data is available for seven of the 19 FORPLAN Level 1 basins. A rainfall isohyetal map was constructed from all precipitation measurement stations distributed around the Forest Because precipitation varies greatly within the FORPLAN planning basins, a basin weighted average was computed using mass balance techniques. A simple linear model was developed regressing rainfall (weighted by basin) as the independent variable, and runoff as the dependent variable.

The water yield from ungauged basins was predicted from mean basin rainfall using the rainfall-runoff equation:

Annual Water Yield = 1 5 (Mean Basin Rainfall) - 71 where
units are in inches and "r" squared = 0.98

This equation predicts the **existing** water yield from each planning basin and therefore the Forest

The effect of clearcut harvest was predicted using the results from five clearcut watersheds in Western Oregon (Harr, 1979). Each clearcut acre was estimated to yield an additional 20 inches of water in the first year after harvest and return to preharvest yields in 20 years. The decay of water yield was assumed to be logarithmic in shape (Harr, personal communication). A computer program was written (process records) to numerically simulate the interaction of thousands of clearcut acres in various stages of water yield decay The program was run outside of FORPLAN but utilized final harvest acres generated within the model by decade.

Harvest clearcutting in fog prone areas in known to decrease water yields (Harr, 1982). Since fog prone areas (similar to the Bull Run Watershed where this phenomenon was reported) represent a small proportion of this Forest, we conclude that harvest clearcutting on the Forest will predominantly increase water yield.

ROADS

Classification of Road Type. The classification of collector or local roads was done by alternative based on specific roads representing probable collectors The theme of each alternative identified areas to be roaded, the extent of emphasis on roaded recreation, and helped determine which extensions of existing collectors and connector roads to include for loop roads in the collector system. These specific roads which fit the alternative theme, both new and existing, were classed as collectors and the balance were local roads Distribution of the new collector roads varied by decade in each alternative, with all collector roads built by the fifth decade. The arterial road system did not vary

Classification of Roads Open to Public Use The classification of the Forest road system open to passenger cars, open to high clearance vehicles, or closed was determined outside the FORPLAN model. The miles of road open to passenger cars was figured as all maintenance Levels 3 and 4 roads plus a percentage of the Level 2 roads. The Level 2 roads open to passenger car use are an estimate of the mileage at any period of time in which the surface is graded for timber haul or other project work and the road is suitable for passenger car use during the project operations and for a while afterward.

Maintenance Levels 1, 2, and 3 varied by alternative, to represent the theme of the alternative. A percentage of miles of Levels 1 and 3, both existing and new roads, was used to represent the alternative theme according to a high, medium, or low amount The balance of the miles were classified as Level 2

An additional fifty miles of road not built by timber sales were added to represent other roads built and included on the Forest transportation system. These are roads built under special use permits by miners, to administration sites such as weather or radio sites, for added recreation sites, and private roads added to the system by rights-of-way acquisition The mileage and distribution of these miles varied out to the fifth decade, depending on the alternative theme The private roads acquired were added to the collector system and the balance were local roads.

FIRE MANAGEMENT

Fiscal Trends in Fire Management The fire management budget for the Forest has been decreasing steadily since its peak in the mid 1970's. The base fire planning period budget (Fiscal Year 1978) for the Forest's prevention, detection and presuppression programs was $585,500 or $794,500 in 1982 dollars A presentation of program expenditures is presented in the following data

Fire management program expenditures for the Siskiyou National Forest base fire planning period in actual fiscal year dollars as follows:

Functional Area	Fiscal Year/$ 1977	1978	1979
Consolidated Functional Costs			
Forest Resources	787,900	585,500	623,800
Shared Resources	1,224,200	606,900	521,000
Fuels	-	*164,100*	*52,700*
Approximate Functional Cost for Forest Resources			
Prevention (111)	63,100	112,500	114,000
Detection (112)	57,800	88,000	58,800
Attack (113)	627,000	348,000	372,300
Air (114)	(40,000)	(37,000)	36,600
Support (115)	248,600	236,200	-
Fuels (115)	-	164,100	52,700

Period	Expenditure
Fire Program Costs 1/	
1 Jul 74 - 30 Jun 75	1,964,385
1 Jul 75 - 30 Jun 76	2,391,496
1 Jul 76 - 30 Sep 76 (mini-year)	1,302,680
1 Oct 76 - 30 Sep 78	1,634,922
1 Oct 77 - 30 Sep 78	1,452,730
1 Oct 78 - 30 Sep 79	1,689,544

1/Includes costs for emergency fire fighting and the construction of fire facilities

The funds spent to treat fuels created by management activities have increased steadily over the decade in response to both inflation and the need to mitigate impacts on other resources Average treatment costs on the Forest in fiscal year 1982 dollars are presented below

Base Fire Planning Period Fuels Management Costs for the Siskiyou National Forest in 1982 Dollars follows.

Size (Acres)	$/Acre	Size (Acres)	$/Acre
Average Total Fuel Treatment Costs for Activity Fuels			
Clear Cuts		Partial Cuts	
1-5	916	1-15	776
5-10	727	5-20	753
10-40	576	20-45	679

Activity	$/Acre
Average Costs for Typical Treatment Activities	
Broadcast burning	241
Underburning	196
Pile burning	93
Handpile and burn	345
Burning hardwood conversion areas	71

National Fire Management Analysis and Planning The Fire Planning Process used on the Siskiyou National Forest followed FSH 5109.19, Fire Management Analysis and Planning This handbook provides the basic steps followed in developing the fire management program, to include a level of protection, responsive to management direction and resource objectives stated in the Forest Plan

Two levels of planning were completed to bring the fire planning process to this juncture Level 1 which was a general fire management analysis; and Level 2, which was a technical fire management analysis that evaluated fire management program mixes and program levels, and estimated the costs and effects of each through a detailed analytical process.

The following is a summary of the process followed and some of the key assumptions made in completing the Level 1 and Level 2 analysis.

The first step in the Level 1 process was to compare the master fire occurrence file with the individual fire reports for the 1970 decade and correct any errors in the master file. From this file fires not to be used in the planning process were identified. Typically, these fires were far enough outside the Forest boundary that the Forest Service would no longer respond. The 510 fires shown in the master file were reduced to 495 fires for the 1970 decade These 495 fires burned a total of 2,884 acres.

The next step was to gather all available 1970 decade fire weather data for the Forest This information was collected primarily from the National Fire Weather Data Library.

After gathering the weather data, fuel models and weather stations were assigned to each of the 495 fires This was accomplished by utilizing the planning basins established by the IDT for analysis purposes National Fire Danger Rating System (NFDRS) fuel models were then identified for each basin A basin could be represented by one fuel model or a combination of two models A weather station was assigned to each basin after consultation with National Weather Service Fire Weather Forecasters.

When this step was completed, the daily fire weather data was matched against fire occurrence days in each weather station's zone of influence to see if there was weather data for the day of the particular fire Missing days were identified and then corrected by either using interpolated values for a missing day from the FPL-MOIST fire planning computer file, data from nearby stations, or "best estimates" developed after a review of seasonal climatic data for the station in question. With matching weather data for all fire days, it was then possible to develop tables which reflected the number of fires and acres burned by intensity level and size class for each of the basins This information, plus other data generated by the FPL-FREQUENCY fire analysis computer program, was documented in the Planning Records as part of the analysis of the management situation

The planning basin approach was not conducive to fire management planning, therefore, the basins were collapsed into five Fire Management Analysis Zones (FMAZ's) (see map in Chapter III of the FEIS) These zones were based on fuel types, fire weather climatology and resource management direction

The zones utilized in the process were

Zone 1.	Powers Ranger District
Zone 2.	Chetco and Gold Beach Ranger Districts
Zone 3:	Illinois Valley and Galice Ranger Districts
Zone 4:	Kalmiopsis Wilderness
Zone 5:	Wild Rogue Wilderness

Each FMAZ was assigned an NFDRS fuel model or pair of fuel models and a key fire weather station. The process of matching fire weather data to each fire was repeated, and a new set of fire frequency tables was generated for each FMAZ.

A key decision made at the completion of the Level 1 phase of the analysis was to collapse the six Fire Intensity Levels to three. The FIL's were redefined as:

FIL 1	0-2 feet flame length
FIL 2	2-8 feet flame length
FIL 3	8+ feet flame length

In the Level 2 analysis, only the data generated in the FMAZ portion of the Level 1 analysis was used The first step in the Level 2 analysis was to generate the fiftieth and ninetieth percentile rates of spread for each of the fire FMAZ This data, along with the number of fires by size class, and intensity level developed in Level 1, were utilized later in the process to calibrate the Initial Attack Analyzer computer model.

The selection of representative fires was the next step in the Level 2 analysis. In this particular analysis, fires in each FMAZ were analyzed to determine attack type and mix by attack time This data was then used to define the character of the fire workload in each FMAZ in the Initial Attack Analyzer model

Next, the 1978 base fire organization was identified and a dispatch philosophy developed for each of the 13 representative fire situations, which when combined, represented the fire workload in the five FMAZ's The dispatch levels were then combined with data developed in Level 1 to calibrate the Initial Attack Analyzer model.

In calibrating the Initial Attack Analyzer model, the rate of spread was increased or decreased, the number of fires by intensity level shifted slightly up or down, and the weighting of the representative fires varied as the 1978 organization fought the fires in the computer. The various inputs, excluding the organizational dispatch level, were manipulated until the numbers of fires and acres burned by size class in the model matched closely the actual number of fires and acres burned by size class as experienced in the 1970 decade After the Initial Attack Analyzer was calibrated, the fire workload in each FMAZ was analyzed in detail

The suppression costs for each representative fire situation were calculated and weighted against the annual frequency to determine an annual expected suppression expenditure Costs for escaped fires were based on actual large fire costs experienced on the Siskiyou National Forest. The Pistol Basin Fire (1971) at 1,088 acres; Quail Creek Fire (1970) at 683 acres; and the Shasta Costa Fire (1975) at 471 acres were used for the development of the large fire costs These costs were equated to 1980 dollars and weighted against the annual frequency to determine an annual expected expenditure.

Resource value change was calculated for each representative fire situation in each zone that exceeded ten acres These calculations included an estimate of maximum loss per acre in immature timber stands; both seedling and sapling, and pole stands, an estimation of mature timber value loss, damage to improvements, as well as changes in dollar values of commercial forage, new water, fish habitat, wildlife habitat, and recreation resources (Table B-1).

In calculating timber losses in the "General Forest Zones" (FMAZ 1, 2, and 3), each FMAZ was first analyzed to determine what percent of the area represented old-growth timber, pole timber, seedling and sapling stands, as well as brush Once these values were determined, a weighted timber dollar value for each zone was developed which represented the diversity of the timber stands

Damage to improvements in each zone was based on a best estimate of improvements that could be lost in a large fire. Dollar values for commercial forage were not calculated in the analysis as grazing was of only minor value Inputs of dollar values for new water, fish habitat, and wildlife habitat were obtained from the appropriate resource specialists and geared to fire intensity levels and fire size classes Recreation resources were handled in much the same way.

Dollar value changes were totaled and summarized by FMAZ and then further combined into total Forest value tables An assessment for shared resources; air tankers, smokejumpers, repellers, and light helitack was also developed using guidelines developed by the Region. This assessment was included in the calculation of the Fire Management Effectiveness Index (FMEI).

Once the FMEI for the 1978 base organization (C10) was calculated, the detailed analysis was repeated for five other program level and program mixes. These included.

K10: The 1978 base budget level decreased by 30 percent with a light helicopter located at Merlin, Oregon

K20. The 1978 base budget level decreased by 45 percent with no helicopter located at Merlin, Oregon

K30: The 1978 base budget level increased by 15 percent with a rappel helicopter (Bell 212) located at Merlin, Oregon

K41· The 1978 base budget level decreased by 15 percent with a light helicopter located at Merlin, Oregon.

K42: The 1978 base budget level decreased by 15 percent with a rappel helicopter (Bell 212) located at Merlin, Oregon

In each of the five other detailed analyses, an organization was developed which reflected the dollars available in the various program levels analyzed, and those organizations fought the same fires in the Initial Attack Analyzer as did the 1978 base organization. When all the detailed analyses were complete, the respective FMEI's were compared to identify the most cost efficient organization--the organization with the least cost plus net value change, as well as the organization management felt would best meet the new management direction outlined in the LRMP

The K42 option (Table B-2) was selected by the Forest Supervisor as the organizational level that would most realistically meet the direction provided in the Forest Plan. Although this option was $0 02 per acre more costly in respect to cost plus net value change than the most cost efficient option, it was felt that the budget levels displayed were more realistic, and the expected annual acres burned were more attainable than those generated in the cost efficient option (K30)

After the desired level of protection was selected by the Forest Supervisor, the costs associated with protection (111 to 114 Dollars), fuels management support (115 Dollars) and the shared resource assessment were combined to represent the estimated annual budgetary needs of the fire management program in FORPLAN for the first ten years of the planning period in 1982 dollars

Table B-1. Summary of Resource Values by Fire Management Analysis Zone Used to Calculate Net Value Change for Representative Fires Over Ten Acres

Resources		Zone 1	Zone 2	Zone 3	Zone 4	Zone 5	Remarks
Timber	Regen MBF/Acre	41.9	34.1	26.2	N/A	N/A	$345 per MBF
	Poles $/Acre	4766	4095	3429	N/A	N/A	
	Seed and Sap $/Acre	944	1574	1500	N/A	N/A	
New Water	Acre/Foot	11.5	11.5	10.0	10.0	11.5	$1.50 Per Acre/Foot
Fish Habitat	Lbs/Acre	6.40	4.00	1.60	1.6	0.0	$1.61 per Pound
	RVD/Acre	5.92	4.78	1.97	2.0	2.8	$56.60 per RVD
	$/User Day						Size in Acres at FIL3 (10-100) (100-300) (300+)
Wildlife Habitat	Big-game	16.80	16.80	16.80	4.20	4.20	15 RVD 8 RVD 4 RVD
	Other Game	23.42	23.42	23.42	5.85	5.85	6 RVD 3 RVD 2 RVD
	Nongame	29.00	29.00	29.00	7.25	7.25	21 RVD 11 RVD 2 RVD
Recreation	$/RVD	15.31	15.31	15.31	20.19	14.25	
	RVD/Acre	.31	.31	.31	.11	7.89	
Improvements	$/Acre	50	50	50	N/A	N/A	

Table B-2. Expected Siskiyou National Forest Fire Management Program, Annual Costs, and Acres Burned for Program Options Analyzed for Fire Planning Process for the First Decade 1/

Program Option	Level Of Protection (111-114 Dollars)	Suppression Cost	Total Net Value Change	Shared Resources	Fuels Support And Projects (115 Dollars)	Cost Plus Net Value Change	FEMI	Acres Burned
C10	795,000	445,000	254,000	630,000	216,000	2,340,000	2,140	215
K10	635,000	476,000	274,000	505,000	76,000	1,965,000	1,798	232
K20	478,000	649,000	555,000	393,000	91,000	2,165,000	1,981	394
K30	879,000	255,000	81,000	412,000	288,000	1,915,000	1,752	73
K41	671,000	470,000	269,000	479,000	264,000	2,171,000	1,986	228
K42	671,000	410,000	176,000	421,000	264,0000	1,942,000	1,776	171

1/ Dollar values shown are 1982 dollars. Fire Management Efficiency Index (FEMI) calculated on a protection base of 1,093,000 acres.

COST EFFICIENCY AND NET PUBLIC BENEFIT

This section describes how the efficiency criterion of PNV, which is one of the components of NPB was formulated and modeled for the benchmark analysis and evaluation of alternatives. This analysis is required by NFMA regulations and has played an important part in the development and comparison of alternatives in Forest planning

NET PUBLIC BENEFIT (NPB)

NPB is the overall value to the nation of all outputs and positive effects (benefits) less all the associated Forest Service inputs and negative effects (costs) of producing priced and nonpriced outputs from National Forest System Land (NFS) (36 CFR 219.3). Thus, NPB represents the net value of priced outputs PNV plus the net value of nonpriced outputs. NPB cannot be expressed as a numeric quantity because PNV cannot be numerically added to qualitatively valued nonpriced outputs Maximization of NPB is a goal of the Forest planning process.

PRESENT NET VALUE (PNV)

PNV is the quantitative component of NPB. PNV represents the dollar difference between the discounted value of all priced outputs and all Forest Service costs over the 150-year planning period. All costs and benefits are expressed in 1982 dollars. The GNP Implicit Price Deflator was used to adjust values from other years to this base.

Each benchmark and alternative was designed to achieve goals and objectives in a manner that produced the greatest PNV This was accomplished by solving FORPLAN with the objective function of maximizing PNV, while meeting the specified constraints of the benchmark or alternative. PNV is used to assess the economic efficiency of the alternative or benchmark. This section describes how the prices and costs which make up PNV were calculated, and how they are used within the model.

ECONOMIC PARAMETERS GOVERNING PNV

A discount rate of 4 percent was used to solve FORPLAN and to calculate the economic consequences of the benchmarks and alternatives (36 CFR 219.3). The 4 percent rate approximates the real return on corporate long-range investments above the rate of inflation. Inflation is not included in the discount rates, benefits, and costs due to the difficulty of estimating future inflation rates and because inflation is assumed to equally affect both costs and prices. This rate was used to solve FORPLAN in all cases to date. A second rate, seven and one-eight percent, was used to determine the sensitivity of solutions to a higher discount rate. All costs and benefits were discounted from the midpoint of each planning period.

Timber Demand Curves. No local demand curve for timber was used in the FORPLAN model. None of the available techniques for developing Forest level demand functions has a strong enough theoretical basis that it can be suggested for use in Region Six. Available evidence also indicates that if a reliable Forest level demand function could be calculated, the elasticity would be such that the use in FORPLAN would not be significant.

Real Price Increases. A one percent per year price trend was incorporated in the FORPLAN model for timber values. This trend reflects the assumption of scarcity, ie. that future demand increases and, or supply restrictions will increase national product prices. This trend was chosen based on the work of Harold J. Barnett, and Chandler Morse ("Scarcity and Growth", Johns Hopkins Press, Baltimore, 1963, p.213.) No other price or cost trends are used in the analysis.

BENEFITS AND COSTS USED IN THE PNV CALCULATION

Two types of outputs (benefits) are valued in the model; outputs which can be valued with market prices, and those which have no market prices, but can be assigned a proxy value Timber and commercial anadromous fish are the market valued outputs in the FORPLAN model. Willingness to pay values for recreation were derived in the 1980 RPA assessment, and represent what consumers would be willing to pay for a recreational experience rather than forego the opportunity

Other uses which remain fixed among the benchmarks and alternatives are valued within the model These are not used to make resource scheduling decisions. They include fuelwood, special uses, river use fees, power and minerals, campground, and grazing fees. Fuelwood is valued at the 1980 RPA benefit value for Region Six, the remaining benefits were valued from 1984 Forest receipts reports.

Costs. Four types of costs are valued in the FORPLAN model: Variable costs, fixed costs, resource capital investment costs, and logging costs:

VARIABLE COSTS include: Costs incurred as a result of program activities for controllable outputs or controlled use. Costs which vary between benchmarks and alternatives. Examples of variable costs are silvicultural exam and prescription, and road construction and reconstruction.

FIXED COSTS include: Nondeferrable activities for insuring public safety and environmental protection. Activities to protect natural resources on adjacent lands. Costs to keep existing capital assets at agreed levels of service and availability. Long-term management planning and resource inventories. Costs of general administration. Costs that cannot be assessed on a per unit basis Examples of fixed costs are timber management planning and inventory, and coop law enforcement.

RESOURCE CAPITAL INVESTMENT COSTS are costs of implementing resource-specific mitigation or enhancement projects. Decisions to implement these projects are made outside of FORPLAN, for each alternative and benchmark, based on the emphasis and objectives. Project costs and benefits are additions to FORPLAN generated solutions. Examples of these projects are wildlife enhancement (meadow rehabilitation) and recreation enhancement (construction of additional campgrounds).

NONFOREST SERVICE COSTS of production are costs incurred by producers other than the Forest Service. The Siskiyou model incorporates logging costs

All costs but logging costs are components of PNV. Variable costs are linked with prescriptions for Analysis Areas. They and logging costs are the only costs which influence scheduling decisions within FORPLAN. Fixed costs occur as a lump sum per period, regardless of the prescriptions chosen They are equal for all benchmarks and alternatives. Resource capital investment costs are entered uniquely for each alternative or benchmark.

The variable costs for timber related activities are specific to the management areas and type of treatment where significant differences could be identified. Costs were derived from empirical data as much as possible. The costs for Retention, Partial Retention, and General Forest Management Areas are based on even-aged silvicultural systems and the clearcutting harvest method. Costs for Riparian areas are based on partial removal and harvest of these areas in conjunction with the treatment of adjacent areas This categorization is in line with experienced management practices for these types of areas, and the assumption of a similar pattern for the future is supported by the analysis in Appendix G This assumption simplifies the modeling and allows the straightforward use of local empirical data for many of the activities As indicated in Appendix G, individual sites may vary from this pattern, however, the variation is not expected to effect the evaluation of the alternatives nor the Forest-wide economic parameters.

The compilation and analysis of data used to determine cost and benefit information for the alternatives and benchmarks involved two distinct procedures. First, those costs and benefits which contributed to the scheduling of prescriptions in FORPLAN were compiled and entered into the model through the use of common economics tables. These tables relate costs and output values to management prescriptions associated with Analysis Areas. The tables allow FORPLAN to assign the most cost efficient prescription to any given Analysis Area to meet the constraints of the alternatives or benchmarks.

The second procedure in the analysis involved determining the costs and benefits that were not associated with prescriptions, but which were also affected by alternative formulation These include the costs and, or benefits of the resource capital investment programs. Estimation of these costs and benefits were entered as direct yields in FORPLAN to be included in the PNV totals.

PNV CALCULATIONS (BUDGET COSTS)

Budget costs consist of the estimated appropriated costs of management for each alternative and benchmark These costs were reported as average annual. Budget costs were stratified into the following categories:

Fixed costs
Operation and maintenance costs
Capital investments

Purchaser credit road costs were added to show the cost of constructing purchaser credit roads for timber harvests. This cost was not included in the total budget costs, but was added to the total agency cost estimates used to calculate PNV. Budget costs were calculated similarly to the method used to determine cost data by resource component. Variable or allocation costs along with fixed costs were summarized from the FORPLAN economic reports by planning period for each alternative and benchmark.

OPPORTUNITY COSTS

In order to determine the relative cost efficiency of the various alternatives and benchmarks, opportunity costs were derived to show the difference in PNV between FORPLAN runs Opportunity costs are defined as the value of a resource's foregone net benefit in its most economically efficient alternative use. In relation to the economic analysis, it represents the difference in PNV between the Maximum PNV Benchmark or alternative with the highest PNV and subsequent runs. Opportunity costs measure both the change in PNV value for priced resource outputs, and can be used to measure the relative value of nonpriced benefits included in NPB.

DETERMINATION OF ECONOMIC VALUES

The timber values listed below were developed from a Timber Sale Statement of Account data base for 1973-1982. They are cut values, computed at the time that the timber is actually harvested and paid for, adjusted to 1982 dollars with the GNP Implicit Price Deflator.

BENEFIT VALUES

They were developed using the following methodology:

Timber

1. Determine species composition from data base of 2400-17's, 1975 - second quarter 1980

2. Develop weighted average stumpage value. 1/

Species	Percent of Total Volume Sold	Stumpage Value (1982 $/MBF)
Douglas-fir	83	241
Port-Orford-cedar	7	851
Pine 2/	6	284
White fir	3	174
Hemlock 3/	2	150

1/ Weighted average value = $285/MBF
2/ Based on 75 percent sugar pine at $316/MBF, and 25 percent
3/ Value is for a mixture of species including incense cedar, Shasta red fir, noble fir, Englemann spruce and western hemlock

3. Develop selling value by adding logging and manufacturing costs to stumpage value. Costs were derived from the data base of 2400-17s, 1973-1982.

$285		Stumpage value
$150	+	Logging costs
$200	+	Manufacturing costs
$635		Selling Value 1982 $/MBF

4. Convert $/MBF to $/MCF with average board foot/cubic foot conversion ratio for existing stands of 5.41.

   Selling value = $3,435/MCF

   This represents the average selling value for currently harvested old-growth stands.

5. Estimate selling value for smaller diameter future stands and commercial thinning opportunities. This was done with indices developed by Cahill and Snellgrove, PNW, "Young-Growth Douglas-fir Tree Value Indices - Region Six", according to direction from the Regional Office.

   The current average diameter is estimated to be 30" DBH, by a survey of each Ranger District's TMA 30" DBH and Selling Value of $3,435/MCF were used as the base values The indices were applied to this to develop selling values for other diameters.

6. Pond values were developed by subtracting manufacturing costs from selling values. Average manufacturing cost = $200/MBF * 5 41 BF/CF conversion ratio = $1,082/MCF.

   Pond values are used in the FORPLAN model. They will be trended to increase at one percent per year.

The follow data display the computation of timber values

DBH (inches)	Relative Value	Selling Values (1982 $/MCF)	Pond Values (1982 $/MCF)
8	62	2,130	1,048
9	62	2,198	1,116
10	67	2,301	1,219
11	70	2,404	1,322
12	72	2,473	1,391
13	74	2,542	1,460
14	76	2,611	1,529
15	79	2,714	1,632
16	82	2,817	1,735
17	84	2,885	1,803
18	86	2,954	1,872
19	88	3,023	1,941
20	90	3,092	2,010
21	.92	3,160	2,078
22	94	3,229	2,147
23	.95	3,263	2,181
24	96	3,298	2,216
25	96	3,298	2,216
26	97	3,332	2,250
27	97	3,332	2,250
28	98	3,366	2,284
29	99	3,401	2,319
30 Base	1 00	3,435	2,353
31	1 00	3,435	2,353
32	1 01	3,469	2,387
33	1 01	3,459	2,387
34	1 01	3,469	2,387
35	1 02	3,504	2,422
36	1 03	3,538	2,456
37	1 01	3,572	2,490
38	1.05	3,607	2,525
39 +	1 06	3,641	2,559

Other Forest Service Receipts The outputs that follow are tracked on an annual, fixed basis The data source for items 1-5 is the 1984 Forest Receipt Reports adjusted to 1982 dollars with the GNP Implicit Price Deflator The data source for grazing fees is 1984 grazing fee permits (adjusted to 1982 dollars) on file in the Forest Supervisor's Office.

Activity	Total Value (1982 $)
Special Uses	3,178
River Recreation	
Outfitter (Commercial) Use	20,464
Private Use Application Fees	25,497
Power Uses	493
Minerals	245
Campground Fees	28,308
Grazing Fees	1,728
Fuelwood	49,600

Fuelwood is valued at its RPA benefit value of $31/MCF. It is valued up to its current level of consumption of 1,600 MCF (16,000 cords) Presently Forest production of fuelwood and per acre material = 6,400 MCF (64,000 cords). (Source: Assistant Timber Staff)

Wildlife, Fisheries, and Recreation

Assigned RPA values are as follows:

Activity	Value($)/Unit
Recreation	
Wilderness	17 50/RVD
Dispersed (Nonwilderness)	
Primitive	11 25/RVD
Semi-primitive Non-motorized	13 25/RVD
Semi-primitive Motorized	12 13/RVD
Roaded Natural	9 38/RVD
Developed Use	
Includes Camping and Picnicking	6 00/RVD
Wildlife	
Big-game Use	30 00/WFUD
Small Game Use	19 00/WFUD
Nongame Use	25 00/WFUD
Fisheries	
Anadromous Sport Fishing	33 00/WFUD
Anadromous Commercial Fishing	1 05/LB
Resident Sport Fishing	15 00/WFUD

Range

$5 90/AUM * 1.18 = $7/AUM 1982 $
1980 RPA Value GNP Implicit Price Deflator

$7/AUM * 3,000 AUM's per year = $21,000 per year

This value is tracked on an annual, fixed basis.

COSTS

Fixed Costs and Variable Costs. There are two types of costs incurred in FORPLAN, fixed costs and variable costs. Fixed costs are incurred, in a lump sum, regardless of the land management or resource scheduling regime chosen (with the exception of the "minimum level" alternative) Variable costs, as the name implies, vary by prescription n emphasis and/or management alternative

FIXED COSTS include nondeferrable activities for insuring public safety and environmental protection Activities to protect natural resources on adjacent lands Costs to keep existing capital assets at agreed levels of service and availability Long-term management planning and resource inventories. Costs of general administration Costs that cannot be assessed on a per unit basis.

VARIABLE COSTS include road construction and reconstruction Costs incurred as a result of program activities of controllable outputs or controlled use Costs which vary between alternatives

Source

Interim Directive No. 10, September 16, 1981.
1970 Economic and Social Analysis,
U S. Forest Service, Washington D C

Fixed Costs. The following data display Fixed Costs

Activity	1982 $
Developed Recreation Management	191,309
Dispersed Recreation Management	150,218
Cultural Resource Management	13,879
Wilderness Management	15,118
Fish and Wildlife Planning and Maintenance	84,913
Range Planning and Inventory	2,775
Timber Management Planning and Inventory	15,677
Genetic Forest Tree Improvement	718,000
Soil and Water Planning and Inventory	227,410
Administration of Minerals and Mining	32,943
Lands	822,500
Transportation Planning and Inventory	345,341
FA and O Facility Maintenance	246,517
Fire Management Planning and Analysis	673,000
Fire Prevention, Detection, and Fighting	377,000
Coop Law Enforcement	57,820
Fixed Program Management	481,461
General Administration (GA) (Line Management and Common Services)	1,947,866

Variable Costs. Costs for the following activities were collected from the five Ranger Districts for the years 1975 to 1980, when available.

Forest-wide average costs were developed from 1980 costs by weighting the District's costs by volume of timber or number of acres treated. Program management costs, obtained from the 1980 unit summary reports, are included All costs have been converted to 1982 dollars with the GNP Implicit Price Deflator.

Costs were verified with the Supervisor's Office timber staff personnel and with data from the Forest budget unit summary and attainment reports. Costs have also been reviewed by economists from the Umpqua and Rogue River National Forests and the Regional Economist

SILVICULTURAL EXAMINATION AND PRESCRIPTION involves selected timber stands, visual description on aerial photographs and maps, establishing data files, and recommending appropriate management activities.

District's Costs	= $ 26 MBF
Program Management	= $ .06/MBF
Total	$ .32/MBF

Converted to a per acre cost using 30 MBF/acre (Forest average volume per acre derived from District TMA data)

= *$10/acre for Clearcuts*

District timber sale planning personnel estimate that silvicultural exam and prescription will be approximately twice as costly for commercial thins, on a per acres basis, because of the need for more intensive field exams.

= $19/acre for Commercial Thins

TIMBER SALE PREPARATION includes sale area planning and design, tree marking, sale value determination, appraisal, environmental assessment preparation, advertisement, auction, and sale award

District's Costs	= $8 26/MBF
Program Management	= $1.04/MBF
Total	$9.30/MBF

Converted to a per acre cost using Forest average volume/acre of 30 MBF = 279/acre for Clearcut

It is estimated by District timber sale planning personnel that timber sale preparation will be approximately twice as costly for commercial thins, on a per MBF basis. The per MBF cost was doubled, and converted to a per acre cost using the weighted average volume per acre for current commercial thins of 8 MBF/acre = $149/acre for commercial thins.

TIMBER HARVEST ADMINISTRATION includes the supervising and administering of sales, includes activities such as scaling and check scaling, management of sale accounts, contracts modifications, rate redeterminations, and breach actions.

Districts' Costs	= $2 83/MBF
Program Management	= $1 18/MBF
Total	$4 01/MBF

Converted to a per acre cost using Forest average of 30 MBF/acre = $120/acre

It is estimated by District timber sale planning personnel that timber harvest administration will be approximately twice as costly for commercial thins, on a per MBF basis The per MBF cost was doubled and converted to a per acre cost using the weighted average volume per acre for current commercial thins of 8 MBF/acre = $64/acre for Commercial Thins

REFORESTATION

Planting It is assumed that every acre of final harvest will be planted.

Districts' Costs	= $290/acre
Program Management	= $ 4/acre
Total	$294/acre

Replanting The same per acre cost ($294/acre) is used for replanting as for planting Replanting is assumed to occur on 25 percent of all harvested acres. (Estimate of Forest Silviculturist).

Animal Damage Control It is assumed to occur on 10 percent of all planted acres

District' Costs	= $ 91/acre
Program Management	= $ 1/acre
Total	$ 92/acre

PRECOMMERCIAL THINNING is assumed to occur on 65 percent of all planted acres as determined from Forest Silviculturist review of TRI data.

Districts' Costs = $242/acre
No Program Management

RELEASE COSTS (displayed below) were obtained from the analysis done for the 1983 Vegetation Management Program. They include all of the costs of the vegetation management program planning through project preparation, contract bid and administration and concluding with post treatment evaluation.

Type	Cost/Acre (1982 $)
Commercial Aerial	52
Chemical Ground	117
Manual	196

A 1981 review of TRI data revealed that 43 percent of all planted acres were released with chemicals aerially, 2 percent with chemicals on the ground, and 3 percent manually. These are the proportions used for Forest Planning It is assumed that each released acre is treated twice (Source: Forest Silviculturist)

FERTILIZATION costs were derived from a Regional Office study of five Forests with fertilization programs.

A weighted average cost for aerial and hand application was developed for 1983. This was $56/acre 1982 costs were approximately 1/3 higher at $75/acre. These costs were used.

An additional $10/acre was added for project layout and EA preparation, this equaled $85/acre.

An additional 10 percent allowance for increased costs due to fertilization not having been done on the Siskiyou was added, this equaled $94/acre.

BRUSH DISPOSAL (BD) costs (treatment of activity fuels) following timber harvest were derived by computing weighted averages from 1980 experience cost data from each of the five Ranger Districts This data was disaggregated into three unit-size categories for use with the General Forest and visual management prescriptions Costs were updated to 1982 with the GNP Implicit Price Deflator.

Brush Disposal Costs for Clearcut Units:

Prescription Emphasis	Unit-Size (Acres)	$/Acre
Retention	1- 5	916
Partial Retention	5-10	727
General Forest	10-40	576

These costs include those incurred by the Forest Service and the purchaser and reflect the average costs per acre of activities such as yumming, fire line and fuel break line and fuel break construction, manpower (including overtime), helicopter rentals, etc Costs were verified with a Forest average estimate derived from timber Sale Report forms for 1980; average BD cost was $23/MBF, average MBF/Acre = 30, average total cost/acre equaled $690.

Costs for BD for partial cuts were obtained from three Ranger Districts (Galice, Gold Beach, and Illinois Valley) Little actual data was available, thus costs are based on the specialists' judgment and reflect the necessity for more hand piling and other manual techniques and less line construction. Information was also obtained from the Rogue River, Umpqua, and Mt Baker-Snoqualmie National Forests. Per acre costs are shown below. Costs are assumed to occur on 40 percent of thinned acres. (Forest Timber and Fire Management Staff Officers.)

Brush Disposal Costs for Commercial Thinning

Prescription Emphasis	Unit-Size (Acres)	$/Acre
Retention	1-15	776
Partial Retention	15-20	753
General Forest	20-45	679

The cost for BD for riparian areas was obtained from a Westside Fuel Treatments Cost Study undertaken by the Wenatchee National Forest (and including data for nine other Forests) It is assumed that the only fuel treatment method to be undertaken in the riparian areas is hand piling, at a cost of $345/acre.

All costs reflect fuels treatment to the most cost effective level for fire protection, as directed by National policy (Forest Service Manual 5150).

SPECIES TYPE CONVERSION. Costs for species type conversion were developed from 1980 data from the Chetco Ranger District, where most of this activity occurs. Costs were adjusted to 1982 dollars with the GNP Implicit Price Deflator.

Type Conversion Costs

Activity	Cost/Acre
Stand Exams thru Burning	371
Road Construction 1/	17
Total	388

1/ Cost for road construction was developed by (1) computing a weighted average road construction cost per acre, (2) developing a coefficient to reflect the proportion of conversion acres that have associated roading costs by dividing the number of acres with associated road costs by total number of acres of conversion (3) multiplying (a) average costs per acre accessed by (b) proportion of accessed acres with associated road costs $157/acre access * 11 access with road costs/total conversion acres = $17 per all conversion acres

Reforestation costs, following removal, are the same as those for clearcuts

Release costs are also the same as those for plantations following clearcuts with the exception that three applications (instead of 2) are necessary.

OTHER RESOURCE SUPPORT, MITIGATION, AND ENHANCEMENT COSTS RELATED TO TIMBER PRODUCTION Specialists in Cultural Resources, Visual Management, Fish and Wildlife, Soils, and Water Quality all provide input to timber sales This input ranges from review of timber sale Environmental Assessments to field examinations and writing proposals to mitigate the impacts of timber management, or enhance the quality of their resource These costs are charged against final harvest timber prescriptions.

Activity	$/Unit
Cultural Resources	11/Acre
Visual Management	11/Acre
Soil and Water	
General Forest	6/MCF
Riparian Prescription B	35/MCF
Riparian Prescription C	10/MCF
Mitigation and Enhancement	24/Acre
Fish and Wildlife	8/Acre

The data source for cultural resources and visual management support costs was the 1985 RPA estimate of dollars spent divided by total acres of planned timber harvest.

Cultural Resources	= $60,700/5,600	Acres planned	= $11/acre
Visual Resource	= $62,800/5,600	Acres planned	= $11/acre

The data source for soil and water support costs was the Fiscal Year 1980 soil and water support program, also divided by program acres. This information was updated to 1982 dollars and converted to a cost per MCF with the average board foot/cubic foot conversion ratio for existing stands. It was adjusted for management in the riparian areas.

The data source for soil and water and fish and wildlife mitigation and enhancement was a sample of forty 1980-1981 timber sales. Total costs for these activities was divided by total volume harvested to develop a cost/MBF. This was multiplied by the average volume per acre (30 MBF) for existing stands, to develop a cost per acre.

LOGGING COSTS - EXISTING STANDS/CLEARCUT. Logging costs for existing stands were developed from 2400-17 data for 1973-1982. They represent a Forest-wide weighted average, by volume, by year, adjusted to 1982 dollars. The following costs are included.

Activity	$/MBF
Fell and Buck	13 10
Skid and Load	39 88
Haul	28 62
Overhead and Dep	29 24
Erosion Control	2.64
Miscellaneous Amount	1 51
TOTAL	114 99

Road maintenance, temporary road costs and slash disposal are not included in logging costs. They are dealt with elsewhere in the model.

The average board foot/cubic foot conversion ratio for existing stands was used to convert the cost from a MBF to a MCF cost for use in FORPLAN.

$115/MBF * 5.41 average BF/CF conversion ratio = $622/MCF

Logging costs were adjusted for cost increases for harvest in Riparian, Retention Visual, and Partial Retention Visual Management Areas.

LOGGING COSTS - RIPARIAN The additional cost of harvest in riparian areas is directional felling (Forest Logging Systems Specialist). Thirteen Siskiyou National Forest sales with directional felling were sampled. The average cost for tree lining for these sales was $28/MBF. Average cost for conventional felling for the same sales was $10/MBF, therefore, costs increase for directional felling is employed (Forest Logging Systems Specialist), thus the net cost increase for directional felling is $13/MBF. This was converted to a cost increase per MCF with the Forest average BF/CF conversion ratio of 5.41 = $70/MCF.

LOGGING COSTS - VISUAL RESOURCE AREAS Additional harvest costs in Retention and Partial Retention Visual Management Areas result from additional equipment moving because of smaller unit size (Forest Logging Systems Specialist).

The assumptions used to derive the costs are:

Average Sale	=	142 acres
Average Sale Unit Size	=	20 acres
Average Volume/Acre	=	30 MBF

Compute number of moves for average sale.

142 acres 20 acres/unit = 7 units = 7 moves

Compute acreage move in and set up cost per sale.

Regional average move in and setup = $3.43/MBF
Average sale volume = 30 MBF/acre * 142 acres = 4,260 MBF
$3.43/MBF * 4,260 MBF/sale = $14,612 move in and setup/sale
$14,612 total move in move out and set up 7 moves = $2,087 for each move and set up

Partial Retention Visual

Same average volume/sale = 4,260 MBF
Same average sale size = 142 acres
Smaller unit size = 7 acres/unit
142 acres/sale 7 acres/unit - 20 units - 20 moves
20 moves/sale * $2,087/move = $41,740 sale
$41,740/sale 4,260 MBF/Sale = $9.80/MBF
$9.80/MBF converted to $/MCF with Forest average BF/CF conversion ratio of 5.41 = $53/MCF additional logging costs.

Retention Visual

Same average volume/sale = 4,260 MBF
Same average sale size = 142 acres
Smaller unit size = 4 acres/unit
142 acres/sale 4 acres/unit = 35 units = 35 moves
35 moves/sale * $2,087/move = $73,045 sale
$75,045/sale 4,260 MBF/Sale = $17.15/MBF
$17.15/MBF converted to $/MCF with Forest average BF/CF conversion ratio of 5 41 = $93/MCF additional logging costs.

Summary of Existing Logging Costs ($ Per MCF)

General Forest	Riparian	Retention	Partial Retention
622	692	715	675

LOGGING COSTS - MANAGED STANDS AND COMMERCIAL THINS. Logging costs for future (managed) stands and commercial thins were estimated using two sources: equations from the research paper entitled "Logging costs for Young-Growth Management Planning for Coastal Douglas-fir;" Fight, Roger D. et. al. 1984; and Forest experience cost data.

Equations from the paper were used to estimate yarding and changing yarding corridors, felling, bucking and limbing, branding, and loading.

THE EQUATIONS ARE:

Yarding.

Small Diameter (6 to 16" DBH) (VOAC 0.4-15 MCF/acre)

Cost = 491.4 - 40.48 (DBH) + 0.8886 $(DBH)^2$ + 0.1205 (SYD) + 16.1/VOAC

Large Diameter (18 to 24" DBH) (VOAC 0.4-15 MCF/acre)

Cost = 737.4 - 61.90 (DBH) + 1.2926 $(DBH)^2$ + 0.1497 (SYD) + 52.7/VOAC

Yarding Delay (Percent of time that equipment is idle)

Clearcuts and VOAC greater than 5.4 MCF/acre

Percent delay = 9 percent

Partial cuts and VOAC 0.4 - 5.4 MCF/acre

Percent delay = 22.9 - 2.61 (VOAC)

Changing Yarding Corridors (for 300 to 3000' SPAN).

Cost = 43 + 0.0001271 $(SPAN)^2$

Delay

Percent delay = 4.9 + 0.0052 (SPAN for 300 to 1950' SPAN)

Felling, Limbing, and Bucking (for 6 to 24" DBH).

Cost = -17.4 + 876/DBH

Delay - Clearcut and VOAC greater than 4.3 MCF/acre

Percent delay = 4

- Partial cut if VOAC 0.4 - 4.3 MCF/acre

Percent delay = 18.3 - 3.33 (VOAC)

Branding.

Cost = (-47.9 + 1678/DBH) (0.15)

Loading.

Cost = -9.8 + 545/DBH (for 6 to 24" DBH)

Percent delay = -4.0 + 104/DBH (for 6 to 13" DBH)
Percent delay = 4 (for DBH greater than 13")

WHERE:

DBH = Arithmetic mean diameter breast height of trees harvested.

VOAC = Volume per acre harvested in thousands of cubic feet.

SYD = Average yarding distance measured along the slope.

SPAN = Horizontal length of span in feet.

DBH and VOAC vary as shown in columns 1 and 2, respectively, in the following table. Forest Average values, developed by the Logging Systems Specialist, were used for SYD and SPAN They are

SYD = 939 Feet
SPAN = 1,047 Feet

The costs estimated by the above equations are in 1983 $. They were adjusted to 1982 $ with the GNP Implicit Price Deflator (Factor = .94).

Forest experience costs from 2400-17 data, 1973-1982, in 1982 $/MBF were converted to dollars per MCF with the average BF/CF conversion ratio for managed stands of 4.5 and added to the costs obtained from the equations. These costs are

Experienced Costs	$/MBF	BF/CF	$/MBF	Commercial Thins Projected Costs $/MBF
Haul	= 30 00 *	4 5 =	135 00 =	135 00
Erosion Control	= 2 64 *	4 5 =	11 88 =	11 88
Miscellaneous Amount	= 1 51 *	4 5 =	6 80 =	6 80
Move in and Setup 1/	= 3 43 *	4 5 =	15 44 * 2 =	30 87
Total			169 00	185.00

1/ Regional Average Cost

The solutions of the equations, plus the additional experience costs result in logging costs for General Forest managed stands and commercial thins. These are listed in Column 3 of the following table. Riparian, Retention Visual, and Partial Retention Visual logging costs are listed in Columns 4, 5, and 6. They reflect the General Forest logging costs of Column 3, plus the appropriate additions as described in the documentation for existing stands logging costs. The additional costs per MBF were multiplied by 4.5, the average BF/CF conversion ratio for managed stands.

		$/MCF			
DBH	VAOC	General Forest	Riparian	Retention Visual	Partial Retention Visual
Clearcut					
7 5 - 9 6	022 - 099	877	935	954	921
10 1 - 12 0	318 - 999	774	832	851	818
10 1 - 12 1	1.000 - 2.900	738	796	815	782
12 2 - 14 0	.514 - 1 400	706	764	783	750
12 2 - 14 2	1 400 - 4 125	673	731	750	717
14 1 - 16.7	.600 - 15 300	640	698	717	684
16.0 - 18 0	800 - 1 500	657	715	734	701
16 0 - 18 2	1 500 - 12.700	612	671	690	657
18 3 - 20.9	2 070 - 14.700	585	643	662	629
21 0 - 16 4	2 500 - 16.400	556	614	634	600
24 1	+ above	556	614	634	600
Commercial Thin					
10 0 - 10 8	1.000 - 1 900	820	878	897	864
12 0 - 13 2	1 800 - 2 200	732	790	809	776
13 2 - 17.0	1 000 - 3 400	682	740	759	726
19 0 - 21 5	2 100 - 3 400	625	683	702	669

ROADING COSTS. Roading projections and costs are documented under the section on Development of Yield Coefficients previously presented in this appendix.

Capital Investment Costs. The capital investment programs for recreation, wildlife, and fisheries are developed outside of the FORPLAN model. The Forest derives each series of investments as follows

RECREATION. The cost of developed recreation sites is derived from a survey of potential sites, examination of experienced costs, and adjustment of costs related to standards of construction due to anticipated trend of use. These yearly costs range from $4,000 to $92,000 for the first decade representing a wide range of investment strategies.

The cost of constructing and maintaining trails is based on recent historic costs in similar terrain. These costs are $17,000/mile for construction and $300/mile for maintenance. District personnel with experience in managing the maintenance program formulated the maintenance cost

FISHERIES. The cost of fisheries improvements is derived from existing basin action plans. These plans indicate the amount of work planned. Historic costs and professional experience are the basis for costs to accomplish the annual work load. The level of investment varies by alternative ranging from $175,000 to $350,000. The range represents different intensities of fish management.

WILDLIFE. Costs shown in the alternatives are derived from the Forest's Comprehensive Fish and Wildlife Plan and other documents. If wildlife projects listed in the plan are spread out evenly over a ten year period, the cost per year ranges as high as $123,000. This dollar amount represents (annually) as many as 4,550 acres of habitat improvement and 420 new structures. This amount could also be sustained in subsequent decades because most of the projects deal with meadow improvement and other recurring projects. These projects are scheduled to be repeated at ten year intervals (they only produce benefits for ten years). Some of the projects scheduled for the first decade are nonrecurring; however, for each decade throughout the life of the plan, it is expected that the same level of one-time opportunities exist as for the first decade.

SOCIAL AND ECONOMIC IMPACT ANALYSIS

OVERVIEW

Social and economic impact analysis examines the relationships between National Forest activities and the people within the Forest's area of influence. Social and economic impacts resulting from Forest decisions do not occur in a vacuum. These impacts are, in part, determined by other forces operating within an area. Social and economic forces change over time, many of which are independent of National Forest actions and policies.

The Siskiyou National Forest's area of primary influence is Coos, Curry, Jackson, and Josephine counties, in Oregon. Chapter III of the FEIS presents an in-depth description of this area, and its major social and economic features. The Planning Problems, described in Chapter I of the FEIS, and Appendix A also provide valuable insights into the important issues.

POPULATION

Population statistics are important to the selection of alternatives. The total population of the four-county area is approximately 271,500. County populations range from a high of 132,456 in Jackson County to a low of 16,992 in Curry County (Table B-3). Historically, all of the counties have been rural, and population growth has been slow. The decade of the 1970's, however, witnessed rapid increases in the growth rates of the two eastern counties.

DEMOGRAPHICS

Between 1950 and 1970, the median age of Oregonians steadily declined (Figure B-2) In the Siskiyou National Forest four-county area, only Jackson County exhibited a trend similar to this. Median age declined from 1950 to 1960 and then even more rapidly from 1960 to 1970 The median age in Coos and Curry Counties was lower in 1970 than in 1950, but had risen during the decade of the 1960's. Only in Josephine County did the median age increase consistently during this 20-year period. The percentage of the population over 65 rose from 9.4 percent in 1950, to 12.3 percent in 1960, to 15.5 percent in 1970. The State average for 1970 was 10.8 percent. The reason for the age disparity is a large influx of retired people to the county (U.S. Department of Commerce, 1960 and 1970).

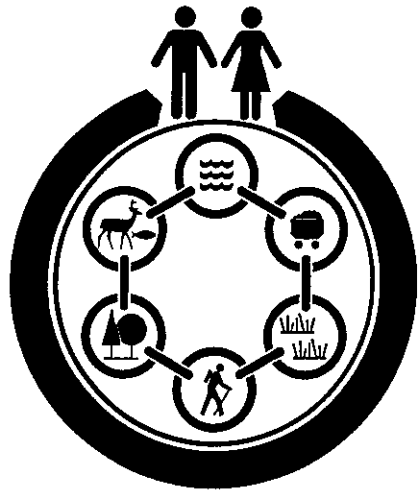


Table B-3. Population 1/

STATE/County/City	Year 1960	1970	1980	% Change 1970-1980
STATE		2,091,533	2,632,663	25 9
Coos County	54,955	56,515	63,200	11 9
Bandon		1,832	2,311	26 1
Coos Bay		13,466	14,424	7 1
North Bend		8,553	9,779	14 3
Coquille		4,437	4,481	1 0
Eastside		1,331	1,601	20 3
Myrtle Point		2,511	2,859	13 9
Powers		842	819	-2 7
Curry County	13,923	13,006	16,992	30 6
Brookings		2,720	3,384	24 4
Gold Beach		1,554	1,515	-2 5
Port Orford		1,037	1,061	2 3
Jackson County	73,963	94,533	132,456	40 1
Ashland		12,342	14,943	21 1
Talent		1,411	2,577	82 6
Butte Falls		358	428	19 6
Eagle Point		1,241	2,764	122 7
Jacksonville		1,611	2,030	26 0
Medford		28,973	39,603	36 7
Phoenix		1,287	2,294	78 2
Rogue River		841	1,286	52 9
Gold Hill		603	904	49 9
Central Point		4,004	6,357	58 8
Josephine County	29,917	35,746	58,820	64 5
Cave Junction		415	1,023	146 5
Grants Pass		12,455	14,997	20 4

1/ Source US Department of Commerce, Bureau of The Census, 1980 Census of Population and Housing, Oregon, Final Population and Housing Unit Counts, March 1981

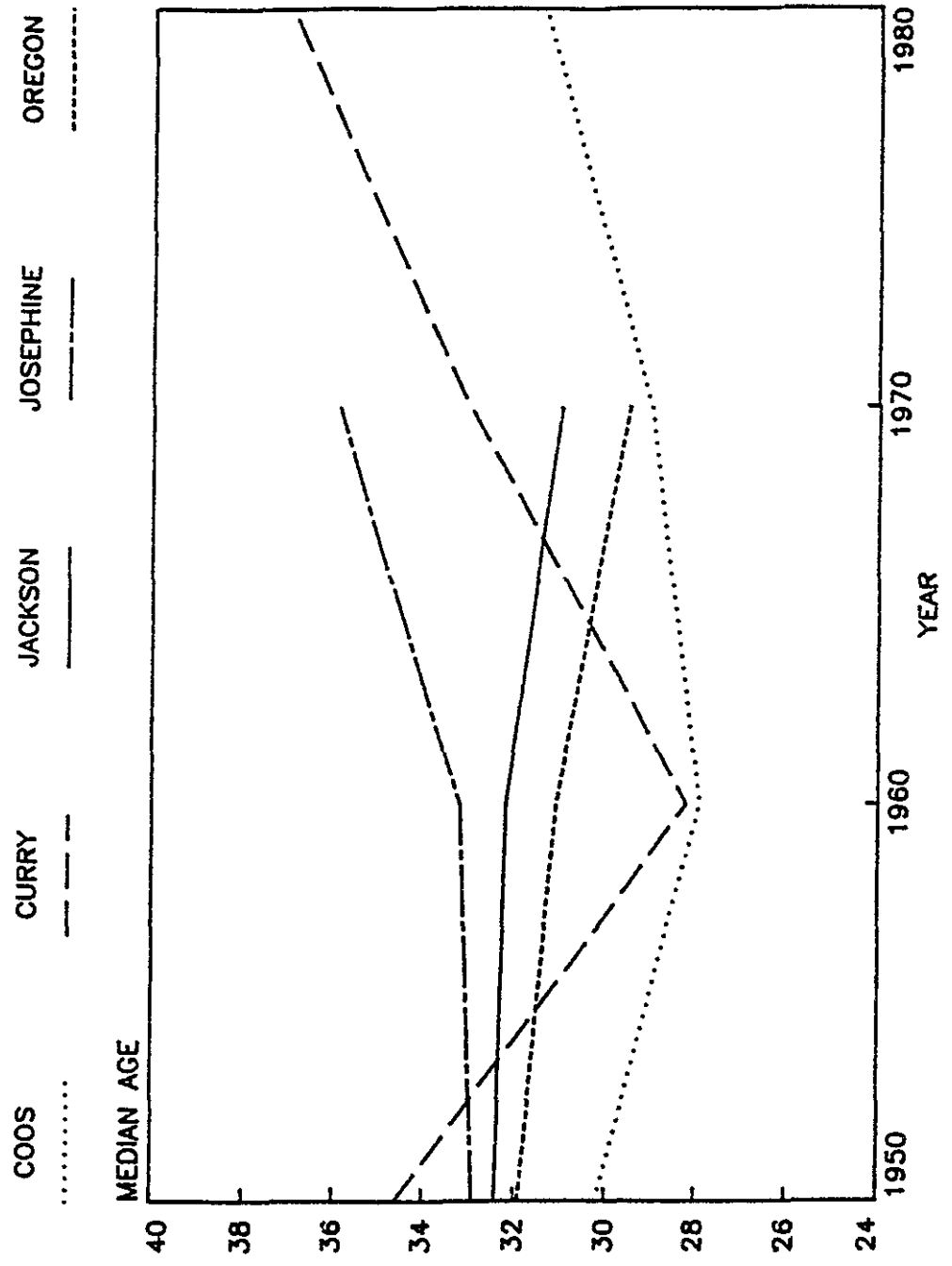


Figure B-2 Median Age, by County and the State 1950-1980

Race. The population in the area as a whole is 96 to 97 percent caucasian. From all indications, it is likely to remain so in the foreseeable future. The following table displays the distribution of population by race, 96 to 97 percent of the area is White; 0.1 percent,Black; 1.5 percent, Native American; 0.5 percent, Asian; and 2 percent, Hispanic. Coos County contains the largest nonwhite population at 3.6 percent (U S Department of Commerce, 1980). (See discussion on American Indians in Chapter III of the FEIS)

Percent of Population by Racial Type, 1980 1/

	Percent					
County	White	Black	American Indian, Eskimo, and Aleut	Asian and Pacific Islander	Other	Spanish Origin 2/
Coos	96 4	1	2	7	8	2
Curry	97.1	1	2	3	6	1 3
Jackson	96 7	1	9	.6	1 7	3
Josephine	*96 7*	*.1*	*1*	*4*	*6*	2

1/ Source U S. Department of Commerce, Bureau of The Census, 1980 Census of Population and Housing, Oregon
2/ This is a unique category which overlaps several of the others and should not be added with the other categories to form the total

Sex The male/female ratio in the four county area is somewhat higher than the State average and that for the Nation as a whole. In the past (1940 to 1960) this difference was even more pronounced This was, most likely, due to the relatively recent settling of the area and the predominance of male-typed, forest products employment. However, the number of women has been increasing in recent years, particularly in the larger, more service-oriented, east side communities.

Urban-Rural Distribution. The U.S. Bureau of the Census considers an urban place to be a location with 2,000 or more inhabitants. The following table presents population data by urban and rural residence, according to this definition.

Preliminary census figures shown an increase in the urban population in 1980 in Coos County to 53 percent, with little change in Curry County. The Josephine County Plan (1980) estimated that 78 percent of the county population resided within eight miles of Grants Pass in 1978. It should be remembered that urban population is derived according to different criteria here Although it is likely that the urban/rural ratio has increased, the change is probably overstated when comparing the 1970 and 1978 estimates. The census definition undoubtedly underestimates urban population in Josephine County, due to the large number of people who live near Grants Pass but outside of the city limits More recent information for Jackson County was not yet available.

In 1970, more than half the population of three of the four-counties in the area of influence resided in urban areas (Coos, Jackson, Josephine), and, from all indications, this trend toward increasing urbanization will continue. Curry County is the one exception; its population is about 80 percent rural and has been so for the last two decades (U.S. Department of Commerce, 1980).

Percentage of Urban and Rural Populations

County	Percent			
	1960		1970	
	Urban	Rural	Urban	Rural
Coos	47	53	51	49
Curry	19	81	21	79
Josephine	34	66	52	48
Jackson	45	55	55	45

EMPLOYMENT

The most significant employers are lumber and wood products, government, tourism, agriculture, and fisheries. Lumber and wood products manufacturing, which includes logging, is the largest employer, providing total employment of 17 to 18 percent in the four counties. Lumber and wood products jobs have decreased in number from 1979 due to economic adjustments made by industry to remain competitive. Concurrently, other sectors have grown. The flow of people moving into the area has served to promote growth in finance, insurance, real estate, and other trade and service industries Other industries which have provided basic employment growth include apparel, fiberglass, and electronics manufacturing In Coos Bay, the transportation, communication, and utilities sector is relatively large primarily due to the shipping industry.

Government jobs provide a significant percentage of employment in all four counties, exceeding employment provided by the lumber and wood products industry in 1983. Covered employment, by economic sector in the four counties for 1979, 1982,and 1986, is displayed in Table B-4.

Table B-4. Nonagricultural Wage and Salary Employment for 1979, 1982, and 1986 1/

Coos - Curry Counties	1979		1982		1986	
Sector	Employ-ment	Percent of Total	Employ-ment	Percent of Total	Employ-ment	Percent of Total
TOTAL PAYROLL JOBS	27,020	100 0	22,610	100 0	23,190	100 0
Manufacturing Subtotal	7,670	28 4	5,420	24 0	5,510	23 8
Durable Goods	6,580	24 4	4,290	19 0	4,510	19 4
Lumber and Wood Products	6,130	22 7	3,940	17 4	4,180	18 0
Other Durable Goods	450	1 7	350	1 5	330	1 4
Nondurable Goods	1,090	4.0	1,130	5 0	1,000	4 3
Food and Kindred Products	670	2.5	680	3 0	600	2 6
Other Nondurable Goods	420	1 6	450	2 0	400	1 7
Nonmanufacturing Subtotal	19,350	71 6	17,190	76 0	17,680	76 2
Construction and Mining	1,050	3 9	550	2 4	700	3 0
Transportation, Communications, and Utilities	1,940	7 2	1,650	7 3	1,500	6 5
Trade	5,500	26 2	4,850	21 4	5,330	23 0
Finance, Insurance, and Real Estate	1,180	5 0	980	4 3	1,030	4 4
Service and NEC	3,640	13 5	3,530	15 6	3,900	16 8
Government	6,040	22 4	5,630	24 9	5,220	22 5

Table B-4 (continued) Nonagricultural Wage and Salary Employment for 1979, 1982, and 1986 1/

Jackson - Josephine Counties	1979		1982		1986	
Sector	Employ-ment	Percent of Total	Employ-ment	Percent of Total	Employ-ment	Percent of Total
TOTAL PAYROLL JOBS	60,010	100 0	53,810	100 0	63,250	100 0
Manufacturing Subtotal	12,400	20 7	9,450	17 6	12,240	19 4
Durable Goods	10,570	17.6	7,780	14 5	10,510	16 6
Lumber and Wood Products	8,440	14 1	5,600	10 4	7,740	12 2
Other Durable Goods	2,130	3 5	2,180	4 1	2,770	4 4
Nondurable Goods	1,830	3 0	1,670	3 1	1,730	2 7
Food and Kindred Products	590	1 0	390	0 7	380	0 6
Other Nondurable Goods	1,240	2.1	1,280	2 4	1,350	2 1
Nonmanufacturing Subtotal	47,610	79.3	44,360	82 4	51,010	80 6
Construction and Mining	2,930	4 9	1,440	2 7	2,250	3 6
Transportation, Communications, and Utilities	2,830	4 7	2,630	4 9	3,330	5 3
Trade	15,730	26 2	14,450	26 9	17,540	27 7
Finance, Insurance, and Real Estate	3,000	5 0	2,950	5 4	3,040	4 8
Service and NEC	10,110	17 2	11,100	20.6	13,260	21 0
Government	12,820	21 4	11,790	21 9	11,600	18 3

1/ Source: Program Year 1988 and 1989 Business and Employment Outlook, JTPA Districts 7 and 8, State of Oregon, Employment Division, Department of Human Resources (Anderson 1985)

Percent Average Annual Covered Employment by Sector for the Four County Study Area 1/

Sector	Average Percent			
	1960	1970	1978	1986
Agriculture, Forestry, and Fisheries	6	.7	1 8	–2/
Mining	.2	2	2	1
Contract Construction	4 7	3 6	4 6	4 0
Manufacturing Total	45 5	37 9	23 8	15 8
Lumber 3/ and Wood Products	40 0	29.9	17 9	10 7
Food and Other	2 0	2 8	1 4	1 1
Transportation, Communication, and Utilities	8 9	7 9	5 3	4 4
Wholesale and Retail Trade	23.1	27 2	25 5	23 0
Finance, Insurance, and Real Estate	2 6	3 5	3 3	4 3
Services	8 7	12 4	14 7	15 3
Government 4/	5 7	6 4	20 8	18 9

1/ Source Oregon Covered Employment and Payrolls, By Industry and County, 1960, 1970, 1978; Occupational Employment Trends in the Governor's Administrative Planning District, Districts 7 and 8 All publications prepared by Research and Statistics Section, State of Oregon, Employment Division, Department of Human Resources
2/ Data not available
3/ Includes logging
4/ Includes Education and Social Services

LUMBER AND WOOD PRODUCTS is the most important manufacturing industry in the area as a whole, however, the relative dependence of each of the counties on this sector varies widely. Curry County is the most highly timber dependent, followed by Josephine, Coos, and lastly, the more diversified Jackson Counties.

Estimates of log flows from the Siskiyou National Forest lands to mills in these counties are shown below In addition to being the most timber dependent of the four-counties, Curry County is also the most dependent on the Siskiyou, receiving more than half of its timber supply from this source. Josephine County mills obtain about one-fourth of the timber they process from Siskiyou lands Relatively minor proportions are processed in Coos and Jackson counties.

Although lumber and wood products are still the most important industry in the area, it has made adjustments to remain competitive in the marketplace These adjustments mainly are increases in efficiency with corresponding reductions in labor requirements

Total Number of Logs Consumed by Mills within Zone of Influence from the Siskiyou National Forest 1/

	Number of Logs (Year)					
	1972		1976		1982	
County	MBF	Percent	MBF	Percent	MBF	Percent
Coos	49,797	6	37,136	6	33,278	6
Curry	148,390	73	83,364	54	17,845	25
Jackson	--	--	573	--	10,673	3
Josephine	75,612	26	44,300	26	28,282	28

1/Source 1972 data derived from Schuldt and Howard, (1974), 1976 data derived from Howard and Hiserote (1978), and 1982 data derived from Howard, (1984) The volume and percent figures are those amounts attributable to the Siskiyou National Forest

Figure B-3 graphically portrays the decline in the local timber employment, which was most pronounced in Curry County where employment in this industry fell from 65 percent to 21 percent of total employment over the period.

The reason for this adjustment was due to reduced demand for wood products and increasing mechanization in the industry which has resulted in a shift toward more capital and less labor intensive production processes (Wall and Oswald, 1975). The modernization resulted from increased competition from the southern region of the United States and western region of Canada As the South and Canada deplete their supplies of mature timber, the Northwest area (including the area of influence surrounding the Siskiyou National Forest) will experience less competition. Depending on the amount and cost of raw material, the area may experience an increased demand for wood products (Schallau and Maki, 1986) A slow steady increase in demand for wood products due to increased housing starts as the first children of the baby boom generation enter the housing market is predicted.

AGRICULTURE AND FISHERIES are important to the area's economy much more than covered employment statistics show This sector is considered to be second or third in importance Many workers in these fields are self-employed and do not appear in the data, but this sector brings in considerable revenue and is important in supporting the food processing industries Eighty-eight percent of the employment in the food processing industry in Coos and Curry Counties was in seafood processing in 1977.

Coos and Curry Counties ranked second and fourth, in terms of total commercial fish landings, in the State in 1979. They accounted for 26 percent and 12 percent of total commercial fish and seafood landings in the state in that year. Commercial fishing also supports jobs in the food processing industry, which is the number two industry, following wood products, in the manufacturing sector of these counties The industry is located in the coastal communities of Port Orford, Gold Beach, and Brookings in Curry County, and Bandon and Charleston in Coos County. Forest fisheries habitat also provides sport fishing opportunities for local residents and tourists, this contributing to the area's tourism-related employment.

Agriculture is also important to communities in Coos and Curry Counties Dairy farming is a large industry in each, and the specialty crop of Easter lily bulbs is a major cash crop and tourist attraction to Brookings (located in Curry County). Jackson County contains over 10,000 acres of pear orchards, which account for its primary agricultural crop and food processing industry. Josephine is the only county in the Siskiyou's area of influence which has little cropland, 80 percent of the land area is mountainous

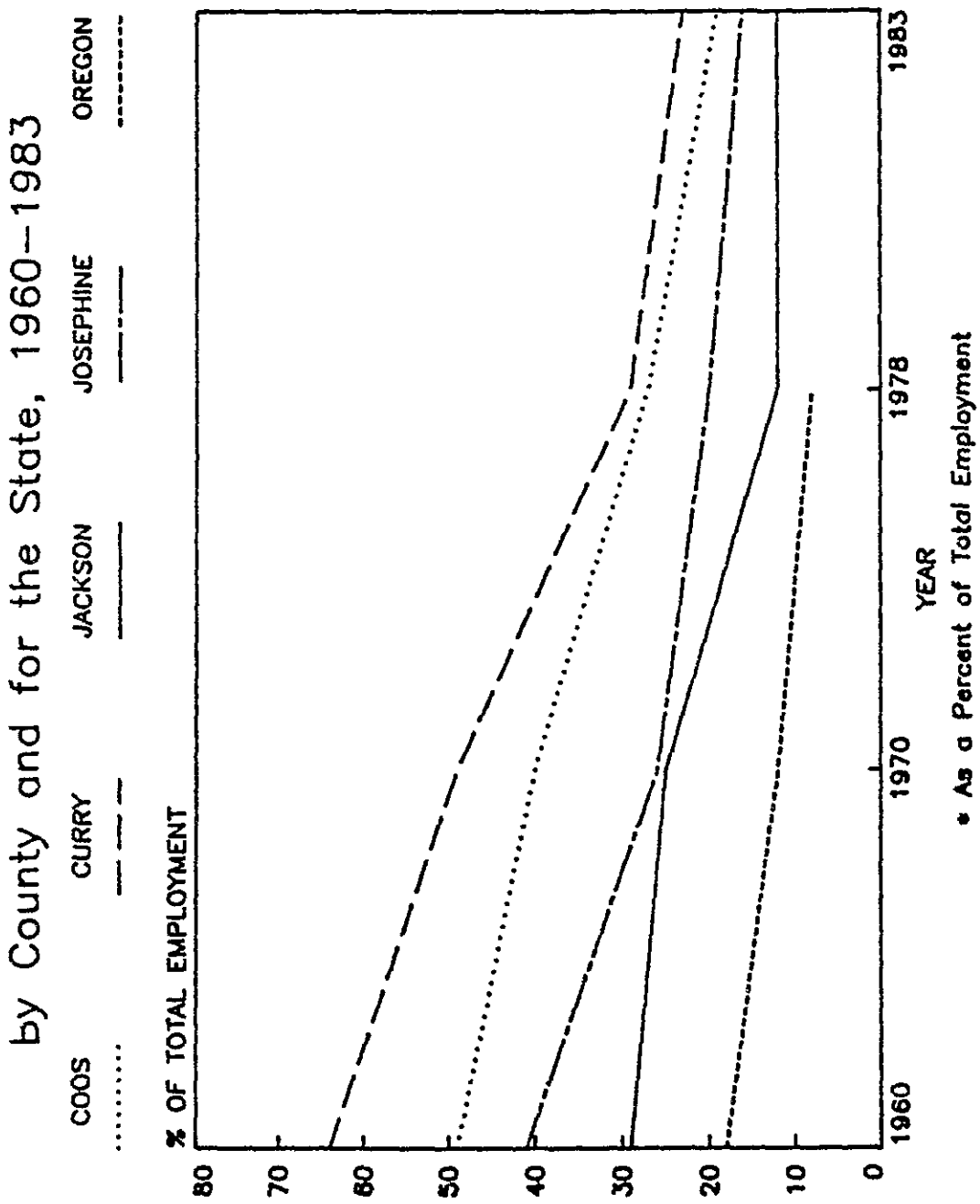


Figure B-3. Lumber and Wood Products Employment *

TOURISM is a key industry in all of the counties. It has been growing in importance during the last decade.

Since tourism is not a homogeneous, or strictly-defined industry, measurement of its economic contribution is less precise than for other sectors. Economic support through tourist expenditures shows up in the trade and service sectors, primarily from the purchases of food, lodging, gasoline, and souvenirs.

Jackson and Josephine Counties are heavily visited by out-of-state tourists. Both of these counties are transected by Interstate-5, the main north-south route through Oregon.

Jackson County has the highest proportion of employment in wholesale and retail trade and services in the four-county area, even higher than in the State. This is primarily due to the nature of its two largest cities The city of Medford is a major shopping and service area for the region and consequently benefits from the secondary benefits of tourism and wood processing. Ashland is the home of the Oregon Shakespearean Festival, which draws vacationers from all over the western United States

Josephine County also has nonmanufacturing strength in trade and services. Tourism along with indirect benefits from the wood products and food processing industries, and the large amount of transfer payments due to social security and retirement incomes,account for this strength. The county shares the Wild and Scenic Rogue River with Curry County. The Rogue is a National attraction, drawing recreationists to its excellent fishing and whitewater opportunities.

The coastal counties, Coos and Curry, are also supported by this industry. Tourists are attracted to the miles of bluffy, scenic coast along U.S. Highway 101, and the many types of recreation that they provide.

The Forest contributes to tourism-related employment in a rather minor way, mostly through the attraction of the Rogue River for boating, fishing, and hiking. Many of the area's features that draw tourists are not located on the forest.

Employment Projections. Projecting future employment trends is tricky, especially now, when trends from the 1970's point in one direction and the occurrences of the last several years point in quite another.

Employment gains have occurred in the trade, finance and service, and government sectors, and these trends are expected to continue. The important point to consider is that employment projections, like population projections, are only as valid as the methods and assumptions used to arrive at them. For the most part, projections are linear extrapolations of historic trends. They cannot foresee and account for different future developments. For example, radical change in wood processing technology or a prolonged energy crisis could profoundly change the structure of the economy in southwestern Oregon.

UNEMPLOYMENT. Average annual rates of unemployment for the four counties and the State are shown below. The average unemployment rate in the four counties is generally two to six points higher than the State, which is generally several points higher than the U.S. This is common for undiversified, rural economies. The area is also sensitive to national and regional economic cycles, primarily because of its dependence on the wood products industry. A significant portion of recent unemployment has resulted from adjustments in the wood products industry and resulting slowdowns in other related industries.

Seasonal fluctuations in unemployment are high, dropping to low points in late summer and early fall and reaching peaks in midwinter months. Seasonal variations reflect the constraints of the winter season on the basic industries of logging and wood products, agriculture, fishing, and tourism As would be expected, Jackson County, with its more diversified and less seasonally-oriented economy, has lower and more stable levels of unemployment

Josephine County experienced the highest unemployment during the late 1970's, but during the 1980's, the coastal counties fared somewhat worse. This was particularly true in the winter of 1981 to 1982, when the coastal counties experienced the highest unemployment since 1958.

Average Annual Unemployment Rates by the Four Counties The State of Oregon and the United States - 1977 to 1982 (Projected)

Year	Percent of Unemployment					
	U S	Oregon	Coos	Curry	Jackson	Josephine
1977	7 0	7.3	8.7	8 6	7 9	11 0
1978	6 0	6.0	7 2	6 9	7 0	9 0
1979	5 8	6 8	8 8	10 2	8 9	10 1
1980	7 1	8 2	13 9	12 6	10 4	13 0
1981	7 5	9 1	15 9	15 9	11 0	14 6
1982	9 3	11.3	15.2	20.5	13 5	15 4

All of the counties in the area of influence were designated as "labor surplus" for the period of June 1, 1981, to May 31, 1982. This designation applied to areas which experienced unemployment at 1.2 times the national rate (in excess of 7.9 percent) for two calendar years. Coos and Curry Counties are recent additions to this list; Jackson and Josephine Counties were classified as "labor surplus" in prior years. This is a federal designation, giving the counties preference in bidding for federal contracts.

Coos and Curry Counties were also identified as economically lagging areas effective April 1981 to April 1983. This is a State designation, and is based on high unemployment, low per capita income, closure or anticipated closure of major employers, or out-migration due to lack of economic opportunity. Josephine County was considered to be such an area until September 1981. State policy is to encourage economic and community development in these areas by providing tax relief for investments in job-producing projects.

Income. The four-county area of influence has traditionally had lower levels of income than the State as a whole, and incomes in Oregon are below the National average. The following table displays that information. This is, again, not unusual for a rural, undiversified, resource-based economy.

The residents of Coos County have traditionally had the highest incomes; those of Josephine, the lowest. Residents of Josephine County earned the lowest income in the state in every year but one from 1977 to 1982. Josephine is also the county with the highest proportion of below-poverty population and food stamp recipients. From 1974 to 1979, 58 percent of the total income for Josephine County was income paid to labor and proprietors, compared with a state average of 72 percent. This is one measure of economic health, as this is the type of income occurring to goods or services-producing segments of the population The other two income types, property income and transfer payments, do not reflect the creation of any economic product. Transfer payments, which are generally government assistance of some sort, accounted for 24 percent of total income in Josephine County in 1979. These payments generally comprise only about 11 percent of a county's total income.

A 1982 State of Oregon publication, Josephine County Economic Review, examined real income growth--or increases in income that remain after inflation is adjusted out--for Josephine County Incomes increased at an average rate of 5.8 percent a year from 1975 to 1977, then actually declined 2.7 percent in 1979 and 6.9 percent in 1980. Similar declines have probably occurred in the other counties, though probably smaller in magnitude.

Future trends in income in this area, like trends in population, employment and unemployment, depend on local and external factors. National economic recovery, the attraction of new industries, the adjustment

of existing industries to remain competitive, and increase in transfer payments will provide any appreciable gains in real income.

Per Capita Income, Oregon and the Four Counties 1976 to 1980

Year	$ Per Person				
	Oregon	Coos	Curry	Jackson	Josephine
1976	6,368	5,722	5,675	5,452	4,926
1977	6,982	6,418	6,256	6,035	5,503
1978	7,800	7,183	7,042	6,800	5,935
1979	8,615	7,974	7,662	7,461	6,424
1980	9,296	8,093	8,192	8,102	6,972

The following table displays payrolls by economic sector, for 1978 and 1983. Lumber and wood products comprises the largest share of payrolls in all counties except Jackson It is 40 percent of Curry County payrolls, and 34 percent and 28 percent of Coos and Josephine County payrolls, respectively. The proportion of total income in each sector, not surprisingly, is closely allied with employment by sector. Wood products also ranks high for individual employee income. It is the highest-paying sector in all but Coos County, where it is second to fisheries Coos County has the highest overall payroll levels (in agreement with the other income information). Curry County is below average in many of the sectors

Payrolls by County, by Sector, 1978 and 1983 1/

Sector	County/Year (M $)							
	Coos		Curry		Jackson		Josephine	
	1978	1983	1978	1983	1978	1983	1978	1983
Agriculture, Forestry, Fisheries	3,450	5,223	1,060	2,072	2,250	7,467	1,066	1,999
Mining	380	626	--	205	1,366	1,314	914	800
Contract Construction	12,045	7,485	1,927	2,300	32,773	17,420	3,382	5,040
Manufacturing	113,172	94,066	22,368	22,206	122,763	152,488	55,936	66,847
Lumber & Wood Products	3,299	4,426	916	477	5,286	6,419	798	916
Food	99,901	78,332	20,429	21,179	92,826	103,962	44,097	45,579
Other	9,972	11,308	1,024	550	24,651	42,107	11,041	20,352
Transportation, Utilities, Communication	29,466	33,131	1,640	3,333	31,698	44,206	8,288	7,736
Wholesale & Retail Trade	37,561	42,023	468	7,972	105,528	131,511	28,789	32,586
Finance, Insurance, Real Estate	7,260	8,997	1,064	1,828	14,743	24,609	5,347	8,033
Service	23,456	30,778	2,812	4,547	57,236	101,752	17,424	29,439
Government 2/	51,078	67,076	13,231	16,644	99,620	133,835	32,585	43,603
Total	269,230	289,405	51,431	61,107	471,229	614,602	158,731	198,083

1/ Source Oregon Covered Employment and Payrolls, By Industry and County, 1960, 1970, 1978, Occupational Employment Trends in the Governor's Administrative Planning District, Districts 7 and 8 All publications prepared by Research and Statistics Section, State of Oregon, Employment Division, Department of Human Resources
2/ Includes Education and Social Services

DISTRIBUTION OF INCOME. The distribution of income is an indicator of a region's economic health and social structure. The following table displays the proportions of population in five income categories. Coos County has the lowest proportion in the lowest income category and is slightly ahead of the State in all but the highest income group. All of the other counties have higher proportions of low-income residents Josephine County, again, is the least well-off, with a full 38 percent of its residents earning less than $8,000 a year and only 9 percent earning above $25,000 (Kohl 1980)

Effective Buying Power Percent of Population in Each Income Class, 1978

	Percent of Population				
Income ($)	Coos	Curry	Jackson	Josephine	State
0- 7,999	24	27	28	38	25
8,000- 9,999	6	6	7	8	6
10,000-14,999	20	17	19	22	17
15,000-24,999	35	34	32	23	33
25,000-+	15	16	14	9	19

Josephine County also contains the greatest proportion of poverty population with 16 6 percent of its population below the poverty level, as opposed to the State average of 11 2 percent. Almost 12 percent of its population receives foodstamps as shown below:

Indicators of Poverty

	Percent		
County/State/Nation	Poverty Population 2/ (1970)	Recipients Rank	Food Stamp 1/ (1979)
Coos	10 1	32	7 6
Curry	13 2	14	5 4
Jackson	12 2	20	8 9
Josephine	16 6	2	11 7
State	11 2	--	--
Nation	13 0	--	--

1/ Kohl, Don C., Department of Human Resources, State Community Services Program, Social Accounting for Oregon, Socio-Economic Indicators, 1980.
2/ 1970 Census of population and census definition of poverty

COUNTY REVENUES

The Siskiyou contributes to revenues for four-county governments: Coos, Curry, and Josephine in Oregon, and Del Norte in California. The counties receive two types of payments.

Oregon and California (O&C) payments were established in 1937 to provide in-lieu-of-taxes revenue from lands repossessed by the Federal Government following a breach of contract by the Oregon and California railroad in 1916. Funds are generated by timber harvest on Bureau of Land Management (BLM) as well as National Forest lands. Counties involved receive 50 percent of sustained-yield timber revenues from all O&C lands in western Oregon O&C funds are also used by the agencies, in cooperation with the respective counties, for resource improvements on the O&C lands within their jurisdiction.

National Forest Fund (NFF) payments remand 25 percent of total Forest revenues to the States in which Forests are located. The payments are then delivered to the counties containing the National Forest lands and must be used for schools and roads as prescribed by the State.

The following table displays the NFF payments received by the counties from 1972 through 1983. The amount of these payments is determined by the bid price, and the amount of timber actually harvested in any given year. Since both bid price and cut volume are highly variable, payments to counties are also highly variable.

Payments increased throughout the 1970's, when timber bid prices were high and much timber was being cut Since 1979 they have fallen off dramatically. This is due to the decline in bid prices, and slowdown in timber harvest activity resulting in a decrease in timber revenues received by the Forest. Future payment trends depend, again, on resumed activity in the national housing market and the resultant creation of demand for stumpage.

Payments to Counties (NFF) in 1982 Dollars

Year	County (M $)			
	Coos	Curry	Josephine	Del Norte
1972	224,659	2,666,297	1,354,134	161,731
1973	297,263	3,543,566	1,789,668	213,905
1974	272,223	3,247,592	1,638,918	195,966
1975	223,087	2,661,412	1,343,098	160,595
1976	219,054	3,807,664	1,920,861	229,678
1977	430,007	5,133,715	2,588,924	309,556
1979	677,079	8,036,590	4,045,243	479,756
1980	383,768	4,555,403	2,292,841	271,922
1981	277,116	3,726,819	1,655,641	196,353
1982	85,040	1,009,452	508,078	60,256
1983	135,134	1,604,009	807,372	95,750

AREA LIFESTYLE

This section is a discussion of the lifestyles, values, and interests of the people living in southwestern Oregon.

The land manager is involved in reconciling and balancing social groups' demands and needs An understanding of the underlying forces which give rise to these needs and expectations can be a very valuable tool. Conflict over natural resources is social conflict The forest land manager can and does have a profound effect on people as well as the land. The use pressures on our natural resources are increasing. Social conflict over this use, and the need to recognize and deal with it, is here to stay

The social climate of southwestern Oregon can be described as extremely diverse, with some social cohesion at the local, city level, but little for the area as a whole.

Curry County can probably be considered the most socially uniform of the four counties in the area of influence. It is rural and conservative, with a majority of its residents conforming to traditional values and lifestyles. Coos County is somewhat more economically developed and diverse, and its residents tend to be slightly more socially diverse and liberal in their attitudes.

Both Jackson and Josephine Counties are composed of a number of very different groups of people. Each has significant alternative lifestyle communities, religious communities, and survivalist groups. Grants Pass, in Josephine County, hosts a very large population of retired people, who tend to be fiscally and socially conservative. Ashland, in Jackson County, is the home of Southern Oregon State College, the Oregon Shakespearean Festival, the State Ballet, and a large number of people aged under 40.

While the residents of southwestern Oregon are extremely diverse in terms of values, attitudes, and beliefs, there is one underlying lifestyle that is common to much of the area. This lifestyle is outdoor, natural resource-oriented. It is pursued in a variety of forms; for example: large scale wood products work, traditional and alternative forms of agriculture, forest products gathering, fishing, and commercial and noncommercial whitewater boating. Despite the variety of pursuits, there is a common theme that unites those involved. All are intimately connected with the outdoor environment and its resources for their economic well-being and/or leisure enjoyment. In order to appreciate exactly what the relationship between the Forest and local lifetypes and values are, however, it is necessary to consider a number of factors.

Despite its location, the Siskiyou is a relatively isolated Forest. The only major transportation route to pass through it is U.S. Highway 199, the Redwood Highway, for less than five miles There are no direct north-south routes. The only east-west route, the Bear Camp Road, is used primarily by Forest Service personnel and Rogue River guides and floaters. It is closed during the winter months, due to snow.

The Forest is similarly isolated from the local communities. BLM and private lands buffer the Siskiyou from populated areas on all sides. Thus, few community viewsheds are impacted by the Forest's management activities. Firewood, berries, ferns, and other products from the woods are generally available on other lands that are more convenient than the Siskiyou.

Terrain on the Siskiyou tends to be rocky and steep; many areas are covered with brush species that render off-trail hiking a near impossibility. The Forest contains few lakes, loop trails, or other day-hike destinations. Short duration recreational opportunities are much more abundant on the neighboring Rogue River National Forest. Because of its terrain, accessibility, and the availability of substitutes, the Kalmiopsis Wilderness is one of the least-used Wildernesses in the Nation. Most recreation takes place on or near the major rivers, which are rather unique in terms of whitewater experience. Another unique feature of the Siskiyou is its array of rare and unusual plants which provide an excellent opportunity for the area's surprisingly high number of professional and amateur botanists. The Forest also has large unroaded areas which are valued by many.

While southwestern Oregon residents exhibit a myriad of different lifestyles, one in general appears common to many residents and is particularly relevant to National Forest management It is what can be called a seasonal, outdoor lifestyle. It is subject to infinite variations, but essentially involves paid employment for part of the year--generally, the late spring-summer-early fall months--and involuntary idleness or living off the land in the remaining cold-weather months. During these months, many residents fill their time and supplement their lowered incomes with outdoor activities such as woodcutting, hunting, fishing, or crabbing. This lifestyle is related not only to the natural environment of the area, but to social forces, such as the economy and social heritage of the region.

Employment in the area has been previously examined. Four of the most important industries, i e., timber, agriculture, commercial fishing, and tourism, rely primarily on the mild weather and growing season months The rural tradition is a primary cultural factor which reinforces the seasonal, outdoor lifestyle This tradition, with its general orientation toward the land and the outdoors, make it seem natural to turn to the land and its resources to satisfy needs.

The seasonal, outdoor lifestyle has elements that crosscut different, sometimes opposing, groups of people; while many different people feel a commitment to the land and the outdoors in southwestern Oregon, they do so in different ways.

Major Values Relating to Resource. Values are very general, underlying beliefs or orientations toward objects, ideas, relationships, goals, etc. Since one's values are learned through social interaction with others from early childhood on, they tend to be held both widely and deeply within a given culture, and are very resistant to change. Because they are held so widely and deeply, they are often difficult to pinpoint They are usually expressed only as themes cutting across specific attitudes and actions, and may not even be apparent to those holding them.

These underlying values are expressed in specific attitudes and opinions which change with the movement of events and the passage of time. While by no means wishing to downgrade the importance of public opinion on the specific issues, it should be remembered that public opinion is very issue-specific, and that the issues change over time. If a social overview is to remain valid for a 5- or 10-year planning period and be applied to a succession of changing issues, it must dig to a deeper level, i.e., the underlying orientations, or values, of the people. Nevertheless, specific issues and controversies are valuable. It is in them that the deeper orientations and values are reflected. A more thorough discussion of this topic may be found in Peterson (1980).

At the very root of many conflicts regarding resource management are two fundamentally different conceptions of the relationship between humanity and nature The human-centered view assumes that humanity is the central reference point and that nature exists for society's use. Any part of nature that is not used is considered either irrelevant or wasted.

Those holding this view would be likely to favor intensive timber management and the liquidation of old-growth forests, and would be opposed to the expansion of wilderness (perceived as producing nothing for people)

The opposite perspective assumes that nature has inherent value in its own right. From this perspective, people are responsible for wisely using, conserving, and protecting the natural environment The proponent of this view is more likely to favor preserving stands of old growth for their own sake, eliminating use of chemical herbicides because of potential dangers to the environment, and protecting fish and wildlife habitat at the cost of reduced timber production.

This portrayal is necessarily over-simplified Rarely is either perspective consistently applied, rather, many intermediate views exist between the extremes However, identifying two essentially-distinct views enables us to follow them as themes that cut across many resource-related issues which are important to the economy and lifestyle of the area--and, hopefully can lead to a better understanding of the basis of many conflicts.

Changing Values. No one can predict with accuracy what a population's values will be for the next twenty years However, there are some trends in evidence that are likely to continue, barring unforeseen change. There are two ways in which the basic value orientations of an area's population can change· the same people may change over time, or new people may bring in new values. Both of these are taking place in southwestern Oregon.

Environmentalism, as a movement, has been gaining strength nationwide for the last decade, southwestern Oregon is no exception. This trend will likely continue. Concurrent with the growth in environmentalism, there is developing what can be called a backlash. Timber industry and other more business-oriented groups and individuals are becoming more focused and vocal regarding their interests. As these issues sharpen and more people realize that there are ever-greater pressures on public lands, there could be even further polarization.

This greater pressure on public lands stems from increased population pressure due to an influx of residents relatively new to the Forest influence area. There has been no work done on the value differences between new residents and those with longer histories and ties to the local area, but several characteristics can be inferred. First, the rise in the number of new residents has accompanied a decline in the timber sector employment. Additionally, no statistical relationship could be established between harvest levels and employment in the timber sector, and increasing numbers of new residents (Owen 1979).

New residents may either be retired or are finding work in sectors other than timber; consequently, fewer people have a direct interest in timber production.

Another aspect involving the growing number of new residents that may have important implications for the Forest Service is the particular location of population growth. If it occurs in rural areas, more people are likely to develop an interest in "what goes on in their own backyards." Forest management objectives and activities will acquire much more than an abstract significance. On the other hand, if new residents concentrate in urban areas the result may be increased demand for local outdoor recreation experiences.

In summary, it is unlikely that the Forest Service will enter a period of calm. If present trends continue, there will undoubtedly be a continuing increase in the diversity of values, lifestyles, and demands for forest resource use.

The Community Stability Issue. Forest planning has long recognized the issue of community stability, or a community's capacity to handle change without major hardships or disruptions to component groups or institutions The NFMA regulations also require that alternative management strategies be analyzed in terms of their impacts on affected communities.

In Region Six, most affected communities have generally been synonymous with a timber-dependent community. A timber-dependent community relies on the harvesting and processing of wood, especially National Forest timber, for much of its economic base. It follows that providing a consistent, sustained supply of National Forest timber would promote community stability.

Employment in the lumber and wood products sector, as previously shown, has been declining for the past several decades. Coincident with the employment decline in this sector has been the growth in population, employment, and incomes from other sectors of the local economy, including industries that benefit from resources such as clean water, scenic vistas, and recreational opportunities.

In-migrants in the survey conducted by Stevens (1980) found such things as recreational opportunities and air and water quality to be important in their decisions to move to this area.

The communities and counties in the Siskiyou's area of influence are economically dependent on the Forest for much more than its timber resource. The resource values of air and water quality, visual resources, and diverse recreational opportunities are, increasingly, economic, as well as social, values which are important to community stability.

Sustained growth in the area will depend on the quality of resource conditions as well as the supply of timber. The Siskiyou National Forest is in a position of contributing to community stability with all resource outputs.

The Forest interacts with its surrounding area economically by providing commodities (timber and fish) and an appealing environment to draw outdoor recreation-oriented tourists. It is one of many suppliers in this area Demand for these goods and services is affected primarily by nation-wide phenomena, such as conditions in the housing market, people's preferences for recreation, and the price of gasoline Therefore, the Forest's economic effects on its area of influence are also indirect. Changes in national economic factors cause a much more profound impact on the economy of southwestern Oregon than do changes in Siskiyou National Forest policies and programs.

PLANS, POLICIES, AND CONTROLS OF OTHER AGENCIES

County Comprehensive Plans. In 1973, Oregon instituted a State-wide land use planning system. The process of implementing this system was directed by a state commission - the Land Conservation and Development Commission (LCDC). LCDC was directed to develop and adopt State-wide Goals and Guidelines for management of lands, air, and water resources. Nineteen goals were developed and adopted and they have formed the foundation for all of the County Comprehensive plans prepared in the state. LCDC oversees the operations of the Department of Land Conservation and Development which, in turn, was responsible for working with all of the counties in the State to ensure that the State-wide goals were consistently applied.

All of the counties which include Forest land have either completed their comprehensive planning or have plans in the draft stage. These plans have been reviewed and the zoning designations on adjacent and intermingled non-Federal lands inspected for compatibility with the actions proposed in the alternatives In most instances, the zoning designations on adjacent and intermingled non-Federal land is for forest or agricultural management. These are broad designations which cover a wide variety of uses. None of the activities proposed in the alternatives are incompatible with these designations.

Coastal Zone Management Act (CZMA). In 1972, the Coastal Zone Management Act was passed, requiring that "Each Federal agency conducting or supporting activities directly affecting the coastal zone shall conduct or support those activities in a manner which is, to the maximum extent practicable, consistent with approved state management programs." (Subsection 307(c)(1) of the CZMA of 1972, as amended). Although Federal lands are excluded from the boundaries of the coastal zone, the "directly affecting" provision necessitates a consistency review be performed if the Federal action has significant off-site effects. The significance of the Federal action must be reviewed in terms of the primary, secondary, and cumulative effects on the Coastal Zone.

The LCDC has administered the Oregon Coastal Management Program (OCMP) since 1975. The Federal Government officially recognized and approved that program in 1977. The OCMP is based on the 19 State-wide Planning Goals, particularly the four coastal goals adopted by LCDC in December 1976: Goal 16, Estuarine Resources, Goal 17, Coastal Shorelands; Goal 18, Beaches and Dunes; and, Goal 19, Ocean Resources. These goals form the basis of County Comprehensive Plans; the Coastal Zone Management Program in Oregon is implemented through these county plans.

Portions of Oregon's coastal zone in Curry county has the potential to be directly affected by activities included in the alternatives. The activities: silviculture, including timber harvest, road construction, fish habitat improvement, wildlife habitat improvement; recreation development; land acquisition; and, mineral resource development. These actions can affect water quality, water quantity, aquatic resources, water aesthetics, and water surface area (page 17 of the OCMP). The alternatives include all of the above actions and effects. The coastal zone and estuaries on Del Norte and Coos Counties are far removed from the source of activities; the potential for adverse effects is negligible.

The coastal compliance portions of the Comprehensive Plans in the two Oregon counties have been acknowledged by the LCDC. These plans have been reviewed and the actions and effects predicted for the alternatives compared with them. At the programmatic level the alternatives are consistent with the

coastal portions of the county comprehensive plans. Some site-specific actions may have to be examined in more detail before a final consistency determination can be completed. Project implementing actions will be examined to determine if they have the potential to directly affect Oregon's Coastal Zone. If the directly affecting test is met, a site specific consistency determination will be made. This approach is consistent with the OCMP (page 44 of the Program).

SOCIAL AND ECONOMIC SUMMARY

The primary zone of influence of the Siskiyou National Forest consists of Coos, Curry, Jackson, and Josephine Counties. The area is primarily rural in character, although urbanization has been increasing and, most likely, will continue. The population is currently at approximately 270,000, and could reach 420,000 by the year 2000. Jackson County, with the city of Medford, is the most populous county; Curry County, the least.

In-migration has become a dominant force in the area's growth. It accounted for more than 90 percent of the population growth of Josephine County during the first eight years of the 1970's. In-migrants favor the area because of its high amenity and quality of life characteristics, i.e., clean air and water, the pace of daily life, and outdoor recreation. A significant proportion are retired persons. Employment opportunities and incomes are not the counties' main attractions.

A primary employer in the area is still the lumber and wood products industry, (with the exception of Jackson County which is more diversified and service-oriented). This industry accounted for 24 percent of total employment in 1978. Other important industries are agriculture and fisheries, in the coastal counties, and tourism. The area presently operates on a largely seasonal cycle, with the three primary industries most active during the summer months. Unemployment, which tends to be several points above the state average, worsens during the off-season. The trade, finance, communications, and transportation sectors have been gaining in importance and appear to be the region's keys to economic growth in the future.

Incomes in the four-county area tend to be low. Coos County leads the group in this parameter, just slightly below the State average. Josephine County exhibited the lowest median effective buying power in the State in 1978, and almost the highest proportion of population below the poverty line in 1970.

A predominant, though far from the only, lifestyle in southwestern Oregon can be categorized as "seasonal-outdoor." Many residents work part of the year and depend on outdoor activities, fishing, wood cutting, and gardening, to name a very few, for income or leisure time supplements.

This lifestyle is relatively dependent on natural resources and fosters two distinct and strongly-held value structures, which are of relevance to the forest manager. The human-centered view holds that man's relationship to nature is one of dominance, i.e., natural resources exist for man's use alone; to not fully utilize them is wasteful. The humanity-in-nature view holds that the natural environment has value apart from human use. These highly-polarized views, and the nearly infinite intermediate views, result in conflicting opinions on forest resource management issues.

Further pressure on resources, and increasing diversity of values, is likely to result from the in-migration of people who are either more economically aligned with amenity-based resources, or are retired-and are, therefore, not reliant on economic growth at all.

The traditional, implicit equation of community stability with health in the timber industry has expanded to include fisheries and tourism which require high quality resources such as water, air, visuals resources, and recreation. This formerly timber-dependent community is rapidly becoming forest-dependent, in a multiple-resource sense. The Siskiyou National Forest is in a position of being able to contribute to local community stability by responding to economic and social needs for a supply of many goods

The largest employers in the four-county area are the manufacturing industry (primarily wood and food processors), government, wholesale and retail trade industries, and the services industry. These industries provide 86 percent of the employment in the four-county area.

Economic activity in the Coos, Curry, Jackson, and Josephine County areas is affected by activity on the Forest. Some communities rely on a variety of Forest outputs for a significant portion of their economic activity.

Economic activities which affect local areas include logging, wood processing, Port-Orford-Cedar timber exports, river rafting, commercial fishing, sports fishing, hunting, camping, backpacking, and other forms of tourist activity. Employment and income data for these areas of the economy are summarized

Comparison of Economic Sectors in the Area of Influence

Aggregate Sector	No of Firms	Total Average Employment	Total Payroll (M $)
Forestry/Woods Products	404	12,100	274,500
Fishing/Hunting/Trapping	106	200	3500
Eating/Dining/Hotel/Lodging/ Amusement and Recreation	731	8,100	49,000
Mining	34	200	3000
(Transfer Payments/Social Security Payments, etc)			563,100
(Siskiyou National Forest/ Total Forest Budget)			15,800

The most important industries affected by the Forest are the forestry and wood products industry, the fishing, hunting, and trapping industry, the eating/dining industry, hotel and lodging, amusement and recreation industry, and mining industry. These industries employ approximately 21,000 people in the four-county area which represents 28 percent of the employed labor force. The forestry/wood products industry employ the largest number of people (12,100) and pay about 80 percent of the wages of the listed categories.

Transfer payments, including such items as social security payments, retirement incomes, and disability payments, are about double the amount of wages paid by all the listed categories. Most of this income is due to the large percentage of retired citizens who have moved into the area due to its attractions. These attractions are a low cost of living, low population densities, mild climate, and opportunities for outside activities such as gardening, fishing, firewood cutting, and motorized recreation. Primitive recreation opportunities such as backpacking and hiking are not major attractions for this expanding group of citizens

The Forest itself impacts the local economy with its employees, wages, and contracts. This impact is most dramatic in rural isolated towns adjacent to the Forest. A good example is the town of Powers, Oregon Here, the Forest Service is the largest employer in town and provides additional income through silviculture, recreational facilities, and resource enhancement contracts. The community stability provided by this income is an important consideration.

One other major industry is affected by the Forest - Marijuana. It is purported to be the largest cash crop of southwestern Oregon bringing in more dollars to the area than the timber industry This illegal crop is grown on public land where the risk of punishment due to discovery of growing plants is limited.

SOURCES OF DATA

Economic and social characteristics of communities and areas are related, but also exist somewhat independently, and are best examined through different means. Forest-related economic impacts are derived quantitatively, through use of IMPLAN (an input-output model) and FORPLAN, a linear programming model. Effects on local employment and incomes, are estimated with IMPLAN using outputs generated by the FORPLAN model and other predictive tools. Effects on local government revenues are also estimated, but this is done outside of the IMPLAN model. Forest-related social impacts are in part caused by these economic impacts. The latter are considered, along with other, more qualitative information on local lifestyles, attitudes, beliefs, values, and social organization in the social impact analysis.

ECONOMIC IMPACT MODEL

Overview. The IMPLAN input-output model was used to estimate the employment and income impacts of Forest outputs and activities on the local area. Direct, indirect, induced and total impacts were calculated.

Economic input-output (I-O) analysis is a procedure for describing the structure of inter-industry and labor force relationships, and predicting short-term impacts that result from changes in product supply or demand in one or more of these sectors. I-O analysis is based upon the interdependence of the production and consumption sectors in the impact area. Industries must purchase inputs from other industries, as well as primary sources, (i e. natural resources) for use in the production of outputs which are sold either to other industries or to final consumers. A set of I-O accounts can be thought of as a numerical "picture" of an impact area's economic structure.

Flows of industrial inputs can be traced via the I-O accounts to show linkages between the industries composing the economy. The accounts are also transformed into a set of simultaneous equations that permit the prediction of economic effects (employment and income) resulting from changes in Forest outputs and activities.

The National Model. The IMPLAN model has a data base consisting of two parts: (1) a national level technology matrix, and (2) a county-by-county file of estimated activity levels for total gross output, six components of final demand, three components of final payments, and employment for 466 industrial/business sectors.

The national technology matrix is based on a 1972 U S. Department of Commerce I-O model that was converted to an "industry by industry" basis and updated to 1977 using the RAS procedure (Clopper, Almon, et al., 1983. The county level information is based on a 1977 data set constructed by Engineering Economics Associates of Berkeley, California. The end product is a model that represents the structure of the economy in 1972, but uses actual data for prices and product output levels for 1977.

National Data Base Reduction to Impact Area. Utilizing the national technology matrix and the control totals for the local, multi-county impact area, a data reduction method was employed to develop a regional input-output table. The method used incorporates the property of "openness" displayed by regional economies in comparison with the National economy (Richardson 1972. Smaller, regional economies are less self contained, and hence are more "open" to import and export than the national economy Based on the assumption that trade balances are the principal difference between national and regional purchase

patterns (i.e, industry production functions are identical but regional imports and exports make local inter-industry transactions different), the supply-demand pool technique Schaffer, W A. and K. Chu. 1969) for data reduction was adopted.

Region Six Adaptation - Final Demand Expenditures. The I-O model translates NFS outputs and activities into employment and income impacts. An intermediate step in this process is the translation of NFS outputs (timber, range, recreation, etc.) into final demand dollars. Final demand expenditures are different from the "values" used in the cost efficiency analysis. Final demand expenditures represent the dollars spent by consumers to purchase the finished products that are made from NFS outputs. For instance, timber (a Forest output) is processed into lumber which is sold, as a final product, to consumers. The consumers' final demand expenditures represent the amount of new money that is directly input to the local economic impact area (under the assumption that most of the lumber is purchased by buyers who reside outside of the impact area).

This modeling step is accomplished by applying a final demand expenditure per unit of output to total outputs and linking the resulting dollar amount to the sectors in which the direct expenditure takes place This process determines the direct impact that can be expected to take place in the economy The IMPLAN model, through the inter-industry and labor force linkages, uses this information to compute the indirect, induced, and finally, the total impacts predicted to occur in the area.

Final demand expenditures for Oregon and Washington were developed by the Regional Economist and a team of Forest Economists, in 1984. Expenditures were developed by RIM activity and then allocated to each individual sector impacted, based on patterns established in studies specific to the activity, or assumptions about similar activities Expenditures are reported by RVD, using Region Six estimations of activity durations. Expenditure information is contained in the planning records on file in the Siskiyou National Forest Supervisor's Office, and in the office of the Regional Economist.

One important assumption of the model is that consumption occurs as predicted and that the other segments of the economy are static. Examination of this assumption with regards to timber outputs is revealing.

The amount of trees harvested on the Siskiyou National Forest is correlated with the number of jobs that is connected with harvest and processing. The IMPLAN model coefficients range in date from 1977 to 1984. Since that time there have been substantial increases in productivity of the wood products industry; the projections of the IMPLAN model may over-estimate the jobs associated with timber volumes. Though the nature of the relationship is evolving due to technological changes, a relationship still exists and is valid for relative comparison purposes.

In practice, examination of the historic sale amount reveals no apparent relationship between the Forest's allowable sale quantity and employment in the wood products' sectors. Due to the projected lack of timber available on private ground (Peinecke 1986), an assumption is made for future employment projections that the allowable sale quantity will be harvested at an average rate equal to its amount.

Base Year Alternative and Benchmark - Related Employment and Income. Forest outputs for the existing conditions and current direct alternative were determined and run through the I-O model to provide a base situation from which employment and income changes can be measured.

RETURNS TO LOCAL AND FEDERAL GOVERNMENT. Predicted returns to the U.S. Treasury and local governments were calculated for each alternative and benchmark. These returns illustrate the impact of management on both Federal Government receipts collected as a result of revenue-producing programs on the Forest, and the Forest's payments to local governments.

Returns to the U.S Treasury were calculated by deriving the revenue of income producing programs on the Forest which correspond to FSM 6531.12b "Annual Collections Statement," or the NFF. Total Treasury returns include revenues from timber, grazing, fuelwood sales, recreation, special uses, power, and mineral fees. Timber returns were calculated for each FORPLAN run from the net value of timber revenues All other returns are assumed to be constant at their base year level.

Resource	U S Treasury Returns (1982 MM $)
Timber	49 0200
Range	0017
Fuelwood	0496
Recreation	0743
Special Uses	0032
Power	0005
Minerals	0002

Returns to local governments are Treasury funds paid to the States of Oregon and California and passed on to local county governments. There are two types of payments to counties: NFF and O&C payments The NFF payments were assumed to be 25 percent of all commodity receipts except minerals where 50 percent of the receipts were paid to counties. The O&C payments were assumed to be 75 percent of gross revenues on the percentage of O&C lands managed on the Forest. These funds are paid to the State of Oregon who distributes them to the counties. Both funds are commonly referred to as payment in lieu of taxes.

Social Measures. Social impact analysis is the estimation of how Forest Service policies and actions affect the quality of life or social well-being. The analysis is accomplished by projecting future social conditions in an area influenced by Forest Service actions if current management were unchanged, then comparing this projection with conditions likely to occur as a result of implementing management alternatives.

Social measures include two aspects of social impact analysis· social variables and social zones of influence Social zones of influence identify who is affected by Forest Service activities, and social variables define how people are affected and the relationship between people and the natural environment The following describes the social measures and how they are used.

Social Zones of Influence. The following is a description of the groups of people or communities within the impact analysis area

LOCAL ZONE. The local social impact area was divided into four types of communities The first type of community is the urban service and government centers including Grants Pass, Coos Bay, and Medford. These cities, although still highly dependent on wood products-related employment, have other industries which are well developed and have been expanding. Industries such as electronics, other light manufacturing, wholesale and retail trade, and service sectors, provide nonresource oriented basic employment and incomes. They offer county and regional business, medical, and social services.

The interests of the urban community are diverse. Forest issues which may affect different interests of the urban community are timber outputs, primitive recreation opportunities, Wild and Scenic River recreation opportunities, motorized recreation opportunities, Botanical areas, hunting and viewing wildlife, mining opportunities, and interest in old-growth wildlife species.

Two predominant types of rural communities exist in the area. Eastside rural communities are scattered throughout Jackson, eastern Coos, and Josephine Counties. They include such towns as Selma, Kerby, Powers, and Myrtle Point, which are highly dependent on wood products and farming, and generally offer

few other employment opportunities and limited retail trade and services Residents tend to travel to the more urban centers for shopping, entertainment, medical care, and government services.

The interests of the rural eastside communities are timber outputs, motorized recreation, wildlife habitat primarily dealing with big-game hunting, and mining

The westside rural communities, such as Brookings, Gold Beach, Port Orford, and Bandon are larger and more diversified than the eastside towns. Wood products are important, but tourism, fishing, and agriculture also play major roles in their economies and lifestyles. These communities are located along the coast and are bordered by mountains to the east. Tourism and the relative isolation of these communities have promoted economic diversification and the development of retail, medical, and entertainment services.

The interests of the westside rural communities are related to timber outputs, river recreation, motorized recreation, primitive recreation, fisheries outputs, wildlife hunting and viewing, old-growth habitat, and mining opportunities.

Alternate lifestyle areas are found in the Illinois and Applegate Valleys of Josephine and Jackson counties. These areas, particularly the communities of Takilma and Ruch, were resettled primarily by younger people during the 1960's. Many of the residents gain income in nontraditional ways Takilma contains a cooperative forestry corporation which engages in tree planting and labor-intensive silvicultural management. Several organic food and herb growing and processing industries operate in the Applegate Valley.

The interests of the alternate lifestyle communities are projected to be related to timber production, primitive recreation opportunities, river recreation opportunities, botanic areas, old-growth preservation and habitat, and mining opportunities.

NATIONAL ZONE The national zone of influence is not significantly affected in terms of response to changes in Forest outputs for a given level of management. For instance, a change in timber output would not significantly vary supply or demand on a national scale. However, changes in policy affecting resource values such as scenic quality, timber production, water quality, wildlife and fisheries management, and similar values will continue to draw attention from special interest groups at the state and national levels. This is evidenced in the presently by these interest groups' involvement in issues regarding allocations of roadless areas.

Social Variables. The following social variables are considered for each local social group. Disruptions due to change from the current situation result in economic dislocation and/or social change. This change can be estimated by examining changes in lifestyles, attitudes, beliefs, values, social organization, and land use patterns.

INFORMATION GENERATED FROM THE SOCIAL AND ECONOMIC IMPACT ANALYSIS

Chapters II and IV of the FEIS present the summary of the social and economic effects of alternatives A more detailed narrative of the findings is presented here. The modeling of economic impacts was derived from the generated changes in planned outputs compared to the current direction Alternative A. These changes were used as inputs into the IMPLAN model to determine **relative** (not absolute) changes in the economy due to direct, indirect, and induced effects. For example, a decrease in 1 MMCF of wood harvest would result in an estimated reduction of 91 jobs and $2,149,000 of income in all segments of the economy. One must emphasize these figures are only to be used for comparison between alternatives and should not be interpreted as absolute numbers of jobs and wages. The actual number of jobs affected and income

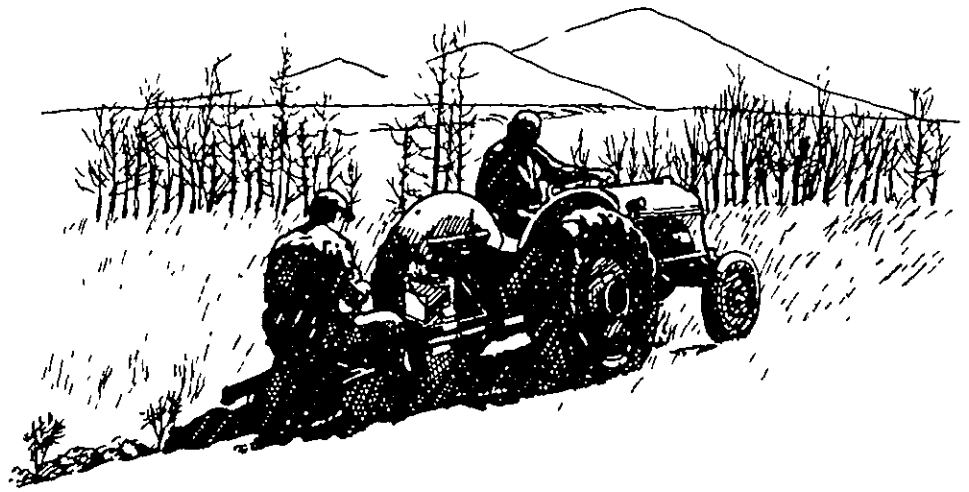
generated would depend on the economic adjustments needed in response to national markets, local labor supply conditions, and fluctuations in the local and national economy at one time and place

Employment and Income Response Coefficients by Resource

Output	Unit of Measure	Change in Employment (Jobs)	Change in Income (M $)
Roaded Dispersed Recreation	M RVD	1 3	20 9
Unroaded Dispersed Recreation	M RVD	99	14 5
Softwood Timber	M MCF	90 67	2,149 3
Big Game	M WFUD	1 1	18 8
Small Game	M WFUD	1 5	23 9
Nonconsumptive Wildlife	M WFUD	3 24	54 9
Freshwater Fisheries	M WFUD	1 23	19 6
Saltwater Fisheries	M WFUD	3 64	51 8

In general, alternatives which emphasize timber outputs tend to produce the most jobs, income, returns to the U.S Treasury, and payments to local governments. Timber receipts are the largest source of returns to the Treasury, local governments, and local economy. Recreational values tend to be constant from alternative to alternative due to the excess capacity of the Forest to supply present-day use

The anticipated social impacts of the alternatives can be compared by examining the degree of change from current outputs of commodities and amenities. In general, those alternatives which produce a large decrease in commodity outputs negatively affect the lifestyles, social organization, and attitudes of those who perceive the area as serving humankind's needs. Those alternatives which produce decreased outputs of nonmarket derived goods such as old growth, wildlife, and esthetically pleasing landscapes negatively affect the lifestyles, social organization, and attitudes of those who generally perceive nature as being preserved for its own value and economic benefits Conversely, increased outputs of desirable products would affect each group in a positive manner. The views are not mutually exclusive, as many people understand and accept both opinions.



ANALYSIS PRIOR TO DEVELOPMENT OF ALTERNATIVES

This analysis process included compiling data (i.e , issues, concerns, demand projections, the current situation assessment, etc.), and using the FORPLAN model to process or develop information on Forest output production capability, economics, and resource interrelationships During the analysis of the management situation, resource supply potentials were determined by establishing minimum and maximum production levels called benchmarks A point of reference was also defined (Base Runs) from which the costs and effects of applying regulation and policy constraints were measured Production capabilities were determined for single resources as well as for sets of multiple resource outputs produced in the most cost efficient way. This analysis established the benchmark levels required by National planning direction. Those benchmarks served as references from which the costs and effects of various objectives and constraints used in developing alternatives were evaluated

The benchmark analysis was performed prior to the formulation of alternatives and used the FORPLAN model. The purpose of the benchmark analysis was fourfold:

1 Estimate the schedule of management activities, resource outputs, effects, discounted benefits and costs, PNV, and acreages of prescription assignments appropriate to achieving the purposes of the benchmarks;
2. Define the resource production levels associated with maximizing single resource outputs,
3. Analyze the implications of legal and policy constraints.
4. Comply with the analysis of MR's of 36 CFR 219 27.

In order to fulfill these requirements, the Forest developed three types of benchmarks. These are:

1. Max PNV Benchmark. Maximizes PNV for the Forest and displays the associated resource outputs.
2. Resource Benchmarks. Defines the maximum potentials for timber production, fisheries, visuals, wildlife, recreation and unroaded areas
3. Min Level Benchmark. Defines the minimum outputs associated with custodial management of the Forest and the unavoidable costs and benefits of public ownership.

Several variations of the PNV and Resource benchmarks were analyzed to determine the opportunity cost and resource tradeoffs of meeting specific constraints, objectives, regulations, and policies. In addition to these requirements, all benchmarks were designed to be approximately implementable, were not constrained by budget, and used a maximization of PNV as the objective function to obtain comparable solutions

DEVELOPMENT OF MANAGEMENT REQUIREMENTS

In order to perform the stepwise analysis in the benchmarks, various sets of management requirements were modeled in FORPLAN to insure that the purposes of the benchmark analysis could be achieved. These management requirements are discussed in the following categories in this section: (1) MR's of 36 CFR 219 27; (2) timber harvest dispersion constraints, (3) timber policy requirements; and, (4) maximum resource output constraints. The management requirements were incorporated into FORPLAN in two ways First, many of the standards and guidelines for prescriptions were developed to include specific management requirements. These requirements are included in FORPLAN as cost and yield table variations reflecting management under these assumptions. Second, various management requirements were incorporated into FORPLAN by imposing constraints on the linear program. These constraints were used to insure that outputs, effects, and Forest conditions will be produced in the proportions required to achieve the particular purposes of a benchmark.

In linear programming analysis, constraints override the objective function Thus, if a predetermined level of outputs or minimum physical condition is entered as a constraint, it is always achieved (or no feasible

solution is found). In the design of the benchmarks, care was taken to insure that the various constraints or sets of constraints used constituted the most cost efficient method for attaining the desired results.

Following is a discussion of the management requirements used in the Siskiyou FORPLAN model

MANAGEMENT REQUIREMENTS OF 36 CFR 219.27 (MR'S)

The MR's are designed to meet the requirements of applicable laws and regulations, specifically those of 36 CFR 219.27. Many if these items were at one time refered to as Minimum Management Requirements (MMR's). A February 9, 1983 Regional Office memo on "Regional Guidelines for Incorporating MMR's in Forest Planning" fostered consistency among different Forests in the implementation of MR's Treatment of wildlife indicator species was further described by the Regional Office in a 1920 memo on April 16, 1984 Clarification of Wildlife MMR Direction. And finally, two documents were issued by the Regional Office in June 1986: **A Report on Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service**; and **A Background Document on the Development and Review of Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service**. Additional background information on the development of the MR's, and the tradeoff analysis done to assure that methods selected efficiently achieve the required condition, can be found in Appendix J.

The MR's included in this analysis are those that impose substantive standards, can be incorporated in the analysis, and are likely to have an impact on the analysis. There are many other requirements that the Forest Service must meet which are not discussed here including substantive requirements that do not have significant impacts when viewed on a Forest-wide scale, as well as procedural requirements Examples of substantive requirements that are not included in the modeling include those for cultural resources, and those for threatened and endangered species These requirements are part of the Standards and Guidelines in the LRMP; while significant in themselves, they do not have significant affects on the Forest-wide analysis and are not discussed here. Specific requirements and how they were modeled through cost and yield adjustments in the prescriptions, or constraints on the linear program, are discussed below.

Conservation of Soil and Water Resources. The basic soil, water quality, and water yield resources were protected by the application of: (1) specific management standards, guidelines, and practices integrated within management prescriptions, and (2) area harvest dispersion constraints in the FORPLAN model. This methodology provides a baseline necessary to protect the physical integrity of the land and water systems. Soil resources were protected by employing standards, guidelines, and practices within the management prescriptions, particularly those which allow ground disturbing activities (i.e., timber harvesting and road construction). Costs developed for the prescriptions allow for these mitigating practices.

Water quality resources were protected by a combination of standards, guidelines, and practices within the management prescriptions, and area harvest dispersion constraints in the FORPLAN model These measures were taken to minimize stream sedimentation, maintain stream water temperatures and minimize the occurrence of landslides. Costs and yields developed for the Riparian Management Area prescriptions allow for these practices. Area harvest constraints were also used to distribute timber harvest and road building activity around the Forest using planning basins as geographic locators within the model Timber harvest was limited to 20 percent of the suitable land base per decade by planning basin (see **TIMBER HARVEST DISPERSION CONSTRAINTS** in this section). These area constraints limit the acres of final harvest by basin to avoid concentrating landslides, hillslope erosion, and stream sedimentation inordinately within some drainages. These measures will also protect minimum viable fisheries populations on each watershed available for timber harvest on the Forest, and meet the general harvest dispersion requirements.

MINIMIZE HAZARDS FROM FLOOD, WIND, WILDFIRE, EROSION, OR OTHER NATURAL PHYSICAL FORCE. The Forest-wide management standards and guidelines incorporated in management prescriptions include the necessary mitigation and protection from the above hazards A floodplain assessment including a flood hazard analysis is required for any construction within the 100 year floodplain of streams and rivers Specific requirements are included which prevent the compaction and bare mineral exposure of the soil from timber harvest activities. Erosion control measures, such as grass seeding or mulching, are implemented on highly erosive sites. Costs developed for the prescriptions include allowances for such measures

Reduce Hazard from Pest Organisms. Activities to prevent conditions favorable to pest organisms are included in management prescriptions and Standards and Guidelines

Protection of Riparian Areas. Riparian areas are protected by specific management standards, guidelines, and practices within the management prescriptions (see the Riparian Management Area Prescriptions described previously in this appendix). All identified Riparian areas are managed to avoid stream water temperature increases, and protect riparian ecosystem resources. Riparian Prescription option B is the MR since vegetation removal above this level would result in detrimental changes in water temperature which are not allowed (36 CFR 219.27(e)). Timber harvest in Riparian areas is also dispersed in time and space by constraining first entry harvest to 11 percent per decade by planning basin

Diversity. Animal and vegetative diversity is currently very high and is well distributed on the Forest. Diversity is maintained through Standards and Guidelines and a combination of old growth maintenance in some areas with harvesting in others to regenerate the younger seral stages. A minimum of 15 percent of the Forest is maintained at any one time as old growth. This is modeled by constraining harvest on specific habitat areas in the FORPLAN model.

Adequate Fish and Wildlife Habitat to Maintain Viable Populations.

FISH. Requirements for fish habitat to maintain minimum viable populations is met by the application of requirements for riparian areas and requirements for soil and water described above, and by application of the Riparian Prescription option B which does not allow detrimental changes in water temperature.

WILDLIFE. One or more selected indicator species are used to represent wildlife species that have similar biological requirements. Seven species and one species group were selected as indicators. Species selected are either impacted by management direction, emphasized in Forest management, or endangered, threatened or sensitive. For instance, osprey, a species which could be affected by Forest management, was used as an indicator for riparian habitat along major river courses. Osprey nests are located and monitored to detect population changes Maintenance of viable populations of wildlife was a part of the design for management prescriptions As a result, all alternatives and benchmarks, except the No Change Alternative, maintain at least those minimums.

In the case of cavity nester habitat, we analyzed the snag data collected during our 1979 timber inventory. Natural background snag levels were calculated, and the values generated were used to estimate percent habitat capability for cavity nester populations in unmanaged stands. Information in the Blue Mountain and Westside Wildlife Habitat Guidelines (Thomas 1979, Brown 1985) were used in determining habitat needs and rating habitat capability for woodpecker populations on the Siskiyou (and therefore for cavity nesters in general). Averaged plot data from the Siskiyou's 1979 timber inventory showed that unmanaged stands contain approximately 2 65 snags per acre, regardless of whether the stand is immature or mature/old growth (counted snags were at least 10 inches DBH and 15 feet tall).

The present Siskiyou Wildlife Tree (Snag) Guidelines are designed to maintain woodpecker populations at 60 percent of maximum habitat capability in managed stands The MR level to maintain viable populations of the indicator species-group (woodpeckers) for this habitat is 20 percent of maximum habitat

capability. Application of the snag guidelines (60 percent level) reduces timber yields of managed stands by less than one percent and has even less effect on current harvest levels. The minor reduction in yield expected from managed stands is built into the timber yield tables used in FORPLAN

Three wildlife indicator species (spotted owl, pine marten, and pileated woodpecker) have optimum habitat in mature or old growth ecosystems; an involved procedure was used in the development of their MR's A series of Washington (WO) and Regional Office (RO) documents have guided our interpretation of MR's for these species:

1. February 24, 1982. WO 2620 Wildlife and Fish Viable Populations in Forest Planning, by J. B Hilmon
2. February 9, 1983. RO 1920 Regional Guidelines for Incorporating MMR's on Forest Planning, by J Sirmon.
3. April 16, 1984. RO 1920 Clarification of Wildlife MMR Direction, by J. Sirmon. (Based in part on results of Westside Cascades Wildlife Zone Coordination meeting in Eugene, December 5-6, 1983.)
4. June 1986. (RO). A Report on Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service.
5. June 1986. (RO). A Background Document on the Development and Review of Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service.
6. July 1988. (WO). Final Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide, Spotted Owl Guidelines. USDA Forest Service.

These documents form the basis for the Siskiyou's approach to providing well distributed habitat for indicator species inhabiting mature or old-growth forest. For each species, the scheme provides enough well distributed habitat to maintain the Siskiyou's portion of a Region-wide viable population (western Washington and Oregon, plus northwestern California).

The objectives for our approach were: (1) provide enclaves of mature and old-growth habitat throughout the Forest for indicator species, and (2) minify the effect of the scheme on commercial forest land A composite habitat network was developed for spotted owls, pileated woodpeckers, and pine marten. Three steps were used in the selection of required habitat areas. First, dedicated areas were used as the initial building blocks (Wildernesses, RNA's, Wild and Scenic River corridors). Second, additional mature and old-growth sites were located in areas unsuitable for timber harvest (forest regeneration or soil stability problems). As the last step, remaining required habitat enclaves were selected from commercial forest land; whenever possible, we utilized sites with other current or proposed land assignments (such as visuals, RNA's, Botanical areas, etc.).

In February 1984, a "first cut" mockup map of potential habitat enclaves for spotted owls, pileated woodpeckers, and pine marten was put together. The map was shown to various Forest Service personnel, they agreed that the concept was sound and met the intent of Washington and Regional Office direction. Concurrently, a prescription was developed to provide management direction for these mature and old-growth habitat areas. In March 1984 the MR map was presented at our annual meeting with the Oregon Department of Fish and Wildlife in Roseburg, and at a Forest staff meeting. In April three news releases were prepared on mature and old-growth indicator species and the MR concept. During May 1984 the Forest Wildlife Biologist coordinated with district personnel in selecting actual habitat enclaves for the network. Habitat areas were selected which had the least impact on commercial forest land and the five year timber action plan, and still met the requirements of the network. During July through September 1984 the network map was revised to take into account site-by-site concerns of district personnel. In 1987, as part of the analysis process for the Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines), personnel from the Regional Office conducted a formal review of the Siskiyou habitat network; minor revisions were made to the network Copies of the network (MR) map have been given to representatives of forest industry, environmental groups, and others who requested them.

The network of mature and old-growth habitat enclaves established to meet wildlife MR's has been closely coordinated with managers of adjacent public lands: Rogue River National Forest, Klamath National Forest, Six Rivers National Forest, Medford District BLM, Coos Bay District BLM. The Siskiyou's habitat enclaves interlock with theirs.

A minimum network for mature and old-growth indicator species on the Siskiyou requires approximately 92,000 well dispersed acres; this includes 36,712 acres of commercial forest land. An additional 67,862 acres of mature/old-growth habitat not needed for the minimum network exists in Wildernesses, this means that approximately 160,000 acres are actually available to the three indicator species as part of the MR network. Acre figures listed in this paragraph and the following two tables reflect minor changes made as a result of the 1987 Regional Office review Although in the FEIS only Alternative S includes the revised acre figures, they would be incorporated in any alternative developed for implementation in the Forest Plan

The following data show mature or old-growth Forest habitat acres needed to meet MR's for spotted owls, pileated woodpeckers, and pine martens on the Siskiyou National Forest It does **not** include "extra" mature/old-growth habitat present in Wildernesses which is not actually required for a minimum network.

	Indicator Species 1/			
Land Category 2/	Spotted Owl	Pileated Woodpecker	Pine Marten	Total
Number of Pairs Supported	47	63	85	-
Acres*				
Unavailable	19,000	5,700	3,882	28,582
Unsuitable	5,142	12,862	8,789	26,793
Tentatively Suitable	24,935	6,349	5,428	36,712
Total	49,077	24,911	18,099	92,087
Percent of Total.				
Tentatively Suitable	4.0	1.0	0 8	5 9
Tentatively Suitable, but Under Other Land Assignments per Current Direction (Estimated)	2.0	0.5	0 4	3 0

1/ Pileated woodpeckers utilize spotted owl habitat Pine martens utilize pileated woodpecker and spotted owl habitat However, acres and numbers of pairs are not double-counted in this table

2/ Unavailable = Wildernesses, RNA's, Wild Rivers; Unsuitable = Areas unmanageable for timber production because of soil instability or forest regeneration problems; Tent Suitable = Areas otherwise tentatively suitable for timber harvest Many acres in this category have restrictions in land use (VQO's, recreation sites, etc)

The following table shows the combined mature or old-growth Forest habitat acres needed to meet MR's for spotted owls, pileated woodpeckers, and pine martens; **and** the additional habitat (Mature/Old-Growth) in Wildernesses not actually needed for a minimum network.

In this table long-term habitat capability for spotted owls is 62 pairs; the Spotted Owl SEIS lists the Siskiyou at 71. The Forest Plan Preferred Alternative (S) shows 75 pair over the long term (see Table II-48); this is because Alternative S contains slightly more habitat outside of wildernesses than needed to meet Minimum Requirements This table ONLY reflects habitat needed to meet MR's (in this instance MR habitat is defined as ALL acres in areas otherwise unsuitable for timber management, plus 37,000 acres of land otherwise suitable for timber management). The 62 pairs also reflects the Siskiyou's list of named and numbered habitat areas, while the 71 pairs listed in the SEIS analysis were calculated from figures based on gross acres of habitat. The 62/71 difference comes mainly from calculations of habitat capability for wildernesses, and the two numbers represent a reasonable "range" for long-term habitat capability of spotted owls on the Siskiyou National Forest.

Land Category 2/	Indicator Species 1/ Spotted Owl	Pileated Woodpecker	Pine Marten	Total
Number of Pairs Supported	62	63	85	-
Acres				
Unavailable	72,905	19,657	3,882	96,444
Unsuitable	5,142	12,862	8,789	26,793
Tentatively Suitable	24,935	6,349	5,428	36,712
Total	102,982	38,868	18,099	159,949
Percent of Total				
Tentatively Suitable	4 0	1 0	0 8	5 9
Tentatively Suitable, but Under Other Land Assignments per Current Direction (Estimated)	2.0	0.5	0 4	3 0

1/ Pileated woodpeckers utilize spotted owl habitat Pine martens utilize pileated woodpecker and spotted owl habitat However, acres and numbers of pairs are not double-counted in this table
2/ Unavailable = Wildernesses, RNA's, Wild Rivers (not all of this habitat is needed to meet MR's, but total acres of this land category are shown); Unsuitable = Areas unmanageable for timber production because of soil instability or forest regeneration problems, Tent Suitable = Areas otherwise tentatively suitable for timber harvest Many acres in this category have restrictions in land use (VQO's, recreation sites, etc)

Two options were considered for managing enclaves of mature and old-growth habitat in commercial forest land: designation (allocation) and rotation. Habitat for wildlife species dependent on mature or old-growth Forest can be provided through two modeling methods:

1. *Designation of suitable habitat areas where timber harvest will not be allowed, or*
2. Projection of long rotations on enough acres to maintain the necessary habitat through time, with all areas being rotated

For this planning period, habitat areas will be ***designated*** *(not rotated) for the three indicator species. For* the current planning effort on the Siskiyou National Forest, designation of suitable areas would have the least impact on the timber harvest schedule and would be the most efficient for implementation and record keeping. The following provides the rationale supporting the designation conclusion.

The Siskiyou is a deficit inventory forest. Per acre volumes projected for managed stands are higher than the volumes inventoried in existing stands. To manage habitat on a rotated basis, existing stands would be protected until replacement areas could provide suitable habitat. The minimum time required to produce mature forest habitat is 100 years. At that time the replacement area would contain more volume than the original habitat area, according to our yield estimates. Rotating the areas would result in less timber yield than harvesting the replacement area and leaving the original area to continue providing habitat. This is demonstrated by the following comparison of the empirical yield table volumes after 100 years with the volumes from the intensive managed yield tables at age 100:

Site	Volumes After 100 Years Empirical (MCF)	Managed (MCF)
High	9 226	11 830
Medium	5 049	9 704
Low 1/	3 687	3 225

1/Low site would not provide mature Forest habitat at this age

The implications for LTSY present a different picture in that the mean annual increment (MAI) would be higher for the areas managed for mature forest habitat. The following figures present the MAI's for the

intensive General Forest at 95 percent of culmination, Spotted Owl Areas at age 300, and mature forest habitat at age 140 Also presented are per acre PNV's for General Forest and mature habitat regimes

	MAI's (Cubic Feet)		
Site	(100) General Forest	(300) Owl	(140) Mature Habitat
High	127 5	76 4	141 4
Medium	114.3	57 9	124 0
Low	34.3	19 6	37 9
Per Acre PNV (bare land)·			
High	-142 84		-386 30
Medium	-214 09		-427 70
Low	-331 94		-457 25

In the case of spotted owl sites, long run timber yields would be impacted the least by dedicating existing habitat areas (no designated replacement areas). This is because more volume could be produced if the acres planned for replacement areas (two acres per each existing habitat acre) are allocated to General Forest (100 year rotation), than if these acres plus the existing habitat are allocated to a rotation for spotted owls (300 years). In the case of mature Forest habitat, the long run timber yields would be higher if the areas are rotated. However, per acre PNV suffers a 170 percent loss relative to General Forest while yields increase only 11 percent. The key points here are:

1 Modeling these areas as designated for this planning period does not preclude future planners from identifying replacement areas as substitution opportunities can be identified (i.e., some existing pole stands could be substituted for originally designated areas by the 5th decade).
2. Whether areas are modeled as designated or rotated, there is essentially no difference in implementation for the first planning period.
3. With the volume projections higher in the managed stands than the existing, the timber outputs will be as great or greater for the first 8 or 9 decades if areas are designated, instead of rotated

Designation concurrently results in savings in mapping, record keeping, monitoring, and FORPLAN analyses.

The word "designated" carries the connotation of permanency, i.e., as with Wilderness, Wild and Scenic Rivers, RNA's, etc. designated by the Chief or higher authority. Although these habitat enclaves are allocated to Designated Wildlife Habitat (Management Area 8), these areas can be adjusted, or substitutions made, in future planning efforts

Forest Service wildlife biologists realize that perceived habitat needs for mature/old-growth species may change based on research now in progress. For the next 10 to 15 years the Siskiyou will maintain the option to increase the size and number of habitat enclaves for spotted owls. Additionally, the Siskiyou network of habitat areas for spotted owls was developed using standards and guidelines described in the Supplement to the Regional Guide ("Spotted Owl SEIS"); these standards and guidelines will be evaluated five years after implementation of the Final SEIS At the present time the Siskiyou has approximately 393,000 acres of old-growth habitat suitable for spotted owls (and approximately another 50,000 acres of mature forest), under most alternatives, not much over 50,000 acres of mature and old growth forest would be harvested in the next ten years There will be a monitoring plan in place which will be used to evaluate the influence of the Forest Plan on habitat for indicator species; adjustments in the Plan can be made if necessary

Road Construction Standards. Access roads are necessary for efficient timber harvest and management of the Forest Road standards are determined from several sources to ensure that they are appropriate

to the planned uses, considering safety, cost of transportation, and effects upon lands and resources. Costs commensurate with these standards are included in the roading costs of the prescriptions, and capital investments scheduled for each FORPLAN run depending on the objective of the run (or theme of the alternative) and the level of activity projected.

The purpose or objective identified for the road determines the amount and type of traffic expected or to be managed and the safety requirements for planned users. Economic considerations help identify standards for lowest construction, user costs, and maintenance of the road Resource prescriptions identify standards such as avoiding meadows for wildlife or special water protection needs to meet the prescription or to mitigate adverse effects on the resource. The known physical land and weather features help set standards such as road surfacing depths and subsurface drains to protect the road structure both during use and when not being used.

Specific road standards involve the clearing width, the width of the driving surface, the sharpness of curves, road grade, cut and fill slope steepness, surface drainage and cross drain requirements, and amount and type of surfacing

Clearing limits are normally five feet beyond the top of the road cut to the toe of the road fill Special project or site requirements may adjust these requirements.

The width of road and sharpness of curves is primarily determined by the type, amount, and speed of planned traffic. The minimum single lane driving width is ten feet; however, equipment requirements usually dictates a minimum twelve foot width with fourteen feet being the common width for safety. Turnouts of six to ten feet width for passing are added as required for safety. The minimum curve is a fifty foot radius with larger radii designed for special equipment and for higher speeds. The minimum curve radius is used as a check since the free flow alignment design being used does not result in true geometric curves. Curve widening is designed as needed based on approximate radius, equipment needs, and length of curve.

The grades of the road vary by planned future use. Roads maintained for passenger cars have a maximum 12 percent sustained grade with pitches to 18 percent. Roads not planned for use by passenger cars have maximum grades up to 18 percent and may exceed this when justified. Pitches over 18 percent are exceptions. The steeper grades are used to reduce costs, but the resulting shorter road can benefit wildlife and reduce visual impacts. The impact of steeper grades can adversely affect soil and water if not properly mitigated.

Surface drainage and cross drain designs, along with revegetation measures and control of the construction period, help to maintain water quality and reduce damage to fisheries by limiting the amount of sediment that enters the streams. Paving, additional riprap in ditches and slopes, energy dissipation at culvert outlets, pit run or larger crushed rock surfacing, and additional culverts are procedures used to reduce erosion and sediment movement. A major part of road maintenance is to assure that drainage features are operating as designed or to improve on the drainage designs.

Surfacing of rock or asphalt is placed on the driving road width for various reasons. Some of these reasons are to provide access when the ground is saturated with moisture or provide support to heavy machinery on soils with low bearing strength, to protect the road surface from erosion caused by surface water flow, and to provide a cushion on very rough subgrade materials.

Temporary Roads. Temporary roads are short term (normally less than one year) structures used to harvest timber, control fires, or complete a project activity. Permanent structures such as retaining walls, and materials not easily removed such as asphalt pavement, are normally not proper for these roads Following use, the roads are treated to, as much as practical, return the land to the original condition. Such roads are planned and designed to re-establish vegetative cover on the disturbed area within a reasonable

period of time, not to exceed 10 years after the termination or contract, lease or permit. The treatment normally includes removing culverts and establishing water bars, ripping the surface to loosen the soil, and establishing vegetative cover by seeding or planting. The costs developed for the prescriptions include these activities.

Maintaining Air Quality. This requirement was handled outside of FORPLAN. The Regional Guide directs the Forest to work through cooperative agreements with the States to manage smoke emissions Scheduling the time and number of prescribed burns is done outside the FORPLAN model and in cooperation with the State of Oregon.

Reforestation. In order to have reasonable assurance of regeneration in five years, seedlings are planted on most harvested areas. Planting occurs because of the long periods between cone crops, insect effects on seed viability and seedlings, and the intensity of competition that occurs if the seedlings are preceded by other species of vegetation. The stocking rate varies to provide flexibility for establishing the optimum stocking level needed to capture the growth potential over widely varied site conditions. Site preparation is required in most cases because native conifer species cannot grow efficiently if existing vegetation competes for soil nutrients, water, and sunshine. Reforestation is included in the prescriptions with timber harvest as a management practice.

Sixty Acre Clearcut Limit. Clearcutting is one silvicultural system used on the Forest for even-aged timber harvest. The Regional Guide establishes that the openings created by even-aged silviculture normally will be 60 acres or less. Costs and practices used with clearcutting are based on units of 60 acres or less and are included in the management prescriptions.

TIMBER HARVEST DISPERSION CONSTRAINTS

The objective of timber harvest dispersion is to disperse activities over time and space, to reduce the potential for landsliding and sedimentation, and detrimental effects to the beneficial uses of water. The constraints were formulated to limit the acres harvested in a planning basin in any decade. The timber harvest dispersion constraints are also known as the *basin constrains*. As discussed earlier, the constraint set at 20 percent was identified as the minimum necessary to achieve the MR's for watershed and fish habitat protection. This also provides flexibility to comply with the opening size and dispersal requirements of the Regional Guide. The ID Team developed discretionary options for the harvest dispersions constraints that are specific to each planning basin. These optional discretionary constraints are evaluated through the range of alternatives The basin constraints applied to each alternative are shown in Table II-3 of the FEIS.

The only identified opportunity cost of tightening the dispersion constraints is a reduction in timber harvest level. The timber harvest dispersion constraint has a nonlinear relationship with timber production; as it is made more restrictive, it becomes increasingly more binding on timber production. In the range around 20 percent it somewhat disperses harvests between the basins, but has little effect on Forest-wide timber outputs With average rotation lengths of 90 to 100 years, allowing harvest of 20 percent of the suitable land base per decade leaves the flexibility to maximize (or nearly so) timber outputs Tightening the constraint from 20 to 16 percent results in less than one percent change in the ASQ. It becomes more binding between 16 and 10 or 11 percent, as optimum scheduling options are eliminated. The relationship would become nearly linear if the constraint were made tighter than 10 or 11 percent on all basins, each percentage reduction would directly reduce the total number of acres that could be harvested Forest-wide In other words, above 11 percent this constraint distributes the harvest across the Forest and, while it does become limiting as it approaches 11 percent (it becomes a cap on harvest acres below that), it has little effect on total timber outputs at the MR level of 20 percent.

The ID Team ranked the planning basins based on past harvest activities, geologic hazard, recovery potential, and beneficial uses. An index was then used to adjust the harvest constraints to fit the specific

conditions of individual planning basins. The initial analysis arranged the basin constraints around 11 percent and resulted in constraints ranging from 9 to 13 percent of the suitable acres for individual planning basins. These are used in a number of the alternatives, including Alternative K which was the Preferred in the DEIS.

Based on the information contained in the DEIS and associated process records, several individuals and organizations commented on the use of these constraints in the analysis, suggesting that they go beyond the original objective of dispersing activities, arbitrarily limiting timber harvest. Additional analysis indicated that the constraints were more binding on timber than originally thought (due to changes made in the FORPLAN model). The ID Team developed another set of constraint coefficients with more refinement ranging from 7 to 17 percent, but arranged around 15 percent as the initial point. These constraints also include some adjustment based on the watershed recovery needed after the 1987 fires. This set of constraints is evaluated in Alternative S in the FEIS.

More detailed information on the timber harvest dispersion constraints is located in the Planning Records.

TIMBER POLICY REQUIREMENTS

Nondeclining Yield (NDY). A constraint on timber outputs which limits the per period harvests to levels greater than or equal to the preceding period level, and less than the LTSY level.

Sequential Upper and Lower Bounds and Harvest Floors. In lieu of the NDY constraint on timber outputs, Sequential Upper and Lower Bounds and Harvest Floors were used to constrain the fluctuation of harvest to reasonable levels in specific benchmark runs. Floors were to establish a lower limit on timber harvests which would invoke substantial change in local consumptive patterns. The initial floor was calculated at 80 percent of the base harvest level (190 MMBF), or approximately 150 MMBF. This is equivalent to the floor of 28 MMCF used in the model. A ceiling or upper limit on harvest level was not used because the market area for the Siskiyou National Forest has the capacity to absorb any level of outputs expected from the FORPLAN model.

Long-term Sustained Yield (LTSY). For departure runs, LTSY was constrained to be equal to or greater than the LTSY of the base run.

Culmination of Mean Annual Increment (CMAI). 36 CFR 219.16 (2) (iii) directs the Forest Service to timber rotation lengths based on the time required for stands to reach the culmination of net growth. Unless specifically analyzing an exception to this requirement, all prescriptions are constrained to not allow final harvest prior to stands reaching 95 percent of CMAI. This sets the minimum age when harvests could occur.

Timber Rotation Lengths Based on Utilization Standards. In order to evaluate the effects of timber rotation lengths constrained by CMAI, rotation lengths based on Regionally proposed utilization standards were used to determine what, if any, change in timber harvest levels or PNV could be attributed to the more constraining CMAI levels.

BENCHMARK ANALYSIS

Resource supply potentials were determined by establishing minimum and maximum production levels called benchmarks. A level (Base Run) was also established from which the costs and effects of applying regulation and policy constraints were measured. Production capabilities were determined for single resources and for a set of multiple resource outputs that maximized PNV. This analysis established the benchmark levels required by NFMA (36 CFR 219.12(e).

BENCHMARK LEVELS

Nine benchmark levels were developed to define resource supply potentials and economic relationships on the Forest. Production capabilities were determined for a minimum level, for single resources and for a set of multiple resource outputs that maximize PNV. A level was also established from which the costs and effects of applying regulation and policy constraints were measured. The FORPLAN model was used to determine the resource supply potentials.

The benchmark levels and results are summarized in this section. A detailed discussion of benchmark descriptions and results follows in the next section of this chapter.

BENCHMARK CONSTRAINTS AND REQUIREMENTS

Regulation and policy constraints applied to benchmarks have, in most cases, the effect of reducing the maximum resource supply potential. NFMA (36 CFR 219.27) specifies that certain MR's be included in the planning process. The methods to meet these MR's include developing standards, guidelines, and appropriate management practices for inclusion in multiple-use management prescriptions; assignment of management prescriptions and intensities containing specific practices to analysis areas in FORPLAN; and applying specific constraints in FORPLAN.

The MR's used in this analysis are designed to:

- conserve soil and water resources.
- minimize serious or long-lasting hazards from flood, wind, wildfire, erosion or other natural physical forces.
- reduce serious, long-lasting hazards or damage from pest organisms
- protect Riparian areas.
- maintain diversity of plant and animal communities.
- provide adequate fish and wildlife habitat to maintain viable populations
- conform with multiple-use laws.
- prevent the destruction or adverse modification of critical threatened and endangered species habitat.
- provide for utility and transportation rights-of-way corridors to avoid adverse resource impacts
- ensure roads are designed to standards appropriate to planned uses.
- revegetate temporary roads within ten years
- maintain air quality.
- assure that cuttings are made in such a way that lands can be restocked within five years after final harvest.
- adhere to clearcut size limits.

Except for the Min Level Benchmark, the resource supply potential benchmarks described below were constrained as follows:

- all benchmarks complied with MR's.
- an ending timber inventory constraint was used so that the timber inventory in 150-years will equal or exceed the volume that would occur on a regulated forest.
- timber rotation length was based on 95 percent of CMAI determination.
- a timber harvest flow constraint of nondeclining yield was used.
- an objective function of maximizing PNV was used.
- a minimum level of the existing Wildernesses was maintained in all benchmarks
- the Min Level Benchmark was constrained to produce no management outputs such as timber harvest and livestock grazing to determine the basic cost of Federal ownership.

BENCHMARK DESCRIPTIONS

MAX PRESENT NET VALUE

This benchmark established the mix of resource uses and schedule of outputs and costs that maximized PNV using market and nonmarket assigned values. It is displayed in order to provide a reference point to compare other benchmarks and alternatives to the maximum PNV potential considered, and thus to assess opportunity costs.

MAX TIMBER

The maximum legal capability of the Forest to produce timber was determined by this benchmark. Timber production was maximized in the first decade; for fifteen decades; then "rolled over" under a "Maximum PNV" objective function.

MAX VISUALS

The purpose of this benchmark was to analyze the potential for producing other resource outputs and services while meeting all of the inventoried VQO's on the Forest.

MAX UNROADED

This benchmark was designed to analyze the potential for producing other resource outputs and services while maintaining all presently unroaded areas in their unroaded condition.

MAX RECREATION

This benchmark determined the potential for utilizing all of the primitive ROS classification on the Forest Recreation was maximized by assigning all inventoried roadless areas to an unroaded status and allocating 25 Supplemental Resource Management Areas to a dispersed recreation emphasis.

MAX FISH AND WATERSHED

The purpose of this benchmark was to establish the highest reasonable level of anadromous fisheries outputs. Management that was designed to improve overall watershed conditions was also included in this benchmark

MAX WILDLIFE

This benchmark was designed to maximize biotic diversity in an attempt to achieve a desirable mixture of wildlife habitats. This benchmark emphasizes a balance of all habitat types

MIN LEVEL

This benchmark defined the minimum costs of public landownership and the resource outputs which are incidental to Forest management. This benchmark served as a reference point to develop or test alternative outputs and costs which result from Forest Service management activities. This benchmark is displayed in this FEIS when a comparison of alternatives is made in order to provide a reference to the minimum level considered

CURRENT DIRECTION

This benchmark defined the level of goods and services that the Forest could produce if current management direction is followed with no budget constraint, and the most likely amount of goods and services expected in the future.

Tables B-5 and B-6 summarize the results of the eight benchmarks developed in the analysis of the management situation.



Table B-5. Land Assignments by Management Area for Benchmarks

Benchmark	Management Area (Acres)												
	General Forest 1/	Retention Visual	Partial Retention Visual	Riparian	Designated Wildlife Habitat 2/	3/ Wilderness	Research Natural Area	4/ Botanical	Wild/ Scenic/ Recreation Rivers 5/	Supple-mental Resource	Unique Interest	Custodial (Roadless)	Special Wildlife Site
Current Direction (B06-5)	380,272	53,207	253,585	80,003	56,270	220,036	1,938	1,067	23,417	22,507	0	0	0
Max Present Net Value (B30-1)	705,511	0	0	84,063	56,270	220,036	1,938	1,067	23,417	0	0	0	0
Max Recreation (B19-2)	433,119	0	0	56,547	56,270	220,036	1,938	1,067	27,399	37,825	0	258,101	0
Max Visuals (B12-1)	385,051	68,092	262,035	83,318	56,270	220,036	1,938	1,067	14,495	0	0	0	0
Max Unroaded (B20-2)	450,139	0	0	58,907	56,270	220,036	1,938	1,067	20,700	0	0	283,245	0
Max Fish/Watershed (B16-1)	697,538	0	0	64,563	56,270	220,036	1,938	1,067	22,976	27,914	0	0	0
Max Wildlife (B13-3)	576,235	0	0	65,424	56,270	220,036	1,938	1,067	20,913	0	0	89,114	61,305
Max Timber (B11-3)	705,511	0	0	84,063	56,270	220,036	1,938	1,067	23,417	0	0	0	0

1/ Recreation/Administrative sites and road acreage are included in General Forest.
2/ Wildlife MR's in Unavailable (i.e. Wilderness) lands are 96,602. Total acres Forest-wide are 160,000.
3/ Wild River acres not included are 12,459 with 3,280 acres Botanical included. Total Wilderness acres are 232,495.
4/ Botanical acres in Wilderness and Wild River are 3,408. Total Botanical acres are 4,475.
5/ Botanical acres included in Wild River acres (128). Unavailable acres in designated rivers total 17,758; (14,495 in Wild, 386 in Scenic and 923 in Recreation rivers). Wildlife MR acres in Scenic are 1,255 available suitable (454 unsuitable) and 225 available suitable (20 unsuitable) in Recreation rivers. Wildlife MR's, visuals, etc. areas reduce acreage of tentatively available/suitable/unsuitable acres in Scenic/Recreation rivers from run to run. Total designated River acres are 26,680.

Table B-6. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs by Benchmark

Outputs/Effects	Units of Measure	BENCHMARK							
		Current Direction	Max PNV	Max Recreation	Max Visuals	Max Unroaded	Max Fish/ Watershed	Max Wildlife	Max Timber
Developed Recreation Use	1000 RVD's								
Decade 1 1/		121.6	121.6	121.6	121.6	121.6	121.6	121.6	121.6
Decade 2		127.8	127.8	127.8	127.8	127.8	127.8	127.8	127 8
Decade 5		148.4	148.4	148.4	148.4	148.4	148.4	148.4	148.4
Non-Wilderness Dispersed Recreation Use									
Roaded	1000 RVD's								
Natural									
Decade 1		388.1	388.1	388.1	388.1	388.1	388.1	388.1	388.1
Decade 2		408.0	408.0	408.0	408.0	408 0	408.0	408.0	408.0
Decade 5		473.9	473.9	473 9	473.9	473.9	473.9	473.9	473 9
Semi-Primitive Motorized									
Decade 1		72.3	72.3	72.3	72.3	72.3	72 3	72.3	72.3
Decade 2		76.0	76.0	76 0	76.0	76.0	76.0	76.0	76.0
Decade 5		88.2	88.2	88.2	88.2	88.2	88.2	88.2	88.2
Unroaded	1000 RVD's								
Semi-Primitive Non-Motorized									
Decade 1		12.1	12.1	12.1	12.1	12.1	12.1	12.1	12.1
Decade 2		6.2	6.2	12.7	12.7	12.7	12.7	12.7	6.2
Decade 5		6.2	6.2	14.8	14.8	14.8	14.8	14.8	6.2
Primitive									
Decade 1		0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Decade 2		0.0	0.0	0.8	0.8	0.8	0.8	0.8	0.0
Decade 5		0.0	0.0	0.9	0.9	0.9	0.9	0.9	0.0
Wilderness Use	1000 RVD's								
Decade 1		22.7	22.7	22.7	22.7	22.7	22.7	22.7	22.7
Decade 2		23.6	23.6	23.6	23.6	23.6	23.6	23.6	23.6
Decade 5		27.4	27.4	27.4	27.4	27.4	27.4	27.4	27.4
Wild and Scenic River Use	1000 RVD's								
Decade 1		122.8	122.8	122.8	122.8	122.8	122.8	122.8	122.8
Decade 2		129.7	129.7	129.7	129.7	129.7	129.7	129.7	129.7
Decade 5		152.6	152.6	152.6	152.6	152.6	152.6	152.6	152.6
Trail Construction/ Reconstruction 2/	Miles	23.0	23.0	134.7	23.0	23.0	23.0	23.0	23.0
Developed Site Construction/ Reconstruction	PAOT	1,850.0	1,850.0	3,145.0	1,850.0	1,850.0	1,850.0	1,850.0	1,850.0
Visual Quality Objectives									
Retention	Acres								
Decade 1		87,747.0	87,747.0	8,910.0	87,747.0	8,910.0	8,910.0	87,747.0	8,910.0
Partial Retention	Acres								
Decade 1		300,215.0	300,215.0	0.0	300,215.0	0.0	0.0	300,215.0	0.0
Modification/Max-Mod.	Acres								
Decade 1		524,534.0	524,534.0	591,019.0	524,534.0	591,019.0	903,586.0	524,534.0	903,586.0

Table B-6. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs by Benchmark (Continued)

Outputs/Effects	Units of Measure	BENCHMARK: Current Direction	Max PNV	Max Recreation	Max Visuals	Max Unroaded	Max Fish/ Watershed	Max Wildlife	Max Timber
Unroaded Areas Assigned to Roaded Management Prescriptions, but Which Have No Development Activities Planned for the Next 15 years	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Unroaded Areas Assigned to *Unroaded Management* Prescriptions	Acres	0.0	0.0	314,000.0	0.0	314,000.0	0.0	133,000.0	0.0
Fish Use	1000 WFUD's								
Decade 1		69 0	65.0	69.0	69.0	69.0	71.0	69.0	69.0
Decade 2		73.0	65.0	73.0	73.0	73.0	77.1	73.0	73.0
Decade 5		73.0	65.0	73.0	73.0	73.0	79.3	73.0	73.0
Anadromous Fish									
Commercial Harvest	1000 Pounds								
Decade 1		934.0	880.0	934.0	934.0	934.0	958.0	934.0	934.0
Decade 2		988.0	880.0	988.0	988.0	988.0	1,038.0	988.0	988.0
Decade 5		988.0	880.0	988.0	988.0	988.0	1,072.0	988.0	988.0
Management *Indicator Species*									
Steelhead	Smolts				Not Estimated				
Chinook Salmon	Smolts				Not Estimated				
Searun Cutthroat Trout	Smolts				Not Estimated				
Spotted Owls	Pair								
Decade 1					Not Estimated				
Decade 2					Not Estimated				
Decade 5					Not Estimated				
Deer	Deer								
Decade 1		26,579.0	28,015.0	23,388.0	26,930.0	23,753.0	27,013.0	25,551.0	35,750.0
Decade 2		27,591.0	28,534.0	23,817.0	28,024.0	24,195.0	29,243.0	25,296.0	33,005.0
Decade 5		32,600.0	37,257.0	29,423.0	33,213.0	30,160.0	30,047.0	33,940.0	36,980.0
Osprey	Pair								
Decade 1, 2, 5		18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
Wildlife 3/	1000 WFUD's								
Decade 1		72.4	68.8	63.8	73.3	64.8	73.6	69.6	97.1
Decade 2		75.1	70.2	64.9	76.2	66.0	79.6	68.8	89.6
Decade 5		88.6	93.4	80.0	90.2	82.0	81.7	92.2	100.4
Habitat Improvement	Acres								
Decade 1, 2, 5		449.0	0.0	449.0	449.0	449.0	449.0	449.0	449.0
Habitat Improvement	Structures								
Decade 1, 2, 5		191.0	0.0	191.0	191.0	191.0	191.0	191.0	191.0
Range-*Permitted Grazing*	1000 AUM's								
Decade 1, 2, 5		3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0

Table B-6. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs by Benchmark (Continued)

Outputs/Effects	Units of Measure	BENCHMARK: Current Direction	Max PNV	Max Recreation	Max Visuals	Max Unroaded	Max Fish/ Watershed	Max Wildlife	Max Timber
Selected Suitable	1000 Acres	532.8	549.4	397.6	549.8	411.1	539.6	460.4	570.6
General Forest	1000 Acres	38,072.0	705,511.0	433,119.0	385,051.0	450,139.0	697,538.0	576,235.0	705,511.0
Long-term Sustained Yield	Million CF	51.0	52.0	39.0	53.0	40.0	50.0	44.0	59.0
Timber Offered	Million CF								
Decade 1		29.6	32.4	22.3	30.5	23.1	29.1	25.8	33.4
Decade 2		29.6	32.4	22.3	30.5	23.1	29.1	25.8	33.4
Decade 5		29.6	32.4	22.3	30.5	23.1	29.1	25.8	33.4
Timber Offered	Million BF								
Decade 1		160.1	175.3	120.6	165.0	125.0	157.4	139.6	180.7
Final Harvest	Acres								
Decade 1		3,782.5	4,444.6	2,899.2	3,871.1	3,011.3	4,047.8	3,656.9	4,733.8
Decade 2		4,440.8	4,734.3	3,384.8	4,559.8	3,485.4	5,211.5	3,683.5	6,084.0
Decade 5		6,241.6	8,364.3	4,748.7	6,469.5	4,970.0	5,211.5	5,220.3	8,169.9
Commercial Thinning	Million CF								
Decade 1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Decade 2		0.1	0.0	0.0	0.1	0.0	0.0	0.0	2.7
Decade 5		6.6	3.7	5.3	6.6	5.4	5.7	4.9	5.2
Commercial Thinning	Acres								
Decade 1		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Decade 2		64.7	0.0	0.0	64.5	0.0	0.0	0.0	1,216.4
Decade 5		4,357.9	2,401.0	3,649.5	4,339.7	3,701.4	3,882.1	3,340.4	3,537.3
Fuelwood	1000 CF								
Decade 1		47.8	52.5	36.4	49.3	37.6	48.7	42.5	53.0
Decade 2		47.0	51.8	35.7	48.4	37.0	47.9	41.5	50.0
Decade 5		37.1	46.8	27.4	38.6	28.6	37.5	30.3	46.0
Reforestation	Acres								
Decade 1		5,387.1	6,219.9	4,032.4	5,503.0	4,212.2	5,059.7	4,978.9	11,587.6
Decade 2		6,665.1	7,060.3	5,027.3	6,842.1	5,170.5	6,514.4	5,406.2	8,861.2
Decade 5		9,136.5	11,760.0	7,817.9	9,400.7	8,171.8	6,514.4	10,325.8	11,646.1
Timber Stand Improvement	Acres								
Decade 1		7,103.4	7,147.8	6,619.9	7,145.9	6,698.3	6,387.1	6,859.4	7,499.8
Decade 2		6,617.0	7,276.1	5,394.2	6,725.5	5,570.7	6,645.3	6,254.1	13,798.3
Decade 5		10,339.1	12,270.2	8,191.0	10,623.3	8,448.6	9,275.7	10,551.0	11,496.1
Timber Growth in Year 2030	Million CF	35.7	37.3	29.5	36.4	30.4	34.7	32.8	46.3
Reforestation Backlog	Acres	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Reforestation Backlog	Million $	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Water Yield	1000 Acre Foot								
Decade 1		8,183.0	8,183.0	8,183.0	8,183.0	8,183.0	8,183.0	8,183.0	8,183.0
Decade 2		8,183.8	8,184.2	8,183.4	8,183.9	8,183.4	8,184.0	8,183.8	8,186.1
Decade 5		8,185.4	8,186.3	8,184.6	8,185.5	8,184.7	8,184.9	8,185.4	8,185.7
Sediment	Tons								
Decade 1		689.8	702.5	671.3	691.1	674.0	696.3	686.5	737.2
Decade 2		704.2	707.5	686.2	706.6	687.4	724.7	690.2	738.6
Decade 5		725.8	749.5	712.6	728.5	716.0	696.2	722.0	748.5
Improved Watershed Condition	Acres								
Decade 1		378.2	444.5	289.9	387.1	301.1	404.8	365.7	834.8
Decade 2		444.1	473.4	338.5	456.0	348.5	521.2	368.4	616.7
Decade 5		638.1	847.9	559.8	659.2	588.1	521.2	739 0	838.8

Table B-6. Quantitative Resource Outputs, Environmental Effects, Activities, and Costs by Benchmark (Continued)

Outputs/Effects	Units of Measure	BENCHMARK							
		Current Direction	Max PNV	Max Recreation	Max Visuals	Max Unroaded	Max Fish/ Watershed	Max Wildlife	Max Timber
Energy Minerals	Oper Plans	1	1	1	1	1	1	1	1
Non-Energy Minerals	Oper Plans	335	335	335	150	150	150	335	335
Arterial and Collector Road Construction	Miles/Decade								
Decade 1		20.0	28.0	24.0	18.0	24.0	19.0	25.0	40.0
Decade 2		20.0	18.0	3.0	19.0	3.0	17.0	15.0	40.0
Decade 5		7.0	8.0	0.0	7.0	0.0	9.0	0.0	0.0
Timber Purchaser Road Construction/ Reconstruction	Miles/Year								
Decade 1		110.6	105.2	83.1	114.3	84.5	119.9	92.4	133.9
Decade 2		125.5	134.9	86.6	130.9	90.7	168.1	115.8	176.6
Decade 5		234.4	305.1	195.8	240.9	202.4	187.9	199.2	295.1
Roads Suitable for Public Use									
Passenger Car	Miles								
Decade 1		1,547.0	1,558.0	1,656.0	1,488.0	1,583.0	1,570.0	1,305.0	1,576.0
Decade 2		1,593.0	1,602.0	1,675.0	1,524.0	1,606.0	1,605.0	1,328.0	1,670.0
Decade 5		1,752.0	1,791.0	1,739.0	1,642.0	1,679.0	1,706.0	1,381.0	1,887.0
High Clearance Vehicle Only	Miles								
Decade 1		927.0	932.0	506.0	821.0	860.0	601.0	1,006.0	816.0
Decade 2		924.0	980.0	536.0	852.0	896.0	633.0	1,038.0	917.0
Decade 5		1,183.0	1,255.0	654.0	988.0	1,034.0	752.0	1,222.0	1,306.0
Fire Management Effectiveness Index	$/1000 Protected Acres								
Decades 1, 2, 5		1,535.0	1,535.0	1,535.0	1,535.0	1,535.0	1,535.0	1,535.0	1,535.0
Fuel Treatment	Acres								
Decades 1, 2, 5		400.0	400.0	400.0	400.0	400.0	400.0	400.0	400.0
Operational Costs	Million $								
Decade 1		17.9	18.8	15.2	18.1	15.4	17.5	16.6	22.7
Decade 2		19.4	19.9	16.5	19.7	16.7	19.6	17.3	23.1
Decade 5		24.9	27.0	21.1	25.4	21.7	22.3	23.5	27.6
Capital Investment Costs	Million $								
Decade 1		4.2	4.0	2.8	4.3	2.8	4.4	3.1	5.2
Decade 2		4.9	5.0	3.1	5.1	3.2	6.1	4.1	6.4
Decade 5		8.6	10.8	6.6	8.9	6.7	6.8	6.8	10.6
Returns to Government	Million $								
Decade 1		54.3	60.0	41.4	55.9	42.9	54.0	47.8	60.7
Decade 2		59.9	66.2	45.7	61.7	47.4	59.6	52.8	65.5
Decade 5		66.4	79.6	48.3	68.9	50.4	66.8	53.5	79.4
Changes in Jobs	Number								
Decade 1					Not Estimated				
Changes in Income	Million $								
Decade 1					Not Estimated				
Payments to Counties	Million $								
Decade 1					Not Estimated				

1/ These decades represent an average annual output or effect for their 10-year periods.
2/ Total miles completed by the end of Fifth Decade or sooner.
3/ The method of calculating WFUD's was changed and corrected between draft and final for alternatives, but not for benchmarks.

The following tables display PNV's and discounted benefits and costs for the benchmarks by major resource Timber is the main component of PNV and discounted costs and benefits Recreation is the next major component of all three economic variables. The fisheries resource contributes the next greatest amount to PNV and total discounted costs and benefits. Wildlife is approximately 5 percent of PNV in all benchmarks. Wilderness accounts for less than 2 percent of all three variables in all of the benchmarks.

PNV, Discounted Benefits, Discounted Costs, by Major Resource, by Benchmark *1/* (MM $, Discounted at 4 percent for 15 periods)

	Discounted Benefit (MM $)					
	PNV	Timber	Recreation	Fish	Wildlife	Wilderness
Current Direction	1,170	1,536	175	83	50	10
PNV	1,300	1,716	175	75	48	10
Recreation	918	1,178	175	83	44	10
Visuals	1,205	1,582	175	83	51	10
Unroaded	954	1,221	175	83	45	10
Fish/Watershed	1,209	1,562	175	88	52	10
Wildlife	1,041	1,354	175	83	48	10
Timber	1,276	1,732	175	83	59	10

	Discounted Costs (MM $)					
	PNV	Roads 2/	Recreation	Fish	Wildlife	Wilderness
Current Direction	349	121	10	4	2	1
PNV	383	133	9	1	1	1
Recreation	268	87	12	4	2	1
Visuals	357	125	10	4	2	1
Unroaded	276	90	10	4	2	1
Fish/Watershed	338	125	10	4	2	1
Wildlife	308	108	10	5	2	1
Timber	425	144	10	4	2	1

1/Direct comparisons of benefits and costs displayed for individual resource outputs provide general indications of relationships However, many activities of multiple-use forestry have common costs and benefits, and cannot be exclusively separated and attributed to individual resources

2/Cost for roads includes Forest Service and purchaser costs for road construction and reconstruction No costs for maintenance are included



Table B-7. FORPLAN Run Specifications

Run					Harvest Flow Constraint	Rotation	MR Groups			
Name	Number	Objective Function	Value Set	Planning Horizon	NDY	95% CMAI	Riparian Prescription	% Basin Constraint	Wildlife	Other Constraints
Base	B18-3	PNV	All	150	-		-	-	-	
Base w/CMAI	B17-3	PNV	All	150	-	X	-	-	-	
Base w/CMAI,NDY	B22-2	PNV	All	150	X	X	-	-	-	
Base w/CMAI,NDY,MR's	B11-4	PNV	All	150	X	X	B	20	X	Wild and Scenic Rivers
Timber Base	B18-2	TM/1	All	10	-	-	-	-	-	
		TM/15	All	150	-	-	-	-	-	
		PNV	All	150	-	-	-	-	-	
Timber Base w/CMAI	B17-2	TM/1	All	10	-	X	-	-	-	
		TM/15	All	150	-	X	-	-	-	
		PNV	All	150	-	X	-	-	-	
Timber Base w/CMAI,NDY	B22-1	TM/1	All	10	X	X	-	-	-	
		TM/15	All	150	X	X	-	-	-	
		PNV	All	150	X	X	-	-	-	
Timber Base w/CMAI,NDY,MR's	*B11-3*	*TM/1*	All	10	X	X	B	20	X	Wild and Scenic Rivers
		TM/15	All	150	X	X	B	20	X	Wild and Scenic Rivers
		PNV	All	150	X	X	B	20	X	Wild and Scenic Rivers
Base w/CMAI,NDY,S&W	B28-1	PNV	All	150	X	X	B	20	-	Soil and Water MR's
Base w/CMAI,NDY,WL	B29-2	PNV	All	150	X	X	-	-	X	Wildlife MR's
Base w/CMAI,NDY,MR's Market	B30-2	PNV	All	150	X	X	B	20	X	Market Values Only
Base w/CMAI,NDY,MR's,7%	B30-3	PNV	All	150	X	X	B	20	X	7% Discount Rate
Base w/CMAI,NDY,MR's,0%	B32-1	PNV	All	150	X	X	B	20	X	0% Timber Trend
Base w/CMAI,NDY,MR's,3%	B33-1	PNV	All	150	X	X	B	20	X	3% Timber Trend

Table B-7. FORPLAN Run Specifications (Continued)

Run					Harvest Flow Constraint	Rotation	MR Groups			
Name	Number	Objective Function	Value Set	Planning Horizon	NDY	95% CMAI	Riparian Prescription	% Basin Constraint	Wildlife	Other Constraints
Current Direction/Budget	R13-1	PNV	All	150	X	X	B	20	X	Current Funding by Program
Current Direction/Old SOMA's	A07-5	PNV	All	150	X	X	B	20	SOMA's	Interim SOMA's, Current Funding
Current Direction/Max Timber	R12-1	TM/15	All	150	X	X	B	20	X	
		PNV	All	150	X	X	B	20	X	
Current Direction Benchmark	B06-5	PNV	All	150	X	X	B	20	X	
Max Timber Benchmark	B11-3	TM/1	All	10	X	X	B	20	X	
		TM/15	All	150	X	X	B	20	X	
		PNV	All	150	X	X	B	20	X	
Max Visual Benchmark	B12-1	PNV	All	150	X	X	B	20	X	All VQO's Achieved
Max Unroaded Benchmark	B20-2	PNV	All	150	X	X	B	20	X	All Unroaded to MINLVL
Max Recreation Benchmark	B19-2	PNV	All	150	X	X	B	20	X	Unroaded to MINLVL, Recreation Land Assignments
Max Fish/Watershed Benchmark	B16-1	PNV	All	150	X	X	C	9/13	X	Basin Constraints
Max Wildlife Benchmark	B13-3	PNV	All	150	X	X	B	9/13	Exceeded	60% Snag's, 6 Unroaded Basins, Wildlife Land Assignments
Base w/CMAI,NDY,MR's (Max Present Net Value Benchmark)	B30-1	PNV	All	150	X	X	B	20	X	

BENCHMARK RESULTS

Modeling assumptions and environmental consequences associated with each Benchmark are discussed in this section. FORPLAN specifications for the benchmarks and runs designed to evaluate constraints are displayed in Table B-7 which precedes this section.

MIN LEVEL BENCHMARK

Purpose.

The Min Level Benchmark is a determination of the custodial costs and resulting incidental outputs necessary to maintain the Forest, subject to certain environmental constraints and an obligation to the protection of life, health and safety of the casual visitor. The objective of this benchmark is to minimize cost while meeting limited public ownership obligations.

Assumptions and Modeling Constraints.

- the minimum management level prescription was selected for all analysis areas.
- costs reflect the fixed costs of Federal ownership. Costs associated with the prevention of damage to adjoining ownerships, administration of unavoidable special uses, and maintenance of long-term productivity are included.
- only incidental outputs and uses, such as recreation, wildlife, and fisheries are given economic value for purposes of this benchmark.
- transition, or "close down" costs, needed in the event this benchmark is implemented, are not included.

Summary of Environmental Consequences

WILDLIFE. The Min Level Benchmark would have major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; it would continue at this level under this benchmark. More than four times as much old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have a very adequate habitat base; this additional habitat will provide a very good margin of safety to insure that well-dispersed viable populations of all native species will not perish from this Forest. This safety margin is doubly important, given that very little mature/old-growth habitat will remain on private lands outside the Forest boundary

Deer herd levels will be considerably lower than at present, especially after recently harvested areas progress into older seral stages; WFUD's are correspondingly reduced.

Habitat capability for cavity nesters would be maintained at high levels.

Most meadow habitat would slowly disappear as forest encroachment slowly obliterated this valuable component of habitat diversity. No hardwood stands are converted into conifer plantations, thereby prolonging this habitat type.

Riparian areas would not be entered and would retain their value to wildlife

FISH. Riparian areas would be at minimum level which would have positive benefit to fish habitat capability. Water temperatures would reduce and input of large organic debris would improve. Minimum level management would allow water temperature reduction by at least two degrees Fahrenheit at the end of the third decade. Minimal ground disturbance would reduce input of sediment to streams.

WATER. Under a minimum level or custodial management, watershed condition will improve generally for about eight decades (or until the recent clearcut acreage has reforested and grown to maturity). Sediment production is estimated to remain stable at 623 M tons per year. Slight reductions in water yield will be evident compared to the current situation.

MAX PRESENT NET VALUE (B30-1)

Purpose.

This benchmark provides the mix of goods and services necessary to maximize PNV over a 150-year planning horizon at a four percent discount rate when all resources are valued according to specifications in the 1985 RPA DEIS. The results also provide a basis, or reference point, for the evaluation of opportunity costs associated with the attainment of other resource objectives, four percent discount rate when all resources are valued according to specifications in the 1985 RPA DEIS. The results also provide a basis, or reference point, for the evaluation of opportunity costs associated with the attainment of other resource objectives, as well as evaluations concerning the impact of legal and policy constraints

Assumptions and Modeling Constraints.

- economically efficient capital investments for fish and wildlife improvements are included.
- no economically efficient capital investments for recreation were identified.
- no viewshed allocations were found to be economically efficient.
- no special areas were allocated.

Resource-specific Environmental Consequences.

RECREATION.

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148.4 RVD's by the fifth decade under this management scheme. Current developed capacity is approximately 157,600 RVD's and can be increased to approximately 172,000 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections. Each of these categories will be summarized individually in addition to the information presented in this section

Roaded Natural (RN). 653,283 acres of the Forest land is currently inventoried as RN and is expected to increase to 739,333 acres in the second decade under this management scheme. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and can be increased to approximately 1,197,700 RVD's by the fifth decade.

Semi-Primitive Motorized (SPM). 115,393 acres of the Forest land is currently inventoried as SPM and will remain the same over the planning horizon Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 RVD's and will remain constant over the planning horizon because of the difficulty of determining the degree of impact necessary to distinguish between roaded natural and semi-primitive.

Semi-Primitive Non-Motorized (SPNM). 195,175 acres of the Forest land is currently inventoried as SPNM and will decrease to approximately 119,494 acres in the second decade of this management scheme due to the impacts of road construction and timber harvest. 294,181 acres will be harvested

over five decades, and 1,596 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 25,000 RVD's in the second decade of this management scheme, and can be increased slightly to 25,100 RVD's with the current capital investment program

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will decrease to approximately 114,070 acres by the second decade, and will remain constant over the planning horizon. Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 13,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will decrease to approximately 11,400 RVD's in the second decade and can be increased to approximately 13,400 RVD's through the current capital investment. Demand is expected to reach capacity in the second decade.

VISUAL RESOURCE. Visual resources will be managed at the minimum level under this management scheme. 8,910 acres of Recreation/Scenic Rivers can be managed under the Retention VQO. All other inventoried areas will be managed under the Modification VQO.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers, the Rogue, and the Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. The Min Level Benchmark would have benefits for wildlife resources in general. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 13 percent. A minimum 13 percent of the Forest is maintained as old growth at all times. Twenty percent more old-growth habitat is preserved indefinitely than required under MR constraints; most of the 'extra' habitat is in Wildernesses, and dispersion of old-growth habitat would be at minimum levels. In the first two decades the deer herd averages five percent lower than at present; WFUD's follow a similar pattern.

Forest-wide habitat capability for cavity nesters is maintained at 51 percent at the end of the first five decades, a fairly low level. The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife No hardwood stands on the Forest are converted into conifer plantations until the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 84,000 acres of riparian habitat (45 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH. Under this benchmark forest habitat capabilities for anadromous and resident salmonids are enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids. Stream temperatures are maintained by maintaining streamside canopy cover through application of the Riparian Prescription option B. Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and 11 percent entry in the Riparian areas

TIMBER. The annual harvest level is 32.375 MMCF during the first decade and LTSY (51.938 MMCF) is not achieved until the tenth decade.

Harvest is conifer except for an insignificant amount (118 acres) of hardwood conversion in the fifth decade.

Riparian harvest ranges from about 1,800 acres in the first decade to about 3,400 acres in the fifth decade. This gradually declines to 1,125 acres in the fifteenth decade. There could be some detrimental effects on stream quality and wildlife habitat during periods of high level Riparian harvesting.

Reforestation is a high level program and will require higher than current budget and more people than currently employed.

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction in the first two decades. In Decades 3-5, watershed condition will decline because of the increased levels of timber harvest and road building.

FACILITIES. The new road construction in the Forest decade is about 40 percent the mileage of the last five year period. New construction decreases considerably in the sixth decade and is completed in the seventh decade. The decrease takes place when the Forest starts obtaining large amounts of the annual timber cut from commercial thinnings and from second growth stands.

Reconstruction miles increase to a high of 265 miles per year in the fifth decade, which is higher than the Forest has experienced in the past (Fiscal Year 1982 had 177 miles).

The local road miles will increase 84 percent, from an existing 1,807 miles to an estimated 3,317 miles, when the system is complete sometime in the seventh decade. Over 95 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 4,242 miles, an increase of 60 percent. The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,802 miles (42 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,276 miles (30 percent) of the completed system. The remaining 10 percent (258 miles) of the current road system and 27 percent (1,164 miles) of the completed system will be closed to vehicles except for intermittent project use.

MAX TIMBER (B11-3)

Purpose.

This benchmark establishes the highest level of sustainable timber production possible on the Forest under a policy of nondeclining yield, subject to MR's. It provides a basis for a basis for the estimation of physical timber harvest tradeoffs when compared to runs having other resource objectives.

Assumptions and modeling Constraints.

- no special areas are allocated to other uses.
- VQO's are not achieved except for modification and maximum modification.

Resource Specific Environmental Consequences.

RECREATION.

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148.4 RVD's by the fifth decade under this management scheme. Current developed

capacity is approximately 157,600 RVD's and can be increased to approximately 172,000 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections Each of these categories will be summarized individually in addition to the information presented in this section.

RN. 653,283 acres of the Forest land is currently inventoried as RN and is expected to increase to 739,333 acres in the second decade under this management scheme. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and can be increased to approximately 1,197,700 RVD's by the fifth decade.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will remain the same over the planning horizon. Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will remain constant over the planning horizon because of the difficulty of determining the degree of impact necessary to distinguish between RN and semi-primitive.

SPNM. 195,175 acres of the Forest land is currently inventoried as SPNM and will decrease to approximately 119,494 acres in the second decade of this management scheme due to the impacts of road construction and timber harvest. 294,181 acres will be harvested over five decades, and 1,596 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 25,000 RVD's in the second decade of this management scheme, and can be increased slightly to 25,100 RVD's with the current capital investment program.

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will decrease to approximately 114,070 acres by the second decade, and will remain constant over the planning horizon. Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 13,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will decrease to approximately 11,400 RVD's in the second decade and can be increased to approximately 13,400 RVD's through the current capital investment. Demand is expected to reach capacity in the second decade.

VISUAL RESOURCE. Visual resources will be managed at the minimum level under this management scheme. 8,910 acres of Recreation and Scenic River can be managed under the Retention VQO. All other inventoried areas will be managed under the Modification VQO.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed.

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers; the Rogue and Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. This benchmark has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 20 percent. A minimum of 15 percent of the Forest is maintained as old growth at all times. Fifty percent more old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature and old-growth forest communities will have an adequate habitat base. In the first two decades the deer herd averages 21 percent above current levels; WFUD's follow a similar pattern.

Habitat capability for cavity nesters is maintained at 59 percent at the end of the first five decades. The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife Thirty-eight percent of the hardwood stands on the Forest are converted into conifer plantations in the first decade, which effectively removes a large proportion of this habitat type before its value as wildlife habitat can be adequately understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 84,000 acres of riparian habitat (45 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH Under this benchmark, forest habitat capabilities for anadromous and resident salmonids are enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids Stream temperatures are maintained by maintaining streamside canopy cover through application of the B management prescription. Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and no more than 11 percent entry in the Riparian areas.

TIMBER. The annual harvest level is 33.441 MMCF during the first decade and LTSY (58.529 MMCF) is not achieved until the tenth decade.

Harvest is conifer except hardwood conversion scheduled in the first (3,614 acres), second (83 acres), third (3 acres), fourth 74 acres), and fifth decades (218 acres).

Commercial thinning acres are scheduled through all decades. The quantity fluctuates but increases significantly through the tenth to the fifteenth decade. Final harvest acres also fluctuate but peak in the fifth decade at 8,170 acres. The combined effect of this relatively high level of harvesting is to move more rapidly toward a smaller product size.

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will decline compared to the current direction benchmark, especially in the first two decades. In the third decade, sediment production will roughly equal the current direction. Thereafter, watershed condition will further decline.

The contribution from Riparian areas is very significant in the first decade (6,900 acres). Fluctuations in riparian harvesting continues high through most of the planning horizon but decline to a reasonable level in the fifteen decade.

This relatively high workload program will require significant increases in budget and people.

FACILITIES. The new road construction in decade one is about 40 percent the mileage of the last five year period The decrease in new construction in the sixth decade is when the Forest starts obtaining large amounts of the annual timber cut from commercial thinnings and from second growth stands

Reconstruction miles increase to a high of 256 miles per year in the fifth decade, which is higher than the Forest has experienced in the past (Fiscal Year 1982 had 177 miles).

The local road miles will increase 84 percent, from an existing 1,807 miles to an estimated 3,316 miles, when the system is complete sometime in the seventh decade. Over 95 percent of this increase is in the first five decades

The existing road system of 2,645 miles will expand to 4,241 miles, an increase of 60 percent. The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,802 miles (42 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,276 miles (30 percent) of the completed system. The remaining 10 percent (258 miles) of the current road system and 27 percent (1,163 miles) of the completed system will be closed to vehicles except for intermittent project use

MAX VISUALS (B12-1)

Purpose.

This benchmark achieves the inventoried VQO on each acre of the Forest.

Assumptions and Modeling Constraints.

- all Retention and Partial Retention VQO acres are allocated to their respective management prescription.

Resource-specific Environmental Consequences

RECREATION

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148.4 RVD's by the fifth decade under this management scheme. Current developed capacity is approximately 157,600 RVD's and can be increased to approximately 172,000 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections Each of these categories will be summarized individually in addition to the information presented in this section

RN. 653,283 acres of the Forest land is currently inventoried as RN and is expected to increase to 724,963 acres in the third decade under this management scheme. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and can be increased to approximately 1,174,400 RVD's by the fifth decade.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will be increased to 129,763 acres by the third decade. Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will increase to 170,700 RVD's in the third decade.

SPNM. 195,175 acres of the Forest land is currently inventoried as SPNM and will decrease to approximately 119,494 acres in the third decade of this management scheme due to the impacts of road construction and timber harvest. 266,818 acres will be harvested over five decades, and 1,588 miles of road will be constructed under this management scheme Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 25,000

RVD's in the third decade of this management scheme, and can be increased slightly to 25,100 RVD's with the current capital investment program.

Primitive 128,440 acres of the Forest land is currently inventoried as Primitive and will decrease to approximately 114,070 acres by the third decade, and will remain constant over the planning horizon. Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 13,400 RVD's by the fifth decade Current capacity is approximately 13,100 RVD's and will increase to approximately 13,400 RVD's in the fourth decade when demand will reach reach capacity.

VISUAL RESOURCE. Visual resources will be managed at the current level under this management scheme. 87,747 acres of Retention, 300,215 acres of Partial Retention and 524,534 acres of Modification will be allocated under this management scheme.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers; the Rogue and Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. This run has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 22 percent. A minimum of 16 percent of the Forest is maintained as old growth at all times. Fifty percent more old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have an adequate habitat base.

In the first two decades the deer herd averages three percent below current levels; WFUD's follow a similar pattern.

Habitat capability for cavity nesters is maintained at 63 percent at the end of the first five decades.

The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife. No significant acres of hardwood stands are converted into conifer plantations until after the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 83,000 acres of riparian habitat (45 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH Under this benchmark, forest habitat capabilities for anadromous and resident salmonids are enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids. Stream temperatures are maintained by maintaining streamside canopy cover through application of the B management prescription. Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and no more than 11 percent of the Riparian area.

TIMBER. The annual harvest level is 30.501 MMCF during the first decade and the LTSY (52.886 MMCF) is not attained until the eleventh decade

Harvest is all conifer except for an insignificant quantity of hardwood (tanoak) conversion.

During the middle of the planning horizon, around the tenth decade final harvest acres are low (1,920 acres) and commercial thinning acres are quite high (8,694 acres). This will cause a decrease in future product size. This tends to come into balance toward the fifteenth decade.

Low site is the primary source of final harvest acres in future decades. The high occurs about the tenth decade. An improved blend of High Site, Medium Site and Low Site begins to occur toward the fifteenth decade.

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction benchmark in the first two decades. In subsequent decades watershed condition will decline as timber harvest and road building intensify.

FACILITIES. The new road construction in decade one is about one-third the mileage of the last five year period. New construction decreases considerably in the sixth decade and again in the ninth decade. The first decrease takes place when the Forest starts obtaining large amounts of the annual timber cut from commercial thinnings. The second decrease takes place when the old-growth stands available for timber harvest are mostly gone, the road system is largely in place, and the Forest is harvesting the second growth stands.

Reconstruction miles increase to a high of 210 miles per year in the eleventh decade, which is higher than the range of reconstruction miles the Forest has experienced in the past (Fiscal Year 1982 had 177 miles).

The local road miles will increase 83 percent, from an existing 1,807 miles to an estimated 3,308 miles, when the system is complete sometime in the fourteenth decade. Almost 80 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 4,233 miles, an increase of 60 percent. The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,801 miles (43 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,275 miles (30 percent) of the completed system. The remaining 10 percent (258 miles) of the current road system and 27 percent (1,157 miles) of the completed system will be closed to vehicles except for intermittent project use.

MAX UNROADED (B20-2)

Purpose.

This benchmark maximizes the preservation of presently unroaded areas on the Forest. In addition to designated Wildernesses, all Roadless Area Review and Evaluation II (RARE II) areas that remain unroaded are assigned to a minimum level of management.

Assumptions and Modeling Constraints.

All analysis areas with an unroaded identifier are constrained to minimum level management.

Resource Specific Environmental Consequences.

RECREATION

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148,000 RVD's by the fifth decade under this management scheme. Current developed

capacity is approximately 157,600 RVD's and can be increased to approximately 164,500 RVD's through the capital investment program by the fifth decade under this management scheme

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections Each of these categories will be summarized individually in addition to the information presented in this section

RN 653,283 acres of the Forest land is currently inventoried as RN and is expected to remain at that level over the length of the planning horizon. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and will not be increased over this planning horizon.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will be decreased to approximately 102,593 acres in the first decade of this management scheme. Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will be reduced to approximately 135,400 RVD's by the second decade.

SPNM 195,175 acres of the Forest land is currently inventoried as SPNM and will increase to approximately 207,975 acres in the second decade of this management scheme. 251,730 acres will be harvested over five decades, and 1,849 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 43,800 RVD's in the fifth decade of this management scheme

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will increase to approximately 141,880 acres by the first decade, and will remain constant over the planning horizon Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 14,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will increase to approximately 16,300 RVD's in the fifth decade. Demand is not expected to reach capacity.

VISUAL RESOURCE Visual resources will be managed at the minimum level under this management scheme in order to emphasize non-motorized recreation opportunities. 8,910 acres of Recreation/Scenic River can be managed under the Retention VQO. All other inventoried areas outside of allocated roadless areas will be managed under the Modification VQO.

WILDERNESS 232,495 acres of Wilderness will be carried. No additional areas will be proposed

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers, the Rogue, and the Illinois. No additional rivers will be considered for evaluation under this management scheme

WILDLIFE. This benchmark has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 27 percent A minimum of 24 percent of the Forest is maintained as old growth at all times. More than twice as much old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have a more than adequate habitat base; this additional habitat will provide a margin of safety which insures that well-dispersed viable populations of all native species will not perish from this Forest. This safety margin is doubly important, given that very little mature/old-growth habitat will remain on private lands outside the Forest boundary.

In the first two decades the deer herd averages 16 percent lower than at present; WFUD's follow the same pattern

Habitat capability for cavity nesters is maintained at 67 percent at the end of the first five decades.

The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife No hardwood stands are converted into conifer plantations until the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 59,000 acres of riparian habitat (32 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH. Under this benchmark, Forest habitat capabilities for anadromous and resident salmonid is enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids. Stream temperatures are maintained by maintaining streamside canopy cover through application of the B management prescription. Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and no more than 11 percent harvest of Riparian areas per decade.

TIMBER. The annual harvest level is 23.126 MMCF during the first decade and LTSY (40.472 MMCF) is not achieved until the ninth decade.

Harvest consists of conifer except for 911 acres of hardwood conversion scheduled in the fifth decade.

Reforestation acres increase significantly toward the fifth decade due to increased harvesting in Riparian areas (about 2,300 acres). The contribution from Riparian areas then decreases to about 900 acres in the fifteenth decade.

There are no extreme fluctuations in the overall program except as noted for reforestation.

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction benchmark, especially in the first three decades In decades 4 and 5, sediment production under this alternative will exceed current direction.

FACILITIES. The new road construction in decade one is about one-fifth the mileage of the last five year period. The decrease in the sixth decade is when the forest starts obtaining large amounts of the annual timber cut from commercial thinnings and from second growth stands.

The local road miles will increase 42 percent, from an existing 1,807 miles to an estimated 2,569 miles, when the system is complete sometime in the seventh decade. Almost 95 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 3,494 miles, an increase of 32 percent. The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,697 miles (49 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,082 miles (31 percent) of the completed system The remaining 10 percent (258 miles) of the current road system and 20 percent (715 miles) of the completed system will be closed to vehicles except for intermittent project use.

MAX RECREATION (B19-2)

Purpose.

This benchmark estimates the maximum capability of the Forest to provide both dispersed and developed recreational opportunities.

Assumptions and Modeling Constraints.

- developed recreation facilities are installed or upgraded to meet anticipated future demands
- primitive ROS demand is satisfied through the allocation of all unroaded areas to a minimum level of management
- both candidate Wild and Scenic Rivers are allocated.
- 25 Supplemental Resource areas are allocated to minimum level of management.

Resource-specific Environmental Consequences.

RECREATION

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148,000 RVD's by the fifth decade under this management scheme. Current developed capacity is approximately 157,600 RVD's and can be increased to approximately 164,500 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections. Each of these categories will be summarized individually in addition to the information presented in this section.

RN 653,283 acres of the Forest land is currently inventoried as RN and is expected to remain at that level over the length of the planning horizon. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and will not be increased over this planning horizon.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will be decreased to approximately 102,593 acres in the first decade of this management scheme Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will be reduced to approximately 135,400 RVD's by the second decade.

SPNM. 195,175 acres of the Forest land is currently inventoried as SPNM and will increase to approximately 207,975 acres in the second decade of this management scheme 251,730 acres will be harvested over five decades, and 1,817 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 43,800 RVD's in the fifth decade of this management scheme.

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will increase to approximately 141,880 acres by the first decade, and will remain constant over the planning horizon Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 14,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will increase to approximately 16,300 RVD's in the fifth decade. Demand is not expected to reach capacity

VISUAL RESOURCE. Visual resources will be managed at the minimum level under this management scheme in order to emphasize non-motorized recreation opportunities. 8,910 acres of Recreation/Scenic River can be managed under the Retention VQO. All other inventoried areas outside of allocated roadless areas will be managed under the Modification VQO.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed.

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers, the Rogue, and the Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. This run has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 27 percent. A minimum of 25 percent of the Forest is maintained as old growth at all times. More than twice as much old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have a more than adequate habitat base; this additional habitat will provide a margin of safety which insures that viable populations of all native species will not perish from this Forest. This safety margin is doubly important, given that very little mature/old-growth habitat will remain on private lands outside the Forest boundary.

In the first two decades the deer herd averages 17 percent below current levels, WFUD's follow a similar pattern.

Habitat capability for cavity nesters is maintained at 67 percent at the end of the first five decades. The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife. No hardwood stands are converted into conifer plantations until the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 57,000 acres of riparian habitat (30 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH. Under this benchmark Forest habitat capabilities for anadromous and resident salmonid is enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids. Stream temperatures are maintained by maintaining streamside canopy cover through application of the B management prescription. Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and no more than 11 percent of Riparian areas harvested per decade.

TIMBER. The annual harvest level is 22.304 MMCF during the first decade and LTSY (39.246 MMCF) is not achieved until the ninth decade.

Harvest consists of conifer except for 850 acres scheduled for hardwood conversion in the fifth decade.

The flow of reforestation acres increases from 4,032 acres in the first decade to 7,818 acres in the fifth decade then declines to 4,575 and 4,226 acres in the tenth and fifteenth decades respectfully. Final harvest makes up the bulk of these acres but harvesting in the Riparian areas is the major contributor to the high points in reforestation acres.

There are no unacceptable extremes in the flow of this program

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction benchmark. Of all the benchmarks evaluated to date, Max Recreation produces the least sediment because the fewest acres are clearcut and fewest miles of road are built. From a watershed standpoint, this benchmark produces the fewest detrimental effects.

FACILITIES The new road construction in decade one is about one-fifth the mileage of the last five year period The decrease in new construction in the sixth decade is when the forest starts obtaining large amounts of the annual timber cut from commercial thinnings and from second growth stands

The local road miles will increase 40 percent, from an existing 1,807 miles to an estimated 2,537 miles, when the system is complete sometime in the fifteenth decade. Almost 95 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 3,462 miles, an increase of 31 percent The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,693 miles (49 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,073 miles (31 percent) of the completed system The remaining 10 percent (258 miles) of the current road system and 20 percent (696 miles) of the completed system will be closed to vehicles except for intermittent project use.

MAX FISH AND WATERSHED (B16-1)

Purpose.

Improved fish habitat and watershed conditions are maximized in this benchmark.

Assumptions and Modeling Constraints.

- timber yield in Riparian areas is limited to incidental harvest associated with skyline corridors and other operational considerations.
- harvest flow constraints are limited to between nine and 13 percent per watershed basin per decade
- 27 Supplemental Resource areas are allocated to minimum level of management.
- fish habitat improvement projects are maximized.

Resource-specific Environmental Consequences.

RECREATION

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148.4 RVD's by the fifth decade under this management scheme. Current developed capacity is approximately 157,600 RVD's and can be increased to approximately 172,000 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections. Each of these categories will be summarized individually in addition to the information presented in this section.

RN 653,283 acres of the Forest land is currently inventoried as RN and is expected to increase to 739,333 acres in the second decade under this management scheme. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the

second decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and can be increased to approximately 1,197,700 RVD's by the fifth decade.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will remain the same over the planning horizon. Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will remain constant over the planning horizon because of the difficulty of determining the degree of impact necessary to distinguish between roaded natural and semi-primitive.

SPNM. 195,175 acres of the Forest land is currently inventoried as SPNM and will decrease to approximately 119,494 acres in the second decade of this management scheme due to the impacts of road construction and timber harvest 248,938 acres will be harvested over five decades, and 1,546 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 25,000 RVD's in the second decade of this management scheme, and can be increased slightly to 25,100 RVD's with the current capital investment program.

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will decrease to approximately 114,070 acres by the second decade, and will remain constant over the planning horizon. Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 13,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will decrease to approximately 11,400 RVD's in the second decade and can be increased to approximately 13,400 RVD's through the current capital investment program. Demand is expected to reach capacity in the second decade.

VISUAL RESOURCE. Visual resources will be managed at the minimum level under this management scheme. 8,910 acres of Recreation/Scenic River can be managed under the Retention VQO All other inventoried areas will be managed under the Modification VQO.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed.

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers, the Rogue, and the Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. This run has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 22 percent. A minimum of 16 percent of the Forest is maintained as old growth at all times Sixty percent more old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have an adequate habitat base.

In the first two decades the deer herd averages one percent below current levels; WFUD's follow a similar pattern.

Habitat capability for cavity nesters is maintained at 63 percent at the end of the first five decades. The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadows (4,700 acres) on land classified as nontimber are preserved, but no buffer strips around meadows are managed for wildlife. No small "special habitat sites" are managed exclusively for wildlife. No hardwood stands are converted into conifer plantations until after the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian Areas are converted from even-aged (mainly old growth) to uneven-aged timber stands, in this benchmark a maximum of 66,000 acres of riparian habitat (33 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition. Uneven-aged Riparian areas will be managed under Riparian Prescription option C, which maximizes the value of the habitat for wildlife.

FISH. Through application of the Riparian Prescription option C to 18 basins and minimum level management to one basin, water temperatures are projected to decrease by two degrees Fahrenheit by the end of the third decade within Class I and II streams. This situation is projected to improve salmonid habitat capability by 10 percent by the third decade. Inclusion of 27 Supplemental Resource areas will maintain the high production capability of streams involved. Application of the Riparian Prescription option C also provides for long-term input of large organic debris which is essential to good stream stability and salmonid rearing capability. Nine to 13 percent basin specific harvest dispersion constraints provide additional protection against adverse effects from sediments.

TIMBER. The annual harvest level is 29.063 MMCF during the first decade and LTSY (50.071 MMCF) is not achieved until the ninth decade.

Harvest consists of conifer except for 3,971 acres of hardwood conversion scheduled in the sixth decade. About 47,000 acres of hardwoods are available for conversion.

Except for the lack of hardwood conversion scheduling, there are no significant fluctuations in this program.

SOIL AND WATER. Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction benchmark, especially in the first decade. Watershed condition will also improve due to the application of Riparian Prescription option C and the area harvest constraints.

FACILITIES. The new road construction in decade one is about one-third the mileage of the last five year period. New construction decreases in the sixth decade and again in the eighth decade. The first decrease takes place when the forest starts obtaining large amounts of the annual timber cut from commercial thinnings. The second decrease takes place when the old-growth stands available for timber harvest are mostly gone, the road system is largely in place, and the forest is harvesting the second growth stands.

The local road miles will increase 81 percent, from an existing 1,807 miles to an estimated 3,266 miles, when the system is complete sometime in the thirteenth decade. Over 75 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 4,191 miles, an increase of 58 percent The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,794 miles (43 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,262 miles (30 percent) of the completed system. The remaining 10 percent (258 miles) of the current road system and 27 percent (1,135 miles) of the completed system will be closed to vehicles except for intermittent project use.

MAX WILDLIFE (B13-3)

Purpose.

This benchmark is designed to maximize biotic diversity in an attempt to achieve optimum wildlife habitat without jeopardizing the viability of any one species.

Assumptions and Modeling Constraints.

- habitat for spotted owls is adequate for 80 pairs (twice the minimum requirements).
- habitat capability for cavity nesters is at the 60 percent level.
- riparian habitat disturbance is limited to 35 percent of the total.
- 6 unroaded watershed basins are allocated to minimum level of management (no harvest)
- meadows, including 200 foot buffer strips, and other special habitat sites are managed for the benefit of wildlife.
- habitat improvement projects are planned at maximum levels.

Resource-specific Environmental Consequences.

RECREATION

Developed Recreation. Current use is approximately 115,700 RVD's and is expected to increase to approximately 148.4 RVD's by the fifth decade under this management scheme. Current developed capacity is approximately 157,600 RVD's and can be increased to approximately 172,000 RVD's through the capital investment program by the fifth decade under this management scheme.

Dispersed Recreation. Dispersed recreation is presented by ROS classes. The discussion includes Wilderness and Wild and Scenic River use in the capacity totals and demand projections. Each of these categories will be summarized individually in addition to the information presented in this section.

RN. 653,283 acres of the Forest land is currently inventoried as RN and is expected to increase to 739,333 acres in the fourth decade under this management scheme. Current RN use is approximately 479,100 RVD's and is expected to increase to approximately 614,700 RVD's by the fifth decade of the planning horizon. Current capacity is approximately 1,059,400 RVD's and can be increased to approximately 1,197,700 RVD's by the third decade.

SPM. 115,393 acres of the Forest land is currently inventoried as SPM and will remain the same over the planning horizon. Current SPM use is approximately 80,500 RVD's and is expected to increase to approximately 103,200 RVD's by the fifth decade. Current capacity is approximately 151,800 and will remain constant over the planning horizon because of the difficulty of determining the degree of impact necessary to distinguish between roaded natural and semi-primitive.

SPNM. 195,175 acres of the Forest land is currently inventoried as SPNM and will decrease to approximately 123,495 acres in the third decade of this management scheme due to the impacts of road construction and timber harvest. 259,372 acres will be harvested over five decades, and 1,143 miles of road will be constructed under this management scheme. Current SPNM use is approximately 17,800 RVD's and is expected to increase to approximately 22,800 RVD's by the fifth decade. Current capacity is approximately 41,300 RVD's and will decrease to approximately 25,000 RVD's in the third decade of this management scheme, and can be increased slightly to 26,000 RVD's with the current capital investment program.

Primitive. 128,440 acres of the Forest land is currently inventoried as Primitive and will decrease to approximately 114,070 acres by the third decade, and will remain constant over the planning horizon. Current Primitive use is approximately 11,400 RVD's and is expected to increase to approximately 13,600 RVD's by the fifth decade. Current capacity is approximately 13,100 RVD's and will increase to approximately 13,400 RVD's in the third decade and can be increased to approximately 13,600 RVD's through the current capital investment. Demand is expected to reach capacity in the third decade.

VISUAL RESOURCE. Visual resources will be managed at the minimum level under this management scheme. 8,910 acres of Recreation/Scenic River can be managed under the Retention VQO. All other inventoried areas will be managed under the Modification VQO.

WILDERNESS. 232,495 acres of Wilderness will be carried. No additional areas will be proposed

WILD AND SCENIC RIVERS. The Forest has two designated Wild and Scenic Rivers, the Rogue, and the Illinois. No additional rivers will be considered for evaluation under this management scheme.

WILDLIFE. This benchmark has major effects on wildlife resources. The Forest land base is presently 41 percent old-growth habitat; after five decades it drops to 26 percent. A minimum of 21 percent of the Forest is maintained as old growth at all times. More than twice as much old-growth habitat is preserved indefinitely than required under MR constraints. Wildlife species inhabiting mature/old-growth forest communities will have a more than adequate habitat base; this additional habitat will provide a margin of safety which insures that well-dispersed viable populations of all native species will not perish from this Forest. This safety margin is doubly important, given that very little mature/old-growth habitat will remain on private lands outside the Forest boundary.

In the first two decades the deer herd averages 10 percent below current levels; WFUD's follow a similar pattern.

Habitat capability for cavity nesters is maintained at 77 percent at the end of the first five decades. The proportion of mature (age 101-200) and young (age 41-100) forest fluctuates rather widely throughout the planning period, mostly due to the Forest's uneven distribution of stand age classes. Meadow habitat is maximized at 6,500 acres, with associated 200 foot buffer strips managed for the benefit of wildlife species utilizing this type of habitat. A variety of small "special habitat sites" are managed exclusively for wildlife (2,200 acres). No hardwood stands are converted into conifer plantations until the fifth decade, thereby preserving this habitat type until its value as wildlife habitat can be better understood.

As unmanaged timber stands are harvested and brought into rotation, associated Riparian areas are converted from even-aged (mainly old growth) to uneven-aged timber stands; in this benchmark a maximum of 65,000 acres of riparian habitat (35 percent of the Forest total) are ultimately converted to this type of forest management; the rest of the riparian habitat will not be entered and will essentially remain in its present condition.

FISH. Under this benchmark, Forest habitat capabilities for anadromous and resident salmonid is enhanced through maintaining the natural habitat plus project work primarily designed to improve rearing capability of juvenile salmonids. Stream temperatures are maintained by maintaining streamside canopy cover through application of the B management prescription Stream sediment input is held at current levels by basin constraints which allow no more than 20 percent timber harvest entry per decade, and no more than 11 percent of Riparian areas harvested per decade.

TIMBER. The annual harvest level is 25.771 MMCF during the first decade and LTSY (43.848 MMCF) is not achieved until the ninth decade.

Harvest consists of conifer except for hardwood conversion scheduled in the fourth decade (166 acres), the fifth decade (2,170 acres) and the fifteen decade (2,044 acres).

The contribution to harvest is significant in regard to Riparian area acres. Riparian harvesting increases from 1,322 acres in the first decade to 5,106 acres in the fifth decade, then declines to 1,380 acres and 946 acres in the tenth and fifteenth decades respectfully.

Reforestation acres double from the first decade (4,979 acres) to the fifth decade (10,326 acres). This will require significant increases in budget and people.

SOIL AND WATER Forest watershed condition (as indicated by total sediment production) will improve compared to the current direction benchmark, especially in the first decade. In subsequent decades this alternative will be very comparable to the current situation.

FACILITIES. The new road construction in decade one is less than one-third the mileage of the last five year period. The decrease in new construction in the sixth decade is when the forest starts obtaining large amounts of the annual timber cut from commercial thinnings and from second growth stands.

Reconstruction miles increase to a high of 210 miles per year in the fourth decade, which is higher than the forest has experienced in the past (Fiscal Year 1982 had 177 miles).

The local road miles will increase 58 percent, from an existing 1,807 miles to an estimated 2,863 miles, when the system is complete sometime in the seventh decade. Nearly 95 percent of this increase is in the first five decades.

The existing road system of 2,645 miles will expand to 3,788 miles, an increase of 43 percent. The road system open to passenger cars will increase from 1,504 miles (57 percent) existing to 1,739 miles (46 percent) with the completed system. At the same time, 883 miles (33 percent) of the road system now open to high clearance vehicles will increase to 1,158 miles (31 percent) of the completed system. The remaining 10 percent (258 miles) of the current road system and 23 percent (891 miles) of the completed system will be closed to vehicles except for intermittent project use.

CONSTRAINT ANALYSIS

Additional FORPLAN runs were made to evaluate the impacts and costs of various constraints and objectives. Runs were also made to test the sensitivity of the solutions to changes in certain run parameters. The opportunity costs and sensitivity analysis are documented below. Additional background on the development and selection of methods to meet MR's can be found in Appendix J

OPPORTUNITY COST OF MANAGEMENT REQUIREMENTS

Tradeoffs associated with MR's were analyzed by comparing Base Runs having no provisions for MR's with runs that incrementally added the various components of MR's until the entire MR package was incorporated. MR's that have significant timber and economic tradeoffs fall into two categories; those necessary to meet the distribution of viable fish and wildlife populations, and those necessary to meet soil productivity and water quality standards. Opportunity costs are defined as the difference in PNV between the Base Run (B22-2) and the runs that include MR's. This reduction in PNV represents the opportunity cost of managing the Forest for optimum market and nonmarket resource outputs, while continuing to provide for MR's.

Each component of the MR package was evaluated in separate FORPLAN runs with timber harvest activity controlled by NDY and CMAI.

Soil, Water, and Fish Objectives

Runs compared:	B22-2	(PNV 1,645 10 MM $)
	B28-1	(PNV 1,394.72 MM $)
Opportunity Cost:	250.38 MM $	(15.2 percent reduction)

The analysis showed that when applied separately, MR's for soil and water (B28-1) reduced average annual first decade timber harvest to 34 6 MMCF (13 percent reduction) and LTSY to 55.0 MMCF (5 percent reduction). PNV fell 15 percent (250 MM $), while total discounted costs declined 9.6 MM $ (-1 percent). The major response of applying these MR's was to limit harvest in Riparian areas to 50 percent reduction in basal area during the first commercial entry on Class III streams and 20 percent on Class I and II streams. Created openings were also limited to no more than 20 percent per watershed basin per decade.

Fish MR's require maintenance of existing habitat conditions. Soil and water MR's form the basis for current management direction on the Forest. No additional constraints were necessary to meet fish requirements, since existing fish habitat is the result of implementing soil and water MR's.

Wildlife Objectives.

Runs compared:	B22-2	(PNV 1,645.10 MM $)
	B29-2	(PNV 1,508.48 MM $)
Opportunity Cost:	136.62 MM $	(8.3 percent reduction)

Application of the wildlife MR's (B29-2) reduced average annual first decade timber harvest to 37.1 MMCF (7 percent reduction) and LTSY to 56.0 MMCF (-3 percent). PNV was reduced 137 MM $ (-8 percent), while total discounted costs declined 10 MM $ (-1 percent). Wildlife MR's are principally attained through the maintenance of 1,000, 300, and 160 acre old-growth/mature blocks of timber distributed for spotted owl, pileated woodpecker, and pine marten, respectively.

All MR's with NDY and CMAI.

Runs compared:	B22-2	(PNV 1,645.10 MM $)
	B30-1	(PNV 1,300.55 MM $)
Opportunity Cost:	344.55 MM $	(20.9 percent reduction)

When all MR's are applied (B30-1), average annual first decade timber harvest is reduced to 32 4 MMCF (19 percent reduction) and LTSY to 52 MMCF (-10 percent). PNV is reduced 345 MM $ (21 percent)), while total discounted costs decline 38 5 MM $ (5 percent). The opportunity cost resulting from the simultaneous application of both constraints is less than the sum of the two parts, which indicates wildlife requirements help satisfy soil and water requirements.

All MR's in the Absence of NDY and CMAI.

Runs compared.	B18-3	(PNV 1,909.08 MM $)
	B31-1	(PNV 1,449.04 MM $)
Opportunity Cost:	460.04 MM $	(24.1 percent reduction)

The effect of all MR's was also evaluated in the absence of timber policy constraints. Sequential upper and lower bounds, with a harvest floor of 80 percent of current (28 MMCF), were substituted for the NDY

constraint and rotations based on utilization standards were used in lieu of CMAI to model the Base Run. Refer to Table B-7 for the FORPLAN specifications.

Average annual first decade timber harvest declined 24 percent (18 MMCF) and LTSY by 10.5 percent (6 MMCF), relative to the base without NDY or CMAI, when all MR's were applied PNV declined 24 percent while total discounted cost were reduced 81 MM $ (-8 percent).

Opportunity costs for MR's are higher in the absence of NDY and CMAI than those associated with comparable evaluations which include timber policy constraints. The presence of NDY and CMAI effectively control the rate of access which simultaneously contributes to the satisfaction of the water quality requirements.

OPPORTUNITY COST OF TIMBER POLICY CONSTRAINTS

Rotation ages determined by the general (95 percent) attainment of CMAI and decadal harvest rates that can increase or remain constant, but never decline (NDY) comprise the timber policy constraints that are evaluated in this section. Opportunity costs are determined by applying these constraints to the FORPLAN model and comparing the results with Base Runs that represent the "without condition". Timber policy constraints were evaluated when MR's were installed and in their absence to show what tradeoffs, or opportunity costs, might be masked by the presence of other model parameters such as MR's.

Nondeclining Yield Constraint (NDY).

Runs compared:	B31-1	(PNV 1,449.04 MM $)
	B27-1	(PNV 1,340.03 MM $)
Opportunity Cost:	109.01 MM $	(7.5 percent reduction)

A Base Run with upper and lower sequential bounds and rotations based on Regional utilization standards, governed by MR's (B31-1) was compared to a run with the same specifications except NDY replaced sequential upper and lower bounds (B27-1). Average annual first decade timber yield declined 35 percent (20.1 MMCF) under the NDY scenario while LTSY fell 2 MMCF (4 percent). Replacing sequential bounds with NDY reduced PNV 109 MM $, as total discounted costs declined 103 MM $.

Culmination of Mean Annual Increment (CMAI).

Runs compared:	B31-1	(PNV 1,449.04 MM $)
	B30-4	(PNV 1,386.14 MM $)
Opportunity Cost:	62.9 MM $	(4.3 percent reduction)

The same Base Run referenced above (B31-1) was compared against a run with identical FORPLAN specifications, except rotations based on the general attainment of CMAI were substituted for rotation determinations based on utilization standards (B30-4). Average annual first decade timber yield declined 8 MMCF (14 percent), while LTSY increased 4 MMCF (7.8 percent) because harvest generally occurred at CMAI which produces the greatest amount of wood in the long-term. PNV declined 63 MM $ (4 percent), as total discounted costs fell 98 MM $ (10.8 percent). As CMAI tends to produce more wood, the extra time (about 20 years) does not produce enough extra value to compete with the 4 percent discount rate used to calculate present value. Opportunity costs would be zero if no discount rate were used to make present value calculations; however, as the discount rate is increased, opportunity costs become greater.

Combination of NDY and CMAI.

Runs compared:	B31-1	(PNV 1,449 04 MM $)
	B30-1	(PNV 1,300.55 MM $)
Opportunity Cost:	148.49 MM $	(10.25 percent reduction)

The net effect of NDY and CMAI applied in concert was determined based on a comparison of the Base Run with a run having both policy constraints installed (B30-1). Average annual first decade timber yield was reduced 24 MMCF (43 percent) when both constraints are applied in unison. LTSY, however, increases 1 MMCF (2 percent) due to the longer rotations. The net loss in PNV (148 MM $) is less than the sum of the two parts, which indicates that one of the two policies helps satisfy the objectives of the other.

CMAI in the absence of MR's.

Runs compared:	B18-3	(PNV 1,909.08 MM $)
	B17-3	(PNV 1,834.99 MM $)
Opportunity Cost:	74.09 MM $	(3.9 percent reduction)

The effect of CMAI relative to rotation determinations using Regional standards was also evaluated in the absence of MR's to determine whether tradeoffs (opportunity costs) were being over or understated. Percentage reductions in PNV are less in the absence of MR's, but only by a marginal amount. Average annual first decade timber harvest declines 8 MMCF (11 percent) with CMAI in the absence of MR's which is identical to the reduction experienced with MR's. LTSY increases in the absence of MR's by 6 MMCF (11 percent) as opposed to the 4 MMCF increase realized with MR's in place. The impact of CMAI is essentially the same with, or without MR's.

Combination of NDY and CMAI in the absence of MR's.

Runs compared:	B18-3	(PNV 1,909.08 MM $)
	B22-2	(PNV 1,645.10 MM $)
Opportunity Cost.	263.96 MM $	(13.8 percent reduction)

The combined impact of CMAI and NDY, applied simultaneously in the absence of MR's was also evaluated. Percentage reductions in PNV are greater in the absence of MR's than opportunity costs calculated with MR's by approximately 4 percent. Average annual first decade timber yield is reduced 34.6 MMCF (47 percent) when both timber policy constraints are applied, which is greater than the impact associated with MR's. The impacts on LTSY are identical to those experienced in the presence of MR's (i e., plus 1 MMCF, or a 2 percent increase).

OPPORTUNITY COST OF MAXIMUM PRODUCTION, MIN LEVEL AND CURRENT DIRECTION BENCHMARKS

An analysis of benchmarks was conducted to ascertain opportunity costs associated with the resolution of ICO's. These evaluations were completed using a common constraint set to localize the effect directly attributable to achieving specific resource objectives. Except for the Minimum Level Benchmark, all benchmarks are bound by the following constraints.

- all benchmarks complied with NFMA MR's
- an ending timber inventory constraint was used so that the timber inventory in 150-years will equal or exceed the volume that would occur on a regulated forest.

- timber rotation length was based on 95 percent of CMAI determination
- a timber harvest flow constraint of NDY was used.
- an objective function of maximizing PNV was used.
- a minimum level of the existing Wildernesses was maintained in all benchmarks.
- the Min Level Benchmark was constrained to produce no management outputs such as timber harvest and livestock grazing to determine the basic cost of Federal ownership.

Min Level Benchmark.

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	MINLVL	(PNV 4 99 MM $)
Opportunity Cost:	1,295.56 MM $	(99.6 percent reduction)

The Min Level Benchmark defines the costs and benefits of operating the Forest in a custodial fashion with no production of controllable goods and services such as timber, developed recreation, etc. Management under this benchmark reduces PNV by 99 percent (1296 MM $) and essentially terminates all market outputs with the exception of anadromous fish for commercial harvest. Total discounted cost of .67 MM $ represent the administrative costs necessary to maintain the Forest in public ownership and fulfill public safety and resource protection obligations.

Current Direction Benchmark.

Runs compared.	B30-1	(PNV 1,300.55 MM $)
	B06-5	(PNV 1,170.34 MM $)
Opportunity Cost:	130.21 MM $	(10.0 percent reduction)

Land assignments in this benchmark are identical to those of the "No Action" Alternative, except that NFMA MR's are substituted for the interim direction of 300 acre spotted owl management areas (SOMA's). Budget constraints associated with the No Action Alternative are also relaxed in this benchmark. The mutiple-use orientation of this benchmark reduces average annual first decade timber harvest 2 8 MMCF (9 percent), and LTSY 1 MMCF (2 percent), relative to Max PNV. PNV declines 130 MM $ to meet the resource objectives specified in existing management plans

Max Timber Benchmark.

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B11-3	(PNV 1,276.24 MM $)
Opportunity Cost:	24.31 MM $	(1.87 percent reduction)

Land assignments selected by FORPLAN to maximize timber production (568,000 acres) are essentially identical to those selected to maximize PNV (546,000 acres). This is primarily due to timber's significant contribution to PNV, relative to other resource values Opportunity costs associated with maximizing timber production occur because less efficient acres (principally hardwood stands) are brought into solution earlier in the planning horizon than would occur under Max PNV (22,000 acres of hardwoods go to custodial management). PNV declines 2 percent (24 MM $) while total discounted costs increase 8 percent (59 MM $). Average annual first decade timber production increases 3 percent (1 MMCF), while LTSY increases 13 percent (7 MMCF).

Max Unroaded Benchmark.

Runs compared.	B30-1	(PNV 1,300 55 MM $)
	B20-2	(PNV 953.92 MM $)
Opportunity Cost.	346.63 MM $	(26.65 percent reduction)

All presently unroaded land (258,101 acres) was placed under custodial management in this benchmark which reduced the available/suitable timber base by 100,198 acres, relative to Max PNV Average annual first decade timber yield is reduced 9 MMCF (29 percent), while LTSY falls 12 MMCF (23 percent). A similar reduction in PNV (27 percent) occurs with the reduction in timber harvest as the increased recreational use is not sufficient to offset the loss in timber revenues. Total discounted costs also decline 144 MM $ (20 percent) with the reduction in available timber land.

Max Recreation Benchmark.

Runs compared:	B30-1	(PNV 1,300 55 MM $)
	B19-2	(PNV 917.60 MM $)
Opportunity Cost:	382.95 MM $	(29.4 percent reduction)

In addition to the assignment of all unroaded lands to custodial management, 25 areas with high dispersed recreation potential were allocated to Supplemental Resource areas. The two inventoried Wild and Scenic River candidates were also treated as classified in this benchmark Available/suitable timber acreage was reduced 28,437 acres, in addition to the 101,000 acres removed for custodial management in unroaded areas Average annual first decade timber yield declined 10 MMCF (31 percent), while LTSY fell 13 MMCF (25 percent). PNV was reduced 347 MM $ because increased recreational use could not offset the foregone timber values

Max Visuals Benchmark.

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B12-1	(PNV 1,205.55 MM $)
Opportunity Cost:	95.0 MM $	(7.3 percent reduction)

Inventoried VQO's were achieved on all acres of the Forest in this benchmark. The reduced average timber yield necessary to meet retention and partial retention VQO's reduced average annual first decade timber harvest 1.9 MMCF (6 percent), and dropped LTSY 1 MMCF (2 percent). PNV fell 95 MM $, while total discounted costs declined 28 MM $ (4 percent).

Max Fish and Watershed Benchmark.

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B16-1	(PNV 1,170.34 MM $)
Opportunity Cost:	130.21 MM $	(10.0 percent reduction)

High levels of capital expenditures for habitat improvement, a reduced level of riparian disturbance, and the allocation of 27 valuable fishery streams and rivers to custodial (roadless) management, are utilized to maximize fish production in this benchmark. Average annual first decade timber yield is reduced 3.3 MMCF (10 percent), while LTSY declines 2 MMCF (4 percent). The increased fish production does not yield

enough value (both sport and commercial) to offset the loss in timber revenues, resulting in a net loss of 130 MM $.

Max Wildlife Benchmark.

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B13-3	(PNV 1,040.61 MM $)
Opportunity Cost·	259.94 MM $	(19.98 percent reduction)

Land assignments required to achieve optimum habitat diversity for all wildlife species left an available/suitable timber base of 414,809 acres; 91,342 acres less than the base governing Max PNV Average annual first decade timber harvest declined 6.6 MMCF (20 percent), while LTSY fell 8 MMCF (15 percent). Reductions in PNV (20 percent) are primarily due to the land required to maintain 80 pair of spotted owl (twice the MR level) and custodial management in six unroaded watershed basins.

SENSITIVITY ANALYSIS

Structuring the FORPLAN model to produce solutions that represent reality is the challenge facing analysts with the responsibility of running and interpreting FORPLAN. The degree of data reliability needed to foster confidence in FORPLAN solutions can be determined by examining the sensitivity of FORPLAN solutions to incremental changes in various model parameters. Changes that have little or no effect on the solution indicate that a high degree of data reliability is not necessary, nor would greater precision improve the solution. Those parameters that have a significant impact on solutions deserve special attention during the preparation of the data and in the interpretation of results. A thorough understanding of the model components, their interrelationships, and recognition of their ability to affect the solution is essential to correctly interpret results during implementation

Sensitivity analysis is a procedure used to respond to concerns about data reliability, modeling assumptions, and the effectiveness of measures employed to achieve management objectives. It is an effective means of evaluating "what if" type questions. Sensitivity analysis was used on the Siskiyou to evaluate economic assumptions, and timber harvest and roading patterns.

ECONOMIC ASSUMPTIONS

A level of uncertainty surrounds literally all economic assumptions concerning projections of the future. *Economic parameters such as unit values, trends in time, and the discount rate used to express dollars* in present (1982) terms can exercise considerable influence on a mathematical model driven by an economic selection criterion. In particular, the relative economic merits of different land types may change significantly as economic parameters are varied. The following evaluations were made to apprise the responsible official of the consequences should the future prove the economic assumptions in error.

Market Verses Nonmarket Values.

Runs Compared:	B30-1	(PNV 1,300.55 MM $)
	B30-2	(PNV 1,300 36 MM $)
Sensitivity:	-.19 MM $	(.015 percent reduction)

Both runs have identical FORPLAN specifications, with NDY, CMAI, and MR's governing the solutions. Values for goods and services not necessarily traded in the open market are suppressed, however in B30-2, leaving economic value for those goods and services for which a market exists Because of the consistently high contribution of timber to total PNV (averages between 85 and 90 percent), very little

change occurs in PNV. Reductions in WFUD's were the most significant difference between the two runs Average annual wildlife benefit values declined 41 M $ in the first decade, bringing big-game, and nongame use down 3 and 2 percent, respectively.

Long-term Stumpage Value Trends (0 Percent).

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B32-1	(PNV 960 41 MM $)
Sensitivity:	-340.14 MM $	(26 25 percent reduction)

The maximum FORPLAN specification (B30-1) was reoptimized without the benefit of a 1 percent per annum projected increase in timber stumpage value (B32-1). Significant reductions in PNV occur in the absence of a timber price trend. Average annual timber yield remains constant in the first decade, but LTSY suffers a 3 MMCF loss (6 percent) relative to Max PNV. Selected suitable timber land assignments drop from 546,000 acres to 535,000 acres.

Long-term Stumpage Value Trends (3 Percent).

Runs compared:	B30-1	(PNV 1,300 55 MM $)
	B33-1	(PNV 2,482.80 MM $)
Sensitivity:	+1,182 25 MM $	(90 9 percent increase)

The 3 percent per annum timber price trend substituted in B33-1 significantly increased PNV, relative to Max PNV. Average annual harvest activity remained unchanged until the tenth period where it increases 6 percent. LTSY increases 3 MMCF (6 percent) as a result of the higher discount rate Selected suitable timber land assignments increase to 566,000 acres.

Discount Rate (7.125 Percent).

Runs compared:	B30-1	(PNV 1,300.55 MM $)
	B30-3	(PNV 1,292 85 MM $)
Sensitivity:	-7.7 MM $	(.59 percent reduction)

Lands that are economically marginal with respect to timber production should become even less attractive (economically) as the discount rate increases. To determine which, if any, lands might fall out of solution under such a scenario, a 7.125 percent discount rate was substituted for the standard 4 percent assumption used in other runs. As illustrated above, the change in discount rates reduced PNV 8 MM $ (less than 1 percent). Average annual timber production declined .2 MMCF (1 percent) in the first decade, while LTSY remained unchanged. Selected suitable timber land was 560,000 acres

HARVEST AND ROADING PATTERNS

The feasibility of implementing the timber management part of the FORPLAN solutions was examined with respect to the acres of commercial thinning (CT) programmed for future decades; the distribution of harvest on low, medium, and high site lands through time; and the trend of road construction and reconstruction.

Constraining CT acres to only 4,500 per decade resulted in a reduction in first decade timber production from 32.4 MMCF to 31.4 MMCF (3 percent). Because this extreme constraint resulted in only 3 percent

change, and the acres of CT in future decades has little or no effect on current implementation, constraints for CT acres were not included in the data sets for future runs

Examination of the distribution of harvests over the productivity groups indicated that FORPLAN would harvest only high and medium sites for the first few decades and then harvest most low sites in the fifth through the seventh. A more realistic schedule for implementation would include some of all site groups in each decade. A constraint was installed to force harvest of a minimum of 3,000 acres of low site per decade in the early decades This resulted in no appreciable change in timber outputs and was installed in all future runs.

Initial FORPLAN runs selected acres for harvest that had lowest road costs in the first decades and then those with higher costs in subsequent decades resulting in a trend of increasing road costs over decades one through six after dropping well below the current level in the first. This is not realistic for implementation as acres with low cost per volume could not be singled out in a logical harvesting pattern A constraint was installed to prevent increasing roading costs over the first six decades This resulted in no appreciable change in the timber outputs and was used in future runs

In addition to these constraints, there was also some minor refinement of the economic data for road construction, reconstruction, and maintenance to be used in future analysis. The net effects of the changes in the model for these implementation feasibility constraints and the data refinements can be seen by comparing the following runs. These changes will be carried into the analysis of alternatives.

Runs compared·	B30-1	(PNV 1,300 55 MM $)
	A09-1	(PNV 1,276 25 MM $)
Change:	-24.3 MM $	(1.87 percent reduction)

Timber production for these runs was nearly identical with first decade harvest going from 32.4 MMCF to 32.3 MMCF, and LTSY going from 53.2 MMCF to 51.9 MMCF. Since these data refinements and feasibility constraints resulting from the knowledge gained during the benchmark analysis are carried into all of the alternatives, Run A09-1 will be used for the Max PNV Benchmark in the tradeoff analysis done with the alternatives



FORMULATION OF ALTERNATIVES

INTRODUCTION

A Forest planning alternative is a mix of management prescriptions applied in specific amounts and locations to achieve a desired management emphasis as expressed in goals and objectives To be viable (36 CFR 219.12(f)), the alternative must:

- exist between maximum and minimum resource potential of the Forest.
- facilitate analysis of opportunity costs and of resource use and environmental tradeoffs among alternatives.
- facilitate evaluation of PNV, benefits, and costs of achieving various outputs as well as values that are not assigned monetary values.
- show a different way to address and respond to major public issues, management concerns, and opportunities (ICO's).
- represent the most cost efficient combination of management prescriptions that can meet the objectives of the alternative.
- state the condition and uses that will result from implementation.
- state what goods and services will be produced including timing and flow of outputs and the costs and benefits generated.
- state the resource management standards and guidelines used
- state the purpose of the management direction used.

Formulating alternatives was step five in the Forest planning process following the analysis of the management situation. During the analysis of the management situation a determination was made of the ability of the Forest to supply goods and services. Maximum and minimum output levels were established based on the composite results of benchmarks and constraint analyses. These levels form the range within which the alternatives were developed Five specific alternatives are required. Alternative A was developed to reflect the expected level of goods and services that could be produced should current management be continued (the "No Action" alternative). Alternative B was developed to respond to and incorporate the RPA program tentative resource objectives Goods and services that have value, as determined in the open market, are emphasized in Alternative D Alternative E was developed to favor the production of goods and services that do not necessarily have market determined values, such as dispersed recreation use. Alternative E also satisfied the fifth requirement retaining the unroaded portions of the Forest in an undeveloped status while continuing commodity production at a high level in those areas already roaded.

The process for formulating alternatives can best be explained in a series of steps.

Step 1. Major public issues were identified through public involvement. Internal management concerns were added to the list of issues (further explained in Appendix A of the FEIS). These issues and concerns were reviewed by an IDT and consolidated into a set of planning problems to be addressed.

Step 2. A comprehensive multi-resource data base was formed based on the identified issues and concerns and stored in a computer retrieval system.

Step 3 Land analysis areas with similar physical and biological attributes were identified and mapped. The capability, suitability, and management opportunities of specific areas of the Forest were considered in this step.

Step 4. A set of management prescriptions was prepared to represent a variety of possible ways and intensities to manage the Forest.

Step 5. The 317 analysis areas identified in Step 4 were assigned management prescriptions that could be applied optionally to build the alternatives. Analysis areas, except those allocated by higher authority (e.g., previously designated Botanical areas), were assigned at least two prescriptions including minimum level. Most of the lands available and suitable for timber production were assigned a variety of prescriptions that could be applied.

Step 6. Resource outputs and the associated costs and dollar values that would result when a prescription was implemented were calculated and entered into the computer model FORPLAN

Step 7. Demand was estimated for the resources involved in the planning problems.

Step 8. Supply potentials were determined. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. Benchmarks were established for the minimum, maximum, and constraint analysis levels and maximum PNV. Existing resource supply and projected demand were compared to supply potentials of each benchmark. *Opportunities to resolve issues and management concerns were identified for each resource by* comparing existing and projected demand to potential production levels. These potentials, when compared to the Current Direction, indicate opportunities or need for change This step concluded the analysis of the management situation - benchmark analysis.

Step 9. Alternative objectives were established to provide a broad range of options for future management of the Forest. Selected benchmarks were used to define upper and lower limits for the production of each resource. These upper and lower limits outlined the decision space boundaries for the resources involved. The IDT considered expected use, supply potential (upper and lower limits), and evaluated public input to establish the range of alternatives within the decision spaces Descriptions were written to define the resource management intent for each alternative.

Step 10. The FORPLAN model was again used to estimate the outputs and costs for each alternative by reflecting the theme of the alternative through a given set of objectives and constraints.

Step 11. The results of the FORPLAN analysis for each alternative were evaluated to assure conformance with laws, policies, and guidelines, and to assure that each alternative could be implemented.

The IDT incorporated cost efficiency at several steps in the planning process. Prescriptions were developed using least cost methods that would meet the objectives of the prescription. For the timber resource additional analysis was done to develop a range of management intensity levels within each timber prescription. The IDT developed a range of alternatives and identified the necessary constraints to address specific objectives and planning problems. The prescriptions were combined with the land assignments and constraints to form alternatives that would most efficiently accomplish the goals and objectives for the specific alternative. Each alternative was analyzed through FORPLAN to identify the most efficient prescriptions and intensities for the given objectives and constraints, and to project the stream of anticipated priced and nonpriced outputs. The feasibility of satisfying the package of constraints for each *alternative is also checked with FORPLAN. All constraints must be satisfied or a feasible solution will not* be reported. Using this combination of least cost prescriptions, FORPLAN analysis of prescription options with the PNV objective function, and efficient design of land assignments and constraints, cost efficient solutions in accordance with the themes of individual alternatives are assured

COMMON CONSTRAINTS

The constraints developed in the analysis of the management situation formed the basis for constraints applied to all alternatives. The development of these constraints culminated in FORPLAN run A09-1, Max

PNV with the alternative data set. The result is somewhat different than the Max PNV benchmark due to the constraints that were developed during the benchmark analysis to assure that alternatives would be implementable. Throughout the benchmark and tradeoff analysis common constraints were developed, examined, and tested to see how well they addressed their stated purpose. They also represent the most cost efficient approach to meeting the intended purpose. These constraints were discussed previously in this appendix. The following constraints are common to all alternatives, and to run A09-1. The tradeoff information presented is from comparisons of applying the constraints individually; synergistic or compensating effects are not evaluated.

1. Constraint: All alternatives except departures require nondeclining yield for timber harvests (NDY).
   Purpose: Provides a sustained yield of timber harvests.
   Rationale: Assumes a constant supply or upward trend in timber supply.
   Tradeoff: PNV reduced 7.5 percent, first decade ASQ reduced 35 percent

2. Constraint: Insure an appropriate level of timber inventory at the end of the planning horizon (LTSY link).
   Purpose: To assure that harvestable timber will be available in the decades immediately following the end of the planning horizon.
   Rationale: Assure a future sustained yield of timber harvest.
   Tradeoff: Not evaluated.

3. Constraint: Minimum timber rotations are based on 95 percent of the CMAI for existing and regenerated stands (except Alternative D1).
   Purpose: Assure that timber stands generally reach their maximum mean annual growth rate prior to harvest.
   Rationale: Provide rotation ages that maintain high productivity and meet the requirements of 36 CFR 219.16(a)(2)(iii).
   Tradeoff: PNV reduced 4.3 percent, first decade ASQ reduced 14 percent, LTSY increased 7.8 percent.

4. Constraint: Limit created openings to 20 percent, or less, of watershed basins per decade. (Except some alternatives which have more stringent constraints)
   Purpose: Disperse harvest among the basins to assure that basic soil productivity, water quality, fisheries objectives, and legal size of opening requirements are maintained.
   Rationale: Soil, water, and fisheries resources must be maintained at legally defined levels.
   Tradeoff: Not evaluated independently; applied in concert with the following riparian area constraint (5).

5. Constraint: Riparian zones are protected by limiting timber harvest to 11 percent of the riparian area acres per decade by planning basin; and by reducing projected timber yield to 50 percent of inventoried volume per acre on Class III streams, and 20 percent on Class I and IIs (Riparian Prescription option B).
   Purpose: Protect the areas that are most critical to a wide range of resources including timber, wildlife and fish, recreation, and water.
   Rationale: Riparian ecosystems require special attention to assure that no practices will cause detrimental changes in water quality. (Riparian Prescription option B affords the minimum legal protection.)
   Tradeoff: Not evaluated independently. In combination with the created openings constraint above (4), PNV reduced 15.2 percent, first decade ASQ reduced 13 percent.

6. Constraint: All alternatives except No Change require a minimum network or mature and old-growth habitat to be maintained on land that would otherwise be suitable for timber production.
   Purpose: Maintain viable wildlife populations of species dependent on mature and old-growth habitats.
   Rationale: These habitats would not be maintained with the dispersion needed to maintain minimum viable populations without this constraint
   Tradeoff: PNV reduced 8 3 percent, first decade ASQ reduced 7 percent.

7. Constraint: Low Productivity Group harvest in early decades.
   Purpose: Force harvest of some Low Productivity Group acres in early decades.
   Rationale: The model would put off all harvest in low site until later decades without this constraint. The productivity groups are somewhat interspersed and logical project layout will occasionally include some low site. This constraint forces a mix of productivity groups in all decades representing a more logically implementable solution.
   Tradeoff: No appreciable effect.

8. Constraint: Roading costs are constrained to not increase from decade to decade for the first six decades.
   Purpose: This produces more implementable solutions.
   Rationale: Without this constraint, the model selects acres for harvest in early decades that have low road costs in proportion to the volume harvested. Given the distribution of these acres, this was not feasible to implement. This constraint forces a better balance of road costs and volume outputs spread over the decades when road development would occur.
   Tradeoff: Timber outputs are not affected. PNV is reduced by 1.9 percent.

DEVELOPMENT OF THE ALTERNATIVES

Following the definition of the alternatives, the criteria and assumptions of each were translated into the land assignments, capital investment schedules, and modeling objectives and constraints necessary to represent the alternative in the FORPLAN model. Complete descriptions of the alternatives, including the objectives, land assignments and capital investment schedules, are found in Chapter II of the FEIS. The modeling constraints specific to each alternative are presented in this section.

Each alternative was formulated and run in the FORPLAN model as a package. Iterative runs to quantify the effects (tradeoffs) of individual constraints within the alternative formulation were not made The greatest differences among the alternatives are generally associated with the land assignments which were modeled by applying constraints requiring a minimum number of acres to be assigned to Partial Retention, Retention, Riparian, or Minimum Level prescriptions. Management Area 10 (Scenic and Recreation River) acres are assigned to the Retention FORPLAN prescription for alternatives that allow programmed timber harvest from these areas. The Minimum Level FORPLAN prescription was used for all acres that would not have programmed timber outputs (i.e. Management Areas 1 through 9 and unsuitable lands). Differences in other resource yields associated with these assignments that were not a function of timber activity or age were directly entered for each alternative. Unconstrained suitable timber acres were allowed to go to the General Forest prescription. In all cases, the Minimum Level option was allowed for all acres.

ALTERNATIVE NC

Goals. The goals of this alternative are to continue management direction as set out in previous plans, and that included in existing policies, standards, and guidelines. It does not include all MR's developed for

old-growth indicator species (pileated woodpeckers and pine martens) The designated habitat for spotted owl areas is limited to 300 acre SOMA's. This is the "no change" alternative.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production is increased over time, not to exceed the LTSY. Timber merchantability standards, yield tables, and inventory data are updated to current or proposed standards Tentatively suitable timber land inventory was updated according to Regional direction.
2 Wildlife MR's, developed for old-growth dependent species, are not included.
3 The entire complement of inventoried VQO's from the land use plans are included.
4. Management options for candidate Wild and Scenic Rivers will be maintained as per current direction.
5 Riparian areas will be managed under Prescription option B (current Siskiyou riparian policy)
6. A moderate rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except number 6 which requires protection of network of mature and old-growth habitat.

2. Constraint. Constrained available suitable acres:

Allocated Minimum Level	46,850
Retention	33,115
Partial Retention	145,019

Purpose. Constrain acres with timber management options to those of current plans
Rationale: Represent the no action alternative with current direction land assignments

3 Constraint: Hardwood conversion not to exceed 7,500 acres in any decade.
Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

ALTERNATIVE A

Goals. The goals of this alternative are to continue management direction as set out in previous plans, and that included in existing policies, standards, and guidelines. It also includes the MR's of current laws and regulations This is the "No Action" alternative required by NEPA.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1 Timber production is increased over time, not to exceed the LTSY. Timber merchantability standards, yield tables, and inventory data are updated to current or proposed standards. Tentatively suitable timber land inventory was updated according to Regional direction.
2. Wildlife MR's, which were not required by law when previous plans were completed, are included.
3. The entire complement of inventoried VQO's from the land use plans are included.
4. Management options for candidate Wild and Scenic Rivers will be maintained as per current direction.

5. Riparian areas will be managed under Prescription option B (current Siskiyou riparian policy).
6. A moderate rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints.

2 Constraint: Constrained available suitable acres·

Allocated Minimum Level	46,850
Retention	33,115
Partial Retention	145,019

Purpose: Constrain acres with timber management options to those of current plans.
Rationale: Represent the no action alternative with current direction land assignments.

3. Constraint: Hardwood conversion not to exceed 7,500 acres in any decade.
Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

ALTERNATIVE A-DEPARTURE

Goals. The goals of this alternative are similar to Alternative A. It would continue management direction as set out in previous plans, and that included in existing policies, standards, and guidelines. It also includes the MR's of current laws and regulations. In addition, it would maintain the current level of timber outputs for the next two decades.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production must equal 31.2 MMCF ASQ for the first two decades. It is allowed to decrease in the third and fourth decades, then holds steady or increases over following decades. Timber merchantability standards, yield tables, and inventory data are updated to current or proposed standards. Tentatively suitable timber land inventory was updated according to Regional direction.
2. Wildlife MR's are included.
3. The entire complement of inventoried VQO's from the land use plans are included.
4. Management options for candidate Wild and Scenic Rivers will be maintained as per current direction.
5. Riparian areas will be managed under Prescription option B (current Siskiyou riparian policy).
6. A moderate rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except 1 NDY released first and fifth decades.

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	46,850
Retention	33,115
Partial Retention	145,019

Purpose: Constrain acres with timber management options to those of current plans.
Rationale: Represent the no action alternative with current direction land assignments.

3. Constraint. Harvest volume equal to 31.2 MMCF decades 1 and 2, and 30 3 decade 3.
Purpose: Produce current timber outputs for two decades and then provide transition to floor described below
Rationale: Releasing NDY without these constraints would result in a more radical departure. These constraints provide the moderate departure and smooth transition desired for the alternative

4. Constraint: Floor of 29.4 MMCF.
Purpose: Avoid fluctuating harvest schedule following the departure.
Rationale: This level was determined from the base run as that which could be maintained following the departure until the swing up toward LTSY.

5. Constraint: Minimum LTSY set at 52.7 MMCF.
Purpose: LTSY of departure must be equal to or greater than LTSY of the base run
Rationale: Satisfy requirement.

6. Constraint: Hardwood conversion not to exceed 7,500 acres in any decade.
Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

ALTERNATIVE B

Goals. This alternative is formulated to meet RPA targets. Timber and fish outputs are the hardest to achieve so this alternative is built from a land assignment which emphasizes timber and fisheries management. Targets for other resources are met coincidentally without additional emphasis, or are achieved through increasing capital investments. Fisheries also has a high level of capital investment programmed. In addition to the land assignment, it is also necessary to depart from NDY to achieve the timber target for the first two decades.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production must equal 36.8 MMCF ASQ for the first two decades. It is allowed to decrease in the third, fourth, and fifth decades, then holds steady or increases over following decades.
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would only be allocated in the highest priority viewsheds.
4. Six Planning Basins with high fisheries potential would be allocated to Riparian option C.
5. A high rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except 1 NDY released decades 1 - 5.

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	47,078
Retention	6,817
Partial Retention	77,969

Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas allocated for fisheries and minor allocations to other Management Areas which do not allow timber management. Also to constrain harvest on the areas with allocated VQO's.

Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3. Constraint: Harvest volume equal to 36.8 MMCF decades 1 and 2, 33.0 decade 3, and 28.0 decade 4.

   Purpose: Produce timber outputs at the RPA target level for two decades and then provide transition to floor described below

   Rationale: These constraints provide the target timber outputs and smooth transition to the floor level.

4. Constraint: Floor of 25.0 MMCF.

   Purpose: Avoid fluctuating harvest schedule with extreme low points following the departure

   Rationale: This level is 80 percent of the current output and it was determined from the base run that it could be maintained following the departure until the swing up toward LTSY.

   Constraint: Minimum LTSY set at 54.8 MMCF.

   Purpose: LTSY of departure must be equal to or greater than LTSY of the base run.

   Rationale: Satisfy requirement.

5. Constraint: Hardwood conversion not to exceed 14,000 acres in any decade

   Purpose: Limit conversion acres to a level consistent with the theme of the alternative.

   Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

6. Constraint: Riparian areas constrained to Prescription option C in Basins 01, 04, 05, 07, 13, and 16. Also limited created openings to Basin specific constraints (9 to 13 percent) in these Basins in lieu of common constraint 4.

   Purpose: Increase fish production capability in these Basins to achieve RPA fish targets.

   Rationale: Affording more habitat protection through the prescription option and harvest dispersion results in increased fish outputs as well as increased benefits from the capital investments.

ALTERNATIVE C

Goals. Alternative C is designed to provide the highest sustainable level of timber outputs from the Forest. It includes minimal allocations for other resources beyond MR's.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production will be relatively unconstrained beyond MR's, general multiple use considerations and NDY.
2. Wildlife MR's are included.
3. Only the highest priority viewsheds have VQO's allocated and in these areas the Retention acres are reduced to Partial Retention. The only acres managed for Retention would be the Scenic and Recreation Rivers.

4 Riparian areas will be managed under Prescription option B.
5 A high rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints.

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	39,523
Retention	3,361
Partial Retention	67,657

Purpose: Constrain acres with timber management options to meet MR's and minimal allocations to other resource emphasis.
Rationale: Represent the land assignment designed to accomplish the goals of the alternative.

3. Constraint: Hardwood conversion not to exceed 14,000 acres in any decade.
Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
Rationale. When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

ALTERNATIVE D

Goals. This alternative is formulated to emphasize the production of goods and services that have market values It is similar to the RPA alternative (B) except that it has NDY (actually the base run for Alternative B).

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production would be at a high level under NDY.
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would only be allocated in the highest priority viewsheds.
4. Six Planning Basins with high fisheries potential would be allocated to Riparian Prescription option C
5. A high rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints.

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	47,078
Retention	6,817
Partial Retention	77,969

Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas allocated for fisheries and minor allocations to other Management Areas which do not allow timber management. Also to constrain harvest on the areas with allocated VQO's.

Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3. Constraint: Hardwood conversion not to exceed 14,000 acres in any decade.
   Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
   Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

4. Constraint: Riparian areas constrained to Prescription option C in Basins 01, 04, 05, 07, 13, and 16 Also limited created openings to Basin specific constraints (9 to 13 percent) in these Basins in lieu of common constraint 4.
   Purpose: Increase fish production capability in these Basins.
   Rationale: Affording more habitat protection through the prescription option and harvest dispersion results in increased fish outputs.

ALTERNATIVE D1

Goals. *This alternative is very similar to Alternative D. It also emphasizes the production of goods and* services that have market values. It differs in that it further emphasizes short-term timber outputs by allowing rotations shorter than 95 percent of CMAI.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production would be at a high level under NDY, with short rotations allowed
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would only be allocated in the highest priority viewsheds
4. Six Planning Basins with high fisheries potential would be allocated to Riparian Prescription option C.
5. A high rate of hardwood conversion would be allowed.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except 3, minimum timber rotations at 95 percent of CMAI.

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	47,078
Retention	6,817
Partial Retention	77,969

   Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas allocated for fisheries and minor allocations to other Management Areas which do not allow timber management. Also to constrain harvest on the areas with allocated VQO's.
   Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3. Constraint: Hardwood conversion not to exceed 14,000 acres in any decade
   Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
   Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

4 Constraint: Riparian areas constrained to Prescription option C in Basins 01, 04, 05, 07, 13, and 16. Also limited created openings to Basin specific constraints (9 to 13 percent) in these Basins in lieu of common constraint 4.
Purpose: Increase fish production capability in these Basins.
Rationale: Affording more habitat protection through the prescription option and harvest dispersion results in increased fish outputs.

5. Constraint: Minimum timber rotations are set at two decades prior to reaching 95 percent of CMAI.
Purpose: Allow a higher rate of harvest.
Rationale: This approach would allow the Forest to produce more timber in the early decades without a decline in yield in future decades. It provides another way of addressing the timber supply issue without departing from NDY.

ALTERNATIVE E

Goals. This alternative emphasizes aesthetic and other nonmarket values. All of the unroaded areas would remain undeveloped.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are.

1. Timber production would be subordinate to other resource allocations.
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would be allocated in all viewsheds.
4. Riparian areas would not have programmed timber harvest.
5. No hardwood conversion would be allowed
6. Areas with special resource values, such as sensitive plants, wildlife habitat, and supplemental fish and watershed protection zones, would not have programmed timber harvest
7. Candidate rivers would be recommended for Wild and Scenic River designation.

The constraints used to meet the criteria and assumptions are:

1 All common constraints except 4 and 5. (4 is made more stringent below and 5 is made unnecessary by the land assignment.)

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	318,470
Retention	16,973
Partial Retention	94,202

Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas, areas with special resource values, Wild Rivers, and wildlife habitat areas which do not allow timber management. Hardwood stands and riparian acres are assigned to Minimum Level. Also harvest is constrained on the areas with allocated VQO's. Scenic and Recreation River acres are included in Retention.
Rationale: Represent the land assignment designed to accomplish the goals of the alternative.

3. Constraint: Created openings limited to Basin specific constraints (9 to 13 percent) in lieu of common constraint 4.

Purpose: Provide better dispersion of harvest activities across the Basins.
Rationale: Lessen the risks to soil, watershed and fisheries resources by evening out peaks in ground disturbing activities.

ALTERNATIVE G

Goals. This alternative emphasizes the protection and enhancement of the Forest's nontimber resources, particularly the water related resources associated with the rivers and streams. It favors unroaded recreation and a high level of visual quality management.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production would be at a high level for those areas not allocated to other management emphases.
2. Wildlife MR's are included
3. The full range of inventoried VQO's would be allocated for all viewsheds
4. All Planning Basins would be allocated to Riparian Prescription option C.
5 A low rate of hardwood conversion would be allowed
6. Some areas with special resource values, such as sensitive plants, wildlife habitat, and supplemental fish and watershed protection zones, would not have programmed timber harvest
7. Candidate rivers would be recommended for Wild and Scenic River designation.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except 4 and 5. (4 is made more stringent below and 5 is changed to Riparian Prescription option C)

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	177,519
Retention	19,085
Partial Retention	115,040

Purpose: Constrain acres with timber management options to allow for the Supplemental Resource areas, areas with special resource values, Wild Rivers, and wildlife habitat areas which do not allow timber management Also harvest is constrained on the areas with allocated VQO's. Scenic and Recreation River acres are included in Retention.
Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3. Constraint: Created openings limited to Basin specific constraints (9 to 13 percent) in lieu of common constraint 4.
Purpose: Provide better dispersion of harvest activities across the Basins.
Rationale. Lessen the risks to soil, watershed and fisheries resources by evening out peaks in ground disturbing activities.

4. Constraint: Hardwood conversion not to exceed 4,000 acres in any decade.
Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade

ALTERNATIVE K

Goals. This alternative is designed to produce a wide range of resource outputs It produces a moderate level of timber outputs with some land assigned to other resource emphasis.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are.

1. Timber production would be at a moderate to high level under NDY.
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would only be allocated in the highest priority viewsheds Some of the moderate priority viewsheds have allocations to Partial Retention.
4. Planning Basin 01 would be allocated to Prescription Option C.
5 A moderate rate of hardwood conversion would be allowed.
6 Some areas with special resource values, such as sensitive plants, wildlife habitat, and supplemental fish and watershed protection zones, would not have programmed timber harvest.

The constraints used to meet the criteria and assumptions are:

1 All common constraints except 4. (4 is made more stringent below)

2 Constraint Constrained available suitable acres:

Allocated Minimum Level	72,531
Retention	7,155
Partial Retention	97,253

Purpose· · Constrain acres with timber management options to allow for the Supplemental Resource Areas, areas with special resource values, and wildlife habitat areas which do not allow timber management. Also harvest is constrained on the areas with allocated VQO's. Scenic and Recreation River acres are included in Retention

Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3 Constraint. Created openings limited to Basin specific constraints (9 to 13 percent) in lieu of common constraint 4.

Purpose: Provide better dispersion of harvest activities across the Basins

Rationale: Lessen the risks to soil, watershed and fisheries resources by evening out peaks in ground disturbing activities.

4. Constraint: Hardwood conversion not to exceed 7,500 acres in any decade.

Purpose: Limit conversion acres to a level consistent with the theme of the alternative.

Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade

5. Constraint: Riparian areas constrained to prescription option C in Basin 01

Purpose Increase fish production capability in this Basin.

Rationale. Affording more habitat protection through the prescription option results in increased fish outputs.

ALTERNATIVE M

Goals. This alternative emphasizes preservation rather than human use of the resources All unroaded areas would remain undeveloped. Areas not accessed by current roads would not be managed for timber production. Areas selected for timber production would be managed on a long rotation to mimic natural stands.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are:

1. Timber production would be subordinate to other resource allocations Minimum rotation length is 250 years.
2. New access roads would not be built.
3. Wildlife MR's are included.
4. The full range of inventoried VQO's would be allocated in all viewsheds.
5. Riparian areas would not have programmed timber harvest
6. No hardwood conversion would be allowed.
7. Areas with special resource values, such as sensitive plants, wildlife habitat, and supplemental fish and watershed protection zones, would not have programmed timber harvest
8. Candidate rivers would be recommended for Wild and Scenic River designation.

The constraints used to meet the criteria and assumptions are:

1. All common constraints except 4 and 5. (4 is made more stringent below, and 5 is made unnecessary by the land assignment.)

2. Constraint: Constrained available suitable acres:

Allocated Minimum Level	371,483
Retention	105,004

   Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas, areas with special resource values, Wild Rivers, and wildlife habitat areas which do not allow timber management. Hardwood stands, acres not accessible by existing roads, and riparian acres are assigned to Minimum Level Also, harvest is constrained on the areas with allocated VQO's. Scenic and Recreation River acres are included in Retention.
   Rationale: Represent the land assignment designed to accomplish the goals of the alternative

3. Constraint: Created openings limited to Basin specific constraints (9 to 13 percent) *in lieu* of common constraint 4.
   Purpose: Provide better dispersion of harvest activities across the Basins.
   Rationale: Lessen the risks to soil, watershed and fisheries resources by evening out peaks in ground disturbing activities.

4. Constraint: All acres with timber management allowed are assigned to the Retention prescription in FORPLAN.
   Purpose: Access the Retention yield tables with minimum rotations of 250 years.
   Rationale: This provides for the long rotation required by the definition of this alternative.

ALTERNATIVE S

Goals. This alternative is designed to produce a wide range of resource outputs. It incorporates many suggestions and changes resulting from public comments on the DEIS.

Criteria and Assumptions. The criteria and assumptions underlying the development of this alternative are.

1. Timber production would be at a moderate to high level under NDY.
2. Wildlife MR's are included.
3. The full range of inventoried VQO's would only be allocated in the highest priority viewsheds. Some of the moderate priority viewsheds have allocations to Partial Retention.
4. Planning Basins 01, 03, 05, 06, 07, 12, and 13 would be allocated to Prescription Option C.
5. A moderate rate of hardwood conversion would be allowed.
6. Some areas with special resource values, such as sensitive plants, wildlife habitat, and supplemental fish and watershed protection zones, would not have programmed timber harvest.

The constraints used to meet the criteria and assumptions are·

7. All common constraints except 4. (4 is made more stringent below.)

8 Constraint: Constrained available suitable acres:

Allocated Minimum Level	91,910
Retention	13,021
Partial Retention	101,664

Purpose: Constrain acres with timber management options to allow for the Supplemental Resource Areas, areas with special resource values, and wildlife habitat areas which do not allow timber management. Also harvest is constrained on the areas with allocated VQO's. Scenic and Recreation River acres are included in Retention

Rationale: Represent the land assignment designed to accomplish the goals of the alternative.

9. Constraint: Created openings limited to Basin specific constraints (7 to 17 percent) in lieu of common constraint 4.
   Purpose: Provide better dispersion of harvest activities across the Basins.
   Rationale: Lessen the risks to soil, watershed and fisheries resources by evening out peaks in ground disturbing activities.

10. Constraint: Hardwood conversion not to exceed 7,500 acres in any decade.
    Purpose: Limit conversion acres to a level consistent with the theme of the alternative.
    Rationale: When not constrained, FORPLAN sometimes scheduled large blocks of hardwood acres in a single decade.

11. Constraint: Riparian areas constrained to prescription option C in Basins 01, 03, 05, 06, 07, 12, and 13.
    Purpose· Increase fish production capability in these Basins.
    Rationale· Affording more habitat protection through the prescription option results in increased fish outputs.

SUMMARY OF EFFECTS

A comparative analysis between alternatives and benchmarks is the basis for evaluating alternatives and selecting a preferred alternative. This section displays the differences between alternatives, their outputs, constraints, foregone opportunities, and economic efficiencies. For additional information, refer to the previous sections of this appendix and Chapter IV of the DEIS.

First, the process for evaluating constraints is discussed Then, the different responses of alternatives to the Planning Problems are compared. Last of all, the explanations for different economic benefits among alternatives are presented and compared with the differences in outputs and effects

PROCESS FOR EVALUATING SIGNIFICANT CONSTRAINTS

Management objectives of benchmarks and alternatives were achieved by constraining the FORPLAN model as described in previous sections. The opportunity costs of individual objectives were determined by calculations comparing the FORPLAN solution which achieves a specific objective with a solution which does not (usually the Max PNV Benchmark) When all other objectives are the same, the difference in outputs and effects are the opportunity costs of achieving the objective when both solutions have the same choice of prescriptions.

Opportunity costs were not determined for individual elements of alternatives using FORPLAN because of the prohibitive costs of analyzing every constraint used to develop alternatives. However, the economic tradeoffs of sets of constraints were determined by comparing alternatives, benchmarks, and sensitivity analysis runs. This information was then used to identify the opportunity costs associated with land allocations, objective functions, and riparian prescriptions (see tables at end of section).

Incremental changes in PNV and the timber production opportunities are displayed for each alternative. The opportunity costs for the recreation, fisheries, and wildlife programs are calculated using the PNV benchmark and the alternative with the next highest PNV for comparison For the recreation program, changes in the budget directly affect the opportunity costs since recreation benefits change little between the alternatives. The fisheries opportunity costs are a result of capital investments and riparian prescriptions The foregone timber harvest due to riparian prescriptions is displayed under the timber program For the wildlife program, the opportunity costs are associated with the wildlife capital investments and the benefits derived from the amount of seral vegetation produced by the Forest.

The effects of each change in the constraints are then displayed in order of decreasing PNV by alternatives with the nondeclining harvest constraint

All alternatives, including the departures (Alternatives B and A-Departure) and those with the different rotation lengths (Alternatives D1 and M), were then examined in order of decreasing PNV The constraints associated with the departure alternatives are the residual opportunity costs after all other previously discussed opportunity costs have been calculated. Selected suitable acres also change due to the departure scheduling and are displayed. The opportunity costs and selected suitable acres associated with the change in rotation length were calculated using the same technique The selected suitable acres change for the departures due to the increased flexibility when the nondeclining flow constraint is relaxed and outputs are allowed to drop in decades 3 through 6. Allowing shorter rotations also allows greater flexibility resulting in fewer acres being selected. These opportunity costs and changes in selected suitable acres associated with these variations in harvest flow and rotation constraints are also displayed.

ECONOMIC EFFICIENCY ANALYSIS OF ALTERNATIVES

The purpose of this section is to display and compare the differences in economic costs and benefits of the alternatives, and to discuss the general reasons for these differences. More complete discussions of the relationship between economic values and net public benefits appear in the following section, **MAJOR TRADEOFFS AMONG ALTERNATIVES.**

COMPARISON OF COSTS AND BENEFITS

Table B-8 displays Present Net Value (PNV) and total discounted costs and benefits for the alternatives and the Maximum PNV Benchmark. PNV is the primary measure of economic efficiency used by the Forest Service It is the sum of priced benefits minus the sum of costs for the 150-year planning horizon, discounted to the present at the rate of four percent per year Testing a discount rate of 7 1/8 percent per year has been documented in the section on sensitivity testing

Table B-8 PNV, Discounted Costs, and Discounted Benefits, with Incremental Changes for Alternatives ranked in order of decreasing PNV (MM $ discounted at four percent for 15 periods)

	MM $					
Alternative	PNV	Change	Costs	Change	Benefits	Change
Maximum PNV Benchmark	1,278		785		2,062	
		-37		+15		-21
B	1,241		800		2,041	
		-27		-8		-35
D1	1,214		792		2,006	
		0		-61		-61
NC	1,214		732		1,946	
		-17		+85		+68
C	1,197		817		2,013	
		-37		-37		-73
D	1,160		780		1,940	
		0		-37		-37
A-Departure	1,160		743		1,903	
		-10		-7		-18
A	1,150		736		1,885	
		-19		-24		-42
S	1,131		712		1,843	
		-48		-3		-51
K	1,083		709		1,792	
		-239		-132		-371
G	844		577		1,421	
		-165		-60		-225
E	679		517		1,196	
		-407		-187		-594
M	272		330		602	

Generally, both discounted costs and discounted benefits decrease as PNV decreases. All three variables are directly related to the level of timber harvest As the amount of timber harvested increases, PNV, discounted benefits, and discounted costs all increase (and conversely decrease as timber harvest declines). Benefits generally decline faster than costs. PNV and level of timber harvest range from the highest in Alternative B to the lowest in Alternative M.

Exceptions to the relationship described above occur in Alternatives NC, B, C, and D1. Alternatives B and C were modeled to maximize timber production They would achieve higher timber outputs by including lands and management regimes that are less economically desirable than those selected for alternatives designed to maximize PNV. Alternative NC would operate on the largest suitable land base, but would not maximize timber production as would Alternatives B and C Alternative D1 has a shorter rotation length

which increases harvest levels of existing old-growth, but would provide less benefits in the future due to the smaller diameter of timber harvested.

Benefits associated with nonmarket goods, such as recreation, do not vary as much between the alternatives as do timber benefits. Recreational benefits are very similar between alternatives due to existing excess capacity compared to present and near-future use Fisheries benefits increase with increased capital improvements and increased protection due to riparian prescriptions. With increased vegetative diversity, wildlife benefits also increase. Benefits associated with minerals production are presently not quantified except for recreational mining and mineral use fees The mineral benefits could become greater in the future if the demand for minerals increases.

Table B-9 displays PNV and discounted benefits for the major resources, and Table B-10 displays discounted costs. Timber is the main component of PNV, discounted costs and discounted benefits Wilderness accounts for less than four percent of each variable in all alternatives

Direct comparisons of benefits and costs displayed for individual resource outputs provide general indications of relationships However, many activities of multiple-use forestry have common costs and benefits, and cannot be exclusively separated and attributed to individual resources. For example, harvest clearcuts produce additional forage while decreasing cover which changes the population of big-game animals with subsequent effects on wildlife benefits

Table B-9. PNV and Discounted Benefits by Major Resource, by Alternative (MM $ discounted at four percent for 15 periods)

	MM $	Discounted Benefits (MM $)					
Alternative	PNV	Timber	Recreation	Fish	Wildlife	Wilderness	Misc
Maximum PNV Benchmark	1,278	1,712	175	106	55	10	3
B	1,241	1,691	175	104	58	10	3
D1	1,214	1,666	175	96	55	10	3
NC	1,214	1,614	175	90	53	10	3
C	1,197	1,674	175	92	59	10	3
D	1,160	1,601	175	96	54	10	3
A-Departure	1,160	1,572	175	90	53	10	3
A	1,150	1,554	175	90	52	10	3
S	1,131	1,486	175	103	67	10	3
K	1,083	1,454	175	101	50	10	3
G	844	1,092	175	98	43	10	3
E	679	871	175	97	39	10	3
M	272	286	175	98	29	10	3

Table B-10 Major Resource Discounted Costs by Alternative, (MM $ discounted at four percent for 15 Periods) 1/

	Discounted Costs (MM $)						
Alternative	Timber	Roads 2/	Recreation	Fish	Wildlife	Wilderness	Fixed and Misc Costs
Maximum PNVBenchmark	378	195	12	13	2	2	181
B	415	181	12	10	3	2	177
D1	404	181	12	7	2	2	183
NC	358	162	11	7	2	1	190
C	428	187	11	8	2	3	177
D	405	172	12	7	2	2	179
A-Departure	373	162	11	7	2	1	187
A	366	162	11	7	2	1	185
S	336	142	15	12	7	2	196
K	345	153	12	9	2	2	187
G	251	107	13	8	2	1	195
E	211	88	12	7	2	1	195
M	90	16	13	8	2	1	199

1/ Direct comparisons of benefits and costs displayed for individual resource outputs provide general indications of relationships However, many activities of multiple use forestry have common costs and benefits, and cannot be exclusively separated and attributed to individual resources

2/ Costs for roads includes Forest Service and purchaser costs for road construction and reconstruction but not maintenance

COSTS

Two types of costs are included in Forest management: (1) operation and maintenance, and (2) capital investment

Operation and maintenance costs are the costs of activities required to plan and manage outputs, and maintain existing capital assets at standard levels These include fixed costs such as general administration, and variable costs which vary with different levels of outputs. Fixed costs are constant across all alternatives, whereas variable costs differ among alternatives The major determinant affecting variable costs is the quantity of timber produced, timber production generates the analyses and project support needed to assure quality management of the fisheries, wildlife, and watershed resources.

Capital investment costs are the costs of creating or enhancing capital assets, such as roads, trails, or fish habitat improvement structures. Road construction costs are the main component of capital investments; they are also a direct function of timber harvest activity. Other capital investment costs such as fish and wildlife vary independently of the timber program. Total costs for alternatives vary both above and below the current direction (Alternative A) budget level of 21 million dollars per year.

NET CASH FLOWS, ECONOMIC BENEFITS, AND COSTS

Table B-11 displays average annual net cash flows, total receipts, total costs, and noncash economic benefits, by alternative, for the first and fifth decades. The fifth decade is shown because it represents the RPA planning horizon and captures most of the changes within the alternatives that occur in later decades.

In Table B-11, annual net cash receipts are total Forest receipts minus total Forest costs This economic indicator, like others discussed earlier, varies directly with the level of timber outputs Net cash flow would be positive for all of the alternatives with the exception of Alternative M. In Alternative M, costs of operating and maintaining the Forest would be greater than the receipts from selling timber and other outputs

Table B-11 Average Annual Net Cash Receipts, Total Costs, Total Cash Receipts, and Noncash Benefits for Decades 1 and 5 (MM $)

	MM $/Decade							
	Net Cash Receipts		Total Cost		Total Receipts		Noncash Benefits	
Alternative	1	5	1	5	1	5	1	5
B	43 0	25 0	24 9	26 0	67 9	51 0	8 8	10 8
D1	38 2	29 8	23 1	27 0	61 3	56 8	8 6	10 4
NC	36 0	41 1	21 0	27 1	57 0	68 2	8 6	10 2
A-Departure	35 8	35 4	21 6	27 3	57 4	62 7	8 6	10 2
A	34 1	37 8	21 1	27 1	55 3	64 9	8 6	10 2
C	32 1	45 3	26 3	27 9	58 4	73 2	8 6	9 9
S	31 9	34 3	21 7	25 0	53 6	59 2	9 1	11 0
D	31 6	42 0	24 2	26 2	55 8	68 2	8 5	10 3
K	29 0	35 8	21 6	24 5	50 6	60 3	8 7	10 5
G	20 1	20 5	17.8	20.7	37 9	41 2	8 6	10 5
E	13 2	12 6	16 7	18 4	29 9	31 0	8 7	10 4
M	-1 4	-0 9	12 2	13 0	10 8	12 1	8 7	10 5

The alternatives are listed in order of decreasing first decade net cash flows The ranking of the alternatives is somewhat different than under the decreasing PNV ranking. The primary difference is that the departure Alternatives A-Departure and B would have higher first decade net cash flows because they would harvest more timber in the first decade. Alternatives C and D (which have higher PNV for 15 decades than Alternative A-Departure) are modeled somewhat differently than the other alternatives. They would have higher costs because they include less economically desirable lands and practices in order to increase overall timber outputs. Alternative S is different due to the more intensive timber management of lands currently roaded; fertilization of plantations and the exclusion of expensive road construction in areas allocated to Backcountry Recreation allow cash flows to be higher. Net cash flows for the other alternatives follow the same pattern as that for PNV

Economic benefits are reported in two columns. as total receipts, and as noncash benefits. Total receipts are money that the Forest receives from the sale of products and uses They include timber, fuelwood, developed recreation, river permit fees, range fees, special use permits, and power and minerals use fees. Commercial timber sales represent approximately 99 percent of total receipts across the alternatives, with the exception of Alternative M where they comprise approximately 50 percent because of reduced harvests due to longer rotations and no additional roading. Changes in the amount of timber sold also account for virtually all of the differences in total receipts among the alternatives. The other components of total receipts remain relatively constant through all alternatives.

Noncash benefits are economic values that have been assigned to uses of Forest resources that have value, but have not been generally traded in a marketplace where money is exchanged. They are based on research of individuals' willingness to pay for certain types of experiences. The noncash benefits *included in the Siskiyou's planning model are Recreation Visitor Day (RVD) use values for various types* of wildlife, fishing, and general recreation experiences. General recreation use does not vary much between the alternatives due to excess capacity over existing use. The increase shown in future decades is the result of projections of increased demand for outdoor recreation on the Forest. The RVD values for *fishing experiences depend on the fisheries outputs. As more fish are produced as a result of capital* investments or more restrictive riparian prescriptions, more use is predicted. Wildlife use is modeled by projecting increasing use with increased habitat capability for big game and game birds, and with increased recreational use over time for nongame wildlife use.

PAYMENTS TO COUNTIES

National Forest Funds (NFF), which comprise 25 percent of all Forest receipts to the U S Treasury, are distributed to counties based on the amount of Forest land in each county. O&C funds, which are 50 percent of funds generated from O&C lands, are distributed on the basis of a percentage established by Federal law. The returns projected for each alternative (Figure B-4) vary due to the level of Allowable Sale Quantity and land allocations.

RELATED EMPLOYMENT AND INCOME CHANGES

Projected changes in timber harvest, recreational use, and fish harvest would result in changes in employment and income for the four-county area of influence. The total employment and income for the four-county area in 1983 were 76,000 jobs and 1.163 billion dollars. The estimated changes in employment are calculated using Alternative A (Current Direction) as the basis, with two base conditions for timber outputs: the 10-year average annual historic harvest of 128.1 MMBF, and the Allowable Sale Quantity for Alternative A of 167.9 MMBF. The variation among alternatives in projected employment and income changes (Figures B-5 and B-6) is primarily due to timber harvest related activities. The figures represent direct, indirect, and induced effects of producing outputs.

Alternative B has the highest projected gain in jobs and income, while Alternatives NC, A, A-Departure, C, D, D1, and S project sizable increases (greater than 500 jobs and greater than 13 million dollars income). Moderate increases in jobs and income are projected for Alternative K. Alternative G projects moderate decreases in jobs and incomes (less than 350 jobs and greater than 7 million dollars). Alternatives E and M have sizable decreases in projected jobs and incomes.

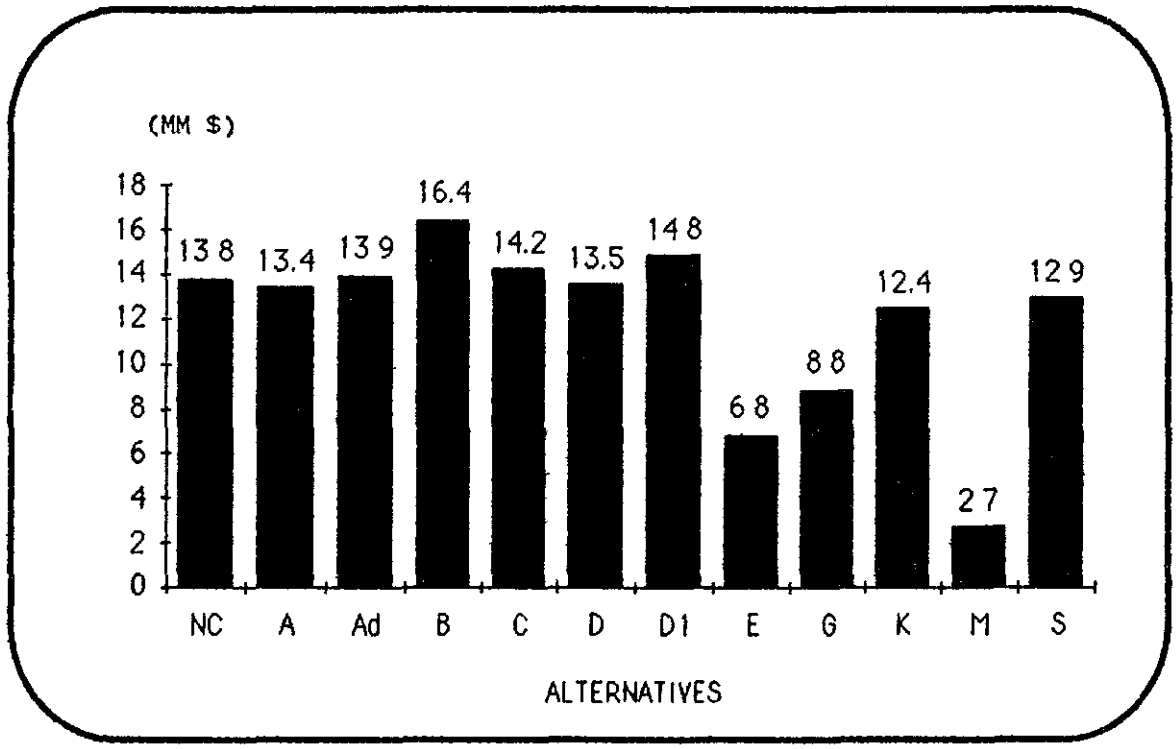


Figure B-4. Predicted Payments to Counties

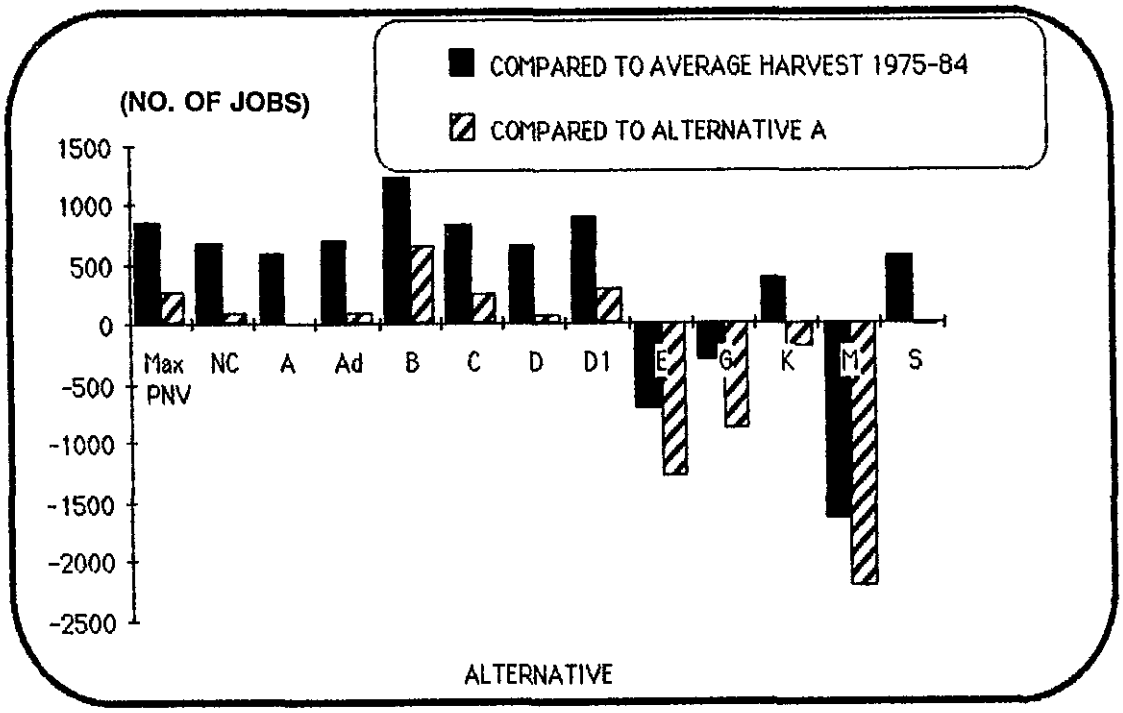


Figure B-5. Predicted Effects on Jobs

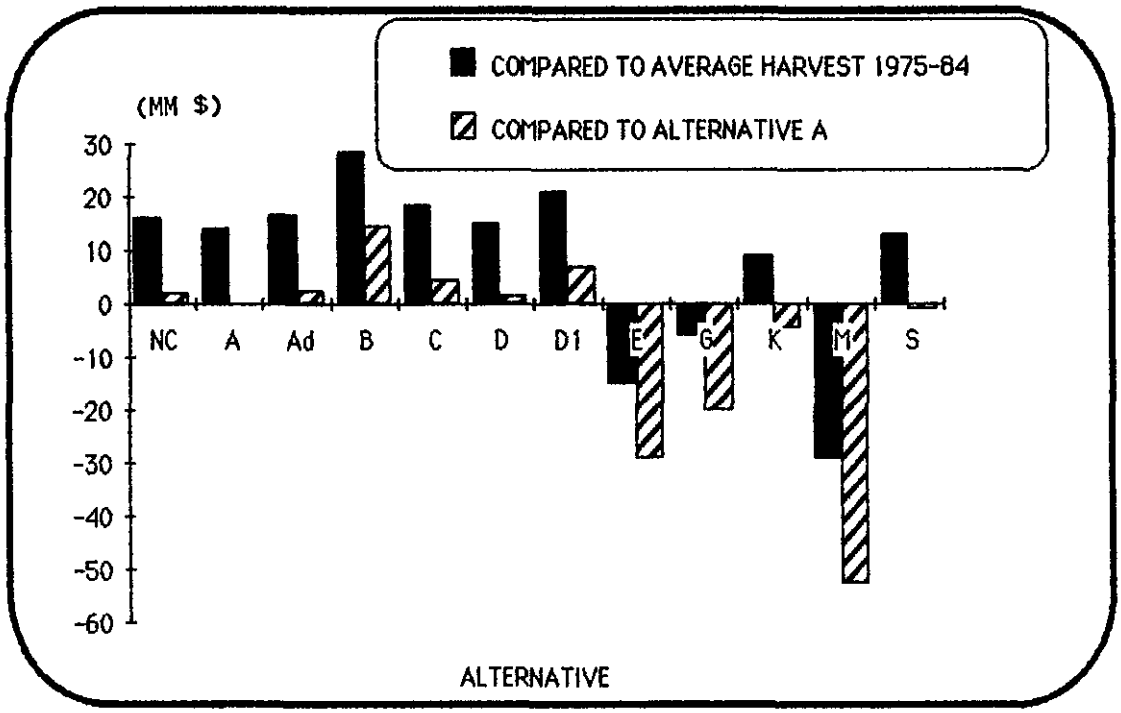


Figure B-6 Predicted Effects on Income

COMMUNITY EFFECTS

The previous discussion has considered only the economic programs of the Forest The social effects of the alternatives including the effects on community stability, lifestyles, and community cohesion are also important considerations.

"Community stability" is defined as a community's capacity to handle change without major hardships or disruptions to component groups or institutions. Slow, steady growth is the desired condition for economic and social stability. It allows for limited economic displacement of jobs due to sudden change with steadily increasing opportunities. Sudden economic booms are also avoided An acceptable range for change will be defined as a predicted increase of less than two percent in jobs or income in the area of influence due to changes in Forest outputs. Any decrease in present jobs or future outputs is deemed less desirable Within this range, the communities would be able to readily adjust to the changes brought on by an increase in jobs and income. If economic stagnation is prevalent, a loss of jobs, now as in the future may require significant community adjustment.

Of course, these communities do not operate in a vacuum and forces other than Forest outputs influence the economic climate. However, for this analysis, these other forces are assumed to be constant. In general, Alternatives NC, A, C, D, D1, K, and S are classified as being more desirable for community stability. Alternatives A-Departure, B, E, G, and M are labeled as being less desirable for community stability due to decreases in either present jobs or future outputs and associated jobs.

Lifestyles are a result of the economic climate and local environment The freedom, individualism, and security associated with the existing local lifestyles are affected little by any alternative, except perhaps Alternative M which greatly reduces Forest-related employment Increases in Forest outputs could increase personal incomes which might provide added security to an individuals chosen lifestyle, provided the economic climate is not favoring development to the point of encroaching on individual freedom.

Alternatives NC, C, D, and D1 have the potential to increase incomes significantly (greater than one percent of total income in the area). Alternatives A-Departure and B would also boost income significantly in the first decade, but would have decreased outputs in the future. Alternatives A, K, and S would not tend to affect incomes very significantly (less than one percent total change in income). Alternatives E, G, and M have potential to decrease incomes significantly (greater than three percent decline in total income in the area of influence).

"Community cohesion" is defined as the degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them. As with lifestyles, community cohesion is not significantly affected by different alternatives due to the degree of existing conflict. The many differing opinions about Forest management can only be resolved by participation and communication of the parties with conflicting opinions. Alternatives that emphasize timber production at the expense of preservation of old growth and unroaded areas, or favor the preservation of old growth and unroaded areas at the expense of timber production, may tend to accentuate the conflict over Forest management Alternatives NC, A-Departure, B, C, D, D1, G, E, and M may then aggravate conflict in those communities where conflict already exists. Alternatives A, K, and S, because they tend to continue present direction or seek a better balance, will not solve conflict, but should not encourage conflict beyond its present evolution

OPPORTUNITY COSTS

Opportunity cost is the value of the opportunity lost or foregone when implementing an alternative instead of the Maximum PNV Benchmark It is calculated as the difference in total PNV between the PNV benchmark and the alternative. Most of the opportunity costs (Figure B-7) for each alternative are related to foregoing timber harvest due to unroaded designation, riparian prescriptions, suitable wildlife habitat, quality visuals management, or old growth preservation.

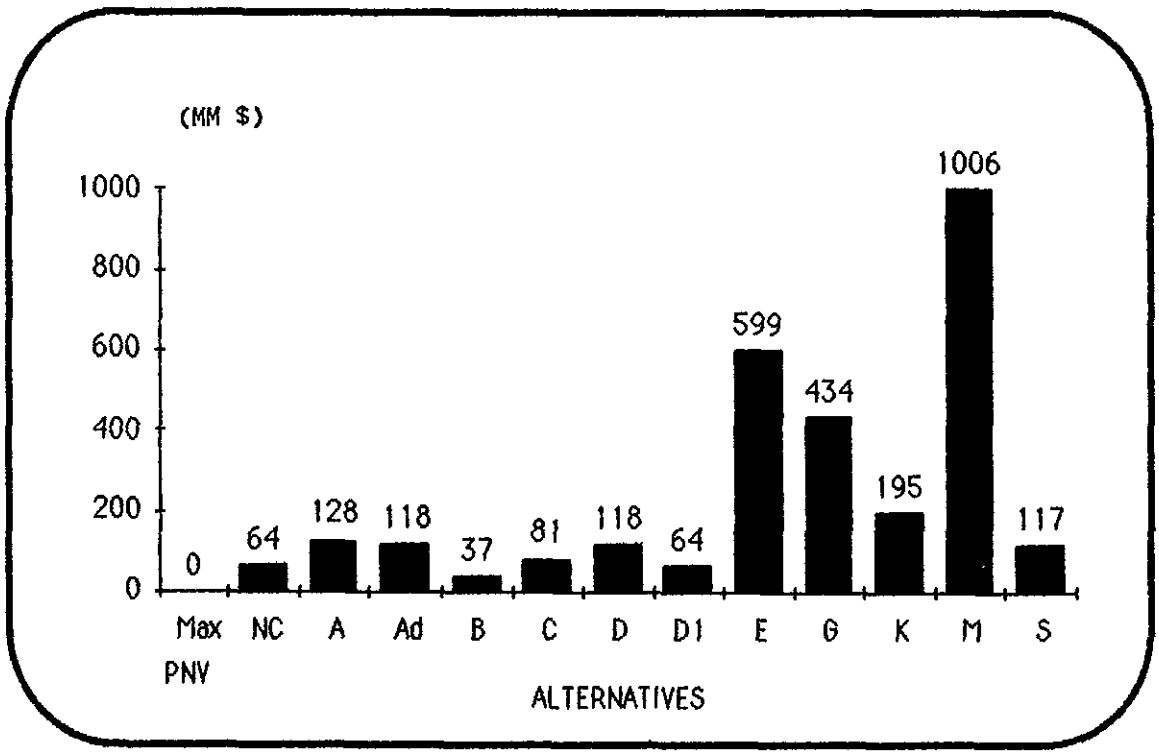


Figure B-7 Change in Opportunity Costs Compared to Maximum PNV Benchmark (MM $)

MAJOR TRADEOFFS AMONG ALTERNATIVES

This section summarizes the relationships among the economic values and community effects discussed in the previous section, **ECONOMIC EFFICIENCY ANALYSIS OF ALTERNATIVES**, and the differing responses among alternatives to the selected Planning Problems discussed in Appendix A The purpose is to highlight major economic and non-economic tradeoffs or combinations of differences that can be quantified as indicators of response to the Planning Problems However, a complete understanding of the differences among alternatives requires reading all of Chapters II and IV, and Appendix B.

To provide a partial framework for assessing these tradeoffs, the long-term resource demands or needs of the Nation, region, and local communities are briefly summarized; then selected economic values and quantified indicators of responsiveness to the Planning Problems are tabulated. Finally, differences and similarities among individual alternatives are summarized in terms of major tradeoffs among competing objectives or responses to expressed public issues, management concerns, or resource use and development opportunities

NATIONAL, REGIONAL, AND LOCAL OVERVIEW

National (RPA) planning estimates that total National demands will rise for outputs from all National Forests. At the same time, there is a strong demand to protect and enhance the quality of the environment. Demands and prices for production are generally determined in National markets and the Nation benefits most when supplies are provided using the most efficient sources of production.

The demands for outdoor recreation uses and wildlife uses are mainly local and regional, although the Rogue River does attract National attention Recreationists that visit the Siskiyou National Forest generally

come from southwestern Oregon and northern California. Total recreation growth is predicted to increase by one-half percent per year

The 1980 population in the four-county area was 271,500 This was an increase of approximately 35 percent from 1970, at least moderate growth is predicted for the next 10 years. In 1980, total employment was about 76,000 for the area of influence with approximately 3,500 of those jobs coming from direct, indirect, and induced effects of Forest outputs Approximately 70 percent of the Forest-dependent jobs are due to consumption of timber outputs Recreation, wildlife, and fisheries activities generate the rest of the Forest-derived employment

ECONOMIC VALUES AND RESPONSES TO MAJOR ISSUES, CONCERNS, AND OPPORTUNITIES

Alternatives differ so that each responds to the Planning Problems identified for this Forest in a different way. This section summarizes many of these differences in response by defining quantitative indicators for gauging the resolution of the Planning Problems It also discusses indicators of central concern to the Nation as a whole. Appendix A and Chapter I discuss the development of the Planning Problems from the issues, concerns, and opportunities identified during scoping, and provides the linkages between the Planning Problems and key indicators. The indicators for the Planning Problems which incorporate the major issues, concerns, and opportunities, and the local and National indicators used in this comparison are.

1. Indicators for TIMBER PRODUCTION
   - Selected suitable area (M Acres)
   - First decade Allowable Sale Quantity (ASQ) (MMCF)
   - Long-term sustained yield (LTSY) (MMCF)

2. Indicators for OLD-GROWTH FOREST preservation
   - Reserved area (M Acres)
   - Old-growth habitat available at end of fifth decade (M Acres)

3. Indicators for maintaining or improving the Forest's SOIL PRODUCTIVITY, WATER QUALITY, and FISH HABITAT
   - Anadromous sport Fish User Days (M WFUD's)
   - Average annual sediment (M Tons per decade)

4 Indicator for management of lands in and adjacent to river corridors to protect, preserve, and enhance WILD AND SCENIC RIVER attributes
   - Adjacent area meeting Visual Quality Objectives (M Acres)

5. Indicators for SENSITIVE PLANT resource management
   - Area allocated to Botanical Areas (M Acres)
   - Area allocated to Research Natural Areas (M Acres)

6. Indicators for management of the VISUAL RESOURCES
   - Area allocated to meet Preservation, Retention, and Partial Retention Visual Quality Objectives (VQO's) (M Acres)
   - Area that meets or exceeds Partial Retention (M Acres)

7 Indicators of WILDLIFE HABITAT management
   - Wildlife User Days (M WFUD's)
   - Old-growth habitat in fifth decade (Percent of Forest acreage)

8 Indicator of recreation opportunities in the WILDERNESS and UNROADED areas

- Areas allocated to remain unroaded (M Acres)

9. Indicator of MINERAL resources development
   - Area accessible with limited restrictions (M Acres)

Indicators of LOCAL ECONOMIC and SOCIAL STABILITY.
- First decade payments to counties (MM $)
- First decade changes in employment (Jobs)
- First decade changes in income (MM $)

Indicators of NATIONAL INTEREST.
- PNV (MM $, discounted at four percent over 150-year period)
- Net cash flow (MM $)
- Noncash economic benefits (MM $)

In Table B-12, the indicators identified above are used to suggest the degree of response of each alternative to these Planning Problems. Other displays in Chapter II and discussions in Chapter IV provide more detailed information about specific effects and tradeoffs The alternatives are arranged in order of decreasing PNV.

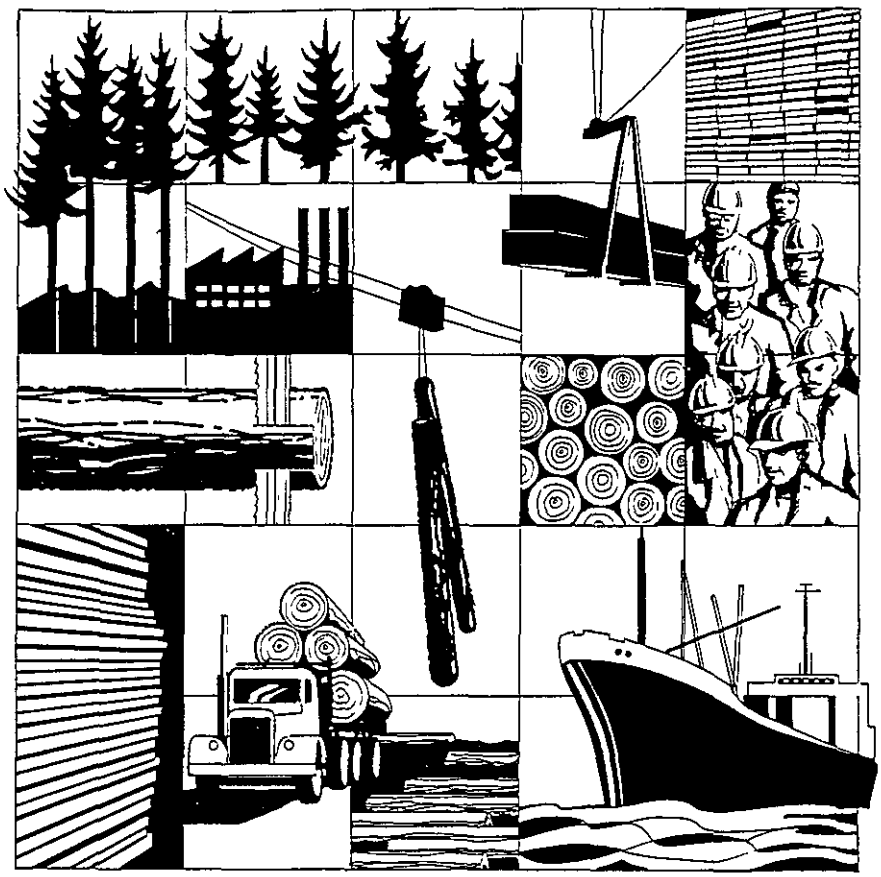


Table B-12. Indicators of Responsiveness to Planning Problems. Alternatives are Ranked in Order of Decreasing PNV.

ALTERNATIVE	National Indicators					Local Indicators										Planning Problems																					
	PNV ($MM)	Avg. Ann. Net Receipts 1st Dec. ($MM)	Avg. Ann. Net Receipts 5th Dec. ($MM)	Avg. Ann. Noncash Ben. 1st Dec. ($MM)	Avg. Ann. Noncash Ben. 5th Dec. ($MM)	1st Dec. Payments to Counties ($MM)	1st Dec. Change in Jobs compared to: Historical Conditions (75-84)	1st Dec. Change in Jobs compared to: Current Direction (Alt. A)	1st Dec. Change in Income compared to: Historical Conditions (75-84) ($MM)	1st Dec. Change in Income compared to: Current Direction (Alt. A) ($MM)	Selected Suitable Area (M Acres)	1st Dec. Avg Sell Volume (MMCF)	Long Term Sustained Yield (MMCF)	1 Total Old Growth Preserved (M Acres)	1 Old Growth 5th Decade (M Acres)	2 Fish User Days ($ MFUDYS)	2 Accelerated Forest Sedimentation (M tons/dec. Mean Dec. 1-5)	3 Adjacent Area Meeting VQO (M Acres)	4 Botanical Areas (M Acres)	4 Research Natural Areas (M Acres)	4 Preservation VQO (M Acres)	5 Retention VQO (M Acres)	6 Partial Retention VQO (M Acres)	6 Net or Exceed P.Retention VQO (M Acres)	7 Wildlife User Days ($ MFUDYS)	7 Old Growth-Hab. 5th Dec. (% Forest)	7 Area Remaining Unroaded (M Acres)	8 Minerals: Access. Area with Limited (low and Moderate) Restrict (M Acres)	9							
Max.PNV	1,278	37.8	48.1	8 8	10.7	N/C	N/C	N/C	N/C	N/C	567	32.4	51.9	164	N/C	74	N/C	N/C	4.5	2.0	342	0	0	0	69.0	N/C	27.8	820									
B	1,241	43.0	25 0	8.8	10.8	16.4	1,230	650	28.7	14.9	558	36.8	54.8	171	175.8	72	990	147.8	9 1	3 3	350	18	106	474	94.3	16.0	36.5	798									
D1	1,214	38.2	29.8	8.6	10.4	14.8	880	300	20.7	6.9	550	33.2	49.0	171	172 6	69	942	147.8	9.1	3.3	350	18	106	474	85.8	15.8	36.5	798									
NC	1,214	36 0	41.1	8 6	10 2	13.8	660	80	15.7	1.9	576	31.0	54.2	153	184.6	67	964	165.6	4.5	3.2	319	72	259	650	77.3	16.9	27 8	786									
C	1,197	32.1	45.3	8.6	10.2	14.2	830	250	18.2	4.4	566	31.8	57.0	166	184 6	68	1,076	145.7	9.1	3.3	342	10	98	450	93.3	16.9	30.7	810									
D	1,160	31.6	42.0	8 5	10 1	13.5	640	60	15.0	1.2	560	30.4	54.8	171	191.2	69	970	147.8	9.1	3 3	350	18	106	474	87.1	17.5	36.5	798									
A-Dep	1,160	35 8	35 4	8.6	10 2	13 9	680	100	16.1	2.3	558	31 2	52.7	174	193 3	67	962	168.1	4 5	3.2	354	66	247	667	84.2	17.7	47.2	787									
A	1,150	34.1	37.8	8 6	9.9	13.4	580	0	13.8	0.0	557	30.1	52.7	174	193.3	67	944	168.1	4.5	3 2	354	66	247	667	83 6	17.7	47.2	787									
S	1,131	31 9	34.4	9 1	11 0	12.9	560	-20	13.0	-1.1	505	29.0	48.0	198	208 6	72	828	156 8	19 6	4.6	488	21	148	657	97.1	19.1	146.5	755									
K	1,083	29.0	35.8	8.7	10.3	12 4	380	-200	9.0	-4 8	529	27.8	48 8	185	199.9	71	800	143.7	10.7	4.8	402	15	145	562	83.1	18.3	70.0	768									
G	844	20.1	20 5	8 6	10.5	8.8	-300	-880	-6.4	-20.2	406	20.5	38.7	254	249 0	70	614	174 5	39 0	4 8	585	31	165	781	78.6	22 8	178.1	732									
E	679	13 2	12 6	8.7	10 4	6.8	-700	-1,280	-15.3	-29.1	287	16 2	32 2	273	296.0	70	510	183.2	27.6	4.8	705	26	116	847	75.5	27.1	284.2	765									
H	272	-1 4	0 9	8 7	10 5	2 7	-1,650	-2,230	-38 8	52 6	207	6.1	22.2	290	356.1	69	174	183.7	39.0	4 8	726	23	109	858	60.0	32 6	347.5	747									

1/ Alternative H includes 98,000 acres of General Forest which was not selected suitable for timber harvest.

Full titles of planning problems:

1 How Much Timber Should the Forest Produce?
2 How Much Old growth Forest Should be Preserved?
3 How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved?
4 How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?
5 How Should Sensitive Plants Resources be Managed?
6. How, and to What Extent, Should Forest Scenic Values be Protected Through Visual Resource Management?
7 How Should Wildlife Habitats on the Forest be Managed?
8 How Will Management Direction Affect Recreation Opportunities in the Wildernesses and Unroaded Areas?
9. How Should Mineral Resources of the Forest be Developed in Coordination with Management of Other Resources?

Maximum PNV Benchmark

PNV $1,278 MM
Opportunity Cost. None

The Maximum PNV Benchmark identifies the mix of goods and services with market and assigned values that results in the largest excess of discounted benefits over discounted costs It meets MR's for resource protection and produces a high level of timber harvest on a nondeclining yield schedule It is summarized here for comparison purposes

The Maximum PNV Benchmark provides 32 4 MMCF of timber the first decade with an LTSY of 51 9 MMCF Protection of old-growth vegetation amounts to 164,000 acres, while 74,000 WFUD's for fisheries, 69,000 WFUD's for wildlife uses, and 735,000 RVD's per year are projected for the first decade

All unroaded areas outside designated Wildernesses would be developed Allocations to Botanical and Research Natural Areas are 1,000 acres and 2,000 acres, respectively A total of 820,000 acres would be available for mineral development.

Average net receipts are $37 8 MM with noncash benefits of $8 8 MM for the first decade In the fifth decade, the net receipts increase to $48 1 MM with noncash benefits of $10 7 MM.

Alternative B

PNV: $1,241 MM
Opportunity Cost $37 MM

INCREMENTAL CHANGE COMPARED TO MAXIMUM PNV BENCHMARK

Alternative B has the highest PNV of any alternative, primarily because first decade timber outputs are high The departure from nondeclining flow allowing more timber harvest in the first decade increases the PNV by $75 MM A reduced land base results in approximately a $13 MM reduction in PNV. The production of the maximum amount of timber given the land base reduces the PNV by approximately $35 MM Other opportunity costs are reflected in reduced harvest levels in riparian areas and General Forest areas in six basins (which reduces PNV by $21 MM). The additional allocation of visual management areas reduces the PNV by $26 MM. The remainder of the changes compared to the PNV Benchmark are due to wildlife, recreation, fisheries, and other miscellaneous programs (net $17 MM reduction).

Returns to the U.S Treasury are increased by $5 2 MM in the first decade The returns decline in the third decade due to reduced timber harvests By the fifth decade, the federal receipts drop by $23 1 MM. Noncash economic benefits, for which no fees would be collected, would stay relatively constant, averaging about $8.8 MM per year in the first decade and increasing to $10 8 MM in the fifth decade

High timber harvests and a large road construction program would result in the largest contributions to community employment (more than 1,220 jobs), income (more than $28.7 MM), and the largest payments to counties ($16.4 MM annually) for the first decade. These would lead to increased economic growth assuming demand for wood products is high enough to result in consumption of all timber offered

Acreages of old-growth trees, Botanical areas, and Research Natural Areas would be increased. The amount of scenic vistas would increase while the area allocated to Backcountry Recreation would remain constant. The projected demand for Primitive and Semi-primitive recreation opportunities exceeds capacity in later decades and Primitive recreation opportunities would be limited to designated Wilderness and Wild River areas by the second decade

Fisheries values are increased due to an intensive capital investment program. Though timber harvest from Riparian Management Areas would be implemented in all planning basins, six basins have more restricted timber harvest constraints in riparian areas and more restrictive scheduling constraints in General Forest areas. This alternative would place the least restrictions on mineral accessibility

INCREASED INDICATORS COMPARED TO MAXIMUM PNV BENCHMARK

1. First decade ASQ (+3.6 MMCF)
2. LTSY (+2 9 MMCF)
3 Botanical areas (+5 M Acres)
4 Research Natural Areas (+1 M Acres)
5 Wildlife (+14.6 M WFUD's)
6 Visual areas (+132 M Acres)
7. Amount of reserved old growth (+6 M Acres)
8 First decade annual net receipts (+$5 2 MM)

DECREASED INDICATORS COMPARED TO MAXIMUM PNV BENCHMARK

1 Selected suitable area for timber production (-9 M Acres)
2. Fisheries (-2 M WFUD's)
3. Fifth decade annual net receipts (-$23.1 MM)
4 PNV (-$37 MM)

Alternative D1

PNV $1,214 MM
Opportunity Cost. $27 MM Compared to Alternative B

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE B

This alternative is second to Alternative B in PNV, net receipts, payments to counties, jobs, and income for the first decade

The major difference between Alternative D1 and Alternative B is the shorter timber rotation and the nondeclining yield timber harvest constraint. The nondeclining yield constraint results in lower first decade timber outputs This accounts for most of the opportunity costs ($75 MM reduction in PNV). The shorter rotation increases PNV by $54 MM The fisheries capital investment program is also reduced with a reduced PNV ($5 MM) for the fisheries program Other benefits and costs do not substantially change

The old-growth trees, unroaded areas, Botanical areas, and area managed for visual resources for this alternative are very similar to Alternative B. Six basins would still be managed with the more restrictive timber harvest within Riparian Management Areas and in General Forest, but fisheries would be managed with a lower capital investment program compared to Alternative B, resulting in slightly lower fisheries benefits. Predicted sedimentation, on the average, would be lower than for Alternative B However, projected sediment would increase in the third, fourth, and fifth decades due to a larger number of acres harvested per year No substantial change would occur in mineral access.

INCREASED INDICATORS COMPARED TO ALTERNATIVE B

1 Increased harvest in the third through fifth decades
2 Amount of reserved old growth (+1 M Acres)
3 Fifth decade annual receipts (+$4 8 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE B

1. First decade ASQ (-3 6 MMCF)
2. Selected suitable area for timber production (-8 M Acres)
3. LTSY (-5.8 MMCF)
4. Wildlife (-2 8 M WFUD's)
5. Old-growth habitat fifth decade (-0 2 percent of Forest)
6. Sedimentation (-46 M tons per decade)
7. Fisheries (-3 M WFUD's)
8. First decade payments to counties (-$1.6 MM)
9. First decade jobs (-350) and income (-$8.0 MM)
10. First decade annual net receipts (-$4 8 MM)
11. PNV (-$27 MM)

Alternative NC

PNV· $1,214 MM
Opportunity Cost: None Compared to Alternative D1

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE D1

Although the No Change Alternative (Alternative NC) has the same PNV as Alternative D1, there are significant differences in the timber, recreation, fisheries, and wildlife programs.

Alternative NC has a larger land base for timber production, which increases the PNV by approximately $33 8 MM. It also has a longer rotation which decreases PNV by $54 MM. Because this alternative does not maximize timber production where costs exceed benefits, its PNV is increased by $35 7 MM compared to Alternative D1 The increased land base allocated to visual management reduces the PNV by $29 3 MM Streamside management with Prescription B in all basins increases PNV by approximately $20.8 MM The total change in the timber program is a $7 MM increase in net benefits.

Other programs are significantly different. A decreased budget for capital investments for recreation improvements results in a $1 MM increase in net benefits due to surplus recreational capacity Lower amounts of fisheries capital investments produce lower net benefits for the fisheries program. Last of all, the lower amount of seral vegetation in the Alternative NC leads to decreased wildlife benefits compared to Alternative D1.

Annual net receipts, payments to counties, and jobs are lower than Alternative D1 in the first decade However, due to the large land base, the fifth decade annual net receipts are larger

Areas reserved for botanical objectives are reduced by approximately 4,000 acres and old-growth habitat reserves are reduced by 39,000 acres. Old-growth habitat existing in the fifth decade would be about 16.9 percent of the Forest, which is an increase compared to Alternative D1 This increase is due to longer rotation on the land base for timber management.

Other changes for key indicators are noted This alternative has the largest land allocation for retention and partial retention visual management. Sediment yields are projected to increase compared to Alternative D1, partially due to less restrictive basin constraints on six sensitive basins.

INCREASED INDICATORS COMPARED TO ALTERNATIVE D1

1 Selected suitable area for timber production (+26 M Acres)
2. LTSY (+5.2 MMCF)
3. Old growth habitat - fifth decade (+1.1 percent of Forest)
4. Visual Management (+207 M Acres Retention and Partial Retention)
5 Annual Net Receipts - fifth decade (+$11 3 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE D1

1 Payments to counties (-$1 MM)
2 Jobs (-220) and Income (-$5 MM)
3 First Decade ASQ (-2.2 MMCF)
4 Old-growth Reserves (-39 M Acres)
5. Botanical Areas (-4,600 acres)
6. First Decade Annual Net Receipts (-$2.2 MM)

Alternative C

PNV $1,197 MM
Opportunity Cost: $17 MM Compared to Alternative NC

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE NC

Alternative C has a lower PNV than Alternative NC due to a reduction in the timber base and due to production of the maximum amount of timber on the land base. The maximum timber objective function has timber produced where the additional costs exceed the marginal benefits The change in the land base and the timber objective function decrease PNV by $58.5 MM Decreased allocations to visual management offset the decreased land base by $35.5 MM.

First decade net annual receipts are decreased due to the additional cost of timber management Payments to counties and local jobs are increased due to additional first decade ASQ. Fifth decade annual net receipts are increased due to the payoff from additional investment in the timber program with increased harvest levels.

The amount of reserved old-growth habitat, the area allocated to Botanical Areas, and the amount of WFUD's would be increased compared to Alternative NC. The change in the old-growth habitat would be mainly due to increased land allocation for Management Requirements (MR's) for old-growth dependent species.

Projected sediment yields are significantly increased compared to Alternative NC due to increased hardwood conversion activity. Area managed for visuals would also be decreased significantly

INCREASED INDICATORS COMPARED TO ALTERNATIVE NC

1. Increased payments to counties (+$0.4 MM)
2 Jobs (+170) and income (+$2 5 MM)
3 First decade ASQ (+0.8 MMCF)
4 LTSY (+2 8 MMCF)
5 Reserved old-growth habitat (+36 M Acres)
6. Botanical areas (+5 M Acres)
7 Annual net receipts - Fifth Decade (+$2 2 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE NC

1. Selected suitable area for timber production (-10 M Acres)
2. Sedimentation (+110 M tons per decade)
3. Visual management (-223 M Acres of Retention and Partial Retention)
4 Average annual net receipts - First Decade (-$3 9 MM)
5 PNV (-$17 MM)

Alternative D

PNV: $1,160 MM
Opportunity Cost. $37 MM Compared to Alternative C

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE C

This alternative has the next lowest PNV (-$37 MM) primarily due to a mixed emphasis on all commodity production. Unlike Alternative C, less intensive timber harvest in Riparian Management Areas and more restrictive watershed harvest constraints are planned for six basins, thus reducing timber outputs while increasing fisheries outputs The cumulative effect on reduced timber outputs then reduces the net receipts, payments to counties, and other indicators for the first decade. LTSY is less by 2 2 MMCF due to operating on a smaller land base

The major reason for reduction of PNV compared to Alternative C is due to reduction in selected suitable acres (-$12 MM), an increase in visual management areas (-$5 MM), and more restricted harvest in Riparian Management Areas with stricter harvest constraints in six basins (-$20 MM) Less intensive timber management of the riparian areas and more restrictive harvest constraints are planned in six basins, so fisheries benefits are relatively high (+$5 MM) compared to Alternative C.

The amount of old growth that is in a preserved status is 171,000 acres. Backcountry Recreation, Research Natural Areas, Botanical, Wild River, and Scenic and Recreation River Management Areas are identical to previous alternatives. There is an increase of 24,000 acres for visual management Sediment production would be lower than Alternative C due to less road construction in the first decade, though still at a relatively high level. Access to lands for mineral production changes little Wildlife use is expected to decrease due to reduced seral vegetation in the first decade.

INCREASED INDICATORS COMPARED TO ALTERNATIVE C

1. Amount of reserved old growth (+2 M Acres)
2. Sedimentation (-108 M tons per decade)
3. Fisheries (+1 M WFUD's)
4. Visual areas (+24 M Acres)
5. Old-growth habitat fifth decade (+0.6 percent of Forest)
6 Area available for mineral development (+1 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE C

1. First decade ASQ (-1.4 MMCF)
2. LTSY (-2 2 MMCF)
3 First decade payments to counties (-$0 7 MM)
4. First decade jobs (-190) and income (-$3 2 MM)
5. Wildlife (-9.0 M WFUD's)
6 PNV (-$37 MM)
7. First decade annual net receipts (-$0 5 MM)

Alternative A-Departure

PNV $1,160 MM
Opportunity Cost· None compared to Alternative D

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE D

Though the opportunity costs of Alternatives A-Departure and D are equal, each program is different The increase in Supplemental Resource area reduces the acres for timber production This reduces the PNV by $8 MM The removal of the timber objective function increases PNV (+$35 MM) The increase in areas managed for visuals lowers the lands available for intensive timber management and PNV (-$48 MM). Managing all basins with the least restrictive riparian harvest prescriptions increases PNV by $19 MM Using Prescription B and lowering capital investments for fisheries result in decreased fisheries benefits Lower investment in recreation does not significantly affect benefits, due to surplus capacity.

The first decade outputs for net receipts, payments to counties, jobs, and income are greater due to the departure of timber outputs However, by the third decade, the timber outputs are reduced.

The amount of old-growth habitat, reserved old growth, and Backcountry Recreation areas are slightly increased. The land dedicated to Botanical areas and RNA's would be the least of any alternative The land allocated to visual management would be the highest of any alternative. The fisheries outputs are expected to decrease due to the implementation of Prescription B in the Riparian areas while projected sedimentation is somewhat lower than Alternative D.

INCREASED INDICATORS COMPARED TO ALTERNATIVE D

1. First decade ASQ (+0.8 MMCF)
2. Amount of reserved old growth (+2 M Acres)
3 Visual areas (+193 M Acres)
4. Unroaded areas (+5 M Acres)
5. Area available for mineral development (+4 M Acres)
6. County payments (+$0 4 MM), jobs (+40), and income (+$1.1 MM)
7. Sedimentation (-6 M tons per decade)
8. First decade annual net receipts (+$4.2 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE D

1. LTSY (-2 1 MMCF)
2. Fisheries (-2 M WFUD's)
3. Botanical (-5 M Acres) and Research Natural Areas (-1 M Acres)
4. Wildlife (-0.8 M WFUD's)
5. Reduced ASQ, annual net receipts, and payments to counties in future due to departure scheduling

Alternative A

PNV. $1,150 MM
Opportunity Cost· $10 MM Compared to Alternative A-Departure

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE A-DEPARTURE

The only significant difference between Alternatives A and A-Departure, which explain the $10 MM opportunity cost, is the decrease in first decade timber outputs in Alternative A Since A has the nondeclining yield timber harvest constraint, the first and second decade outputs are significantly less than the departure alternative Wildlife values are reduced by $1 MM due to the decreased production of seral stages. Other factors are equal including land allocation, program costs, and other benefits

The change compared to Alternative A-Departure in payments to counties, net receipts, and social indicators of jobs and income changes follows the same trend as the amount of timber harvest for the first decade. Third decade outputs are higher due to the use of the nondeclining yield constraint

Most other indicators including mineral accessibility, do not change significantly. However, the first decade sediment outputs are less by 6,000 tons due to less harvest and road construction in the first decade

INCREASED INDICATORS COMPARED TO ALTERNATIVE A-DEPARTURE

1. Amount of reserved old growth (+2 M Acres)
2. Sedimentation (-20 M tons per decade)
3. Higher ASQ, annual net receipts, and payments to counties in third, fourth, and fifth decades

DECREASED INDICATORS COMPARED TO ALTERNATIVE A-DEPARTURE

1. First decade ASQ (-1.1 MMCF)
2. Wildlife (-1.1 M WFUD's)
3. First decade payments to counties (-$0.5 MM)
4 First decade jobs (-100) and income (-$2 3 MM)
5. First decade annual net receipts (-$1.7 MM)
6. PNV (-$10 MM)

Alternative S

PNV: $1,131 MM
Opportunity Cost. $19 MM Compared to Alternative A

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE A

All program costs are different for Alternatives A and S An increase in the land allocated to Research Natural Areas, Botanical, Backcountry Recreation, Supplemental Resource, and Special Wildlife Sites Management Areas reduces the land available for timber harvest. However, the land available for timber production is managed more intensively with fertilizer applications The land available for timber production drops by 52,000 acres with a corresponding drop in PNV (-$18 MM). Use of the timber objective function in Alternative S reduces the PNV by approximately $31 MM compared to Alternative A A reduction in the area allocated to visual management increases the land available for intensive timber management. Relative to Alternative A, the percent increase in General Forest acres corresponds with a $40 MM increase in PNV The change of seven basins to Riparian Prescription C reduces PNV by $2 MM.

The capital investment programs for recreation are increased over those of Alternative A However, all benefits remain the same due to excess capacity for recreation and wilderness experiences in the first decade. The capital investment program for fisheries is increased and results in increased net benefits of $6 MM

Because of timber outputs, changes in wildlife habitat, and increased fish production, a slight increase of jobs, payments to counties, net receipts, and incomes are predicted

The fish outputs are increased due to implementation of a more restrictive riparian harvest in several basins and due to an increased capital investment program Sediment projected in the first decade is lower (-114 tons) due to less acres harvested. Mineral access would be highly restricted on an additional 32,000 acres. Wildlife use would increase due to an increased wildlife capital investment schedule The amount of reserved old growth is also increased.

INCREASED INDICATORS COMPARED TO ALTERNATIVE A

1. Wildlife (+21 M WFUD's)
2. Amount of reserved old growth (+23 M Acres)
3. Sedimentation (-114 M tons per decade)
4 Fisheries (+11 M WFUD's)
5 Old-growth habitat (+1.4 percent of Forest in fifth decade)
6 Unroaded areas (+78 M Acres)
7 Botanical areas (+15 M Acres)
8. Research Natural Areas (+1 M Acres)
9 Average annual Noncash Benefits (+ $0.5 MM)

DECREASED INDICATORS COMPARED TO ALTERNATIVE A

1. First decade ASQ (-1.1 MMCF)
2. LTSY (-4.7 MMCF)
9 Acres available for mineral development (-32 M Acres)
4 Visual areas (12 M Acres)
6. First decade payments to counties (-0.5 MM $/Yr)
7. First decade jobs (-20) and income (-$0.9 MM)
5 PNV (-$19 MM)
11 First decade annual net receipts (- $2 2 MM)

Alternative K

PNV· $1,083 MM
Opportunity Cost· $48 MM Compared to Alternative S

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE S

Alternative K has some differences in land allocations and constraints compared to Alternative S A decrease in land allocations for Backcountry Recreation, Special Wildlife Sites, and Scenic/Recreation Rivers provides a larger land base (+13,000 acres) for timber management which results in a plus $28 MM for PNV A small reduction in visual management results in a slight increase in PNV (+$0.7 MM)

Taking away fertilization as a treatment option and the tighter constraint for watershed management result in a significant decrease in PNV (-$63 MM) The capital investment program for fisheries is the highest for all alternatives, resulting in high fisheries benefits. The recreation and wildlife programs are lower than

Alternative S The recreation program has an increased PNV of $2 8 MM due to existing surplus capacity. The wildlife program has a decreased PNV compared to Alternative S of $13 MM due to a reduced capital investment program.

Decreases in the annual net receipts, payments to counties, change in jobs, and change in income would occur in the first decade

Alternative K would have slightly less old-growth habitat suitable for wildlife use in the fifth decade. Sediment production projected for the first decade is slightly less than Alternative S due to the lower level of harvest and roading Fish production decreases some due to more intensive timber management in six basins. The accessibility of minerals is slightly increased to that in Alternative S.

INCREASED INDICATORS COMPARED TO ALTERNATIVE S

1 Average Annual Net Receipts - 5th Decade (+$1.5 MM)
2. Suitable Land for Timber Production (+24 M Acres)
3. Sedimentation (-28 M Tons/Decade)
4. Minerals (+15 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE S

1. First decade ASQ (-1.2 MMCF)
2. Payments to counties first decade (-$0 5 MM)
3. Number of jobs (-180) and income (-$3.9 MM) first decade
4. Wildlife (-22 M WFUD's)
5. Old Growth Preserved (-9 M Acres)
6 Botanical and RNA Areas (-9 M Acres)
7 Fisheries (-7 M WFUD's)
8 PNV (-$48 MM)
9 Annual net receipts first decade (-$2 9 MM)
10 Average annual noncash benefits (-$0.4 MM)

All other indicators remain relatively constant

Alternative G

PNV: $844 MM
Opportunity Cost. $107 MM Compared to Alternative K

INCREMENTAL CHANGE COMPARED TO ALTERNATIVE K

This alternative has significantly lower PNV compared to the previous Alternative (K) with spin-off decreases in payments to counties, net revenues, jobs, and incomes.

Alternative G's increasing opportunity costs are mainly due to the reduction of investment in the timber program The opportunity costs for timber riparian management are $11 MM Additional areas in Backcountry Recreation, Supplemental Resource, Botanical, and Designated Wildlife Habitat Management Areas reduce the investment opportunities for timber production and PNV by $84 MM. An increase in the visual management areas reduces the land available for intensive timber production. The resulting decrease in General Forest acres equals $10 MM reduction in PNV Due to high capital investments and the lack of harvest in riparian areas, the fisheries benefits are high with an increased PNV (+$3 MM).

The amount of reserved old growth (+27,000 acres) increases in connection with the unroaded areas. Projected sediment decreases significantly in the first decade due to a decrease in road construction and harvest

INCREASED INDICATORS COMPARED TO ALTERNATIVE K

1. Amount of reserved old growth (+74 M Acres)
2. Sedimentation (-182 M tons per decade)
3. Fisheries (+1 M WFUD's)
4. Botanical areas (+28 M Acres outside of Wilderness)
5. Visual areas (+219 M Acres)
6. Old-growth habitat fifth decade (+4.5 percent of Forest)
7. Unroaded area (+70 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE K

1. First decade ASQ (-7.3 MMCF)
2. LTSY (-10.1 MMCF)
3. Selected suitable area for timber management (-123 M Acres)
4. Wildlife (-8.9 M WFUD's)
5. Acres available for mineral development (-37 M Acres)
6. Payments to counties (-$3.6 MM)
7. Number of jobs (-680) and income (-$15 4 MM)
8. PNV (-$239 MM)
9. Annual net receipts (-$8.9 MM)

All other indicators are relatively constant.

Alternative E

PNV. $679 MM
Opportunity Cost: $165 MM Compared to Alternative G

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE G

The PNV for Alternative E is $165 MM less than Alternative G. The decreases in net receipts, county receipts, jobs, and incomes occur mainly due to a decrease of 4.3 MMCF in timber outputs The decrease is due to fewer acres managed for timber with a corresponding decrease in the LTSY (-6.5 MMCF).

Alternative E's emphasis on preserving unroaded areas foregoes timber management opportunities on 302,000 acres The increase in unroaded areas and subsequent decrease in land managed for timber production reduce PNV by $149 MM. Alternative E also foregoes timber management opportunities in all riparian areas. This management reduces PNV by $22 MM Other economic programs are not significantly different The capital investment program for fisheries is reduced The lack of timber harvest in unroaded areas, Riparian areas, and Supplemental Resource areas provide fisheries benefits (though slightly reduced from Alternative G)

The unroaded area allocation and area of preserved old growth are increased The old-growth habitat suitable for wildlife would be increased as would visual management areas. The area allocated to Botanical and RNA's would be decreased by 11,000 acres. Projected sediment is less due to lower harvest levels and less road construction. The areas open to mineral development would be decreased by 148,000 acres

INCREASED INDICATORS COMPARED TO ALTERNATIVE G

1. Amount of reserved old growth (+63 M Acres)
2. Sedimentation (-108 M tons per decade)
3. Visual areas (+66 M Acres)
4. Old-growth habitat fifth decade (+4.3 percent of Forest)
5. Unroaded areas (+10 M Acres)

DECREASED INDICATORS COMPARED TO ALTERNATIVE G

1. First decade ASQ (-4.3 MMCF)
2. LTSY (-6.5 MMCF)
3. Selected suitable area for timber management (-119 M Acres)
4 Wildlife (-6.1 M WFUD's)
5. Acres available for mineral development (-148 M Acres)
6. Botanical areas (-11 M Acres outside of Wilderness)
7. Payments to counties (-$2.0 MM)
8. Number of jobs (-400) and income (-$8.9 MM)
9 PNV (-$165 MM)
10 Annual net receipts (-$6.9 MM)

All other indicators remain relatively constant.

Alternative M

PNV· $272 MM
Opportunity Cost: $407 MM Compared to Alternative E

INCREMENTAL CHANGES COMPARED TO ALTERNATIVE E

Alternative M has the highest opportunity costs due to the long rotation length for timber management on a much reduced land base. Compared to Alternative E, the longer rotation of Alternative M reduces PNV by $239 MM. The maximum area is allocated to an unroaded status, Supplemental Resource, Botanical, RNA's, and Designated Wildlife Habitat areas. The opportunity costs of the reduced area allocated to timber production equals $161 MM compared to Alternative E. These costs are offset somewhat because some of these acres allocated to management not allowing programmed harvest were visual management acres. This reduces the opportunity costs by approximately $10 MM. No harvest is programmed from riparian areas and the maximum amount of land is allocated to scenic vistas including preservation status The increased fisheries budget combined with the lack of timber harvest in riparian areas results in high fisheries benefits, though slightly less than Alternative G. Other economic programs such as recreation and wilderness benefits do not increase due to projected surplus supply of unroaded areas compared to projected use in the near future.

The incremental decrease in county receipts, net cash flow, jobs, and income is the greatest of any alternative. As with the other alternatives, the amount of planned timber harvest accounts for most of this change. The amount of area managed for timber is the lowest for all alternatives and the planned rotation for the Forest is the longest, resulting in a lower LTSY.

The most old growth of any alternative would be preserved with corresponding habitat for old-growth-dependent species. The maximum amount of land of all alternatives would be allocated to Preservation, Retention, and Partial Retention visual management Fish production would also be high, with sediment production the lowest of all alternatives Due to lack of activities that would create forage areas and habitat diversity, big game, small game, and nonconsumptive wildlife use would decline

INCREASED INDICATORS COMPARED TO ALTERNATIVE E

1 Amount of reserved old growth (+63 M Acres)
2. Sedimentation (-334 M tons per decade)
3 Botanical areas (+11 M Acres outside of Wilderness)
4 Visual areas (+11 M Acres)
5 Old-growth habitat (+5.5 percent of Forest in fifth decade)
6 Unroaded areas (+94 M Acres)

Decreased Indicators Compared to Alternative E

1. First decade ASQ (-10 1 MMCF)
2. LTSY (-10.0 MMCF)
3 Wildlife (-14 9 M WFUD's)
4. Payments to counties (-$4.1 MM)
5. Number of jobs (-950) and income (-$23.5 MM)
6. Fisheries (-1 M WFUD's)
7. PNV (-$407 MM)
8. First decade annual net receipts (-$14.6 MM)

CONSTRAINT ANALYSIS

The following tables describe the constraints placed on different alternatives and their effects on costs, benefits, and PNV. The constraints that are discussed include the land assignment changes, departure scheduling, rotation lengths, basin harvest constraints, and capital investments for watershed, fisheries, recreation, and wildlife programs.

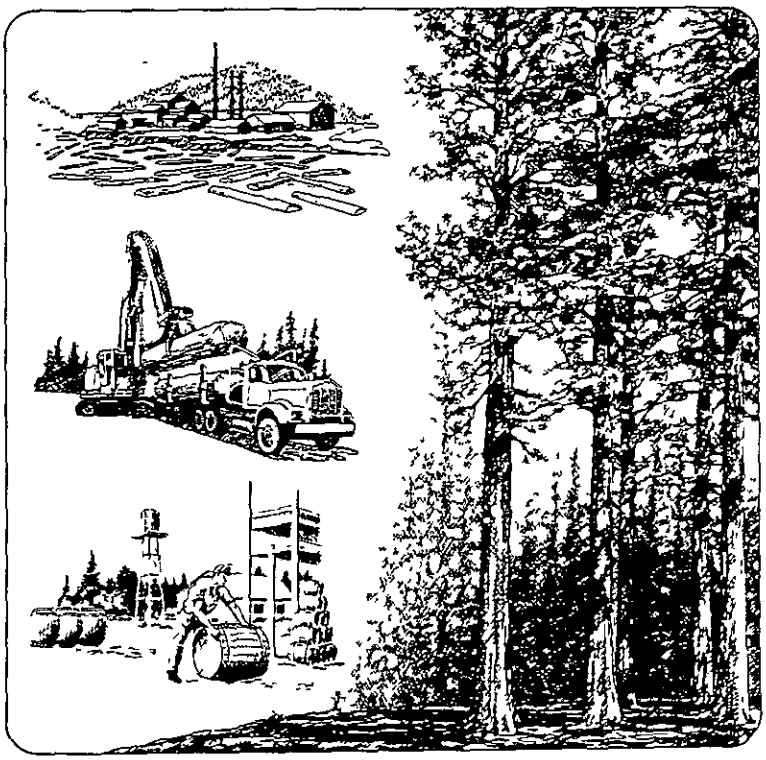


Table B-13. Constraint Comparisons

Alternative B

The following constraints were different between Alternative B and Max PNV Benchmark.

	Compared to Max PNV	
	Item	Opportunity Cost
Change in Land Assignments		
Research Natural Areas	+ 1,411 Ac	
Botanical	+ 4,581 Ac	
Unique Interest	+ 395 Ac	
Supplemental Resource	+ 13,739 Ac	
Special Wildlife Sites	+ 9,195 Ac	
Cumulative Selected Suitable Acres		
Departure Schedule	- 2,000 Ac	+75.0 MM $
Land Assignment	- 6,300 Ac	-12.7 MM $
Opportunity Costs for Maximum Timber Objective Function		-35.1 MM $
Area in Timber Base		
Retention	+ 7,678 Ac	- 3.7 MM $
Partial Retention	+ 94,282 Ac	-22.7 MM $
General Forest	-139,219 Ac	
Riparian Prescription		-20.8 MM $
B	-6 Basins (-35,293 Ac)	
C	+6 Basins (+33,059 Ac)	
Minimum Level	No Change	
Watershed Harvest Basin Constraints	9-13%/Decade in 6 Basins	
Timber Opportunity Costs		-20.0 MM $
Avg. Cost per unit of wood		+ 0.9 $/CuFt
Recreation - Budget PV	+ 4.5 MM $	- 4.5 MM $
Fish Program		
Capital Invest. (Annual $)	-204.0 M $	
PNV		+ 1.0 MM $
Wildlife Program		
Capital Invest. (Annual $)	+ 53.8 M $	
PNV		+ 1.0 MM $
Miscellaneous		-14.5 MM $
Total Opportunity Costs PV		-37.0 MM $

* The departure costs were calculated by comparing Alternatives B and D.

Table B-13 Constraint Comparisons (Continued)

Alternative D1

The following constraints were different between Alternative D1 and Alternative B. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. B		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Research Natural Areas	No Change		+ 1,411 Ac	
Botanical	No Change		+ 4,581 Ac	
Unique Interest	No Change		+ 395 Ac	
Supplemental Resource	No Change		+ 13,739 Ac	
Special Wildlife Sites	No Change		+ 9,195 Ac	
Cumulative Selected Suitable Acres				
No Departure Schedule	+ 2,000 Ac	-75.0 MM $		
Shorter Rotation	-10,000 Ac	+54.0 MM $	- 10,000 Ac*	+54.0 MM $
Land Assignment	No Change	0 MM $	- 6,300 Ac	-12.7 MM $
Opportunity Costs for Maximum Timber Objective Function	No change	0 MM $		-35.1 MM $
Area in Timber Base				
Retention	No Change	0 MM $	+ 7,678 Ac	- 3.7 MM $
Partial Retention	No Change	0 MM $	+ 94,282 Ac	-22.7 MM $
General Forest	No Change		-139,219 Ac	
Riparian Prescription		0 MM $		-20.8 MM $
B	No Change		-6 Basins (-35,293 Ac)	
C	No Change		+6 Basins (+33,059 Ac)	
Minimum Level	No Change		No Change	
Watershed Harvest Basin Constraints	No Change		9-13%/Decade in 6 Basins	
Timber Opportunity Costs		-21.0 MM $		-41.0 MM $
Avg. Cost per unit of wood		+ 0.2 $/CuFt		+ 1.1 $/CuFt
Recreation - Budget PV	No Change	0 MM $	+ 4.5 MM $	- 4.5 MM $
Fish Program				
Capital Invest. (Annual $)	-100.0 M $		-204.0 M $	
PNV		- 5.0 MM $		- 4.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	- 53.8 M $		- 28.2 M $	
PNV		- 1.0 MM $		0 MM $
Miscellaneous		0 MM $		-14.5 MM $
Total Opportunity Costs PV		-27.0 MM $		-64.0 MM $

* The benefits associated with a shorter rotation were calculated by comparing Alternative D1 with Alternative D.

Table B-13. Constraint Comparisons (Continued)

Alternative NC (No Change)

The following constraints were different between Alternative NC (No Change) and Alternative D1. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. D1		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Research Natural Areas	- 100 Ac		+ 1,311 Ac	
Botanical	- 4,581 Ac		No Change	
Unique Interest	- 395 Ac		No Change	
Supplemental Resource	+15,850 Ac		+ 29,589 Ac	
Special Wildlife Sites	- 2,934 Ac		+ 5,883 Ac	
Designated Wildlife Hab.	-47,803 Ac		- 47,803 Ac	
Cumulative Selected Suitable Acres				
Longer Rotation	+10,000 Ac*	-54.0 MM $		
Land Assignment	+16,000 Ac	+33.8 MM $	+ 10,000 Ac	+21.8 MM $
Opportunity Costs for Maximum Objective Function	No Obj.Fnc.	+35.7 MM $		
Area in Timber Base				
Retention	+43,037 Ac (26,000 Suitable)	-12.5 MM $	+ 50,715 Ac	-16.2 MM $
Partial Retention	+135,520 Ac	0 MM $	+229,802 Ac	0 MM $
General Forest	70,000 Ac Selected Suitable	-16.8 MM $	-139,219 Ac	-39.6 MM $
Riparian Prescription		+20.8 MM $		0 MM $
B	+6 Basins (-35,293 Ac)		No Change	
C	-6 Basins (-33,059 Ac)		W. Change N	
Minimum Level Watershed Harvest Basin Constraints	No Change 20%/Decade		No Change	
Timber Opportunity Costs		+ 7.0 MM $		-34.0 MM $
Avg. Cost per unit of wood		- 1.0 $/CuFt		+ 0.1 $/CuFt
Recreation - Budget PV	-1.2 MM $	+ 1 MM $	+ 3.3 MM $	- 3.3 MM $
Fish Program				
Capital Invest. (Annual $)	-23.0 M $		-227.0 M $	
PNV		- 3.0 MM $		- 3 MM $
Wildlife Program				
Capital Invest. (Annual $)	No Change		No Change	
PNV		- 3.0 MM $		- 3 MM $
Miscellaneous		0 MM $		-14.7 MM $
Total Opportunity Costs				
PV		0 MM $		-64.0 MM $

* The benefits associated with a shorter rotation were calculated by comparing Alternative D1 with Alternative D.

Table B-13 Constraint Comparisons (Continued)

Alternative C

The following constraints were different between Alternatives C and NC (No Change). Comparisons are also shown with the Max PNV Benchmark.

	Compared to Alt. NC		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Research Natural Areas	+ 100 Ac		+ 1,411 Ac	
Botanical	+ 4,581 Ac		+ 4,581 Ac	
Unique Interest	+ 395 Ac		+ 395 Ac	
Supplemental Resource	- 28,304 Ac		+ 1,285 Ac	
Special Wildlife Sites	+ 2,934 Ac		+ 9,477 Ac	
Cumulative Selected Suitable Acres Land Assignment	- 10,000 Ac	+22.8 MM $	No Change	0 MM $
Opportunity Costs for Maximum Objective Function	Maximum Timber		-35.7 MM $	-35.2 MM $
Area in Timber Base				
Retention	- 50,715 Ac	+16.2 MM $	No Change	0 MM $
Partial Retention	-143,251 Ac	+19.3 MM $	+ 86,551 Ac	-20.8 MM $
General Forest	-177,286 Ac		-117,856 Ac	
Riparian Prescription		0 MM $		- 1.0 MM $
B	No Diff.		No Change	
C	No Diff.		No Change	
Minimum Level	No Change		No Change	
Watershed Harvest Basin Constraints	No 9-13% Harvest Constraints		No Change	
Timber Opportunity Costs		-23.0 MM $		-57.0 MM $
Avg. Cost per unit of wood		+ 0.3 $/CuFt		+ 1.2 $/CuFt
Recreation - Budget PV	+ 0.1 MM $	- 1 MM $	+ 4.6 MM $	- 4.6 MM $
Fish Program				
Capital Invest. (Annual $)	+ 10.0 M $		-194.0 M $	
PNV		0 MM $		- 9.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	0 M $		0 M $	
PNV		+ 6.0 MM $		+ 3.0 MM $
Miscellaneous		+ 1.0 MM $		-13.4 MM $
Total Opportunity Costs PV		-17.0 MM $		-81.0 MM $

Table B-13. Constraint Comparisons (Continued)

Alternative D

The following constraints were different between Alternative D and Alternative C. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. C		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Research Natural Areas	No Change		+ 1,411 Ac	
Botanical	No Change		+ 4,581 Ac	
Unique Interest	No Change		+ 395 Ac	
Supplemental Resource	+12,454 Ac		+ 13,739 Ac	
Special Wildlife Sites	No Change		+ 9,195 Ac	
Cumulative Selected Suitable Acres	- 6,300 AC	-12.7 MM $	- 6,300 Ac	-12.7 MM $
Opportunity Costs for Maximum Timber Objective Function	No change	0 MM $		-35.1 MM $
Area in Timber Base				
Retention	+ 7,678	- 3.7 MM $	+ 7,678 Ac	- 3.7 MM $
Partial Retention	+ 7,731	- 1.8 MM $	+ 94,282 Ac	-22.7 MM $
General Forest	-21,363		-139,219 Ac	
Riparian Prescription		-19.8 MM $		- 1.0 MM $
B	- 6 Basins (-34,758 Ac)		- 6 Basins (-35,293 Ac)	
C	+ 6 Basins (+33,059 Ac)		+ 6 Basins (+33,059 Ac)	
Minimum Level Watershed Harvest Basin Constraints	No Change 9-13%/Decade in 6 Basins		No Change 9-13%/Decade in 6 Basins	
Timber Opportunity Costs		-38.0 MM $		-95.0 MM $
Avg. Cost per unit of wood		- 0.3 $/CuFt		+ 0.9 $/CuFt
Recreation - Budget PV	- 0.1 MM $	0 MM $	+ 4.5 MM $	- 4.5 MM $
Fish Program				
Capital Invest. (Annual $)	- 10.0 M $		-204.0 M $	
PNV		+ 5.0 MM $		- 4.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	- 28.2 M $		- 28.0 M $	
PNV		- 4.0 MM $		- 1.0 MM $
Miscellaneous		0 MM $		- 13.5 MM $
Total Opportunity Costs PV		-37.0 MM $		-118.0 MM $

Table B-13 Constraint Comparisons (Continued)

Alternative A-Departure

The following constraints were different between Alternatives A-Departure and D. Comparisons are also shown with the Max PNV Benchmark.

	Compared to Alt. D		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	+ 1,077 Ac		+ 1,077 Ac	
Research Natural Areas	- 100 Ac		+ 1,311 Ac	
Botanical	- 4,581 Ac		No Change	
Unique Interest	- 395 Ac		No Change	
Supplemental Resource	+15,850 Ac		+ 29,589 Ac	
Special Wildlife Sites	- 3,312 Ac		+ 5,883 Ac	
Scenic/Rec. Rivers	+ 4,116 Ac		+ 4,116 Ac	
Cumulative Selected Suitable Acres				
Departure Schedule	+ 1,000 Ac*	+ 9.0 MM $	+ 1,000 Ac	+ 9.0 MM $
Land Allocation	- 4,000 Ac	- 8.0 MM $	- 10,300 Ac	-20.7 MM $
Opportunity Costs for Maximum Objective Function	No Obj.Fnc.	+34.9 MM $	No Change	0 MM $
Area in Timber Base				
Retention	+ 38,372 Ac	-18.5 MM $	+ 46,050 Ac	-22.2 MM $
Partial Retention	+124,263 Ac	-30.0 MM $	+218,545 Ac	-52.7 MM $
General Forest	-173,174 Ac		-312,393 Ac	
Riparian Prescription		-18.6 MM $		- 2.2 MM $
Selected Suitable	- 1,000 Ac		- 1,000 Ac	
B	+ 6 Basins (+32,548 Ac)		No Change	
C	- 6 Basins (-33,059 Ac)		No Change	
Minimum Level	No Change		No Change	
Watershed Harvest Basin Constraints	No 9-13%/Decade in 6 Basins		No Change	
Timber Opportunity Costs		+ 6.0 MM $		-89.0 MM $
Avg. Cost per unit of wood		- 0.1 $/CuFt		+ 0.8 $/CuFt
Recreation - Budget PV	- 1.2 MM $	+ 1.2 MM $	+ 3.3 MM $	- 3.3 MM $
Fish Program				
Capital Invest. (Annual $)	- 23.0 M $		-227.0 M $	
PNV		- 5.0 MM $		- 9.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	+ 28.2 M $		0 M $	
PNV		- 2.0 MM $		- 3.0 MM $
Miscellaneous		0 MM $		- 13.7 MM $
Total Opportunity Costs PV		0 MM $		-118.0 MM $

* The costs and benefits associated with the departure were calculated by comparing Alternative A with Alternative A-Departure.

Table B-13 Constraint Comparisons (Continued)

Alternative A

The following constraints were different between Alternatives A and A-Departure. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. A-Dep.		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	No Change		+ 1,077 Ac	
Research Natural Areas	No Change		+ 1,311 Ac	
Botanical	No Change		No Change	
Unique Interest	No Change		No Change	
Supplemental Resource	No Change		+ 29,589 Ac	
Special Wildlife Sites	No Change		+ 5,883 Ac	
Scenic/Rec. Rivers	No Change		+ 4,116 Ac	
Cumulative Selected Suitable Acres				
No Departure Schedule	- 1,000 Ac	- 9.0 MM $	No Change	0 MM $
Land Assignment	No Change	0 MM $	- 10,300 Ac	-20.7 MM $
Opportunity Costs for Maximum Timber Objective Function	No Change	0 MM $	No Change	0 MM $
Area in Timber Base				
Retention	No Change	0 MM $	+ 46,050 Ac	-22.2 MM $
Partial Retention	No Change	0 MM $	+218,545 Ac	-52.7 MM $
General Forest	No Change		-312,393 Ac	
Riparian Prescription		0 MM $		- 2.2 MM $
Selected Suitable			- 1,000 Ac	
B	No Change		No Change	
C	No Change		No Change	
Minimum Level	No Change		No Change	
Watershed Harvest Basin Constraints	No Change		No Change	
Timber Opportunity Costs		- 9.0 MM $		-98.0 MM $
Avg. Cost per unit of wood		+ 0.2 $/CuFt		+ 1.0 $/CuFt
Recreation - Budget PV	No Change	0 MM $	+ 3.3 MM $	- 3.3 MM $
Fish Program				
Capital Invest. (Annual $)	No Change		-227.0 M $	
PNV		0 MM $		- 9.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	No Change		0 M $	
PNV		- 1.0 MM $		- 4.0 MM $
Miscellaneous		0 MM $		- 13.7 MM $
Total Opportunity Costs PV		-10.0 MM $		-128.0 MM $

Table B-13 Constraint Comparisons (Continued)

Alternative S

The following constraints were different between Alternatives S and A. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. A		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	+ 1,909 Ac		+ 2,986 Ac	
Research Natural Areas	+ 1,359 Ac		+ 2,670 Ac	
Botanical	+ 15,208 Ac		+ 15,208 Ac	
Unique Interest	+ 2,015 Ac		+ 2,015 Ac	
Backcountry Recreation	+108,092 Ac		+108,092 Ac	
Supplemental Resource	- 8,177 Ac		+ 21,412 Ac	
Special Wildlife Sites	+ 21,567 Ac		+ 27,450 Ac	
Scenic/Rec. Rivers	- 3,325 Ac		+ 791 Ac	
Cumulative Selected Suitable Acres Land Assignment	-37,000 Ac	-74 MM $	- 47,300 Ac	-95 MM $
Opportunity Costs for Maximum Objective Function		-31 MM $		-31 MM $
Timber Base				
Retention	- 36,333 Ac	+18 MM $	+ 9,717 Ac	- 4 MM $
Partial Retention	- 86,723 Ac	+22 MM $	+131,822 Ac	-32 MM $
General Forest	+ 10,366 Ac		-302,027 Ac	
Fertilization		+33 MM $		+33 MM $
Riparian Prescription		- 2 MM $		- 2 MM $
Selected Suitable	- 16,000 Ac		- 17,000 Ac	
B	- 7 Basins (-41,821 Ac)		- 7 Basins (-14,168 Ac)	
C	+ 7 Basin (+41,821 Ac)		+ 7 Basins (+41,821 Ac)	
Minimum Level Watershed Harvest Basin Constraints	No Change		No Change	
	9-17%/Decade in all Basins			
Timber Opportunity Costs		-33 MM $		-131 MM $
Avg. Cost per unit of wood		+ 1.5 $/CuFt		+ 2.5 $/CuFt
Recreation - Budget PV	+4.0 MM $	- 4.0 MM $	+ 7.3 MM $	- 7.3 MM $
Fish Program				
Capital Invest. (Annual $)	+123.0 M $			
PNV		+ 6.0 MM $		- 3.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	+ 67 M $		+ 67 M $	
PNV		+11.0 MM $		+ 7.0 MM $
Miscellaneous		+ 1.0 MM $		- 12.7 MM $
Total Opportunity Costs PV		-19.0 MM $		-147.0 MM $

Table B-13. Constraint Comparisons (Continued)

Alternative K

The following constraints were different between Alternatives K and S. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. S		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	- 2,986 Ac		No Change	
Research Natural Areas	+ 96 Ac		+ 2,766 Ac	
Botanical	- 8,979 Ac		+ 6,229 Ac	
Unique Interest	- 420 Ac		+ 1,595 Ac	
Backcountry Recreation	-94,401 Ac		+ 13,691 Ac	
Supplemental Resource	+18,086 Ac		+ 39,498 Ac	
Special Wildlife Sites	-12,869 Ac		+ 14,581 Ac	
Scenic/Rec. Rivers	- 6,760 Ac		- 5,969 Ac	
Cumulative Selected Suitable Acres Land Assignment	+13,000	+ 28 MM $	- 33,300 Ac	-67.0 MM $
Opportunity Costs for Maximum Objective Function	No Change	- 2 MM $	No Change	-33.3 MM $
Area in Timber Base				
Retention	+ 563	- 0.3MM $	+ 10,280 Ac	- 4.3 MM $
Partial Retention	- 2,499	+ 1 MM $	+129,323 Ac	-31.2 MM $
General Forest	-84,308		-217,719 Ac	
Fertilization	None	- 33 MM $	No Change	
Riparian Prescription		- 30 MM $		-32.6 MM $
Selected Suitable	+11,000 Ac		- 6,000 Ac	
B	+ 6 basins		- 1 Basin (-14,168 Ac)	
C	- 6 basins		+ 1 Basin (+ 6,161 Ac)	
Minimum Level Watershed Harvest Basin Constraints	No Change 9-13%/Dec.		No Change 9-13%/Decade	in all Basins
Timber Opportunity Costs		-38.0 MM $		-169.0 MM $
Avg. Cost per unit of wood		- 2.1 $/CuFt		+ 0.4 $/CuFt
Recreation - Budget PV	-2.8 MM$	+ 2.8 MM $	+ 4.5 MM $	- 4.5 MM $
Fish Program				
Capital Invest. (Annual $)	No Change		-104.0 M $	
PNV		+ 1 MM $		- 2.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	-67 M $		No Change	
PNV		-13 MM $		- 6.0 MM $
Miscellaneous		- 1.8 MM $		- 13.5 MM $
Total Opportunity Costs PV		-48.8 MM $		-195.0 MM $

Table B-13. Constraint Comparisons (Continued)

Alternative G

The following constraints were different between Alternatives G and K. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. K		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	+ 1,077 Ac		+ 1,077 Ac	
Research Natural Areas	- 11 Ac		- 11 Ac	
Botanical	+28,362 Ac		+ 34,591 Ac	
Unique Interest	- 262 Ac		+ 1,333 Ac	
Custodial (Roadless)	+136,740 Ac		+150,431 Ac	
Supplemental Resource	+18,294 Ac		+ 14,588 Ac	
Special Wildlife Sites	- 5,941 Ac		+ 8,640 Ac	
Scenic/Rec. Rivers	+ 2,406 Ac		- 3,562 Ac	
Cumulative Selected Suitable Acres	-92,000 Ac	-185.0MM $	-125,300 Ac	-252.0 MM $
Opportunity Costs for Maximum Timber Objective Function	No Max. Tim	+33.1 MM $	No Change	0 MM $
Area in Timber Base				
Retention	+ 12,780 Ac	- 6.1 MM $	+ 23,060 Ac	- 11.1 MM $
Partial Retention	+ 20,507 Ac	- 4.9 MM $	+149,830 Ac	- 36.1 MM $
General Forest	-187,533 Ac		-405,252 Ac	
Riparian Prescription		-68.0 MM $		-100.8 MM $
Selected Suitable	- 31,000 Ac		- 37,000 Ac	
B	- 17 Basins (-69,895 Ac)		- 18 Basins (-84,063 Ac)	
C	+ 17 Basins (+39,051 Ac)		+ 18 Basins (+45,212 Ac)	
Minimum Level Watershed Harvest Basin Constraints	No Change		No Change	
	No Change		9-13%/Decade in all Basins	
Timber Opportunity Costs		-231.0 MM $		-400.0 MM $
Avg. Cost per unit of wood		- 0.5 $/CuFt		- 0.1 $/CuFt
Recreation - Budget PV	+ 0.5 MM $	- 0.5 MM $	+ 5.0 MM $	- 5.0 MM $
Fish Program				
Capital Invest. (Annual $)	- 90.0 M $		-196.0 M $	
PNV		- 1.0 MM $		- 3.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	No Change		No Change	
PNV		- 6.0 MM $		- 12.0 MM $
Miscellaneous		- 0.5 MM $		- 14.0 MM $
Total Opportunity Costs PV		-239.0 MM $		-434.0 MM $

Table B-13. Constraint Comparisons (Continued)

Alternative E

The following constraints were different between Alternatives E and G. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. G		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	No Change		+ 1,077 Ac	
Research Natural Areas	No Change		- 11 Ac	
Botanical	- 11,391 Ac		+ 23,200 Ac	
Unique Interest	+ 235 Ac		+ 1,568 Ac	
Custodial (Roadless)	+151,306 Ac		+301,737 Ac	
Supplemental Resource	- 22,773 Ac		+ 27,680 Ac	
Designated Wildlife Hab.	- 31,616 Ac		- 17,028 Ac	
Special Wildlife Sites	- 1,093 Ac		+ 7,547 Ac	
Scenic/Rec. Rivers	+ 229 Ac		- 3,792 Ac	
Cumulative Selected Suitable Acres	- 74,000 Ac	-148.8 MM $	-199,300 Ac	-400.8 MM $
Opportunity Costs for Maximum Objective Function	No Change	0 MM $	No Change	0 MM $
Area in Timber Base				
Retention	- 3,438 Ac	+ 1.7 MM $	+ 19,622 Ac	- 9.5 MM $
Partial Retention	- 33,549 Ac	+ 8.1 MM $	+116,281 Ac	- 28.0 MM $
General Forest	- 37,764 Ac		-443,016 Ac	
Riparian Prescription		- 22.0 MM $		-122.7 MM $
Selected Suitable	- 45,000 Ac		- 82,000 Ac	
B	No Change		- 18 Basins (-84,063 Ac)	
C	- 18 Basins (-45,212 Ac)		No Change	
Minimum Level	+ 18 Basins (+35,066 Ac)		+ 18 Basins (+34,681 Ac)	
Watershed Harvest Basin Constraints	No Change		9-13%/Decade in all Basins	
Timber Opportunity Costs		-161.0 MM $		-561.0 MM $
Avg. Cost per unit of wood		+ 0.4 $/CuFt		+ 0.3 $/CuFt
Recreation - Budget PV	- 1.1 MM $	+ 1.1 MM $	+ 3.9 MM $	- 3.9 MM $
Fish Program				
Capital Invest. (Annual $)	- 10.0 M $		-204.0 M $	
PNV		0 MM $		- 3.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	No Change		No Change	
PNV		- 5.0 MM $		- 17.0 MM $
Miscellaneous		0 MM $		- 14.1 MM $
Total Opportunity Costs PV		-165.0 MM $		-599.0 MM $

Table B-13. Constraint Comparisons (Continued)

Alternative M

The following constraints were different between Alternatives M and E. Comparisons to the Max PNV Benchmark are also presented.

	Compared to Alt. E		Compared to Max PNV	
	Item	Opportunity Cost	Item	Opportunity Cost
Change in Land Assignments				
Wild Rivers	No Change		+ 1,077 Ac	
Research Natural Areas	No Change		- 11 Ac	
Botanical	+11,391 Ac		+ 35,658 Ac	
Unique Interest	- 235 Ac		+ 1,333 Ac	
Custodial (Roadless)	+ 5,217 Ac		+296,520 Ac	
Supplemental Resource	+ 8,464 Ac		+ 36,144 Ac	
Designated Wildlife Hab.	+13,883 Ac		- 3,145 Ac	
Special Wildlife Sites	- 518 Ac		+ 7,029 Ac	
Scenic/Rec. Rivers	- 342 Ac		- 4,134 Ac	
Cumulative Selected Suitable Acres·				
Longer Rotation		+238.7 MM $		-238.7 MM $
Land Assignment	-80,000 Ac	-160.9 MM $	-279,300 Ac	-562.7 MM $
Opportunity Costs for Maximum Timber Objective Function	No Change	0 MM $	No Change	0 MM $
Area in Timber Base				
Retention	- 2,143 Ac	+ 1.0 MM $	+ 17,479 Ac	- 8.4 MM $
Partial Retention	- 6,833 Ac	+ 1.6 MM $	+109,448 Ac	- 26.4 MM $
General Forest	+ 12,252 Ac		-430,764 Ac	
Riparian Prescription		0 MM $		-122.7 MM $
Selected Suitable	No Change		- 82,000 Ac	
B	No Change		- 18 Basins (-84,063 Ac)	
C	No Change		No Change	
Minimum Level	No Change		+ 18 Basins (+34,681 Ac)	
Watershed Harvest Basin Constraints	No Change		9-13%/Decade in all Basins	
Timber Opportunity Costs		-397.0 MM $		- 958.0 MM $
Avg. Cost per unit of wood		+ 2.9 $/CuFt		+ 3.2 $/CuFt
Recreation - Budget PV	+ 1.1 MM $	- 1.1 MM $	+ 5.0 MM $	- 5.0 MM $
Fish Program				
Capital Invest. (Annual $)	+ 10.0 M $		-194.0 M $	
PNV		0 MM $		- 3.0 MM $
Wildlife Program				
Capital Invest. (Annual $)	No Change		No Change	
PNV		- 10.0 MM $		- 27.0 MM $
Miscellaneous		- 1.1 MM $		- 13.0 MM $
Total Opportunity Costs PV		-407.0 MM $		-1006.0 MM $

LITERATURE CITED

Amaranthus, Michael P., R. M. Rice, N. R. Barr, and R. R Ziemer. 1985. Logging and forest roads related to increased debris slides in southwest Oregon. Journal of Forestry, J 83, N. 4

Anderson, H. W. 1975. *Relative contributions of sediment from source areas and transport processes* In: proceedings of the symposium of Forest Land Use and Stream Environment. Corvallis, OR. p 55-73

Andre, J. E., and H. W Anderson. 1961. Variation of soil erodibility with geology, geographic zone, elevation and vegetative type in northern California wildlands Journal Geophysical Research 66 3351-3358

Barnett, Harold J. and Chandler Morse. 1963. *Scarcity and growth. John Hopkins Press, Baltimore, MD* p. 213.

Brown, D. L., and J. M Wardwell (eds.) New directions in urban-rural migration Academic Press, New York.

Brown, E. R. (Tech. Ed) 1985 Management of wildlife and fish habitats in forests of western Oregon and Washington (two volumes). USDA Forest Service Publication No. R6-F&WL-192-1985 Pacific Northwest Region, Portland, OR.

Clopper, Almon 1983. Interindustrial forecasts of the American economy D. C Heath and Company, Lexington, MA

Craig, David W. 1984. Managed yield tables for the Siskiyou National Forest USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Davis, Lawrence S. and K. Norman Johnson. 1987. Forest management. 3rd Edition. McGraw-Hill Book Company, New York 715 p

DeWerff, Lloyd, Ronald Pugh, Teresa Rebagliati, and Jeffery White. 1981. Scheduling timber harvest to meet visual objectives. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Fight, Roger D., Chris B. LeDoux and Tom L Ortman. 1984. Logging Costs for young-growth management planning for Coastal Douglas-fir. USDA Forest Service General Technical Report PNW 176 Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Hansen, William J. and Michael P. Amaranthus. 1979. Erosion rates following logging and prescribed burning on the Siskiyou National Forest Unpublished data.

Harr, R D. 1979. Effects of timber harvest on streamflow in the rain-dominated portion of the Pacific Northwest. In: *Proceedings of Workshop on Scheduling Timber Harvest for Hydrologic* Concerns. USDA Forest Service, Pacific Northwest Region. 136 p.

Harr, R. D. 1982. Fog drip in the Bull Run municipal watershed, Oregon. Water Resources Bulletin 18(5):785-789.

Howard, James O 1984 Oregon's forest products industry: 1982. USDA Forest Service Research Bulletin PNW 118. Pacific Northwest Forest and Ranger Experiment Station, Portland, OR

Howard, James O. and Bruce A Hiserote. 1978. Oregon's forest products industry: 1976 USDA Forest Service Resource Bulletin PNW-79. Pacific Northwest Forest and Range Experiment Station, Portland, OR.

Johnson, K. Norman, Thomas W. Stuart, and Sarah A. Crim 1986. FORPLAN version 2 an overview USDA Forest Service, Land Management Planning Systems Section, Washington, DC.

Josephine County Planning Department. 1981. Comprehensive plan for Josephine County. Grants Pass, Oregon.

Kohl, Don C. 1980. Social accounting for Oregon, socioeconomic indicators. Department of Human Resources, State Community Services Program.

Maxwell J. R., and R. A. Marston. 1980. Geomorphic indices of stream flow and sediment yield. In: Symposium on Watershed Management, American Society of Civil Engineers: 1-12

Megahan, W. F. 1974. Erosion over time on severely disturbed granitic soils: a model. USDA Forest Service Research Paper INT-156. Intermountain Forest Range Experiment Station, Ogden, Utah. 14 p.

Megahan, W. F. 1975. Channel sediment storage behind obstructions in forested watersheds In: Proceedings of Sediment Budgeting and Routing in Forest Catchments. Corvallis, OR.

Megahan, W. F. and D. M. Molitor. 1972. Erosion processes on steep granitic road fills in central Idaho. Journal of the Soil Science Society of America 42(2). p 350-357.

Megahan, W. F., and W. J. Kidd. 1972. Effects of logging and logging roads on sediment production rates in the Idaho Batholith USDA Forest Service Resource Paper INT-23. Intermountain Experiment Station, Ogden, UT.

Owen, Linda P. 1979. Migration and economic change in timber reliant counties: an econometric analysis. Unpublished M.S. Thesis. Department of Agricultural and Resource Economics, Oregon State University.

Peterson, Linda J. 1980. Socioeconomic overview of the zone of influence for the Rogue River National Forest and Siskiyou National Forest. USDA Forest Service Contract

Platts, W. S. and W. F. Megahan. 1975. Time trends in riverbed sediment composition in salmon and steelhead spawning areas: South Fork River, Idaho. North American Wildlife Management Institute, Washington, DC. p. 229-239.

Reiser, D. W. and J. C. Bjornn. 1979. Influence of Forest and rangeland management on anadromous fish habitat in the western North America: habitat requirements of anadromous salmonids USDA Forest Service General Technical Report PNW-96.

Rice, R. M., J. S. Rothacher, and W. F. Megahan. 1972. Erosional consequences of timber harvest: an appraisal: In: Watersheds in Transition. American Water Resources Association, Proceedings Series 14, Urbana, IL. p 321-329.

Richardson, H. W. 1972. Input-output and regional economics. John Wiley and Sons, New York

Schaffer, W. A. and K. Chu. 1969. Nonsurvey techniques for constructing regional interindustry models Papers of the Regional Science Association 23:83-101.

Schallau, Con H., and Wilbur R. Maki. 1986. Preliminary working papers and data on the South and the Pacific Northwest. Pacific Northwest Forest and Range Experiment Station, Corvallis, OR.

Schuldt, John P. and James O. Howard. 1974. Oregon forest industries: wood consumption and mill characteristics 1972. A joint study by Oregon State Univeristy Forestry Extension Service and USDA Forest Service, Pacific Northwest Forest and Range Experiment Station.

State of Oregon. 1977. Regulations relating to water quality control in Oregon. Oregon Administrative Rules, Chapter 340. Department of Environmental Quality. p 1-22, 155-296, 455-456.

Stevens, J. B. 1980. The demand for public goods as a factor in the nonmetropolitan migration turnaround. In: New Directions in Urban-Rural Migration. Academic Press, New York. p. 115-135.

Thomas, J. W. (Tech. Ed.). 1979. Wildlife habitats in managed forests: the Blue Mountains of Oregon and Washington. USDA Forest Service Agricultural Handbook No. 553. 512 p.

U.S. Department of Agriculture, Forest Service. 1986. Recreation opportunity spectrum (ROS) users guide. USDA Forest Service.

U.S. Department of Agriculture, Forest Service. 1985. Management of wildlife and fish habitats in forests of western Oregon and Washington. USDA Forest Service, Pacific Northwest Region

U.S. Department of Commerce. Advance reports 1960, 1970 and 1980 census of population and housing, Oregon. U.S. Department of Commerce, Bureau of the Census.

Wall, Brian, and Daniel D. Oswald. 1975. A technique and relationship for projections of employment in the Pacific coast products industry. USDA Forest Service Research Paper PNW-189. Pacific Northwest Forest and Range Experiment Station, Portland, OR.

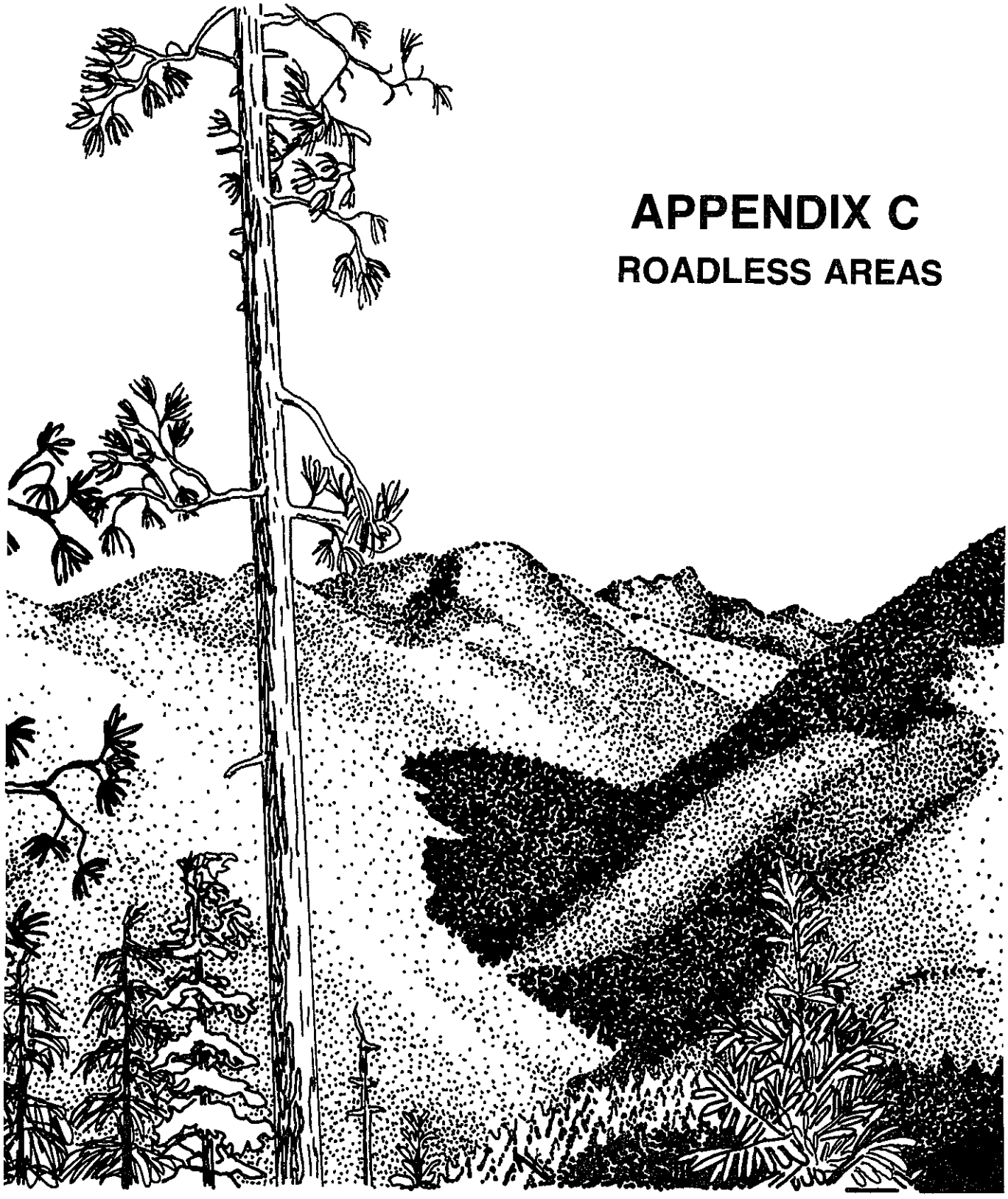
Wischmeier, W. H. and D. D. Smith. 1958. Rainfall energy and its relationship to soil loss. Transactions of the American Geophysical Union 3g: 285-291.

Wischmeier, W. H. and D. D. Smith. 1965. Predicting rainfall-erosion losses from cropland east of the Rocky Mountains. USDA Research Service Agricultural Handbook No. 282.

Wischmeier, W. H. and D. D. Smith. 1968. A guide to conservation planning. USDA Agricultural Handbook No. 537. U. S. Department of Agriculture.

APPENDIX C

ROADLESS AREAS



APPENDIX C
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APPENDIX C

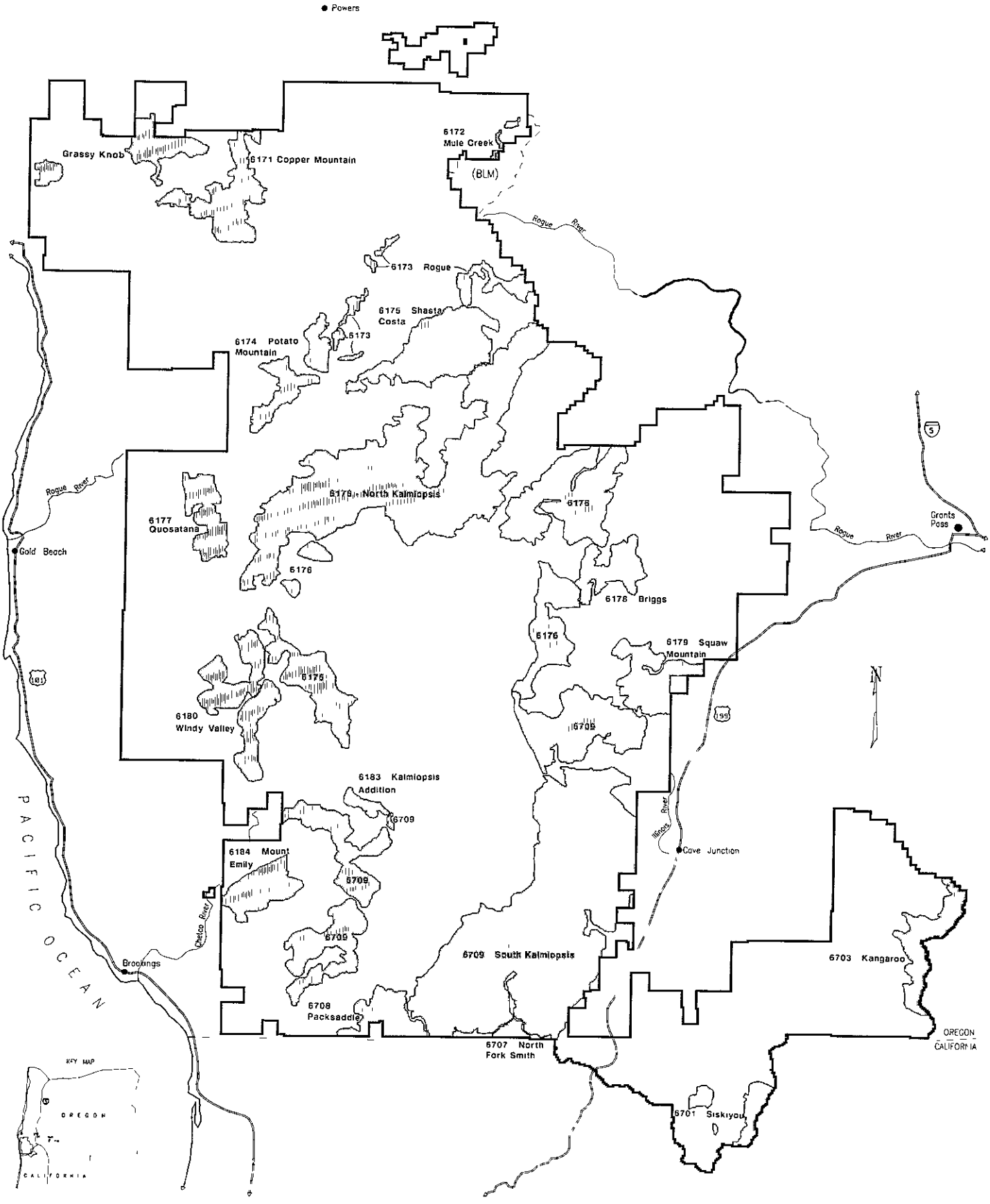
ROADLESS AREAS

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ROADLESS AREAS (1988)

SISKIYOU NATIONAL FOREST



INTRODUCTION

Appendix C provides the description of the environment, alternate management, and **site-specific** consequences for each inventoried roadless area. Treatment of each unroaded area versus treating various arrays of unroaded areas by alternatives is the primary distinction between this Appendix and the Final Environmental Impact Statement (FEIS). In the body of the FEIS, the issues, analysis, and alternative ways of managing currently unroaded areas are evaluated **in the aggregate** as a resource, land use, or environmental condition across the Forest as a whole.

If roads, timber harvest, or other development occurs in these unroaded areas within this planning period (10-15 years), eligibility for Wilderness consideration will be adversely affected This, in itself, may be a significant consequence. For this reason, the unroaded area's attributes for Wilderness, such as its *capability, availability, and need, are considered so that any decision to allocate the area for particular uses* will be made with full disclosure of the environmental effects.

Since the intent of **Appendix C** is to provide site-specific analysis of each unroaded area, the objective herein is to evaluate the allocation of each of these areas to either (1) continued unroaded status, (2) development, or (3) an intermediate level of development. Along with the description and other resource information, the environmental consequences of the alternatives on each area is provided (i e., the evaluation of effects of different management strategies as proposed by each alternative on the specific unroaded area) NOTE: Considerable information and analysis accompanied Roadless Area Review and Evaluation II (RARE II) in the late 1970's; this information is on file in the Supervisor's Office.

The following is provided to help clarify Congressional direction as to future management and evaluation of the roadless areas covered in this FEIS and accompanying appendix. According to the Oregon Wilderness Act of 1984 (and, similarly, the California Wilderness Act of 1984): "...with respect to the National Forest System lands...which were reviewed...in the second Roadless Area Review and Evaluation (RARE II),...(RARE II) shall be deemed for the purpose of the initial land management plans...to be an adequate consideration of the suitability of such lands for inclusion in the National Wilderness Preservation System and the Department of Agriculture shall not be required to review the wilderness option prior to the revision *of the [Forest] plans, but shall review the wilderness options when the plans are revised which will ordinarily* occur on a ten-year cycle... [Roadless areas] shall be managed for multiple use in accordance with land management plans pursuant to Section 6 of [RPA], as amended by [NFMA]..." Since Congress has not designated the remaining roadless areas as Wilderness, this appendix does not made a recommendation on Wilderness options for the unroaded areas. Congress has done this job.

CHANGES BETWEEN DRAFT AND FINAL

The Forest has 18 inventoried roadless areas that total 284,000 acres as of the end of 1988. In 1984, the inventoried area totalled 314,000 acres. Due to continuing management activities, prior activities, and the Silver Fire and resulting decision, the inventoried portion has been reduced by 30,000 acres. The decision covering the salvage timber sales and associated roading of the Silver Fire accounted for 19,000 acres. This reduction was all within the inventoried North Kalmiopsis Roadless Area. The project received National *coverage and extreme notoriety. For specifics, please refer to the Silver Fire Recovery Project FEIS (1988).*

Some reduction is attributable to two inventoried areas that were partially roaded years earlier but not indicated in the 1984 update. The balance of the change comes from timber harvest and associated roading between May of 1984 and the end of 1988. This includes timber sales completed, operating, or *under contract. For specifics of inventory updates for each inventoried roadless, see* **Table C-3.**

APPENDIX C ORGANIZATION

Appendix C is divided into two sections. The first section (pages C-1 through C-10) summarizes the individual roadless area facts and figures. One map (**opposite page**) and three tables provide for rapid review of the individual roadless area narratives. **Table C-1** displays, by alternative, roadless area acres remaining unroaded by the end of decades 1, 2, and 5. **Table C-2** provides a summary of acres remaining unroaded by alternative. **Table C-3** lists each area's acreage and denotes changes, if any, from the inventoried (RARE II) roadless area boundary. **Table C-4** summarizes each area's attributes

In the second section, each unroaded area is treated as a separate entity. Maps of the 18 areas (**Figure C-1a through q**) accompany this listing. **Table C-5a through r** display the Management Areas by alternative (from **FEIS Chapter II**). The narrative evaluation and characterization of Management Area strategies by alternative formulations are provided under the following major headings.

I. **DESCRIPTION** - The existing condition (planning and current use status; physiographic and biological conditions)
II. **CAPABILITY** - The presence of Wilderness characteristics, including manageability and special features; the basic features that made the area appropriate and valuable for Wilderness regardless of the area's availability or need.
III. **AVAILABILITY** - The opportunities of other resources (potentials and management considerations) for indicating the area's availability for Wilderness.
IV. **NEED** - The relevance to other areas and use, ecosystem representation, and public involvement; various factors considered in assessing the Wilderness need of each area.
V. **ENVIRONMENTAL CONSEQUENCES** - The scientific and analytical basis for comparing the alternatives (discussion of environmental effects, and important interrelationships between resources, land uses, and environmental conditions; both quantitative and qualitative aspects of information is provided). The potential consequences of a development (non-Wilderness) and non-development (retaining the potential for Wilderness designation) alternatives are described.

Each Roadless Area will cover all elements under the following headings; detail for each varies depending on size of area, resource complexities, and concerns expressed through public involvement:

DESCRIPTION
- Status of Roadless Area
- Changes Between Draft and Final
- Location and Access
- Physiographic and Biologic Features
- Resource Uses
- Appearances, Surroundings, and Attractions

CAPABILITY
- Manageability
- Natural Integrity and Appearance
- Opportunities for Solitude and Primitive Experience
- Special Features

AVAILABILITY
- Resource Potentials
- Management Considerations

NEED
- Other Areas and Public Use
- Ecosystem Representation
- Public Involvement

ENVIRONMENTAL CONSEQUENCES
- Significant Effects
  - Cultural Resources
  - Energy and Minerals
  - Improvements
  - Wilderness Potential
  - Wild and Scenic Rivers
  - Soil, Water, and Fish
  - Fire
  - Vegetation
  - Sensitive Plants
  - Air Quality
  - Wildlife
  - Visual Resource
  - Recreation Settings
  - Economic and Social
- Mitigation Measures
- Potential Conflicts with Other Jurisdictions

ROADLESS AREA REMAINING OVER TIME

Table C-1 summarizes the approximate area remaining roadless at the end of Decades 1, 2, and 5. The acres are the decade total of the 18 roadless areas by each alternative. The estimates are made with the following assumptions:

1. Areas only counted if (a) greater than 5,000 acres, or (b) contiguous to designated Wilderness;
2. Only the first decade can be estimated with any reliability as based on the Ten-year Timber Sale Action Plan for Alternative S (Appendix C, Forest Plan);
3. The second and fifth decades are extended estimates of the alternative theme and land assignments;
4. The greatest variance in estimates occur in the South Kalmiopsis where large areas of land unsuited for timber production exist; these lands are assumed to remain unroaded over time; and
5. In Alternatives E, G, and M, portions of approximately 25,000 to 30,000 acres are allocated to Backcountry Recreation which would require restoration. Many of these acres have nonconforming features such as roads or timber harvest units attributable largely to the Silver Fire Recovery Project and other timber sales between 1984 and 1988. These acres are not included in Table C-1.

Table C-1. Acres of Roadless Areas Remaining at End of Decades 1, 2, and 5, by Alternative

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	102,000	90,000	85,000
B, C, D, and D1	86,000	74,000	69,000
E and M	284,000	284,000	284,000
G	186,000	173,000	173,000
K	109,000	97,000	92,000
S	135,000	126,000	126,000

1/ Minimum criteria is 5,000 unroaded contiguous acres, or adjacent to designated Wilderness

Table C-2. Summary of Roadless Areas Remaining by Alternative (Sum of Management Areas 1-9)

Management Area No.-Name	ALTERNATIVE										
	N/C	A and A-departure	B	C	D and D1	E	G	K and K-departure	L	M	S
N/A-Grassy Knob	935	2,045	2,050	1,366	2,050	5,428	2,969	2,357	2,357	5,428	3,067
6171-Copper Mountain	27	739	1,755	715	1,755	9,354	8,121	1,521	1,600	9,354	2,736
6172-Mule Creek	0	21	21	21	21	352	37	37	37	352	169
6173-Rogue	89	303	324	324	324	3,839	724	634	698	3,839	784
6174-Potatoe Mountain	249	874	874	921	874	5,963	2,379	2,321	2,640	5,963	2,664
6175-Shasta Costa	948	1,940	2,394	1,551	2,394	14,261	5,162	2,853	3,145	14,261	3,040
6176-North Kalmiopsis	12,355	17,645	11,834	9,729	11,834	88,582	67,404	30,683	108,936	88,564	50,110
6177-Quosatana	100	761	836	831	836	5,097	2,319	1,204	1,999	5,097	1,267
6178-Briggs	277	810	810	810	810	5,544	1,984	1,130	5,744	5,544	1,131
6179-Squaw Mountain	0	390	390	390	390	7,704	1,723	1,370	7,704	7,704	1,371
6180-Windy Valley	1,941	3,024	1,424	1,424	1,424	10,214	4,189	3,258	3,258	10,214	3,615
6183 Kalmiopsis Addition	0	0	0	0	0	1,166	463	32	32	1,166	32
6184-Mount Emily	963	2,191	2,191	2,191	2,191	5,945	3,349	3,349	3,349	5,945	3,349
6701-Siskiyou	3,280	3,280	377	377	377	3,284	3,284	789	789	3,284	1,354
6703-Kangaroo	3,066	3,599	1,673	1,673	1,673	6,651	6,651	3,966	4,202	6,651	3,456
6707-North Fork Smith	0	117	117	117	117	952	952	117	117	952	117
6708-Packsaddle	746	826	484	268	484	5,289	5,289	1,385	1,877	5,289	3,120
6709-South Kalmiopsis	2,841	8,649	8,955	8,022	8,965	104,620	61,124	12,901	21,371	104,575	65,106
TOTAL	27,817	47,214	36,509	30,730	36,519	284,245	178,123	69,907	169,855	284,182	146,488

Table C-3. Summary of Roadless Area Acreage and Change from Inventoried Roadless Area (Siskiyou National Forest; December 31, 1988)

RARE II				
Number	Name	Acres 1/	Revised Acres 1/	Reason for Change
N/A	Grassy Knob	23,137	5,428	Area allocated to nonwilderness in the Mt. Butler-Dry Creek Land Use Plan (FEIS, 1976) Added to inventory in 1983 (not RARE II). 17,200 acres designated Grassy Knob Wilderness by Oregon Wilderness Act of 1984. Approximately 500 acre reduction due to China Peak Timber Sale
6171	Copper Mountain	10,884	9,354	Small areas added on fringe, other areas deleted in the northwest and northeast by North Shelter, Dixie Knot and the Salmon Mountain Timber Sales (approximately 1,500 acres)
6172	Mule Creek	250	352	Wild Rogue Wilderness boundary adjusted to exclude nonconforming uses, the additional acres added have low standard roads Recent mining has reduced the area by 150 acres near Boliver Creek
6173	Rogue	6,744	3,839	Area adjusted by timber sales in Billings Creek (1,100+ acres), Devils Timber Sale along the northern edge; and timber sales in mid-drainage of Stair Creek.
6174	Potato Mountain	8,060	5,963	Area reduced by timber sale activity between Stonehouse Creek and Potato-Illahe Mtn Painted Picture and Waters Timber Sales divided area
6175	Shasta Costa	16,312	14,261	Area reduced by timber sales on the east and west edges (Squirrel Camp, Whitten Prairie, and South Shasta Timber Sales).
6176	North Kalmiopsis	113,254	88,582	Silver Fire Recovery Project removed 19,000 acres in Silver and Indigo drainages. The Chinaman Hat Timber Sale and access road reduced most of unroaded area in South Fork Silver Creek; part of the sale in Silver Fire South Indigo and Lawson Saddle Timber Sales reduced area near Indigo Prairie and Saddle Mountain, respectively. A few other timber sales reduced minor acreages along fringes of the inventoried area.
6177	Quosatana	5,514	5,097	Adjusted along the northern portion near the Rogue River and Fritsche Cabin by the Skookumhouse, Moorsky, and Fritsche Timber Sales.
6178	Briggs	5,762	5,544	Adjusted due to Onion Bowl Timber Sale near Waterdog Creek
6179	Squaw Mountain	8,064	7,704	Adjusted due to timber sale north of Squaw Mountain.
6180	Windy Valley	13,491	10,214	Road construction and timber sales have divided the area All of the area has been eliminated in Eagle Creek drainage due to timber sales. Area reduction west of Snow Camp Mountain-Panther Lake due to roading and timber sales.
6183	Kalmiopsis Addition	1,178	1,166	(-) Data base difference, no activity.
6184	Mount Emily	5,947	5,945	(+) Data base difference; no activity

Table C-3. Summary of Roadless Area Acreage and Change from Inventoried Roadless Area (Siskiyou National Forest; December 31, 1988) (Continued)

RARE II Number	Name	Acres 1/	Revised Acres 1/	Reason for Change
6701	Siskiyou	8,294	3,284	Most of the 5,323 acres designated Siskiyou Wilderness by California Wilderness Act of 1984. No other changes due to activity
6702	Indian Creek	950	0	DOES NOT CURRENTLY MEET MINIMUM CRITERIA due to road construction and timber harvest activities on the Klamath National Forest
6703	Kangaroo	14,192	6,651	Siskiyou National Forest portion reduced to 10,832 acres as a result of nonconforming features existing before RARE II and more recent timber sales. Area situated between Left Fork and main Sucker Creek has been deleted A portion of southwestern edge north of Tannen Lake reduced Another 3,414 acres designated Red Buttes Wilderness by Oregon Wilderness Act of 1984 Siskiyou National Forest portion only
6707	North Fork Smith	950	952	(+) Data base differences, no activity Siskiyou National Forest portion only.
6708	Packsaddle	9,315	5,289	Considerable reduction in the western side (Bear Ridge and Sankey Creek) of the Siskiyou National Forest portion due to timber sales and road construction activity Area divided by roading west of Rowdy Creek Siskiyou National Forest portion only
6709	South Kalmiopsis	111,315	104,620	Timber harvest and road construction, principally in western and southern portion, has reduced area's size since RARE II Also included private land with county road and homes. Siskiyou National Forest portion only
Total 1/		363,613	284,245	

1/ Gross Acres

Table C-4. Summary of Roadless Area Attributes - Description, Capability, Availability, and Need

Name of Area	RARE II Number	EXISTING CONDITIONS AND POTENTIALS: Accessibility	Use Conflicts	Key Resource Values - Potentials: Mining	Grazing	Fish	Wildlife	Timber	Recreation
Grassy Knob	N/A	Mod	Mod	L	0	HIGH	Mod	HIGH	L
Copper Mountain	6171	HIGH	Mod	L	0	HIGH	Mod	Mod	L
Mule Creek	6172	HIGH	Mod	Mod	0	L	Mod	Mod	L
Rogue	6173	Mod	Mod	L	L	L	Mod	HIGH	L
Potato Mountain	6174	HIGH	HIGH	0	Mod	L	HIGH	HIGH	Mod
Shasta Costa	6175	HIGH	Mod	L	L	HIGH	Mod	HIGH	L
North Kalmiopsis	6176	Mod	Mod	Mod	L	HIGH	Mod	HIGH	Mod
Quosatana	6177	Mod	HIGH	0	0	HIGH	HIGH	HIGH	Mod
Briggs	6178	HIGH	HIGH	HIGH	L	HIGH	Mod	Mod	Mod
Squaw Mountain	6179	HIGH	Mod	Mod	0	0	Mod	L	0
Windy Valley	6180	HIGH	Mod	Mod	HIGH	Mod	HIGH	HIGH	Mod
Kalmiopsis Addition	6183	Mod	HIGH	L	0	Mod	L	Mod	0
Mount Emily	6184	HIGH	HIGH	L	0	HIGH	Mod	Mod	L
Siskiyou	6701	HIGH	Mod	Mod	Mod	L	Mod	L	Mod
Kangaroo	6703	HIGH	Mod	L	Mod	0	Mod	Mod	HIGH
North Fork Smith	6707	Mod	Mod	Mod	0	0	L	Mod	0
Packsaddle	6708	Mod	Mod	Mod	0	Mod	L	L	L
South Kalmipsis	6709	L	HIGH	HIGH	L	L	L	L	Mod

Name of Area	RARE II Number	PRESENCE OF WILDERNESS CHARACTERISTICS: Manageability	Natural Integrity	Opportunities for Solitude	Primitive Experience	Special Features	RELEVANCE: Need: Other Areas	Public Use	Ecosystem Represent.	Public Interest
Grassy Knob	N/A	Mod	Mod	Mod	L	Mod	0	0	0	Mod
Copper Mountain	6171	Mod	Mod	L	L	L	L	0	L	Mod
Mule Creek	6172	L	0	L	0	0	0	0	0	0
Rogue	6173	L	Mod	Mod	L	L	0	L	0	0
Potato Mountain	6174	L	Mod	L	0	Mod	L	Mod	Mod	0
Shasta Costa	6175	Mod	Mod	Mod	L	Mod	0	L	L	L
North Kalmiopsis	6176	Mod	HIGH	Mod	HIGH	Mod	0	L	L	HIGH
Quosatana	6177	L	L	L	0	0	0	Mod	Mod	0
Briggs	6178	Mod	Mod	Mod	L	L	L	L	L	0
Squaw Mountain	6179	L	Mod	L	0	0	L	0	L	0
Windy Valley	6180	L	Mod	Mod	L	L	Mod	Mod	Mod	L
Kalmiopsis Addition	6183	L	0	0	0	0	0	0	0	0
Mount Emily	6184	L	L	L	L	Mod	Mod	L	Mod	0
Siskiyou	6701	Mod	Mod	Mod	L	Mod	0	Mod	0	Mod
Kangaroo	6703	Mod	Mod	Mod	L	HIGH	0	HIGH	L	HIGH
North Fork Smith	6707	Mod	Mod	0	0	L	0	0	0	L
Packsaddle	6708	L	Mod	Mod	Mod	Mod	0	0	L	L
South Kalmiopsis	6709	Mod	Mod	HIGH	HIGH	Mod	0	Mod	0	Mod

KEY to Attributes: HIGH - High
Mod - Moderate
L - Low
0 - None, or negligible

NOTE: Explanation of Attribute Ratings follow this table.

Table C-4 KEY to Attributes Ratings

Attribute Rating (**HIGH** - High; **Mod** - Medium; **L** - Low; **0** - None or Negligible)

Accessibility - Ability to access perimeter of unroaded area.

HIGH - Boundary readily accessible (>3/4) by maintained roads and trails for most of the year.

Mod - Most sides accessible (1/2-3/4) for greater part of year.

L - Access (1/4-1/2) to boundary adequate, some seasonal difficulties.
0 - Major portions inaccessible (<1/4) due either to area size, lack of roads/trails, or physical barriers and seasonal difficulties.

Use Conflicts - Degree of conflicting resource uses within area or directly adjacent contributing to area's visual, sound, or physical impairment. (Generally, these are mining, grazing, special use roads within; various activities on boundaries, e g., harvest areas, logging, road building, traffic)

HIGH - Several uses which are quite apparent and/or are of such size or timing to be of obvious detraction.

Mod - Few (<3) whose size and timing may detract, but not for an extended period of time or over a large area.

L - Few (<3) whose size and timing are of minor detraction and of limited extent.
O - Activity not apparent or of very limited size and detraction.

Key Resource Values (Potentials) - The existence or potential (capabilities).

HIGH - Inherent productivity, development potential, or outputs high.

Mod - Moderate inherent productivity, etc.

L - Low inherent productivity, etc. (limited in extent or amount).
O - Resources very limited or nonexistent in amount, extent, or development potential.

Manageability - Ability to manage and protect the area's natural character considering such factors as size, shape, and position (including boundary location) relative to external influences.

HIGH - Inherently protected through excellent topographic positioning, favorable external influence (i.e., land allocation, physical conditions), or very limited hazards/risks to natural character.

Mod - Part of area subject to external influences, or overall positioning and physical conditions are at some risk.

L - Considerable portions at risk or subject to external influences; manageability highly dependent on degree of protection provided in areas outside unroaded part.
O - Protection largely unattainable due to present activities and conditions that are not inherently mitigated. Risks to natural character and processes high

Natural Integrity - Extent to which long-term ecological processes are intact and operating, or are free of disturbances; consideration of extent to which human influences have altered natural conditions and are apparent to user.

HIGH - Extremely limited, or not apparent

Mod - Small portions of area affected by human activity, or recovery of past impacts approaching natural state and not perceived by user.

L - Considerable area impacted, or perceived recovery of past change incomplete or apparent to user.

O - Much of present ecosystem is primarily a result of recent or past activity by man; or major portion is directly or indirectly (from periphery) influenced by human activity; readily noticed by user.

Opportunities for Solitude - Area's feeling of solitude (how it provides for remote and backcountry setting).

HIGH - Most of area free of external influence and provides a strong feeling of remoteness and solitude.

Mod - Fringes influenced by sight and/or sound of human activity; solitude aided by vegetative or topographic conditions.

L - External influences persist over much of area; vegetation and topography generally only aid to providing solitude.

O - Most of area within sight or sound of human activity; topography and vegetation provides only limited relief.

Primitive Experience - Opportunity for primitive and unconfined types of recreation activities; how well the area provides outstanding opportunities for unusual adventures or excitement.

HIGH - Varied type (more than those associated with foot travel only); unique experience, or experience of adventure/excitement.

Mod - Varied type (good mix of foot travel associated activity); potential for adventure exists.

L - Limited type; adventure or challenge related to topographic difficulty and distance from nearest roaded access.

O - Type and adventure not different than much of adjacent lands.

Special Features - Unique, abundant, or varied flora, fauna, historic, scientific, and physiographic features; where protection from nonconforming activities would enhance management of unusual or sensitive species or features.

HIGH - Existence over much of area or very unique.

Mod - Existence of species or features over much of area that would be enhanced; limited extent of unique or sensitive elements.

L - Limited enhancement opportunity; unique or sensitive elements limited to very small areas, or other allocations, standards or guidelines afford adequate protection.

O - Species and features not different than surrounding areas.

Other Areas - Need for area based on nearby Wilderness or other roadless areas.

HIGH - Few tracts of similar protected areas, either by designated status or inherent, nearby (within 2 hours; 30 miles).

Mod - Like tracts nearby, but of limited size or availability.

L - Large tracts nearby.
O - Adjacent sizeable tracts of land supplying similar opportunities.

Relative Use - Need for area based on use demands for primitive forms of recreation and experience levels.

HIGH - Current demand high or projected demands to exceed capacity.

Mod - Current demand moderate, but not expected to approach capacity within planning horizon.

L - Low existing or expected demand.
0 - Very light use; demand not expected to change.

Ecosystems Represented - The need for providing/protecting unusual or sensitive ecosystems; proximity to similar protected ecosystems; uniqueness of ecosystem.

HIGH - Very limited as to extent or protectorate status; unique; very sensitive to disturbances by human activity.

Mod - Limited representation in protected status; unusual, but not unique; sensitive to disturbance, but manageable by other means.

L - Considerable similar systems protected; common to area.
0 - No defined need for protective status or special management.

Public Interest - The degree (extent and intensity) to which the public and other agencies have expressed interest in maintaining the area in either a roaded or unroaded condition.

HIGH - Significant involvement by many sectors; considered "sensitive."

Mod - Significant involvement or intensity by specific interest groups displayed over time.

L - Limited input or low intensity; issue not sensitive.
0 - Interest in area's management very limited.

Table C-5a. Grassy Knob Roadless Area No. N/A (5,428 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	5,428	1,055	0	5,428	2,426
7-Supplemental Resource	679	679	684	0	684	0	1,450	1,610	0	0
8-Designated Wildlife Habitat	256	1,366	1,366	1,366	1,366	0	464	747	0	347
9-Special Wildlife Site	0	0	0	0	0	0	0	0	0	294
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	5
11-Riparian	840	514	505	682	505	0	372	516	0	408
12-Retention Visual	0	0	0	0	0	0	0	0	0	21
13-Partial Retention Visual	26	26	0	0	0	0	13	0	0	167
14-General Forest	3,627	2,843	2,873	3,380	2,873	0	2,074	2,555	0	1,760
TOTAL	5,428	5,428	5,428	5,428	5,428	5,428	5,428	5,428	5,428	5,428
TOTAL UNDEVELOPED (MA 1-9)	935	2,045	2,050	1,366	2,050	5,428	2,969	2,357	5,428	3,067

Figure C-1a
RARE II AREA N/A
Grassy Knob Roadless Area

GRASSY KNOB

(5,428 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The unroaded portion of the Grassy Knob area was studied for potential Wilderness in the Land Use Plan for the Mt. Butler-Dry Creek Planning Unit, Final Environmental Impact Statement (FEIS, 1976). The decision for this area resulted in a combination of management strategies, including timber management, Fisheries/ Wildlife, and Fisheries/Recreation areas. However, in the Oregon Wilderness Act of 1984, an area of 17,200 acres covered by the Mt. Butler-Dry Creek Planning Unit was designated as the Grassy Knob Wilderness.

The residual unroaded area, consisting of 5,428 acres, is divided by the Grassy Knob Wilderness. There is no private land within the unroaded area boundary. The western portion contains approximately 1,200 acres. The Mt. Butler-Dry Creek FEIS allocates the Anvil Creek watershed as a Fisheries/Wildlife area. Rock Creek is managed both for timber management and a Fisheries/Recreation area averaging 1/8 mile on either side of Rock Creek.

The eastern portion of the roadless area contains approximately 4,200 acres, of which only 1,000 acres is included in the Mt.Butler-Dry Creek Planning Unit. The remaining area is covered by the Powers Ranger District Multiple Use Plan of 1969. The eastern portion is allocated to timber management where full timber yield is consistent with land capabilities and appropriate constraints, along with coordination and multiple-use management of other resources. Refer to both the Mt. Butler-Dry Creek Planning Unit and Powers Ranger District Multiple Use Plan for more thorough descriptions and management direction.

Since the completion of the Mt. Butler-Dry Creek FEIS, all management activities in the area have conformed to the direction. Roads and area involved in the China Peak Timber Sale, located in the China Peak vicinity, have been removed from the unroaded area calculation. While quite unusual, the China Peak Timber Sale was specifically referenced in the Congressional Record by Senator Hatfield. Special provisions were added for temporary logging guylines and tailholds within the newly created Wilderness. This represented a compromise aimed at protecting both fishery and wilderness values while reducing the impact on the Forest's programmed timber harvest. Congress not only protected the integrity of the timber sale, but amended the proposed Wilderness boundary to allow for the activity.

CHANGES BETWEEN DRAFT AND FINAL

Between 1984 and 1988, only the China Peak Timber Sale remains active in the area. The upper part of North Fork Dry Creek was not excluded earlier from the inventoried area (Refer to Figure C-1a). This has been updated and the acres reduced from the 1984 figure of 6,009 to the current 5,428 acres. The remainder of the area is as previously described.

LOCATION AND ACCESS

The Grassy Knob area is in Curry County, approximately six miles east of the community of Port Orford, Oregon. The western portion is accessed by the Grassy Knob Road off of U.S. Highway 101, approximately four miles north of Port Orford. The eastern portion is accessed by the China Peak Road off the Sixes River.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the roadless area is on the western side of the coast range (Coast Range Geologic Province) in southwestern Oregon. The terrain is extremely steep and rugged, with deeply incised canyons. Elevation varies from near sea level to 2,900 feet on Mt. Butler. Ecosystems are mixed evergreen and western hemlock types Most of the area is heavily vegetated with stands of old-growth Douglas-fir and tanoak/madrone; the mature stands of Douglas-fir are the result of past fires

Annual precipitation averages over 100 inches per year, with most occurring in the form of rain during the fall, winter, and spring months. Average May through September precipitation for the dry season averages about 12 inches. Due to proximity to the ocean, the climate is heavily moderated by the coastal influence, with summer fog often extending inland to elevations near 1,500 feet.

The western portion of the roadless area drains into Anvil Creek and Rock Creek, both tributaries of Elk River Both streams are important sources of cool water for the lower reach of Elk River. Within the Forest boundary, the Elk River and many smaller tributaries contain a highly valuable anadromous fishery and are the source of water for the State Fish Hatchery.

The eastern portion of the roadless area drains into Butler Creek, Dry Creek and the South Fork Sixes River. Steelhead are found in the lower reaches of South Fork. The entire area is important to downstream fisheries as a supply of high quality, cool water during the summer months

On steep slopes, the surface soils are predominately rock mulch. Movement of this surface talus rock is often active beneath rock outcrops and in draw areas where it is concentrated. Where high precipitation intensities and oversteepened slopes combine with fractured and sheared geologic areas, mass soil movement has occurred. Refer to the Soils Resource Inventory for specific information by landtype.

Black-tailed deer, black bear and a variety of other animals occur in the Grassy Knob Roadless Area. No known threatened or endangered species inhabit the area. The Sixes River area contains possible nesting sites for the northern bald eagle. This potential is described in the Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986). One sensitive species is present; the northern spotted owl, an old-growth dependent species, has been sighted in both portions of the area. Two nesting pairs are believed to be present in the South Fork Sixes River drainage. One site is being managed as a interim SOHA until the Forest Plan is implemented; this site encompasses approximately 1,000 acres. No sensitive plants are known within this area

RESOURCE USES

The South Fork Sixes River receives some of the heaviest mining use on the Powers Ranger District. Two cabins are occupied year round, and approximately 40 claims receive seasonal activity. No mineral claims are on file for the western portion.

Hunting is very limited due to steep, brushy terrain and the lack of roads and trails. For the same reasons, other recreational use is quite limited. There are no existing or planned trails. Anvil Creek is used as a domestic water source immediately downstream from National Forest land.

APPEARANCES, SURROUNDINGS AND ATTRACTIONS

The western portion of the roadless area consists of two steep, paralleling drainages flowing west into the Elk River. The north facing aspects of each is heavily timbered, while the south facing slopes are predominantly brush fields with scattered timber in the side drainages. To the north, south, and east of this portion of the roadless area lies the Grassy Knob Wilderness, which is similar in topography and vegetation. Private

land to the west is also similar, but most of the commercial timber has been logged from the slopes. The northern edge of the area borders the Grassy Knob Road.

The abandoned Grassy Knob Lookout site is on the east side of the western portion. Remnants of the lookout can still be seen. This site is historically significant; a Japanese bomber was sighted from this tower during World War II. Most of the Grassy Knob Trail was obliterated by the construction of the Grassy Knob Road. The only section left is from the end of the new road to the former lookout site.

The eastern portion of the roadless area is very steep, mountainous terrain with deeply incised canyons throughout. The area is heavily vegetated with a variety of cover types; few natural openings exist. The area consists of numerous fingers of undisturbed ground surrounded by roads and existing clearcuts in various states of revegetation. To the north of the area lies Mt. Avery and blocks of undisturbed BLM and State lands. These lands are similar, with Mt. Avery acting as a visual screen between the unroaded portion and harvested lands to the north. To the south and east, man's activities are evident in the form of roads and timber harvest units. To the west is Grassy Knob Wilderness.

Along the South Fork Sixes River is the site of a mining community that was occupied from 1857 until approximately 1900. This site is believed to be one of the first sites in the state where hydraulic mining was used. Remnants of old cabins and mining activity can still be found along the river.

CAPABILITY

MANAGEABILITY

The two portions are not in themselves easily manageable for wilderness characteristics, but their location adjacent to the Grassy Knob Wilderness provides for choices that would not otherwise be available. The western portion borders private land along its west boundary. This is a mid-slope property line with the roadless area on the uphill side. This situation increases the chances of fire entering the existing Wilderness from private land across the unroaded area. Though fire has historically been a major factor in creating and maintaining the present vegetative mosaic and ecology of the area, uncontrolled fire has the potential of destroying many of the area's desirable characteristics.

Except adjacent to the existing Wilderness, the boundaries and shape of the eastern portion are not readily manageable for roadless area qualities. The boundaries to the east, north, and west are defined by roads or timber harvest units. Much of the northern boundary is adjacent to the National Forest boundary, outside of which the Forest Service exerts little influence over activities which may impact or conflict with roadless area management objectives. The shape of the area is a series of fingers, generally one mile or less across, rather than one compact block. This situation will increase the chances of outside activities affecting management of roadless area values.

NATURAL INTEGRITY AND APPEARANCE

Other than the Grassy Knob Road (a portion is closed to vehicular traffic) and private timber harvest adjacent to the area, the western portion of the roadless area has not been measurably disturbed by human activity. Most evidence of human activity in the eastern portion of the roadless area is confined to the river bottom along the South Fork Sixes River. Most of the mining activity has healed over. Though evidence of past activity is still noticeable, its presence would not be perceived as particularly undesirable, i.e., the historical value often becoming an attraction rather than a detriment. The presence of occupied miners cabins in the area may detract from the experience desired by some users.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

With the steep, broken terrain and dense vegetation covering the western portion of the roadless area, the natural screening provides for localized solitude and a primitive experience. Sounds from the county road below, though, will be heard throughout the entire area. While the area is small, only the Grassy Knob Road separates it from the Wilderness Adding of the western portion to the Wilderness would effectively increase the size of the area available for a primitive experience.

The eastern portion of the roadless area offers the same opportunities as the western portion, being similar in topography, vegetation and proximity to the Wilderness. For some users, seeing timber harvest units in close proximity from inside the roadless area could detract from their experience. Periodic logging activity adjacent to the unroaded area may be an additional detraction. Finding occupied cabins in the roadless area may also reduce the feeling of solitude.

These areas offer a challenge for those seeking to test their outdoors skills. Due to the steep terrain, dense vegetation and lack of trails, cross country travel is difficult. The limited recreational use opportunities of these areas is primarily hiking and hunting. Most other uses are very incidental and quite secondary forms.

SPECIAL FEATURES

The primary attractions of this area are the old mining community, the abandoned Grassy Knob Lookout site, and the adjacent designated Grassy Knob Wilderness

AVAILABILITY

RESOURCE POTENTIALS

Use is presently well below its capacity. If the area remains roadless, use would not be expected to increase significantly unless trails were constructed and maintained.

Recreation

The potential for increased recreational use is greatest under roaded conditions where existing uses would continue along with the addition of motorized use. Much of the area would maintain its roadless character as road construction is not contemplated for much of the area due to the extremely rugged nature of the terrain, high costs, and resource impacts.

Wildlife

Under unroaded conditions, wildlife habitat will remain essentially unchanged Management practices, such as habitat improvement and prescribed burning, are not likely to be implemented due to the vegetative type and terrain features. Under roaded conditions, as timber is harvested and varying stages of vegetation become established, deer and elk herds can be expected to increase. Populations of old-growth dependent wildlife would decrease, but individual species would still be present due to land unsuitable for timber production and the adjacent Wilderness area. Sensitive species would be protected through applicable management standards.

Fisheries

Under unroaded conditions, fisheries habitat would not change. Under roaded conditions, the potential for adverse impact to the fisheries resource would increase, though mitigative measures and improved practices can reduce this potential to an acceptable level. The potential for fisheries enhancement projects would increase due to improved access.

Water

The greatest demand for water in these areas is for fisheries. Diversions and other on-site demands, such as for hydro-power, are currently absent. Downstream beneficial uses are primarily domestic, fish culture, and irrigation Quality aspects are of far greater importance than any other factors due to the extremely high value anadromous fishery.

Timber

Of the 1,200 acres in the western portion of the roadless area, approximately 800 acres are considered tentatively suitable for the production of timber. The 4,200 acre eastern portion has approximately 3,000 acres of land suitable for timber harvest. Standing volume is estimated to be 85 MMBF.

Road access is limited in two areas of the eastern portion. At the present time, it may not be feasible to access the area north of Mt. Butler in Section 20 by road. The second area is in Sections 18 and 19 in the Bee Creek drainage. Due to the Grassy Knob Wilderness, routes have not been located that would allow roads to reach harvestable areas without crossing a corner of the Wilderness. In both areas, the feasibility of helicopter logging is marginal due to distance to suitable log landing sites.

More recent timber harvest practices and road location, design, and construction techniques have substantially reduced the risks associated with steep and unstable landscapes. Older practices, as evidenced in one fork of Butler Creek, can result in unacceptable and irreversible damage to the soil and long-term impact on the fishery habitat. While current management practices demonstrate the ability to achieve utilization of the replenishable forest resources along with providing an acceptable environment for other elements, the sensitivity of activity in this area must always be balanced with extremely tight controls

Energy and Minerals

There are no plans for the exploration or development of energy sources in this area. The heaviest mineral use, primarily gold mining, has occurred on the South Fork Sixes River. If the area remained roadless, the level of mining activity would remain essentially constant. If road densities were increased, better access could result in an increase in mining activity, though such an increase is not expected to be great.

Cultural

Other than the sites and trails already noted, most probable occurrence of cultural evidence would be either along the stream benches or on the ridge lines. Few sites have been inventoried to date. Historical and prehistoric sites will be evaluated and provided for under the applicable laws and regulations for any proposed activity, whether under an unroaded or roaded scenario.

MANAGEMENT CONSIDERATIONS

The most critical consideration for management of this area is hazard and risks associated with fire. The potential for a major conflagration exists from the heavy fuels and dense brush. There have been a number of major fires within the area, the last being approximately 60 years ago. Additionally, the position of the area relative to private forested lands increases this threat. Fire severity is somewhat reduced, though, from the coastal marine air influence. The period of severe weather conditions is generally short.

Increased road access would allow for intensified treatment of activity fuels, which would lessen their concentration and continuity. Probability of major wildfire losses would thereby be reduced. Access, however, brings with it increased risk due to greater numbers and dispersion of people.

The potential for insect and disease outbreaks within the coniferous forest exist. Occurrences have been minor and localized. Tansy ragwort and gorse are two noxious weeds that have been introduced into the

area. Various treatments have been implemented to reduce their spread. With road development, the spread of *Phytophthora lateralis* root disease of Port-Orford-cedar may be increased where spores can be spread by machinery and water.

NEED

OTHER AREAS AND PUBLIC USE

Adjacent to the Grassy Knob Roadless Areas is the Grassy Knob Wilderness (17,200 acres). The Wild Rogue Wilderness (36,100 acres) and Kalmiopsis Wilderness (179,850 acres) lay 14 and 25 miles, respectively, southeast of Grassy Knob Numerous small unroaded areas occur throughout the vicinity.

Local users are more likely to utilize the Grassy Knob area than recreationists from major population centers, such as Portland and San Francisco. Some recreationalists may use the area incidental to visiting the Grassy Knob Wilderness. Most nonlocal use will occur with travelers leaving the nearby coastal U.S. Highway 101 during the summer period.

ECOSYSTEM REPRESENTATION

The Grassy Knob Roadless Area is well represented in terms of ecotypes, topography and vegetation by the Grassy Knob Wilderness.

PUBLIC INVOLVEMENT

During the development of the Mount Butler-Dry Creek Land Use Plan in the mid-1970's, public input into the process was extensive at both the local and state levels. The recommendations and opinions expressed varied from total preservation to total development. For a thorough review of public input and responses, refer to the Mt. Butler-Dry Creek Planning Unit FEIS. Earlier input derived from the Roadless Area Review and Evaluation (RARE) process (early 1970's) was also considered in this evaluation.

During 1981 and 1982, the Butler Sky, China Peak and Grassy Knob Timber Sales were appealed by an organization called Citizens for Grassy Knob. Their desire was to see the area remain roadless The Butler Sky and Grassy Knob sales were included in the present Grassy Knob Wilderness boundary and were not cut. The China Peak sale, on the periphery of the new Wilderness, has been roaded

When the Grassy Knob area was proposed for Wilderness status in 1984, local input was strong and highly polarized. Timber harvest interests and Coos and Curry County officials were opposed to the Wilderness because of the sizeable volume of commercial forest at stake; the impacts were expected to translate directly to fewer jobs in the forest products industry and less revenue to the counties Many local residents and representatives of the fishing industry, on the other hand, feared adverse impacts on fisheries resources in the Elk and Sixes Rivers from development activities.

Since the Grassy Knob Wilderness designation in 1984, public comment on the remaining area has been minimal. The only portions currently discussed are the two small western drainages, Anvil and Rock Creeks. A few local citizens still seek inclusion of these areas into the adjacent Wilderness. The two areas are also dealt with through special management areas (reference the Special Area Attributes list of "Supplemental Resource Areas" and inclusion of the two in various alternatives; Chapter II, FEIS).

ENVIRONMENTAL CONSEQUENCES

SIGNIFICANT EFFECTS

The inventoried Grassy Knob Roadless Area is known to contain historic and prehistoric sites, many of which need professional evaluation to determine their significance. Indians traveled the ridges and hunted the waterways during the pre-1856 cultural era. Mining played a strong role in the historical development of the Sixes River drainage; today it provides a living for a select few.

Cultural Resources

All alternatives, except E and M, would develop portions of the area which may disturb any existing cultural resources. Valuable sites will be protected via avoidance or conserved via data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and access limitations for Grassy Knob Roadless Area. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-		
High	-	-	-	-
Moderate	-	-	-	-
Low	-	1,100	4,300	5,400
Total	-	1,100	4,400	5,500

Improvements

The 3,813 acres of tentatively suitable land could generate about 18 miles of new road for timber harvest. However, since a portion of the eastern area between Bee Creek and the South Fork Sixes River may not be feasible to road due to Wilderness blocking the better access routes, the actual mileage would likely be lower. Roads for other purposes would be minor. Tie roads and loop road systems would be difficult and improbable due to steep terrain. No additional collector roads are planned and all local roads would most likely be dead-end systems following along or near ridges. Depending on the alternative, some mileage would remain open to passenger car use; other roads would be open to only high clearance vehicles or closed between projects. The following table shows the mileage of the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC and A	15	4	5	6
B	16	4	6	6
C	18	3	8	7
D	15	5	4	6
E and M	0	0	0	0
G	14	0	6	8
K	15	4	2	9
S	11	3	1	7

Alternatives E and M would have minimal effect on this area due to no roads being built. Alternative S would build the least miles of the roaded options, as it allocates an area to Backcountry Recreation and permits timber management on the remainder. Alternate G would build the next fewest miles of the roaded options and would not maintain roads open for passenger cars Alternatives NC, A, B, C, D, and K would be mostly roaded except for some stream Supplemental Resource areas. Alternative C, without Supplemental Resource areas, would have the highest mileage. Alternatives G, K, and S would close 60 percent of the roads

None of the roads would be expected to cross main streams or tributaries inhabited by fish Where roading requires full bench construction in steep terrain, excavated material would be hauled to stable disposal sites. Few new roads would be seen from the Grassy Knob Wilderness due to the heavy vegetative cover and topographic relief. New roads in the western portion would be seen from sections of U.S. Highway 101; some new roads in the eastern portion would be seen from parts of the Sixes River Road. Except for change in recreation experience from roading, the effects on other resources would be minor.

Wilderness Potential

All alternatives, except E, M, G and S assign most of the area to multiple resource management objectives. Under these, the area would be developed and Semi-primitive recreation opportunities currently available would shift to the motorized end of the opportunity spectrum. Wilderness potential would be lost.

Alternatives E and M would maintain the area in a roadless condition. The Wilderness potential would be maintained. Under alternatives G and S, the area allocated to Backcountry Recreation would be reduced (1,055 acres in G and 2,426 acres in S). Due to size of the allocations and the proximity of roads, the Wilderness potential would likely be lost. These alternatives provide additional capacity for Semi-primitive Non-motorized recreation opportunities and benefit the quality of recreation experience in the Grassy Knob Wilderness. The Wilderness potential would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	500	500	500
B, C, D, and D1	500	500	500
E and M	5,400	5,400	5,400
G	1,100	1,100	1,100
K	500	500	500
S	500	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Soil, Water, and Fish

There are no adverse soil, water, or fish habitat consequences associated with allocating the Grassy Knob area to Backcountry Recreation in Alternatives E and M because of the absence of development activities. All other alternatives allocate all or part of the area to development. Generally, the soils have a high hazard for accelerated sediment production, especially with activities associated with road building. The environmental effects of timber harvest and road construction are discussed in Chapter IV of the FEIS.

The risk of degrading these resources generally increases with more timber harvest and road building. Alternatives NC and C pose a higher risk of degradation than other alternatives because more activities are planned and area of soils with high hazard ratings for both road and regeneration are greater. All other alternatives have lesser risks (moderate) due to protection afforded by Supplemental Resource allocations.

Fire

In an undeveloped scenario (Alternatives E and M), natural fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs, and increased resource losses. In a developed scenario (Alternatives NC, A, B, C, D, K, and S), the fire hazard increases at the time of timber harvest. As fuels are treated, the fire hazard is reduced. In the long-term, the continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs, and less resource loss due to fire.

In Alternatives E and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area. In Alternative G, 38 percent of the area would be developed, creating a mosaic of fuels over time. The remaining undeveloped area would be divided into 6 separate blocks. Alternatives A, B, C, D, K, and S would develop 52 to 62 percent of the area. The remaining undeveloped areas would be broken into 4 to 8 separate blocks. Alternative NC would develop 67 percent; the remaining undeveloped areas being in 5 separate blocks. All alternatives will treat some of the high priority natural fuels accumulations.

In undeveloped areas, the risk of ignition is low due to the low level of human use. As development occurs, risk increases with road construction, timber harvest, and treatment of activity slash from these operations. As access improves, level of dispersed recreation and other public uses increases, resulting in an increased risk of human-caused fires. Lightning fires have similar levels of risk for both developed and undeveloped areas

In Alternatives E and M, risk from human-caused ignition would be limited primarily to the area's periphery due to limited access. In Alternative G, industrial operations would result in increased risk, with risk from public use being increased along 14 miles of road. In Alternatives A, B, C, D, K, and S, industrial operations would result in increased risk over 52 to 62 percent of the area, and risk from public use would be increased along the 11 to 18 miles of road. In Alternative NC, industrial operations would result in increased risk over 67 percent of the area; risk from public use would be increased along 15 miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV of the FEIS).

Sensitive Plants

No botanical sites are proposed in this roadless area. To date, no sensitive plants are known to exist in the area. There are no existing or proposed Research Natural Areas (RNA's).

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning To determine the impacts of each alternative, only the effects of prescribed burning will be considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze Alternatives E and M would contribute no TSP. All other alternatives would produce 12 to 18 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Coos Bay or Roseburg, both designated areas for air quality, is very low based on past performance. The probability of impacting the Grassy Knob Wilderness is low to moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. This area contains potential bald eagle and osprey habitat. Bald eagles may occasionally use the Sixes River as a flight corridor; this river system may also contain potential nesting habitat (USDI Fish and Wildlife Service 1986). Habitat would be slightly degraded in alternatives which do not allocate the unroaded management.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This is especially true for Alternative C which meets Management Requirements (MR's) for mature/old growth wildlife species, but otherwise allocates most of the area to development. At the extreme is Alternative NC, which contains no MR habitat. Except for Alternative NC, a mixture of habitat enclaves to meet MR's for mature/old-growth habitat is located within the roadless area: two for pileated woodpeckers and one for pine marten. At present, this area supports approximately three pairs of spotted owls; there would be no long-term change under Alternatives E and M, and moderate change under G. Mature/old growth habitat would ultimately be reduced to MR levels in all other alternatives, except Alternative NC which has no land assignments for wildlife species which use mature/old-growth forest.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase in all alternatives, except E and M, which open up much of the unroaded area to timber management. Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. No meadows have been identified in the area. Rock bluffs are present, particularly in the eastern portion. Among the alternatives which allocate all or part of the area to timber management and which utilize either a Riparian Prescription C or Supplemental Resource area designation, the highest level of riparian habitat protection for wildlife is provided.

Wildlife Recreation Use. Estimated Wildlife and Fish User Days (WFUD's) currently attributed to the area are low because human use is less in unroaded areas. Fewer hunters use unroaded areas and non-hunters generally stay on the few trails. Alternatives E and M, which leave the area in an unroaded condition, and G and S, which leave about 18 percent, would produce fewer WFUD's; other alternatives would generate more.

Visual Resource

The current VQO inventory indicates that Modification covers nearly the entire area, with exception of less than 100 acres of Retention. All alternatives, except E and M, manage the area under the Modification objective. Alternative S would allocate less than 200 acres to Retention and Partial Retention Visual Management Areas visible from the Elk Wild and Scenic River. A reduction in the natural appearance of the landscape character is expected under all alternatives except E and M. Alternatives E and M would maintain the area in a roadless condition, resulting in management for Preservation which would exceed the inventoried objective.

Recreation Settings

The Recreation Opportunity Spectrum (ROS) displays approximately 800 acres as suitable for Roaded Natural activities. Another 4,600 acres is inventoried as suitable for Semi-primitive Non-motorized and Motorized activities.

All alternatives, except E and M, would allocate most of the area to management for multiple resource objectives. Recreation opportunities would be motorized rather than non-motorized and, in that respect, would be enhanced as roads are constructed. The potential wilderness character and Semi-primitive recreation opportunities would be lost. Alternatives E and M would maintain the 5,400 acres in a roadless condition. Potential wilderness character and Semi-primitive recreation opportunities would be maintained over the planning period.

Alternatives A, B, and D would retain the essentially undeveloped character on approximately 2,000 acres due to assignments to Supplemental Resource and Designated Wildlife Habitat. Alternative NC and C would retain the essentially undeveloped character on 900 to 1,400 acres, respectively. Alternative K would retain undeveloped character on 2,400 acres due to Supplemental Resource and Designated Wildlife Habitat areas. Alternative G would retain the undeveloped character on 3,000 acres due to Backcountry Recreation, Supplemental Resource, and Designated Wildlife Habitat. Alternative S would retain essentially undeveloped character on 3,100 acres due to the above listed allocations.

Economic and Social

There are 3,813 acres of land identified as tentatively suitable for timber management in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,428 acres of the Grassy Knob Roadless Area is 0.21 MMCF. The estimated LTSY would be 0.38 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC	.17	.31
A and D	.13	.24
A-Dep and D1	.14	25
B and C	16	.28
E and M	.00	.00
G and S	09	.17
K	12	22

For projecting effects, the alternatives are divided into three groups: (1) Alternatives E and M leave the area in an unroaded condition; (2) Alternatives NC, A, A-Departure, B, C, D, D1, and K develop much of the area for timber production, and (3) Alternatives G and S develop approximately half the area.

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E and M have the biggest reduction in the timber and road expenditures. Alternatives G and S have a slight decrease. The last group of the alternatives have no significant change.

The indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while Alternatives G and S have a slight reduction in the level of employment, income, and payments to counties The other alternatives have insignificant changes; Alternatives NC, B, and C have a slight positive benefit.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Additional discussion is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E and M, fishing interests are predicted to feel positive about Forest management while timber interests as predicted to feel the Forest is ignoring their interests. An "0" indicates no change from current situation. Such gains and losses may create additional conflict.

	Alternatives		
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G and S (Partially Roaded)	NC, A, B, C, D and K (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Reduction	No Change
Indirect Effects			
Jobs	-12	-4	0
Annual Income (MM $)	-0.27	-0 08	0
Annual Payments to Counties (MM $)	-0 07	-0 02	0
Cumulative Effects			
Westside Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	+	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old-Growth	+	+	0
Mining	-	-	0

MITIGATION MEASURES

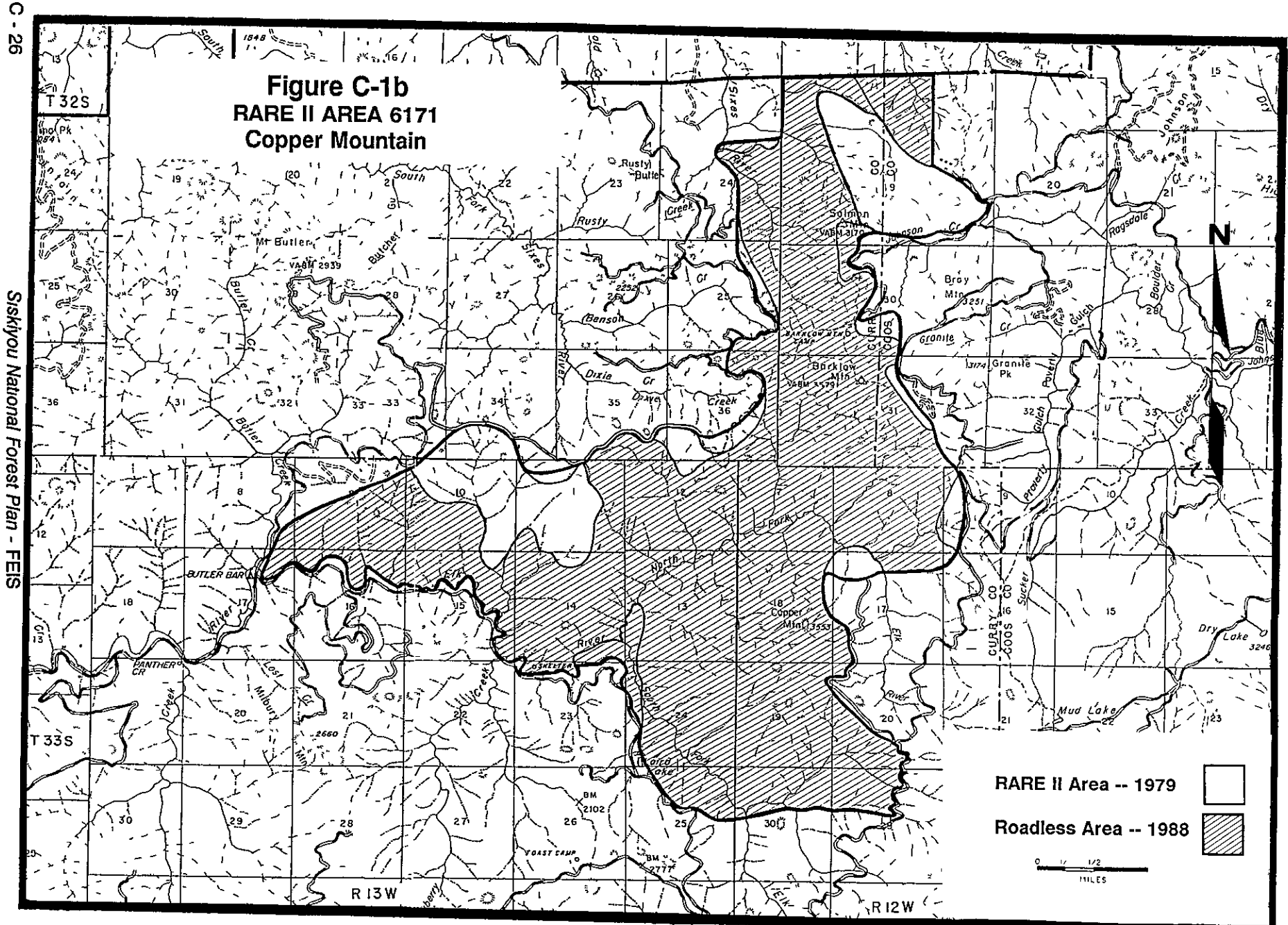
No additional mitigation measures have been identified beyond those already discussed in the above text and listed for each alternative through the application of the Standards and Guidelines.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

Conflict with adjacent landowners may occur over access.

Table C-5b. Copper Mountain Roadless Area No. 6171 (9,354 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	606
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	11	0	11	11	11
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	9,343	7,706	0	9,343	1,332
7-Supplemental Resource	0	0	1,116	0	1,116	0	0	0	0	0
8-Designated Wildlife Habitat	0	715	639	715	639	0	415	1,473	0	389
9-Special Wildlife Site	27	24	0	0	0	0	0	37	0	398
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	791
11-Riparian	1,846	1,661	1,188	1,663	1,188	0	224	1,512	0	1,000
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	2,691	2,392	0	0	0	0	417	428	0	235
14-General Forest	4,790	4,562	6,411	6,976	6,411	0	592	5,893	0	4,592
TOTAL	9,354	9,354	9,354	9,354	9,354	9,354	9,354	9,354	9,354	9,354
TOTAL UNDEVELOPED (MA 1-9)	27	739	1,755	715	1,755	9,354	8,121	1,521	9,354	2,736


Figure C-1b
RARE II AREA 6171
Copper Mountain
T 32S
T 33S
R 13W
R 12W
Butler Creek
Butler River
Mt Butler
Rusty Butler Creek
Sixes River
Benson Creek
Dixie Creek
Bray Mtn
Granite Creek
Barklow Mtn
Granite Pk
Powell Gulch
Ragsdale Cr
Boulder Cr
Johnson Cr
Salmon Mtn
Copper Mtn
Dry Lake
Mud Lake
Sucker Creek
Panther Cr
Lost Creek
Milbourn Mtn
Butler Bar
Shelter
Forest Camp
BM 2102
BM 2717
CURRY CO
COOS CO
N
RARE II Area -- 1979
Roadless Area -- 1988
0 1/2 1
MILES

COPPER MOUNTAIN No. 6171

(9,354 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Copper Mountain Roadless Area was studied as a potential Wilderness During the RARE II process. At that time it contained 10,884 acres and was allocated to non-Wilderness use by the RARE II decision in January of 1979. Since then, acres have been deleted by timber sales and acres added by the addition of two small areas. The new total for Copper Mountain area is 9,354 acres.

The unroaded area is covered by the Powers Ranger District Multiple Use Plan approved in 1969. The management direction and allocation is Principal Forest Resource Zone. In this nearly continuous forested zone, sustained production of timber is the primary goal. Other resources are to be managed for outputs or values consistent with this primary goal. Limited areas within this zone may be protected or managed for other purposes, e.g , watershed protection, recreation, wildlife and fisheries. Reference the Powers Ranger District Multiple Use Plan for management direction and coordinating requirements. Several management requirements have been updated by Forest policy and directives.

CHANGES BETWEEN DRAFT AND FINAL

Between 1984 and 1988, three timber sales and a refinement in the inventory have adjusted acreage of the unroaded area (Refer to Figure C-1a). In the northeast portion of the area, the Salmon Mountain Timber Sale has reduced the area by 600 acres and effectively severed a 1,000-acre block from the unroaded area. Another sale in that same area altered the boundary slightly. In the northwestern part, the North Shelter Timber Sale reduced the unroaded area by approximately 900 acres. Additional acreage was removed from the unroaded area due to the discovery of a portion of the area that was previously roaded in the 1940's and 50's.

As a result of the Omnibus Oregon Wild and Scenic Rivers Act of 1988, the main stem of the Elk and the North Fork for approximately two miles were added to the National Wild and Scenic Rivers System. The new designation affects the acreage array and, to a limited degree, discussion throughout the text. Elk River from the forks to Anvil Creek is classified as a Recreation segment; North Fork Elk River is classified Wild Due to the very recent passage of the Act, the Management Area acreages (Table C-5a) and analysis have not been updated to reflect the changes. Only Alternative S carries the adjustments for Management Areas 2 and 10. All alternatives would be treated the same relative to the Congressionally designated status. Management Area 2 (Wild River) would be 606 acres; Management Area 10 (Scenic/Recreation River) would vary due to the hierarchy of the land allocation scheme.

Also in late 1988 the Elk and both forks were added to the State Scenic Waterways system. The Scenic Waterway extends above the Wild River segment on the North Fork, and covers the South Fork which was not included in the National Wild and Scenic River System. For management, the State Scenic Waterway will increase the visual sensitivity as viewed from these streams. Where applicable, consideration should be made as to the added resource effects and tradeoffs in the following discussion. However, the expected impacts are deemed minor for all alternatives for management of this roadless area.

LOCATION AND ACCESS

The Copper Mountain area is located in Coos and Curry Counties, approximately 12 miles east of the coastal town of Port Orford and 12 miles southwest of the town of Powers. The east side of the roadless area can be accessed by the Mt. Butler Road from the east and Elk River Road from the west. The west side of the area can be accessed from the Sixes River Road 5201 which ties the Elk River and Sixes River transportation systems together.

PHYSIOGRAPHIC AND BIOLOGICAL FEATURES

The physical location of the roadless area is on the western side of the coast range (Klamath Mountain and Coast Range Geologic Provinces) in southwestern Oregon. The terrain is very steep and rugged, with deeply incised canyons Elevations vary from 800 feet to 3,579 feet at the top of Barklow Mountain The area is heavily vegetated with old-growth and second-growth Douglas-fir (a result of old wildfires). A variety of hardwood and brush species intermix with the conifer. The ecosystem is primarily mixed conifer with an intermingled mixed evergreen type.

Annual precipitation averages 115 inches per year, with most of it coming in the form of rain in the fall, winter and spring months An average 12 inches of rain occurs during the dry season (May through September). Summer coastal fog is limited to the lower elevations along Elk River.

A fault line runs through the roadless area along the southeast face of Copper Mountain. Naturally occurring slide activity is frequent along this line. Many of the drainages in the area have deep layers of deposited material, a result of old slide activity.

Soils in this area are quite variable. The steeper, highly dissected areas have shallow, rocky soils commonly with a surface layer of talus rock. A high incidence of debris slide activity occurs on this soil type on lower slope positions, along inner gorge areas, and in swales just above slope breaks. In sharp contrast, some deeper soils with more gently rolling topography are present in toe slope positions, the result of previous deep-seated landflow activity. Soil productivity is greatly increased on this soil type. Steeper pitches along drainages on this soil type have a high incidence of rotational slump failures.

Over 7,000 acres of the area drains into the Elk River drainage. Anadromous fisheries in the Elk River system are native. Steelhead and salmon run up the North Fork approximately 2.5 miles, and up the South Fork one mile from the confluence of both Forks of Elk River. The fisheries inventory crew from the Pacific Northwest Experiment Station, working in the area in May of 1985, found that the North Fork of the Elk River was producing tremendous numbers of fry steelhead and salmon. The crew described the area as being one of the most productive that had been found anywhere in the state. Similar results are expected to be found in the South Fork. The North and South Forks both support large populations of native trout which reach up stream 4 and 2.5 miles, respectively. This headwater area of the Elk River is an important source of water for the Elk River State Fish Hatchery, downstream approximately 10 river miles.

The remaining 2,000 acres contributes to the headwaters of the Sixes River, Johnson Creek, and Salmon Creek Though there are no fisheries in these upslope streams, they are important as sources of cool water during the summer months for downstream fisheries.

Populations of black-tailed deer and Roosevelt elk are present, but numbers are low due to limited forage in the area. A large population of black bear can be found, especially along the North Fork. No known threatened or endangered species inhabit the area. The northern spotted owl, a sensitive animal dependant on old-growth forest, undoubtedly resides in the roadless area; however, to date none have been sighted. No sensitive plants are known to occur in the roadless area, although *Darlingtonia californica*, a watch list plant, is found at a site east of Barklow Mountain. Given the close proximity of Iron Mountain,

an outstanding botanical area, it is probable that a thorough plant inventory of the Copper Mountain Roadless Area would result in the discovery of at least a few sensitive plant species.

RESOURCE USE

There are 10 active gold mining claims in the roadless area, with most activity on the North Fork Elk River. Several other claims are adjacent to the roadless area along Elk River downstream from the confluence of the North and South Forks.

Hunting is generally confined to the perimeter of the roadless area due to steep, densely vegetated terrain and minimal trail access. For the same reasons, other recreational use is limited.

The only maintained trail is 1/2 mile in length, running to the Barklow Mountain Lookout site from the end of a local road. From Barklow Mountain, the trail continues to Barklow Camp, then forks The west fork comes out on the Sixes River Road in Section 36. This piece was cleared and maintained until 1981, but is still in good shape. The east fork comes out near Johnson Creek in Section 30, while overgrown, the trail is in good shape.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The roadless area is long and narrow on its north-south axis. A long 4-mile finger juts westerly from the south end of the area. The north-south length is eight miles and the width is one to two miles. The main body of the roadless area surrounds Copper Mountain. The area is very steep, rugged and heavily vegetated with few natural openings. The south facing slopes are predominantly hardwood stands of tanoak, madrone and chinkapin, and brush fields. The entire area is surrounded by roads and harvest units. The southwest boundary is adjacent to Elk River. To the north of the area is private land. Southeast of the roadless area is the inventoried Iron Mountain Botanical Area.

In addition to Elk River, the principle attraction within the unroaded area is the Barklow Mountain trail and abandoned lookout site. A small pond, two to three acres in size, is located in the northwest corner of *Section 19 at the north end of the roadless area.*

CAPABILITY

MANAGEABILITY

The Copper Mountain Roadless Area boundaries do not follow natural topographic features for the most part, and are not easily discernible on the ground. Because of the shape and indistinct boundaries, protection and maintenance of roadless characteristics and values would be difficult. Potential for conflict with other management activities definitely exists.

NATURAL INTEGRITY AND APPEARANCE

Most of the roadless area has retained it's natural appearance, though past human and management activities are still evident throughout. Much healing has occurred and, while still apparent, does not disturb the area's natural balance.

The area north of Salmon Mountain has seen considerable human activity. Shaft mining has occurred along with access roads. The tipples of the mines were still standing in the late 1950's. Slides have closed the mineshafts, but mining evidence can be seen in the form of tailing piles, old timbers, and some abandoned equipment. About 250 acres was commercially thinned in the early 1970's. In addition, a large amount of Port-Orford-cedar was cut in this area between 1950 and 1970. The roads that access this area took off from Road 3353 near the line between Sections 19 and 20. The road forked and ran up into the

northeast and northwest corners of Section 19, with occasional spur roads along their length, to provide access for cedar logging These roads were waterbarred and grass seeded after the last commercial thinning in 1973, but are still evident on the ground.

The lookout tower at Barklow Mountain has been gone for years, but evidence of its presence is still apparent. North of the former lookout site is the Barklow Mountain trail camp. Remnants of the trail shelter remain. The old Zuber Cabin is still standing in Section 17 on the North Fork of Elk River. Remnants of another cabin have been reported on the North Fork in Section 13.

A portion of the old trail that ran from the Elk River north to Mount Butler Lookout and east to Barklow Mountain Lookout can still be found in Sections 11 and 14, though it has almost returned to a natural state. Remnants of a trail shelter can still be seen in Section 14.

An area in Section 14 north of the Elk River confluence was commercially thinned by a horse logging team, then helicopter yarded across the Elk River. Evidence of this operation can still be seen. Some of the landing piles were not burned.

Evidence of old activities such as the cabins, trail shelters, the lookout, and mining activity would be points of interest to many rather than distractions to their roadless experience. The logging and the roads are considered adverse impacts and would diminish the roadless experience. The trails are attributes that could be maintained for recreational and protection purposes.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The mountainous topography with deep, heavily dissected river drainages and dense, continuous vegetation can provide localized conditions where a user would not be aware of presence of others nearby. These same features, however, tend to restrict cross-country travel whereby use would tend to be concentrated along river bottoms or ridgetops.

The key factor affecting the opportunity for solitude and primitive recreation is the physical size and shape of the roadless area. The core area, itself, is only one mile or so from a road at any point. Motorized activities outside the roadless area are very likely to be heard and possibly seen from within the area. Timber harvest units are visible from much of the area. These factors tend to reduce the opportunity for solitude and a quality primitive experience.

The Recreation Opportunity Spectrum (ROS) displays approximately 6,000 acres as suitable for Roaded Natural activities. Another 3,300 acres is inventoried as suitable for Semi-primitive Non-motorized activities.

SPECIAL FEATURES

The primary attraction of the Copper Mountain area is the Barklow Mountain trail and former lookout site. These provide a fine view of the surrounding area.

AVAILABILITY

RESOURCE POTENTIALS

Recreation

At present, the use of the area is well below capacity. If the area remains roadless, use would not be expected to increase unless the trail system was expanded. Potential for increased recreational use is greatest under roaded conditions where some of the existing roadless use would continue along with increased motorized forms. The area available for roadless uses, though, would greatly decrease.

Wildlife

Under unroaded conditions, wildlife populations would remain about the same unless habitat improvement projects were initiated. Under roaded conditions, as timber is harvested and varying stages of vegetation becomes established in the area, deer and elk herds can be expected to increase. Population of old-growth dependent wildlife would decrease in number, but individual species would not necessarily be eliminated, as considerable variety would remain in the area due to land unsuitable for timber management. Sensitive species would be protected through applicable management standards

Fisheries

This area contains high quality salmon, steelhead, and resident trout habitat. The North Fork of Elk River has been identified as especially important for production of salmon and steelhead. Under unroaded conditions, fisheries habitat would not change in the roadless area unless impacted by localized natural landslide activity. Under roaded conditions, the potential for increased risks to the fisheries would occur with timber harvest and associated roading. Current harvest practices, road location and construction techniques can greatly reduce this impact. Balancing activity with the landscape and fisheries is delicate, though. Past harvest activity heavily affected the headwaters of the North and South Forks of Elk River in the 1960's and early 1970's. The area is healing over time through vegetative regrowth along stream banks, and revegetation of landslides, road cuts and fills. With improved access, fisheries enhancement projects would be more efficiently implemented.

Water

The greatest demand for water is for the beneficial uses attributable to the high value fisheries of the Elk River and water used in the State Fish Hatchery operations. There are no existing or planned water developments. Quality aspects of the water resource remain most important relative to both the fishery and aesthetics of the river, itself.

Timber

Of the 9,354 acres in the roadless area, 7,802 acres are considered tentatively suitable for the production of timber. The area is moderately to highly productive. Standing volume is estimated to be 191 MMBF. The area northwest of Copper Mountain is primarily second-growth Douglas-fir. To harvest this area, special logging systems would be required. To the north, road access into the western half of Section 24 is not feasible at this time due to the low value of timber accessed.

Energy and Minerals

There are no plans for the exploration or development of energy sources in this area. The heaviest mineral use, although quite limited, is gold mining along the North Fork. If the area remained roadless, the level of mining activity would remain constant. With better access, increased mining activity could result, though such an increase is not expected to be appreciable.

Cultural

Other than those noted, historic and prehistoric sites will be evaluated and provided for under the applicable laws and regulations for any proposed activity. Sites in this locale have generally occurred on ridgelines and alongside the major streams.

MANAGEMENT CONSIDERATIONS

Fire is a critical consideration in management of this area. The potential for major conflagration exists with hazards posed by heavy fuels and dense vegetation. Conditions are somewhat lessened in severity due to the relatively short periods of extreme conditions largely attributable to coastal marine air influences.

With roading, access and intensified treatment of activity fuels would reduce fuel concentrations and continuity. Probability of major fire would be reduced. However, access also brings increased risks from the added numbers and dispersion of people and activities.

NEED

OTHER AREAS AND PUBLIC USE

The Grassy Knob Wilderness of 17,200 acres is adjacent to the westerly tip of the unroaded area. The Wild Rogue Wilderness (35,100 acres) is 9 miles southeast, while the Kalmiopsis Wilderness (179,850 acres) is 20 miles south Numerous small unroaded areas are dispersed throughout the Forest nearby. Immediately to the southeast is the inventoried Iron Mountain Botanical Area.

Local users are more likely to utilize the Copper Mountain area than recreationists from major population centers There are no specific attractions to draw much attention to the area, nor is the scenery particularly noteworthy. Users would primarily be drawn for the area's ruggedness and remoteness.

ECOSYSTEM REPRESENTATION

The area is well represented in terms of ecotypes and landform by the Grassy Knob Wilderness. While the proposed Iron Mountain Botanical Area is close, the ecosystems are quite different.

PUBLIC INVOLVEMENT

The area was allocated to non-Wilderness during the RARE II process. Over 60 percent of the 8,000 respondents preferred non-Wilderness due largely to no real drawing features and to the large amount of productive forest land. Reasons for inclusion as Wilderness were dominantly those related to old-growth and the quality salmon and steelhead fisheries of the Elk River. Recent input to the Forest planning process suggests that the same reasons hold true. The emphasis for maintaining the area in an unroaded condition is both light and localized.

Public input since RARE II on several of the inventoried roadless areas within the Siskiyou National Forest has been extensive. However, Copper Mountain has not received the same intensity of concern or advocation of protective status as several of the larger areas. Protection and enhancement of the fine anadromous fishery remains key to management of this area.

During recent environmental analysis of several proposed timber sales, input recommending that the Copper Mountain area be managed as a roadless area for protection of the area's visuals and fisheries resources was received from several local residents. Downstream residents and others in the Port Orford area most active in tracking management and contributing to proposed activities.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Copper Mountain area contains archaeological potential along the Elk River drainage and the ridgelines where foot travel was facilitated by the relatively level terrain. Copper Mountain and Barklow Mountain are likely sites for Indian vision quest rites, although no such evidence has been discovered to date.

Historically, the area is noted for the Barklow Mountain trail and former lookout site. Mining occurred in the area in the 19th century and has continued into the present. Old cabins remain, as do trails and remnants of a trail shelter as reminders of the area's past use.

Alternatives NC, A, B, C, D, K, and S would road the area and possibly disturb unknown existing cultural resources Alternatives M, E, and G would not develop most or all of the area, thereby the potential for disturbance of cultural resources is greatly reduced.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for Copper Mtn. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

Access Restrictions	Mineral Potential (Acres)			
	High	Moderate	Low	Total
Withdrawn	-	-	<100	<100
High	-	-	-	-
Moderate	-	-	-	-
Low	<100	<100	9,200	9,300
Total	*<100*	*<100*	*<9,300*	*9,300*

Improvements

Depending on alternative, the 7,802 acres of tentatively suitable land could generate up to 40 miles of new road for timber harvest. Roads for other purposes would be minor. A new collector road would be planned with some of the roaded alternatives. All local roads would most likely be dead-end systems on or near ridges and off existing roads 5201 and 3353. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows the mileage of the area by alternative:

Alternative	Total Miles	*Miles Open to* Passenger Car	*Miles Open to* High Clearance	Miles Closed
NC and A	40	10	14	16
B	36	9	13	14
C	40	6	18	16
D	36	11	11	14
E and M	0	0	0	0
G	7	0	3	4
K	37	9	6	22
S	29	7	5	17

Alternatives E and M would have minimal effect as no roads are built. Alternate G would have the least miles built of the roaded options and would not maintain any roads open for passenger cars. Alternatives NC, A, B, C, D, and K would be mostly roaded except for the Supplemental Resource areas in Alternatives B and D. Alternatives G and S allocate areas to Backcountry Recreation and permit timber harvest on the remaining areas. Alternatives G, K, and S would close approximately 60 percent of the roads.

None of the roads would be expected to cross main creeks or tributaries inhabited by fish. Several small tributaries to the North Fork and South Fork Elk River would be crossed in all roaded alternatives except

G All roaded alternatives would cross small tributaries of the Middle Fork Sixes River. Some decrease in water quality could be expected from construction and use of the new roads. Full bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites.

A collector road would be planned in Alternatives NC, A, B, C, and D in the vicinity of Barklow Mountain. This road would provide a tie between two existing collector roads (3353 and 5201) and add about four miles to the collector system.

Wilderness Potential

All alternatives, except E, G, M and S, would allocate most of the area to multiple resource management objectives. Under these, the area would be developed and the Semi-primitive recreation opportunities currently available would shift to the motorized end of the opportunity spectrum. The change in the character of the landscape would result in the loss of Wilderness potential.

Alternative G would assign 7,700 acres to Backcountry Recreation and retain the essentially unroaded character on approximately 8,100 acres. Alternative S would assign 1,300 acres to Backcountry Recreation and retain an unroaded character on 2,700 acres. Some Wilderness potential may be retained in Alternative G, however Wilderness potential would be lost in Alternative S.

Alternatives E and M would maintain the Wilderness potential by retaining the area in a roadless condition. Additional capacity for Semi-primitive Non-motorized recreation opportunities would be provided.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	9,300	9,300	9,300
G	7,700	7,700	7,700
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness.

Wild and Scenic Rivers

See **CHANGES BETWEEN DRAFT AND FINAL.**

Soil, Water, and Fish

For soil and water, no adverse consequences are associated with Alternatives E and M because no soil disturbing activities will occur. All other alternatives allocate all or part of the area to Management Areas which permit development A high percentage of the soils within this area have high hazard ratings for both regeneration and road related increases in accelerated sediment. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

The risk of degrading the soil and water resource increases with increasing timber harvest and road construction activity. Except for E, G, and M, all other alternatives pose a higher risk of degradation because more activity is planned with a corresponding increase in landslide frequency on the highly sensitive soils Alternative G greatly reduces the risk as most of the high risk soils are within Management Areas which remain undeveloped.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease that they will create in fire hazard and fire risk. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

Fuels in the Copper Mountain area are moderate to heavy and are very continuous. The stands are predominantly old-growth Douglas-fir, with moderate to heavy understories of brush and hardwood. On some of the south slopes, brushfield conditions exist. In an undeveloped scenario (Alternatives E and M), natural fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario (all other alternatives), the fire hazard increases at the time of timber harvest. As fuels are treated, the fire hazard is reduced. In the long-term, the continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource damage.

In Alternatives E and M, with all the area remaining undeveloped, fuels would remain continuous over the entire area. Alternative G, where 11 percent of the area would be developed, a mosaic of fuels over created over time while the rest of the area would remain undeveloped. Alternatives B, D, K, and S would develop approximately 49 to 75 percent of the area. The remaining undeveloped areas would be broken into 4 to 7 separate blocks. Alternatives A and C develop 75 percent of the area. The entire area is developed over time in Alternative NC. The remaining undeveloped areas would be in 3 separate blocks. All alternatives treat some of the high priority natural fuels accumulations.

In undeveloped areas, the risk of ignition is low due to the low level of human use. As development occurs, risk increases with road construction, timber harvest, and treatment of activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases, resulting in an increase in risk of human-caused fires. Lightning fires will have similar risk levels for both developed and undeveloped areas.

In Alternatives E and M, the risk from human-caused ignition would be restricted primarily to the periphery of the area due to limited access. In Alternative G, industrial operations would result in increased risk over 11 percent of the area; risk from public use would increase along 7 miles of road. In Alternatives B, D, K, and S, industrial operations would result in increased risk over 49 to 75 percent of the area; risk from public use would be increased along 29 to 37 miles of road. In Alternatives NC, A and C, activities would result in increased risk over most of the area; risk from public use would be increased along 40 miles of road

Vegetation

The effects on vegetation relative to diversity and age class distribution do not differ from the Forest as a whole (See Chapter IV of the FEIS).

Sensitive Plants

No botanical sites are proposed in the Copper Mountain Roadless Area. The proposed Iron Mountain Botanical Area is just to the east. As yet, no sensitive plants are known from this roadless area, although a watch list plant (*Darlingtonia californica*) is present. Sensitive plants which may be in the roadless area would be best protected in Alternatives E, G, and M which allocate the area to Backcountry Recreation. Under all alternatives, sensitive plants would be protected through appropriate Standards and Guidelines. There are no proposed RNA's.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning are considered. Total suspended particulates (TSP) is used as a measurement of regional haze. Alternatives E and M would contribute no TSP to the annual total generated on the Siskiyou National Forest. Alternative G would produce 8 tons of TSP per year. Alternatives NC, A, B, C, D, K, and S would generate 46 to 50 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Coos Bay, Roseburg or Grants Pass, all designated areas for air quality, is very low based on past performance. The probability of impacting the Grassy Knob or Wild Rogue Wilderness is low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E, G, and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This is especially true under Alternatives A, A-Departure, C, K, and S, which meet Management Requirements (MR's) for mature/old growth wildlife species, but otherwise allocates most of the area to development. No MR habitat is assigned in Alternative NC.

Except for Alternative NC, a mixture of habitat enclaves to meet MR's for mature/old-growth habitat is located within the roadless area: one for pileated woodpeckers and two for pine marten. At present, this unroaded area can support approximately three pairs of spotted owls; there would be little or no change under Alternatives E, G, and M. Mature/old-growth habitat would ultimately be reduced to MR levels (no spotted owls) in all other alternatives, except for Alternative S which allocates 14 percent of the area to Backcountry Recreation, and Alternative NC which has no allocation for this type of habitat.

Woodpeckers Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E, G and M.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase in alternatives which open up much of the area to development (all alternatives except E, G, and M). Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. No meadows have been identified; a few rock bluffs are present. A small identified wildlife area (Special Wildlife Site) is allocated in all alternatives except B, C, D, and D1. The alternatives which assign all or part of the area to development, and utilize either a Riparian Prescription Cyor Supplemental Resource Area designation, provide the highest level of habitat protection in riparian areas for wildlife.

Wildlife Recreation Use. Estimated Wildlife and Fish User Days (WFUD's) currently attributed to the Copper Mountain area are low because use of the area is less than in roaded areas. Fewer hunters use unroaded areas and non-hunters generally stay on the few trails. Alternatives E and M, which leave the area in an unroaded condition, and G, which leaves 83 percent unroaded, produce the fewest WFUD's.

Visual Resource

The inventoried Visual Quality Objective (VQO) for the area includes 3,100 acres in Partial Retention and the balance of 6,200 acres in Modification.

Alternatives B, C, D, D1 and K develop most of the area and result in management under the Modification objective. Reduction in the natural appearance of the landscape, resulting in a modified forest setting, is expected Alternative G, which allocates 8,100 acres to an nonroaded management objectives, and Alternatives E and M, which allocate all the area to Backcountry Recreation, result in management under a Preservation VQO above the inventoried condition. The natural appearances of the area would be maintained.

Alternatives NC, A, and A-Departure would manage the area under the inventoried VQO's; approximately 2,700 acres are assigned to the Partial Retention Visual Management Area. Alternative S would allocate 1,600 acres to Backcountry Recreation and Partial Retention Visual. The natural/near natural appearance of the Forest would be retained in these areas.

Recreation Settings

All alternatives, except E, G, M and S, would allocate the roadless area to mostly General Forest management objectives. Under these alternatives, the area would be developed and the 3,300 acres capable of Semi-primitive recreation would shift rapidly to the motorized end of the opportunity spectrum. Access to the area and motorized opportunities would be enhanced as the area is roaded.

Alternatives NC, A, A-Departure, and C would retain very little undeveloped character throughout the area. Alternatives B, D, and D1 would retain the essentially undeveloped character on 1,800 acres due primarily to assignments to Supplemental Resource and Designated Wildlife Habitat. Alternative K would retain undeveloped character on 1,600 acres due primarily to assigned Designated Wildlife Habitat. The remaining unroaded areas are too small to provide for integrity of a roadless condition as they would be compromised by surrounding activities.

Alternative G emphasizes the maintenance of amenities and would maintain 8,100 acres in a roadless condition. The allocation would provide a link with the Grassy Knob Wilderness and increase the opportunity for "backcountry" types of recreation activities although, as noted, the area is very susceptible to the influence of management activities on adjacent lands. This alternative would provide a capacity for approximately 1,700 Semi-primitive Non-motorized recreation visitor days (RVD's) annually.

Alternatives E and M would maintain the area in its current unroaded condition. Recreation capacities would remain fixed since no new trail construction would be programmed. Alternative S would allocate 1,300 acres to Backcountry Recreation and retain the essentially undeveloped character on 2,700 acres. The area would be capable of providing Semi-primitive Motorized recreation opportunities in these areas.

Economic and Social

There are 7,802 acres of land identified as tentatively suitable for timber management in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 9,354 acres of the Copper Mountain Roadless Area is 0.43 MMCF The estimated LTSY would be 0.78 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and A-Dep	.42	75
A and C	40	72
D and K	35	.63
D1	.38	.69
E and M	00	.00
G	06	10
S	30	55

For projecting effects, the alternatives are divided into five groups: (1) Alternatives E and M, which leave all of the area in an unroaded status; (2) Alternative G which leaves most of the area unroaded; (3) Alternative S which develops over two-thirds of the area; (4) Alternatives D and K which develop much of the area; and (4) Alternatives NC, A, B, and C which develop nearly all the area.

	Alternatives				
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G	S	K and D (Roaded)	NC, A, B, C
Direct Effects					
Timber and Road Expenditures	None	Largely Reduced	Moderate Reduction	Minor Change	No Change
Indirect Effects					
Jobs	-36	-31	-10	-5	0
Annual Income (MM $)	-0 84	-0 71	-0 21	-0 11	0
Annual Payments to Counties (MM $)	-0 20	-0 17	-0 05	-0.02	0
Cumulative Effects					
Attitudes of Communities in the Local Area					
Timber Related	-	-	-	-	0
Primitive Recreation	+	+	+	0	0
Fisheries	+	+	+	+	0
Wildlife Related					
Hunting	-	-	0	0	0
Old-Growth	+	+	+	+	0
Mining	-	-	0	0	0

The major direct economic effect is government expenditure for the timber and associated road construction program Alternatives E, G, and M have the biggest reduction in the timber and road expenditures. Alternative S has a moderate change, while the other alternatives have insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E, G, and M have the biggest reduction. Alternative S has a moderate reduction. The other alternatives have slight decreases to slight increases when compared to Alternative A.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive to a particular interest while a negative sign indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E, fishing interests are predicted to feel positive about forest management while timber interests as predicted to feel the Forest is ignoring their interests. Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures beyond those listed in the DEIS are required.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No potential conflicts beyond those already recognized in the FEIS are identified.

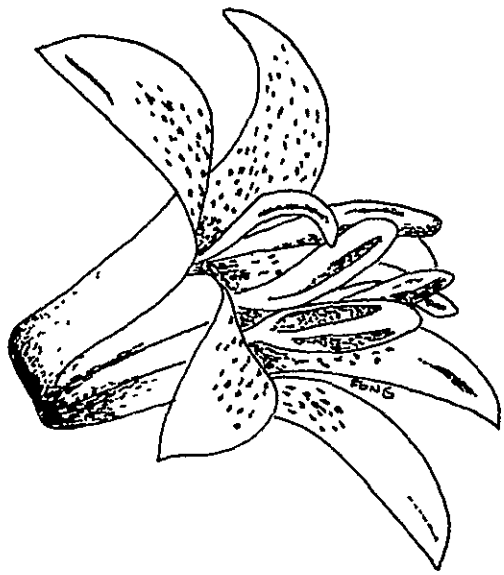
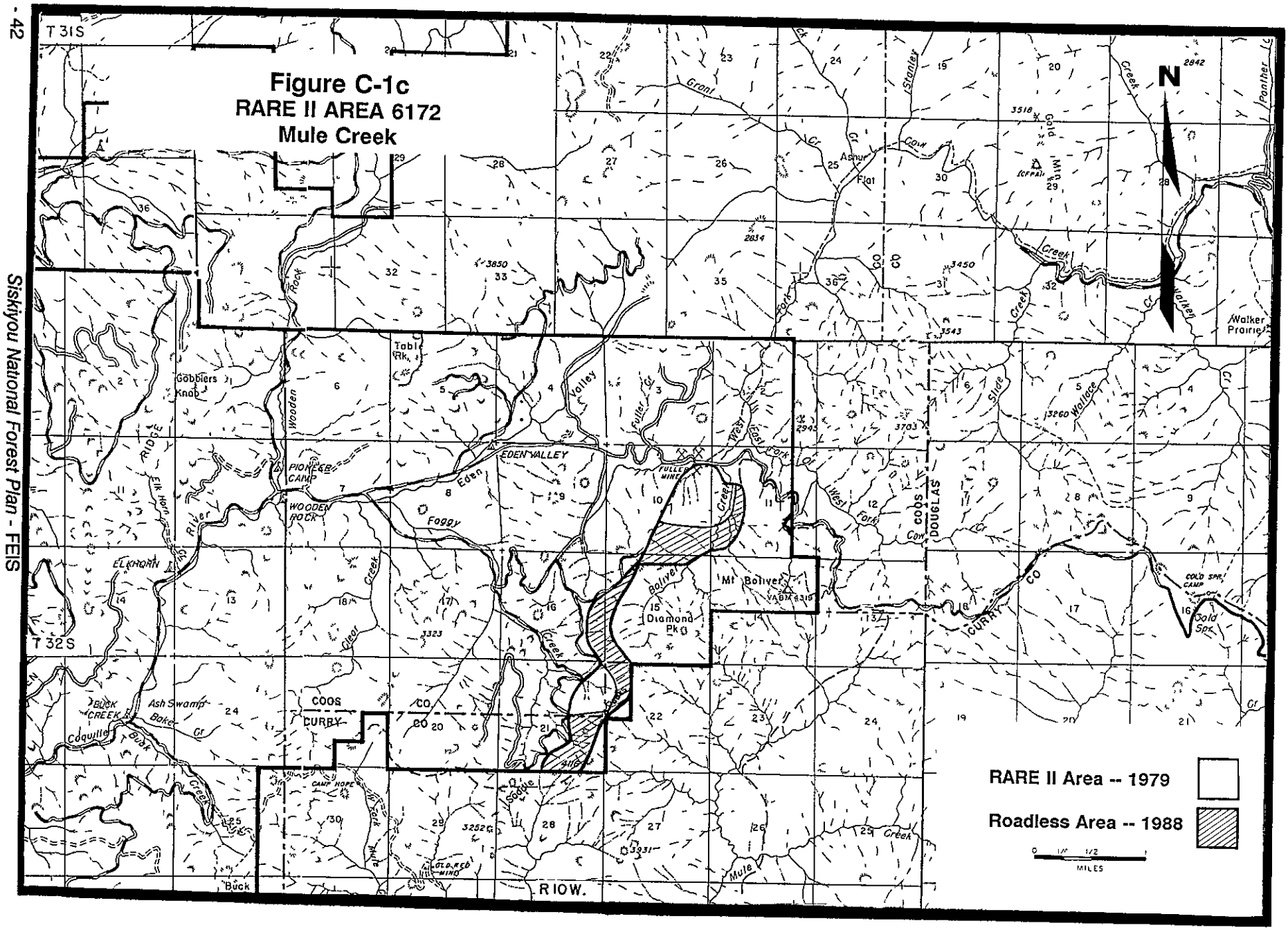




Table C-5c. Mule Creek Roadless Area No. 6172 (352 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	352	0	0	352	0
7-Supplemental Resource	0	0	0	0	0	0	0	0	0	0
8-Designated Wildlife Habitat	0	21	21	21	21	0	37	37	0	137
9-Special Wildlife Site	0	0	0	0	0	0	16	16	0	32
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	29	29	29	29	29	0	29	29	0	4
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	0	0	0	0	0	0	0	0	0	0
14-General Forest	323	302	302	302	302	0	270	270	0	179
TOTAL	352	352	352	352	352	352	352	352	352	352
TOTAL UNDEVELOPED (MA 1-9)	0	21	21	21	21	352	37	37	352	169


Figure C-1c
RARE II AREA 6172
Mule Creek
T 31S
T 32S
N
RARE II Area -- 1979
Roadless Area -- 1988
MILES
Grant Cr
Stanley Cr
Panther Creek
Gold Mtn
Ashur Flat
Cow Creek
Rock Creek
Walker Cr
Walker Prairie
Gobblers Knob
Table Rk
Wooden Valley
Fuller Cr
West Fork
East Fork
Slide Cr
Wallace Cr
EDEN VALLEY
PIONEER CAMP
WOODEN HOUSE
Eden
Foggy
Elk Horn Ridge
Elk River
Elkhorn
Mt Bolivar
Diamond Pk
Bolivar Creek
Cold Spr Camp
Gold Spr
Curry Co
Coos Co
Douglas Co
Ash Swamp
Buck Creek
Coquille
Baker Gr
Buck Creek
Camp Hope
Lobster Creek
Mule Creek
RIOW.

MULE CREEK No. 6172

(352 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Mule Creek Roadless Area was inventoried for study as a potential addition to the Wild Rogue Wilderness during the RARE II process. The area, originally containing 250 acres, was recommended for non-Wilderness use in the RARE II decision of January 1979. Since then, boundaries have been changed to exclude features not conforming to the definition of wilderness, while some areas with low standard roads have been added. The area is now 352 acres and entirely National Forest System land.

The area is covered by the Powers Ranger District Multiple Use Plan of 1969. Management direction for this Principal Forest Resource Zone calls for optimum production of timber as the principal goal in concert with other resource values, outputs, and constraints Limited areas within this zone may have other primary goals such as watershed protection and recreation use

CHANGE BETWEEN DRAFT AND FINAL

During the period from 1984 to 1988 the size of the unroaded area was reduced due to mining activity and road construction in the northern portion of the unroaded area (Refer to Figure C-1c) The remainder of the area is as previously described.

LOCATION AND ACCESS

The Mule Creek area is in Coos County, approximately 13 miles southeast of the community of Powers, Oregon. The area is adjacent to the northern tip of the Wild Rogue Wilderness in the proximity of Mount Bolivar and Diamond Peak.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the area is in the coastal range (Klamath Mountain Geologic Province) in southwestern Oregon. The southern half of the area is very steep, mountainous terrain. The northern half is moderately steep and more rolling landform. Elevations vary from 2,300 feet to 4,116 feet at the top of Saddle Peaks The ecosystem is mixed evergreen, with heavily forested stands of old-growth Douglas-fir, minor amounts of hemlock, cedar and hardwoods, and a moderate to heavy understory of woody brush species Soils are moderately deep to deep, and generally moderately productive and relatively stable. Some inclusions of shallow, rocky soils are interspersed throughout the area.

Annual precipitation averages approximately 80 inches, most arriving in the winter. Rainfall in the dry season (May through September) averages seven inches Summer temperatures may reach into the 90's

The southern half of the area drains into Foggy Creek, a tributary of the South Fork Coquille River. The north half drains from Boliver Creek into the West Fork of Cow Creek, a tributary of the Umpqua River. There are no fisheries in the area, but native trout populations are found downstream in Foggy Creek and the West Fork of Cow Creek.

Populations of black-tailed deer, Roosevelt elk and black bear are found in the area. No threatened or endangered plant or animal species are known. The cliff faces on Saddle Peaks furnish potential nesting

habitat for various raptor species. Northern spotted owls, a sensitive species dependent on old-growth habitat, have been sighted within the northern portion of the area. No sensitive plant species are known from the roadless area

RESOURCE USES

There are numerous active gold mining claims in Section 10, both inside and adjacent to the roadless area. Recreational use in the area is primarily deer and elk hunting. There are no maintained trails, but many of the old roads in the area can be used for access through the northern half.

APPEARANCES, SURROUNDINGS AND ATTRACTIONS

The roadless area is pinched into three segments. It is long and narrow, being three miles in length and 1/2 mile at the widest point. The area is heavily forested with old-growth Douglas-fir stands Natural openings occur along the summit of Saddle Peaks.

Adjacent lands north and west are heavily roaded with numerous timber harvest units visible. South and east lays the Wild Rogue Wilderness. Within a mile of the roadless area are Diamond Peak and Mount Bolivar, both in the Wilderness Vegetative types in the roadless area do not vary greatly from the surrounding areas. The primary attraction in the vicinity is Mount Bolivar, affording a spectacular view of the Rogue River canyon and surroundings.

CAPABILITY

MANAGEABILITY

The boundaries on the north and west sides of the roadless area are defined by roads and timber harvest units Along the south and east, adjacent to the Wilderness, the boundaries follow natural topographic breaks. At present, the Wild Rogue Wilderness follows logical, easily defined natural boundaries in this locale. If the Mule Creek area was added, it would create a non-physiographic buffer where chance of management conflict would be increased.

NATURAL INTEGRITY AND APPEARANCE

The southern half is still in a natural state with little evidence of human activity. The northern half has been heavily impacted by historic mining activity. The Fuller Mine was located at the extreme north end of the roadless area. Numerous mining roads are still present throughout the area. Mine tailings in Section 10 cover approximately 10 acres and still are quite evident and devoid of vegetation. There is some evidence of timber harvest which probably was associated with use in the local mining activities.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The opportunity for solitude and primitive experience in the Mule Creek area is poor. Roaded activities adjacent to the area would have a high probability of being seen and heard from inside the roadless area. Evidence of human activity is still very apparent in the north half of the area, and would detract from a roadless experience. Use of the north end of the Wilderness is very light; the ridgeline serving as the present boundary is an effective screen against outside intrusions.

AVAILABILITY

RESOURCE POTENTIALS

Present recreational use of the area is very light, the bulk of the use coming during hunting season. Future use is also expected to remain essentially unchanged. There are few features to draw use. The greatest

potential for increased use would occur under roaded conditions where, in addition to motorized use, access to the adjacent Wilderness for non-motorized recreation would be enhanced.

Wildlife

Under unroaded conditions, wildlife populations would remain about the same. Under roaded conditions, as units are harvested and varying stages of vegetation become established, deer and elk herds will increase. Populations of old-growth dependent wildlife would decrease over time; old-growth habitat is available in the adjacent Wilderness.

Fisheries

With development, the potential for impacts to the downstream fisheries would increased slightly. Current management practices would provide adequate protection for these fisheries.

Water

The greatest demand for water in this area relates to benefits to downstream fisheries.

Timber

Approximately 256 acres are inventoried as suitable for commercial timber production. Productivity is moderate Estimated standing volume is 6 MMBF.

Energy and Minerals

There are no plans for exploration or development of energy resources. The gold mining activity is not expected to increase even if the area became roaded.

Cultural

No inventoried sites. Historic and prehistoric sites will be evaluated and provided for under the applicable laws and regulations for any proposed activity, whether roaded or unroaded.

NEED

OTHER AREAS AND PUBLIC USE

Adjacent to the roadless area is the Wild Rogue Wilderness (36,100 acres). Local users are more likely to use this area than recreationists from major population centers. Little attraction is afforded by the area, nor is there developed access. Users would be more oriented to rugged cross-country travel.

ECOSYSTEM REPRESENTATION

The area is well represented in terms of ecotypes and landforms by the adjacent Wild Rogue Wilderness.

PUBLIC INVOLVEMENT

During the RARE II process, over 60 percent of the respondents favored non-Wilderness designation. General input was oriented to issues of local economic impact, reduction of the commercial forest land base, old-growth preservation, and Wilderness buffers. State and local agency input varied from moderate to strong opposition to Mule Creek being added to the National Wilderness System.

Public input since the RARE II decision has been keyed to specific roadless areas, however Mule Creek has received little or no input calling for it's protection or development. No input has been given to projects proposed either in or adjacent to the area.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation

SIGNIFICANT EFFECTS

Cultural Resources

The area is rich in history and prehistory. Homesteading and mining played important roles. All alternatives, except E and M, call for a roaded regime which has the potential to disturb existing cultural resources. Alternatives E and M would minimize the potential for disturbance of cultural resources.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for Mule Creek:

Access Restrictions	Mineral Potential (Acres)			
	High	Moderate	Low	Total
Withdrawn	-	-	-	-
High	-	-	-	-
Moderate	-	-	-	-
Low	-	<100	300	300
Total	-	<100	300	300

Improvements

The 256 acres of suitable land could generate about one mile of new road for timber harvest. Roads for mining could equal or exceed this amount, although such roads are not expected to be added to the existing system. All new roads would be dead-end local roads built when needed to access timber. All roads would be open to only high clearance vehicles, or closed between projects. All alternatives, except E and M, would road the area.

Roads on or near the north and west boundary would be extended, or local roads would be built off these roads for access. Some full bench ground would be crossed, especially on the south end, with excess excavated material hauled to stable disposal sites

Wilderness Potential

The maintenance of the roadless area would, in effect, expand the carrying capacity for the Wild Rogue Wilderness; however, the recreation experience would be influenced by adjacent motorized activities so that the quality of the experience is suspect. Access to the area is limited to existing roads within the area. No trails exist in the area; none are planned. Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning period.

All alternatives, except E and M, would allocate the area to multiple resource management objectives. Under these alternatives, the area would be developed and the Roaded Natural recreation setting currently available would shift to a Modified setting. The change in character of the landscape would result in loss of Wilderness potential. Alternatives E and M would maintain the area in a roadless condition, thereby providing additional capacity for Semi-primitive wilderness recreation opportunities. The Wilderness potential of the area would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	350	0	0
B, C, D, and D1	350	0	0
E and M	350	350	350
G	350	0	0
K	350	0	0
S	350	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness.

Wild and Scenic Rivers

The roadless area is over the ridge line which forms the Wilderness boundary and is not visible from the Rogue Wild and Scenic River. None of the alternative allocations will effect the management of the Rogue Wild and Scenic River or the quality of the recreation experience of river users.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated with Alternatives E and M as no soil disturbing activities would occur. All other alternatives allocate all or part of the area to Management Areas which permit development. In these alternatives, the risk of degrading the soil, fish, and water resources due to allocations to various levels of development is minimal. Acreages of activity are similar and limited in all alternatives; soil and water factors are not sensitive to management-induced impacts.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease that they will create in fire hazard and fire risk. In Alternatives E and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area. In all other alternatives, between 51 to 92 percent of the area would be developed, creating a mosaic of fuels over time. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction and timber harvest, and with the treatment of the activity slash from these operations. As access improves, the level of dispersed recreational and other public uses may increase, with an accompanying increase in the risk of human-caused fires. Both developed and undeveloped areas will have similar risk levels for lightning fires.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In all other alternatives, industrial operations would result in increased risk over 51 to 92 percent of the area and to the adjacent Wilderness; risk from public use would be increased along the 1 mile of road.

Vegetation

The effects on vegetation relative to diversity and age class distribution do not differ from the effects on the Forest as a whole (See Chapter IV of the FEIS).

Sensitive Plants

No Botanical areas or RNA's are proposed. No sensitive plants are known within the Mule Creek area.

Air Quality

The principle agent impacting air quality in this environment and surrounding areas is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning are considered. As an indicator of potential impacts, total suspended particulates (TSP) is used. Alternatives E and M would contribute no TSP. All other alternatives would produce three tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Coos Bay or Roseburg, both designated areas for air quality, is very low based on past performance. The probability of impacting the Wild Rogue Wilderness and Rogue River use is low to moderate.

Wildlife

Unless specifically mentioned below, wildlife indicator species and wildlife habitat are the same as for the Forest as a whole

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E, M and S, habitat for mature/old-growth indicator species would be measurably reduced over time. At present, the area supports part of the habitat needs of one spotted owl pair; there would be no change under Alternatives E, M, and S. In all other alternatives, the area would not retain habitat capable of supporting any of the three indicator species.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E, M, and S.

Black-tailed Deer/Roosevelt Elk. Big-game management opportunities would increase in all alternatives, except E, M and S, by creating timber harvest openings over much of the unroaded area. Opportunities for habitat improvement projects for game animals would be greater if the area was developed.

Wildlife Habitats. No meadows have been identified. Rock bluffs/cliffs on Saddle Mountain are allocated to wildlife use in Alternatives E thru S, but would probably remain unaffected in Alternatives A through D1.

Wildlife Recreation Use. Estimated Wildlife and Fish User Days (WFUD's) attributable to the area are low because fewer hunters use unroaded areas and non-hunters generally stay on maintained trails. Alternatives E, M and S produce the fewest WFUD's.

Visual Resource

All alternatives, except E and M, assign the area to management under the Modification objective, resulting in a modified Forest setting. Alternatives E and M assign the area to roadless objectives, resulting in management under the Preservation visual objective whereby the natural appearance of the landscape character would be retained.

Recreation Settings

Recreation use is very light and originates from local communities for the most part. The area is inventoried and capable of providing Roaded Natural ROS opportunities The estimated carrying capacity for the area is approximately 600 RVD's annually. Projected levels of recreation demand indicate that the use will remain well within the carrying capacity over the planning period.

All alternatives, except E and M, would shift the Roaded Natural recreation setting currently available to a Modified forest setting. Access and motorized opportunities would be enhanced as the area is roaded. The natural appearance of the landscape would be reduced to a modified forest setting. Alternatives E and M would maintain the current unroaded status. Recreation capacities would remain fixed since no new trail construction would be programmed.

Economic and Social

No significant social or economic effects associated with the roadless area have been identified.

There are 256 acres of land identified as tentatively suitable for timber management in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 352 acres of the Mule Creek Roadless Area is less than 0.02 MMCF. The estimated LTSY would be approximately 0.03 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and B	02	.04
A, A-Dep, C, D, G, and K	.01	.03
E and M	.00	00
S	.01	.02

MITIGATION MEASURES

No additional mitigation measures have been identified beyond those already listed for each alternative in the Standards and Guidelines.

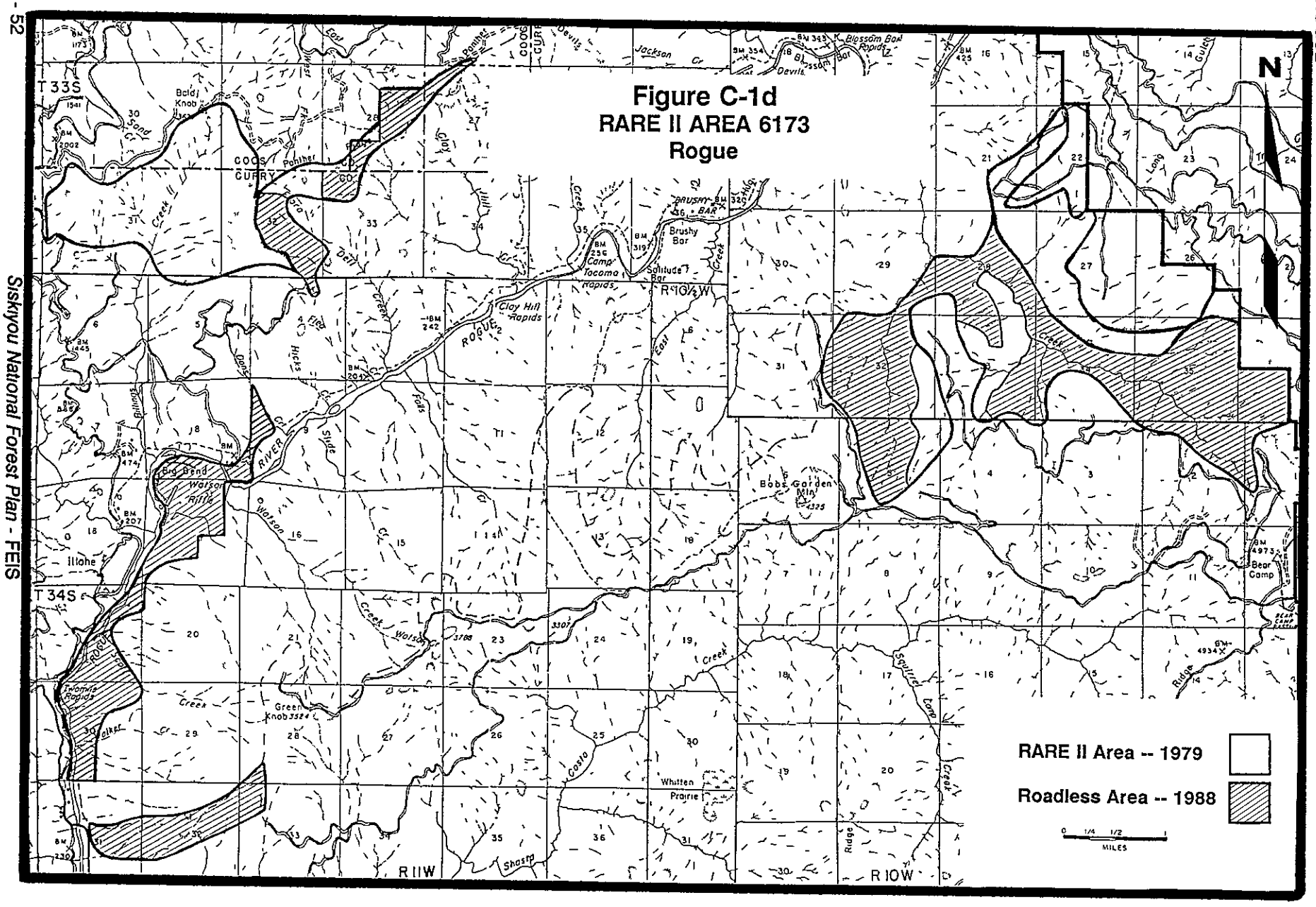
POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

Conflicts with adjacent landowners may occur for access into the area. The Wild Rogue Wilderness bordering this area to the south is under jurisdiction of the BLM. However, this land is currently administered by the Forest Service under a cooperative agreement. No conflicts are anticipated.



Table C-5d. Rogue Roadless Area No. 6173 (3,839 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	74	74	74	74	74	74	74	74	74	74
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	47	47	0	47	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	3,718	0	0	3,718	0
7-Supplemental Resource	0	0	0	0	0	0	342	304	0	475
8-Designated Wildlife Habitat	0	214	214	214	214	0	240	235	0	214
9-Special Wildlife Site	15	15	36	36	36	0	21	21	0	21
10-Scenic/Recreation River	287	287	282	282	282	0	0	0	0	0
11-Riparian	750	629	631	631	631	0	608	621	0	614
12-Retention Visual	224	224	0	0	0	0	202	125	0	0
13-Partial Retention Visual	1,733	1,656	332	332	332	0	1,567	264	0	706
14-General Forest	756	740	2,270	2,270	2,270	0	738	2,195	0	1,735
TOTAL	3,839	3,839	3,839	3,839	3,839	3,839	3,839	3,839	3,839	3,839
TOTAL UNDEVELOPED (MA 1-9)	89	303	324	324	324	3,839	724	634	3,839	784


Figure C-1d
RARE II AREA 6173
Rogue
N
T 33S
T 34S
R 11W
R 10W
R 10½W
Baldy Knob
Sand Ck
Coos
Curry
Co.
Brushy Bar
Camp Tacoma
Clay Hill Rapids
Rogue River
Big Bend
Watson Riffle
Illahe
Bob Garden Mtn
Bear Camp
Green Knob
Whitten Prairie
Squires Camp
Ridge
RARE II Area -- 1979
Roadless Area -- 1988
0 1/4 1/2 1
MILES

ROGUE No. 6173

(3,839 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The original inventoried area included most of the Wild Rogue Wilderness. The RARE II process included the balance for study as additions to the adjacent Wilderness. The RARE II inventory contained 6,744 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979 Since then, timber sale activities have reduced the area to 3,839 acres. The largest change occurred in the Billings Creek area where roading and timber harvest isolated an 1,100 acre tract of unroaded land. The inventoried area contains approximately 400 acres of private land; the balance is National Forest System land The area is actually five separate small parcels surrounding the Wild Rogue Wilderness

The Rogue Roadless Area is located within two Land Management Planning areas and the Powers Ranger District Multiple Use Plan of 1969. The Rogue Planning Unit (FEIS, 1975) generally divided the lands into those visible from the Wild section of the Rogue River and its paralleling trail with those lands outside the Wild and Scenic River Corridor which were not viewed Those areas not seen would be managed for timber production. In 1978, Congress passed legislation which designated all of the "seen" area and surrounding lands as the Wild Rogue Wilderness. The Rogue Roadless Area within the Rogue Planning Unit consists of three separate parcels designated for timber production.

The Rogue-Illinois Planning Unit (FEIS, 1979) allocated management of the two parcels of the Rogue Roadless Area south of the Wilderness to coordinated resource management, with the exception of a small piece of recreational river of the Wild and Scenic Rogue River. Coordinated resource management areas are managed to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big-game habitat and protecting small areas containing exceptional features. The recreational river corridor is managed to: provide for a wide range of recreational activities which are oriented to the river and enhanced by its free-flowing condition; maintain or improve the quality of the water which enters the river; improve the fish and wildlife habitat; maintain or enhance the quality of the scenery; and utilize other resources and permit other activities to the extent that they do not significantly lower the quality of the wildlife or fisheries habitat, scenery, or recreation values.

Please reference these documents for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since completion of the above unit plans, all project activities, e.g., timber harvest, fishery habitat improvements, etc., have been analyzed under their direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

During the period between 1984 and 1988, one timber sale northeast of Bob's Garden Mountain (Stair Creek drainage) has occurred. As a result of this activity, approximately 600 acres were removed from the area (Refer to Figure C-1d). The remainder of the area is as previously described.

LOCATION AND ACCESS

The Rogue area is located in Curry and Coos Counties, Oregon, and includes several small drainages tributary to the Rogue River. A small portion drains into the South Fork Coquille River watershed. The area is located approximately 18 miles from the coast and three miles from the community of Agness. Roads completely encircle the area. Primary access routes include Agness, Bear Camp, and Coquille River Roads These are multi-purpose routes, serving heavy recreation, timber, and administrative traffic.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is on the western side of the coast range (Klamath Mountain and Coast Range Geologic Provinces) in southwestern Oregon. Elevation ranges from 200 feet to 4,000 feet near Bobs Garden Mountain. Topography is very mountainous with steep slopes and deep canyons, with the exception of the river portion. The Big Bend area is a man-made prairie on a relatively flat river bench. Vegetation on the rest of the area is predominately Douglas-fir with a mix of hardwoods and other species. The forested areas have moderate variety due to some hardwood stands and brushfields. The ecosystem is mixed conifer. This zone is characterized by a mixed forest of evergreen needle-leaved trees in the upper strata and evergreen broad-leaved trees in the lower strata.

Soil conditions are highly variable within the proposed roadless area. In the western portion along the Rogue River, soils are generally moderately deep, moderately stable and productive. Some inclusions of rock talus and shallower soils occur in steep pitches along drainages. Broad, flat alluvial benches occur in the Big Bend area above the Rogue River, a rather uncommon landform feature in the Forest.

Along Stair Creek, soil and landform features also indicate a high degree of variability. Streams are generally deeply incised and show evidence of previous debris torrent activity. Streambank failures of various magnitudes are quite common to this drainage. The greatest amount of debris slide activity occurs where stream meanders have undercut toe slopes, creating oversteepened, unsupported blocks of soil material. Areas of water concentration and the presence of the siltstone member of the Dothan Formation are additional indicators of potential instability. On the more moderately sloping landforms, deep, clay rich soils occur. In some isolated toe slopes where massive amounts of water accumulate, deep-seated earthflows are present. These areas are characterized by a slow, large-scale gravitational movement of soil material downhill.

Average annual precipitation varies from 90 to 100 inches; dry season rainfall (May through September) averages 7 to 9 inches. Fog in the spring and summer often moves up the Rogue River corridor. Summer temperatures can exceed 100 degrees Fahrenheit in the lower river area.

Populations of black-tailed deer, Roosevelt elk, and black bear occur within the area. Large runs of anadromous fish utilize the Rogue River. The adjacent Wild Rogue Wilderness contains an active bald eagle nest (threatened species). The portion of the roadless area adjacent to the Rogue River is potential nesting habitat; bald eagles undoubtedly over-fly this zone and use perch trees here. Osprey are commonly observed along the Rogue River and may nest up to a mile or more from the river. Osprey have historically nested in the Big Bend area. Three sensitive plants, *Bensonilla oregana*, *Frasera umpquaensis*, and *Lewisia cotyledon* ssp. *howellii*, have been found in the Bear Camp/Bobs Garden vicinity and may exist within the roadless area. Sensitive animals found in the unroaded area also occur in the adjacent Wilderness and Rogue Wild and Scenic River corridor.

RESOURCE USES

While potential for mineral development exists, there is no current mining or leasing activity. There are no grazing allotments. Minor upland game and moderate big-game hunting on the fringes of the area occurs; interior hunting is very limited due to steep and brushy ground. Current recreation use for the area is

estimated to be 4,500 RVD's. Heaviest use takes place along the banks of the Rogue River bordered by the western unroaded portion (approximately 3,100 RVD's; 600 for tour boats and 2,500 for fishing and other river use). Away from the river, use is limited to some cross country hiking and minor hunting.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

Four of the five parcels surrounding the Wild Rogue Wilderness are steep and heavily vegetated. For the lower elevation parcels, the major feature is the Rogue River. Stair Creek is the dominant feature of the eastern parcel. As the Stair Creek parcel protrudes from the Wilderness boundary, it appears to be part of the Wilderness.

The greatest influence upon the area is the heavily traveled roads. The Bear Camp Road is the major east-west road through the Siskiyou National Forest. Secondly, timber harvest activities and their associated roads abut most boundaries of the unroaded area. The Big Bend area is mostly private land. It currently has two existing residences, several farm buildings, fencing, cattle, old clearcuts, a power line rights-of-way, a tramway for access across the Rogue River, and an short landing strip for aircraft. This gives the appearance of a remote ranch where the natural setting has been altered.

The unroaded portions have no special features or scenic attractions except for the proximity to the Rogue Wild and Scenic River and Wild Rogue Wilderness. The Rogue River is a heavily utilized water resource. The western parcel can be accessed from the river while limited parts of the other unroaded parcels can be seen at a distance from the river.

Significant Indian cultural sites are present in the western unroaded portions due to prehistoric Indian use adjacent to the Rogue River. Petroglyphs are found at Twomile Creek. The Rogue River Trail location was probably used by prehistoric Indians.

CAPABILITY

MANAGEABILITY

The unroaded parcel along the Rogue River tends to straighten the Wilderness boundary, thereby making the boundary more manageable while permanently protecting the foreground view from the river. Leaving this narrow band of unroaded area between the Rogue River and the Wild Rogue Wilderness would affect nearly 600 acres of National Forest System land. While the strip could be managed for multiple resources, factors such as the limited amount of commercial timber, low intensity harvest requirements due to visuals, and problems of access combine to constrain development. The unroaded boundary could be adjusted to eliminate the private land in the Big Bend area. In effect, this would remove most of man's influence while consolidating the integrity of the unroaded area with that of the Wild Rogue Wilderness.

The two parcels on and near Panther Ridge are protrusions to the Wilderness boundary and do not provide good, manageable boundaries. The large parcel in Stair Creek is another protrusion of the Wilderness boundary. Boundaries of all three parcels would be difficult to locate on the ground.

NATURAL INTEGRITY AND APPEARANCE

All parcels, except around Big Bend, have a natural, unaltered appearance. An old road associated with the local residences borders the Rogue River between Big Bend and Illahe. The outer perimeter of the parcels is almost completely surrounded by roads and harvest units.

Fishing and boating are popular on the Rogue River. This use level is high and causes noise pollution impacts on the natural character of the area upslope of the river. And, private land in the Big Bend area

has several man-made features and livestock which have a significant impact on the area's appearance. The other parcels are not distinguishable from the Wild Rogue Wilderness.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

Due to the size of the parcels, external influences such as noise, roads, and harvest units are readily apparent. In all parcels except Big Bend, topography and dense vegetation provide screens. People could easily be within a quarter of a mile of each other and not be aware of one another. The same factors tend to negate cross-country travel so that recreation use is limited to principally the road corridors. The parcels, being almost completely surrounded by roads and timber harvest units (except for their boundary with the Wilderness) and quite small and narrow, do not provide a natural buffer of external influences. The parcels do provide a buffer for activities within the Wild Rogue Wilderness and help provide opportunities for solitude and primitive recreation there.

The opportunity for primitive recreation is limited. The Recreation Opportunity System (ROS) inventory indicates mostly Roaded Natural (3,400 acres); the remaining 400 acres is Semi-primitive Non-motorized.

SPECIAL FEATURES

The Rogue parcels have no special features other than their association with the Wilderness and Wild and Scenic River. Indian cultural sites are limited to specific spots along the Rogue River; they usually occur within the designated Wild and Scenic River corridor.

AVAILABILITY

RESOURCE POTENTIALS

Recreation

The opportunity for measurable change in unroaded recreation use is limited due to the area's size and topography. Use today is below capacity, and pressure for greater use is expected to increase very little in the future. The parcel of greatest existing and potential future use is the western piece bordering the Rogue River.

Potential for increased developed recreation use is greatest with a roaded condition. Access would be provided for hunting, dispersed camping, and other forms of motorized recreation.

Wildlife

Under unroaded conditions, wildlife would remain essentially unchanged. Over time, deer and elk populations will increase in response to the availability of forage. Varying stages of vegetation in harvest units and along roads, with adequate hiding cover, would promote expansion of existing herds. Populations of old-growth dependent wildlife would decrease, but still remain in old-growth forest along the river corridor, tributary streams, within the Wilderness, and on sites classified as unsuitable for timber production. Sensitive species would be protected through applicable standards.

Fisheries

The anadromous fisheries of the Rogue River are extremely important for recreation and commercial fishermen. The tributaries contribute cold clear water for the Rogue River fish However, most of these streams have gradients that are steep and have barriers to fish movement; they also have very limited potential for fisheries enhancement. Stair Creek is the primary stream associated with these parcels. Stair Creek provides a very important cooling effect at its mouth.

Water

There are no man-made impoundments or diversions either existing or proposed. Except for Stair Creek, the potential for small hydroelectric power development is very limited. A small increase in water yields would result as a consequence of timber harvesting. However, the greatest demand for water is directed toward maintenance or improvement of Rogue River water temperature in the summer and fall periods. *Quality aspects for the tributary streams are of far greater importance than water use or development due* to the high value fishery and recreational usage of the Rogue River.

Livestock

There is no livestock grazing on National Forest lands within the area now. Very little potential for livestock grazing exists. Some grazing use occurs on private lands in the Big Bend area.

Timber

The unroaded area contains approximately 3,520 acres of land suitable for the production of timber. Standing volume of timber is estimated at 92 MMBF. Site productivity is relatively high. The area is reasonably stable and could be logged using skyline cable systems that are in common use on the Forest. Additional roads would be required. Because of heavy vegetative competition and steep slopes, management for timber production would require various treatment methods to reduce brush competition for release of crop trees. Management along the Rogue River requires meeting the Visual Quality Objective of Retention.

Energy and Minerals

No exploration and development is known. While potential minerals may occur, development is highly improbable. There are no active mines or mineral leases in the roadless parcels.

Cultural

The area has had significant archeological and historical use along the Rogue River. The eastern part has low potential.

Land Use Authorization

Other than the private land and the various uses listed above, none exist. Few are expected whether roaded or undeveloped.

MANAGEMENT CONSIDERATIONS

Fire is the most serious management consideration. The potential for major conflagration does exist with the hazards posed by heavy fuels and dense brush. Conditions, however, are severe for a relatively short period of time due to coastal influence. With road development, access and intensified treatment of activity fuels would considerably lessen continuity and concentrations. The probability of major losses of resources by wildfire would be reduced. Access, however, also brings increased risks due to greater number and dispersion of people. The current risk of wildfire is greatest along and adjacent to the Rogue River *where concentration of recreational use is high.*

The potential for insect and disease outbreaks within the coniferous forest exist. However, actual occurrences have been minor and localized. With road development, the spread of *Phytophthora lateralis* root disease of Port-Orford-cedar will be increased where spores can be spread by machinery and water.

Private land in the Big Bend area has two existing residences and other man-made features. The Conservation Easement *for the private land within the Wild and Scenic River allows for 10 more residences.*

NEED

OTHER AREAS AND PUBLIC USE

Within 12 miles of Rogue exists three designated Wildernesses (Wild Rogue, Kalmiopsis, and Grassy Knob), and stretches of two Wild and Scenic Rivers (Rogue and Illinois). A portion of the Wild and Scenic Rogue River is located within the roadless area; the area is bordered by the Wild Rogue Wilderness.

Recreation use of the area and Wilderness is extremely light considering the acreage involved. The Wild Rogue Wilderness has many of the same attributes, but is generally far more rugged and diverse in geology and vegetation Use in the surrounding undeveloped areas is concentrated along rivers and trails.

Local users and residents are more likely to utilize the unroaded area than recreationalists from major population centers. Recreation oriented travelers from the metropolitan areas would normally seek areas closer and of higher quality in terms of views and experiences.

ECOSYSTEM REPRESENTATION

The major ecotypes of the unroaded area are well represented in the adjacent Wild Rogue Wilderness and Wild and Scenic River.

PUBLIC INVOLVEMENT

Public input on several of the inventoried roadless areas on the Siskiyou National Forest has been extensive, particularly the North Kalmiopsis. The Rogue parcels, however, have not received much attention or advocation of protective status. Of the 55 letters received during public review of the Rogue-Illinois Unit Plan in 1979, only two specifically stated that the Rogue should be designated as Wilderness. Several letters stated a Wilderness alternative (Alternative B) should have been selected as the preferred, however that alternative did not include the Rogue Roadless Area parcels as Wilderness.

Both the public and Forest managers have had considerable interest and concern for the existing and future management of the larger unroaded areas. During RARE II, units of local and state government responded to the potential inclusion of Rogue Roadless Area as Wilderness. They most often cited those impacts associated with local economy and community stability, loss of timber receipts, and multiple use opportunities foregone. Most respondents voiced similar reasons for opposition; the primary concern being the area's individual and cumulative effects on the critical timber supply of southwestern Oregon.

Since RARE II, the Rogue has been evaluated for timber management through site-specific project planning. Several projects have taken place and others have been planned within the unroaded portions that were inventoried. Little, if any, public input, concerns, or appeal of these activities has occurred.

In the current Forest Planning process, the roadless area question has remained a major issue. Public involvement, beginning with early public scoping in 1979 and continuing with public meetings, workshops, and other contacts in 1984 and later, had not surfaced additional concerns seeding unroaded status for this inventoried roadless area. Beginning in 1986, there was a movement to tie the Wild Rogue Wilderness and all contiguous unroaded areas to the south with the large Kalmiopsis Wilderness. This large block of land was promoted by several individuals and organizations as a potential National Park. As discussed in Chapter II of the FEIS, the proposal was not entertained as an alternative evaluated in detail.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

All alternatives except E and M call for roading, which in turn may disturb existing cultural resources. Valuable sites can then be protected via avoidance or conserved via data recovery. Alternatives E and M call for an unroaded regime which would minimize the potential for disturbance of cultural resources.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations:

Access Restrictions	Mineral Potential (Acres)			
	High	Moderate	Low	Total
Withdrawn	-	100	200	300
High	-		200	200
Moderate	-	-	<100	<100
Low	300	-	3,000	3,300
Total	300	100	<3,500	3,800

Improvements

The 3,520 acres of suitable land could generate about 18 miles of new road for timber harvest. Roads for other purposes would be very minor. About two miles of collector road occurs in the Stair Creek drainage with Alternatives NC, A, B, C, and D. All other roads would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use, depending on the alternative; other roads would be open to only high clearance vehicles or closed between projects. The following table shows the mileage of the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A, B and D	18	5	6	7
C	18	3	8	7
E and M	0	0	0	0
G	15	0	6	9
K	15	4	2	9
S	14	4	2	8

Alternatives E and M would have minimal effect due to no roads being built. Alternative G would not maintain any roads open for passenger cars. Alternatives NC, A, B, C, D, K, and S would be essentially roaded. Alternatives G, K, and S would close approximately 60 percent of the roads.

The road system would be primarily extensions of existing roads. The new roads would cross small creeks and draws with the possibility of the lower parcels crossing some streams inhabited by fish. The new road construction could result in a temporary decrease in water quality. Some full bench ground would be

crossed by roads with excess excavated material hauled to stable disposal sites Some of the roads in the upper (eastern) parcel would be visible from viewpoints on the Bear Camp Road; parts of the lower parcels would be seen from sections of the Agness Road.

Wilderness Potential

The adjacent Wild Rogue Wilderness contains 36,100 acres and has an estimated carrying capacity of 18,700 RVD's. The maintenance of the roadless area would, in effect, expand the carrying capacity by another 5,600 RVD's Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the course of the planning period.

All alternatives, except E and M, would allocate the area to multiple resource management objectives. The area would be entered for timber harvest and the Semi-primitive recreation opportunities currently available would shift to the Motorized end of the opportunity spectrum. The change in the character of the landscape would result in the loss of Wilderness potential.

Alternatives G, K, and S place the foreground of the Rogue River into a Supplemental Resource allocation that would not program timber harvest This assignment essentially eliminates development activities from the western portion of the Rogue Roadless Area. Wilderness potential would be maintained, thereby, between the Rogue River and the designated Wild Rogue Wilderness.

Alternatives E and M maintain the roadless condition and provide capacity for Roaded Natural and Semi-primitive Non-motorized recreation opportunities, along with adding to the quality of the recreation experience in the Wild Rogue Wilderness. Wilderness potential of the area would be maintained

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	3,800	3,800	3,800
G	0	0	0
K	0	0	0
S	800	800	800

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness.

Wild and Scenic Rivers

Alternatives NC, A, A-Departure, B, C, D, and D1 would not maintain the area in a roadless condition and would result in a modified forest setting as they are entered for timber harvest. The recreation setting for the Rogue River would be affected since harvest activities would be visible in the background in the Wild section of the river and in the near foreground in areas adjacent to the Recreation section.

Alternatives G, K, and S would not maintain the areas in a roadless condition. Under these alternatives, however, the foreground areas adjacent to the Rogue River would be removed from the timber base and

managed under the Preservation visual objective in response to the high levels recreation use on the river. The recreation setting would not be affected in these areas. Management activities would be visible in the background to river users in the Wild section. Alternatives E and M assign the area to Backcountry Recreation. The Preservation visual objective would be achieved.

Soil, Water, and Fish

The effects of assigning the area to various Management Area mixes is discussed by similar alternative groupings No adverse soil, water, and fish impacts are associated with Alternatives E and M because no soil disturbing activities will occur. All other alternatives would allow for development such as timber harvest and road building. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

The risk of degrading the soil, water, and fish resources generally increases with more timber harvest and road building. All alternatives, other than E and M, propose similar amounts of soil disturbing activities. Soils in the lower Stair Creek area are sensitive to accelerated mass soil movement due to management activities. Entry into these areas poses a moderate to high risk of degradation of the soil and water resource. Standards and Guidelines are crucial in the planning and implementation of activities here; in particular, preliminary geologic evaluations will be necessary to avoid the more unstable sites and adequately design for minimizing risks of mass failure. The western portion of the roadless area along the Rogue River poses a slight potential of adverse impacts.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

The roadless area is broken into five sections; fuels vary greatly over these areas. The two sections in the Panther Ridge area have light fuel loadings with a large amount of hardwoods and brush, with a scattered overstory of Douglas-fir. Continuity is broken by natural openings. The two sections near Illahe are heavily timbered with light, continuous fuels. These areas are subject to strong local canyon winds. The section near Bobs Garden in Stair Creek is very steep with generally light fuel loadings. The stands are a mix of old-growth Douglas fir and hardwoods with numerous snags. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. This results in higher suppression costs and increased resource losses.

In a developed scenario, fire hazard is higher during the period of timber harvest. As fuels are treated, the hazard is reduced. Over time, the continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives E and M, all the area would remain undeveloped, with fuels remaining continuous over the entire area. In all other alternatives, 64 to 71 percent of the area would be developed, creating a mosaic of fuels over time. The remaining undeveloped areas would be broken into 2 to 4 separate blocks. Some of the high priority natural fuels accumulations will be treated in all alternatives.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and treatment of activity slash. As access improves,

the level of dispersed recreational and other uses increase, resulting in an increase in the risk of human-caused fires. Lightning fires will have similar risk levels for both developed and undeveloped lands.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access In all other alternatives, industrial operations would result in increased risk over much of the area, and risk from public use would be increased along the 14 to 18 miles of road Another source of ignition in these areas could be the planned use of naturally occurring fire in the Wild Rogue Wilderness adjacent to these areas. If fires are allowed to burn, there is a chance of fire escaping from the Wilderness boundaries.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (see Chapter IV of the FEIS).

Sensitive Plants

No sensitive plants are known to occur in this area, and no botanical sites are proposed. Undiscovered sensitive plants which would be best protected in Alternatives E and M which allocate the area to Backcountry Recreation.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning will be considered. Total suspended particulates (TSP) is used as a measurement of the potential for regional haze. Alternatives E and M contribute no TSP. All other alternatives produce 26 to 29 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Grants Pass, a designated area, is very low based on past performance. Because the area is in the Rogue drainage and adjacent to the Wild Rogue Wilderness, probability of impacting the Wilderness and Rogue River corridor is moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. This area contains some of the Forest's prime bald eagle and osprey habitat. Habitat would be slightly degraded in Alternatives A through D1 as they do not allocate the area to Backcountry Recreation or include the Rogue River Visual Supplemental Resource area.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old growth-indicator species would be reduced over time. Except for Alternative NC, a habitat enclave to meet Management Requirements (MR's) for pine marten is located within the area. At present, this area contains enough habitat to support approximately two pairs of spotted owls (and possibly parts of one or two other home ranges), there would be no change under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels (no spotted owls) in all other alternatives, except Alternative NC which does not contain MR's assigned to wildlife dependent on mature/old-growth habitat.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M, which assigns the area to continued roadless status.

Black-tailed Deer/Roosevelt Elk. Big-game management opportunities would increase in alternatives which open up much of the unroaded area to timber management (all alternatives except E and M). Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. Three meadow areas are contained in the Rogue Roadless Area (approximately 100 acres); part of Foster Bar flat is located adjacent to the western boundary of the roadless area. This is one of the most valuable meadow areas on the Forest. Meadow habitat will be maintained under all alternatives, although meadow buffers area not allocated in Alternatives NC, A and A-Departure. Those alternatives (all except NC, A, A-Departure, B, C, D, and D1) which assign the Rogue River Visual Supplemental Resource area provide the highest level of habitat protection.

Wildlife Recreation Use. Estimated Wildlife and Fish User Days (WFUD's) currently attributed to this area are low (except on the western end), because human use of the area is less than in roaded areas. Fewer hunters use unroaded areas and non-hunters generally stay on the few trails. Alternatives E and M produce fewer WFUD's; other alternatives generate more.

Visual Resource

The current visual inventory indicates approximately 600 acres as Retention, 2,200 acres as Partial Retention, and the remaining 1,000 acres in Modification. Alternatives NC, A, and A-Departure would manage the area to meet inventoried objectives; roadless conditions would not be maintained. Management to meet visual objectives would maintain the quality of the landscape, particularly in foreground areas adjacent to the Rogue Wild and Scenic River, and in areas visible from Bear Camp Road

Alternatives B, C, D, and D1 also would not maintain the area in a roadless condition. Under these alternatives the areas would be managed to achieve visual objectives at a reduced level including the foreground area adjacent to the Rogue River. Areas inventoried for the Retention objective would be managed for Partial Retention, and areas inventoried for Partial Retention would be managed for Modification. These management objectives would result in a modified Forest setting throughout the area.

Alternatives K and S do not maintain the majority of the area in a roadless condition. The foreground area adjacent to the Rogue Wild and Scenic River would be removed from the timber base and managed to achieve the Preservation VQO which, in essence, maintains the roadless character of this portion of the area Most of the remaining area would be managed for the Modification objective, although 700 acres would be managed under the Partial Retention objective.

Alternative G does not maintain the roadless condition. The area would be managed to achieve inventoried visual objectives. The foreground area adjacent to the Rogue River would have no programmed timber harvest as a result of assignment to Preservation objective, thereby maintaining the roadless character of this portion. Alternatives E and M would maintain the roadless condition and achieve the Preservation objective.

Recreation Settings

The area has an estimated carrying capacity of 5,600 RVD's. Recreation use in the area is estimated at 3,500 RVDs annually. Most of the use is attributed to the two parcels adjacent to the Rogue Wild and Scenic River. Recreation use in the other parcels is limited by access. These are surrounded by roads, however. Except for the Rogue River Trail that crosses one parcel, there are no trails into any of the areas. Recreation use is not expected to increase beyond the estimated capacity over the planning period.

All alternatives, except E and M, would develop the area for multiple resource objectives. Recreation opportunities would be motorized rather than non-motorized and, in that respect, would be enhanced as roads are constructed which increase access. The two areas adjacent to the Rogue Wild and Scenic River will be managed to achieve the Retention VQO under these alternatives in response to the high levels of recreation use. The natural appearance of the landscape character is expected to be maintained The potential wilderness character and primitive recreation opportunities would be lost or reduced.

All alternatives, except E and M, would retain undeveloped character on only limited areas. These areas may or may not be contiguous to the adjacent Wilderness, so their integrity may be compromised by the close presence of motorized activities (See **Wilderness Potential**).

Alternatives E and M maintain the potential wilderness character and primitive recreation opportunities over the planning period. Maintenance of the natural character of the landscape is expected to contribute to the recreation setting within the Rogue River corridor.

Economic and Social

There are 3,520 acres of land identified as tentatively suitable for timber management in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 3,839 acres of the Rogue Roadless Area is 0.19 MMCF. The estimated LTSY would be 0.35 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC, A, C, and D	18	32
B	.21	39
E and M	00	00
G K, and S	15	28

For projecting effects, the alternatives are grouped into three categories: (1) Alternatives E and M which leave the area in an unroaded status; (2) Alternatives G, K, and S which develop much of the area; and (3) Alternatives NC, A, B, C, and D which develop the area.

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E and M have the biggest reduction in timber and road expenditures. The other alternatives have little or no differences.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have a reduction while the other alternatives have little change compared to Alternative A. Alternative B would provide slightly more jobs and revenues in the first decade than under current direction.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive, while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E, timber interests are predicted to feel negative about forest management while river

recreationists are predicted to see the Forest as responding to their needs. Such perceptions of gains and losses may create additional conflict.

Effects (Changes Compared to Alternative A)	Alternatives		
	E and M (Unroaded)	G, K, and S	NC, A, B, C, and D (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Reduction	No Change
Indirect Effects			
Jobs	-16	-3	0
Annual Income (MM $)	-0 38	-0 06	0
Annual Payments to Counties (MM $)	-0 09	-0 02	0
Cumulative Effects			
Western, Urban, Eastside Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old-Growth	+	+	0
Mining	-	0	0

MITIGATION MEASURES

No additional mitigation measures are identified for this area.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

Potential land management conflicts could occur between the Siskiyou Forest and Bureau of Land Management since the BLM Medford District manages upper fringes of the Stair Creek drainage. Through coordination of management plans, potential conflicts can be avoided.

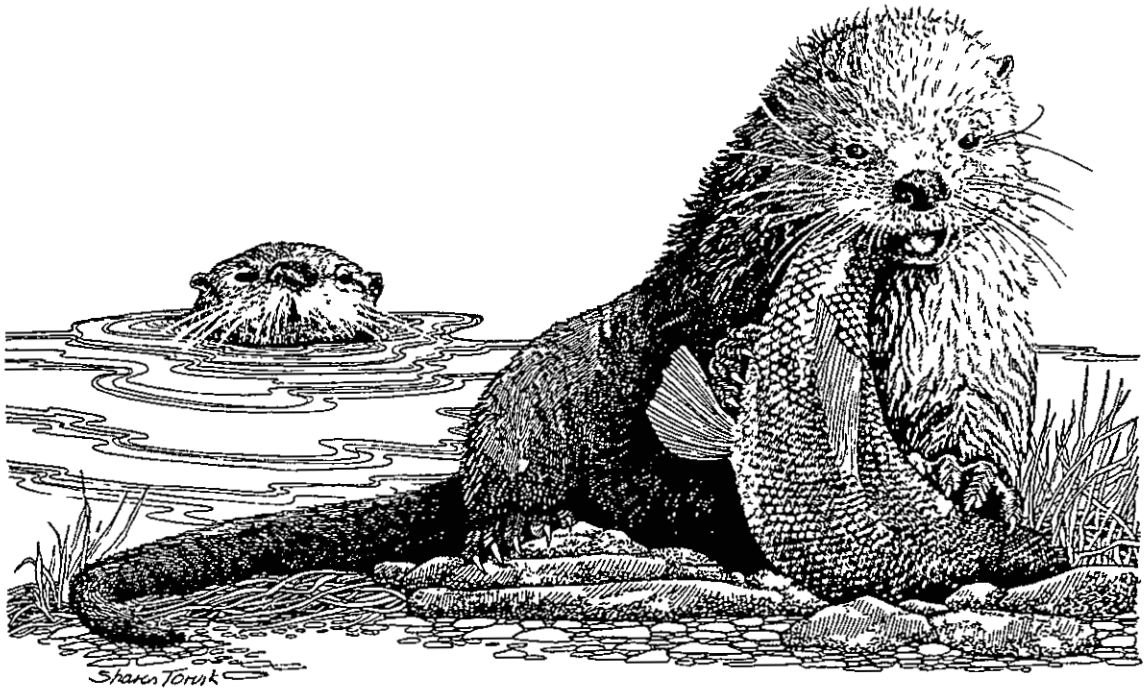
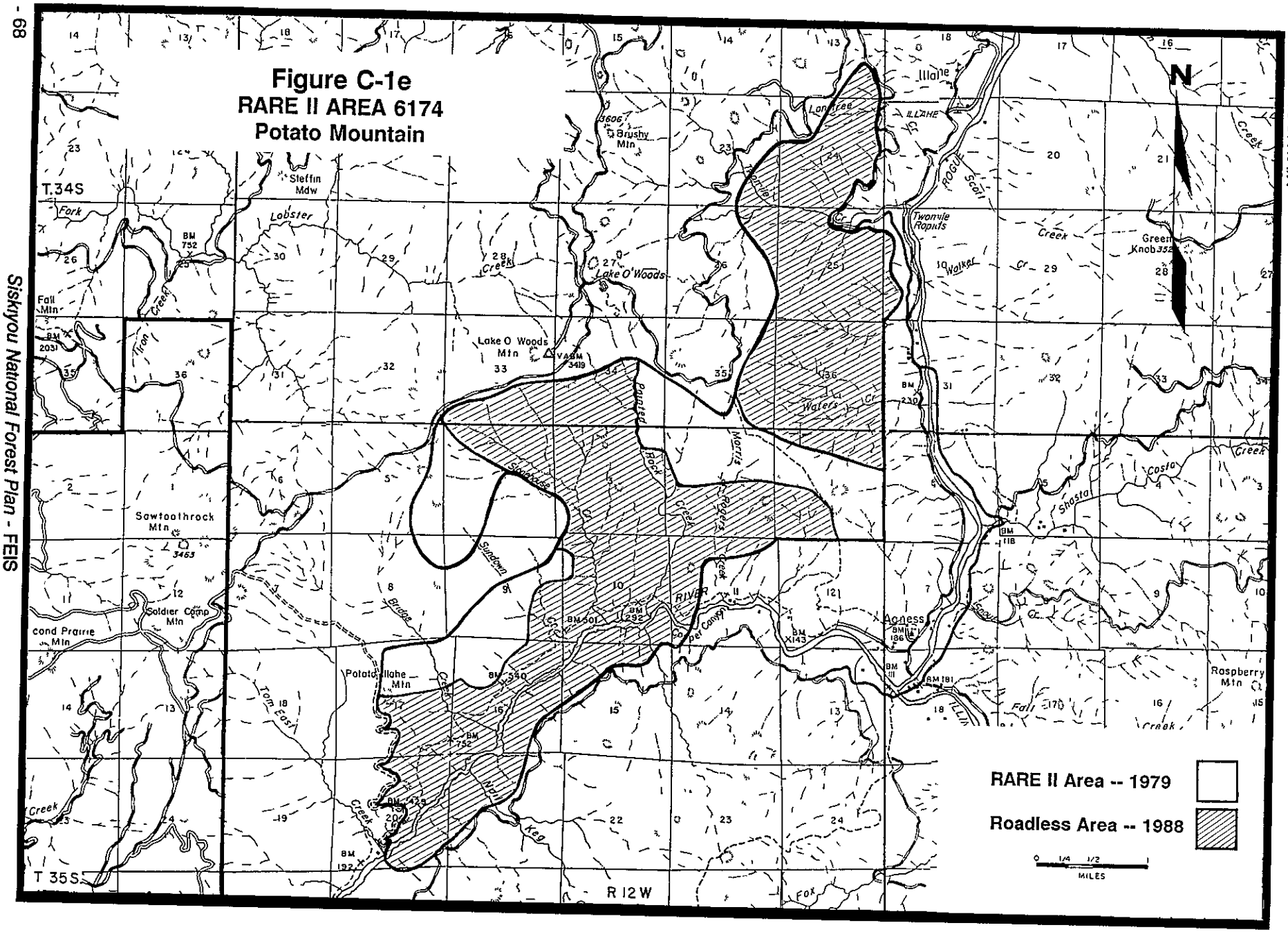

Sharon Torvik

Table C-5e. Potato Mountain Roadless Area No. 6174 (5,963 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	5,963	0	0	5,963	0
7-Supplemental Resource	0	0	0	0	0	0	1,946	1,946	0	1,738
8-Designated Wildlife Habitat	122	874	874	921	874	0	433	375	0	320
9-Special Wildlife Site	127	75	117	117	117	0	96	96	0	606
10-Scenic/Recreation River	1,140	873	868	821	868	0	0	0	0	0
11-Riparian	821	697	693	693	693	0	582	582	0	563
12-Retention Visual	337	261	0	0	0	0	45	45	0	34
13-Partial Retention Visual	2,797	2,587	2,814	2,814	2,814	0	2,278	2,326	0	2,116
14-General Forest	619	596	597	597	597	0	583	593	0	586
TOTAL	5,963	5,963	5,963	5,963	5,963	5,963	5,963	5,963	5,963	5,963
TOTAL UNDEVELOPED (MA 1-9)	249	874	874	921	874	5,963	2,379	2,321	5,963	2,664


Figure C-1e
RARE II AREA 6174
Potato Mountain
N
T.34S
T 35S
R 12W
RARE II Area -- 1979
Roadless Area -- 1988
0 1/4 1/2 1
MILES
Brushy Mtn
Steffin Mdw
Lake O'Woods
Lake O Woods Mtn
Fall Mtn
Sawtoothrock Mtn
Soldier Camp Mtn
Potato Illahe Mtn
Agness
Raspberry Mtn
Lobster Creek
Twomile Rapids
Green Knob
Waters Cr
Sundown Creek
Rock Creek
Costa Creek
Shasta Costa
Tom East
Fall Creek
Illahe
Rogue
Scott
Fox
Keg
Creek
River

POTATO MOUNTAIN No. 6174

(5,963 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Potato Mountain Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. At that time, it contained 8,060 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979. Since then, timber sale activity has reduced the area to 5,963 acres. The entire area is National Forest System land.

The Rogue-Illinois Land Management Plan (FEIS, 1979) encompasses the Potato Mountain area. Management direction allocated most of the area to coordinated resource management to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features.

The other management direction for the area provides scenic river status for a corridor along the Rogue River and is managed to: maintain or enhance the condition of the high quality scenery and the largely undeveloped character of its shoreline; provide opportunities for river-oriented recreation which is consistent with the area's largely undeveloped nature; and utilize other resources and permit other activities which maintain or enhance the quality of the wildlife habitat, river fishery, scenic attractions, and recreation values.

Complete descriptions of these management areas can be found in the Land Management Plan. Readers are directed to this document for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements considered and currently implemented for the area. Since implementation of this Plan, all project activities, e.g , timber harvest and road construction, wildlife enhancement, etc , have been analyzed under it's direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

Between 1984 and 1988, timber sales have developed portions of the unroaded area. The most significant changes resulted from the Painted Picture and Waters Creek Timber Sales which essentially split the area into two portions (Refer to Figure C-1e). Another timber sale occurred along the northwest edge of the area. The remainder of the area is as previously discussed.

LOCATION AND ACCESS

The south and east facing Potato Mountain area is located in Curry County, Oregon, and includes portions of several small drainages tributary to the Rogue River. The area is located approximately 13 miles from the coast and is within a five mile radius of the community of Agness. The area is completely encircled by the Agness Road, Sawtooth-Foster Road, and Lake O' Woods Road.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is on the west side of the coast range and within the Klamath Mountain Geologic Province. Elevation varies from 200 to 3,419 feet near Lake O' Woods Lookout. Topography varies from rolling, hummocky terrain to steep slopes and deeply incised drainages. Most of the area is generally well timbered except for the river banks and bars and Adams Prairie. The forested

areas have much variety due to hardwood stands, brushfields, and various small open grassy sites. Douglas-fir is the primary conifer species with associated species being Port-Orford-cedar and sugar pine. Tanoak, madrone, and canyon live oak are important hardwoods with red alder, bigleaf maple, and myrtle found in drainages and wet areas. The ecosystem is predominately mixed-conifer and mixed evergreen type.

Soils are generally moderately deep to deep and productive. Shallow, rocky soils as inclusions occur in steeper headwall areas. Soil stability varies greatly; however, the great majority of the area is moderately stable. Some isolated mass movement activity has occurred on oversteepened slopes that have been undercut by stream channels and along geologic contacts.

Average annual precipitation varies from 100 to 110 inches; dry season rainfall (May through September) averages 9 to 11 inches. The climate is mild and heavily influenced by marine air. Fog in the spring and summer often lies in the Rogue River corridor to an elevation of 1,500 feet. Summer temperatures often exceed 90 degrees Fahrenheit in the Agness area.

Populations of black-tailed deer, Roosevelt elk, and black bear occur within the area. Large sea runs of salmon and steelhead use the Rogue River. The Federally listed threatened bald eagle has been observed in the area, but no nest sites have been found. Up to a half dozen osprey nests exist within the roadless area along the Rogue River. Northern spotted owls (sensitive species) have been observed in the roadless area. The area contains portions of two of the Forest's important meadow complexes and a large cliff site. A few sensitive plant species are found within the area: *Allium bolanderi* and *Erigeron cervinus*. A review list plant, *Arenaria howellii*, is also present.

RESOURCE USES

Little or no mineral development has occurred in the past and no activity other than occasional recreational exploration is present today. Livestock grazing occurs in Adams Prairie. Minor upland game and moderate big game hunting on the fringes of the unroaded area takes place; interior hunting is very limited due to steep and brushy ground. Fishing in the Rogue River is a major use.

Recreation along the Rogue River is the dominant use of the area. The Lower Rogue River Trail crosses the unroaded area along and near the north bank of the river and is well used The unmaintained Lake O' Woods Trail receives very little use. Hiking, fishing, and boating (including large commercial tour boats and other motorized craft) are popular along the river. The total annual recreation visitor days for this area is estimated to be 4,500, tour boats providing 3,000 visitor days and fishing and other river use 1,500 days.

The area just outside and upstream along the Rogue River is utilized for summer homes and private cabins. This use is well established and is very important to the people involved. Water is withdrawn from two streams; Waters Creek (domestic use) and from Morris Rodgers Creek (irrigation purposes).

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The landform within the area has rounded, relatively flat ridges and sideslopes which average 60 percent. The area is covered by vegetative canopy of conifers, hardwoods, and brushfields. Prairies near and around Agness, Adams Prairie, and rock bluffs above Copper Canyon provide diversity. The most significant feature of the area is the Rogue River canyon.

The surrounding conditions do not vary greatly from within the unroaded portion. Vegetative type and landform is consistent. Man's activities have modified the environment on the ridgelines and along the Rogue River. Timber harvest entries have provided a mosaic of patch clearcuts where the vegetation varies a few decades in age.

Influences most predominate in this locale are heavily traveled roads. The Agness Road, the only east-west access to the community of Agness, is the western segment of the principal east-west road through the Siskiyou National Forest. Secondly, timber harvest activities and associated roads immediately border the area. Near the community of Agness, private lands which border the unroaded area have been altered through removal of much of the overstory vegetation and development.

Indians have occupied the Rogue River corridor in both historic and prehistoric times. Inventoried vision quest sites and a historic/aboriginal trail, which may follow a route used by native Americans prior to 1856, are located here.

CAPABILITY

MANAGEABILITY

The Potato Mountain unroaded area is well defined and management for protection and maintenance of unroaded characteristics and values in all or part would not pose any difficult or unreasonable situation. The location and size does not allow the complete screening from the sights and sounds of developments or activities However, the size and shape is adequate to reduce offsite intrusion from adjacent roads, timber harvesting, power tour boats, and associated human activity noises. The roadless area boundary is somewhat poorly defined as it crosses midslope along much of its length.

NATURAL INTEGRITY AND APPEARANCE

Human influences have had little impact on the natural appearance or long-term ecological processes of the roadless area, however, it does contain a number of man-made features along the Rogue River. The impact of the two trails, while low, will be evident for many years. Here, man's activities are noticeable, but would not be perceived by users as undesirable. Fishing and boating are popular on the Rogue River. This use level is high and causes considerable noise as well as visual impacts on the naturalness of the area.

Adams Prairie, along the southwestern edge, has been used many years for livestock grazing. This use has altered the natural processes of the area by retarding the invasion of forest trees and brush. Because of this use, fences have been added and non-native grass species have been introduced. A low standard road in Adams Prairie serves two summer homes along the Rogue River. Even if closed, it will affect the naturalness of the area for many years, although effecting only the fringe of the unroaded area. These summer homes are just outside the area's boundary. Power lines to the summer homes also have an effect on naturalness, but are not highly visible.

The Adams Prairie, Newhouse Cabin, and Painted Rock areas contain old orchards of planted fruit trees. While noticeable, they are not perceived as particularly undesirable; their historic value is an attraction rather than a detriment.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The topographic and vegetative screening over most of the Potato Mountain area is sufficient to provide a sufficient opportunity for solitude. Due to the relatively small size, slope positioning, and narrowness of the unroaded area, however, there are many off-site intrusions on the opportunity for solitude. Frequent truck traffic and motorized boats are heard throughout area. The occupancies along the Rogue River also conflict with the naturalness of the area. Access roads, power lines, and other development on private ownership in the Agness vicinity provide a poor buffer for a primitive experience or solitude.

Use of the area for primitive recreation experiences is limited due to density of vegetation, steepness of slopes, and proximity to human activity and development. Few trails exist and in places the vegetation is so thick as to make cross country foot travel extremely difficult. Due to limited use and physical attributes,

entering the area a short distance would provide a feeling of solitude, adventure, and awareness of untrammeled conditions. The Recreation Opportunity Spectrum (ROS) of the area is split between Roaded Natural on the fringe and Semi-primitive Motorized upslope from the river.

SPECIAL FEATURES

The most significant feature is the classified Scenic segment of the Rogue Wild and Scenic River. The unroaded area encompasses over three miles of the designated river corridor. Previously noted are the native American cultural sites.

AVAILABILITY

RESOURCE POTENTIALS

Recreation

Undeveloped/unroaded. The opportunity for measurable change in type or use is limited even though there is some potential total use increases. Other than in the Rogue River corridor, there is little opportunity for increasing use. Use today is below capacity.

Developed. The potential for increased use is greatest with roaded development. The existing use on and along the Rogue River would not be impaired due to its designated status of Wild and Scenic River. Roads would provide greater access for hunting, dispersed camping, and other forms of motorized recreation.

Wildlife

Under unroaded conditions, game and nongame wildlife would remain constant unless specific management practices such as habitat improvement or prescribed fire were implemented. As development occurs over time, elk and deer populations would increase in response to increased forge. Varying stages of vegetation in harvest units and along roads with adequate hiding cover would promote expansion of existing herds. Populations of old-growth dependent wildlife species would decrease. They would not be eliminated, however, because considerable habitat would remain along the river corridor, tributary streams, and in areas unsuitable for commercial purposes. Sensitive species would be protected through applicable standards.

Fisheries

The anadromous steelhead and salmon fisheries of the Rogue River are extremely important for recreation and commercial fishermen. While the small tributary streams within the unroaded area do not provide spawning or rearing habitat, they do contribute clear, cool water to the Rogue River fishery. The stream gradients are steep and have very limited potential for fisheries enhancement. The fishery would be best protected under the existing condition where natural conditions prevail. Development poses only limited risk; that being principally related to land instability.

Water

There are no man-made impoundments or diversions either existing or proposed. The potential for small hydroelectric power exists on the steeper tributaries with development. A small increase in water yields would result as a consequence of timber harvesting. However, the greatest demand for water is directed toward maintaining the Rogue River water temperature in the summer and fall periods. Quality aspects for the tributary streams is far greater in importance than water use or development due to the high value fishery and recreational use of the Rogue River.

Livestock

The grazing of livestock at Adams Prairie is well established and is important to the permittee. The permit is for 30 AUM for the period of October 15 through May 31. There is little potential for increase with development. If the area were not available for grazing, the permittee would either have to severely reduce his herd or quit the livestock business.

Timber

The unroaded area contains approximately 5,147 acres of land suitable for producing timber. The standing volume of timber is estimated at 144 MMBF. Site productivity is relatively high. The area is reasonably stable and could be logged using skyline cable systems that are in common use on the Forest. Additional roads would be required. Because of heavy vegetative competition and steep slopes, management for timber production would utilize various methods, including use of herbicides, to reduce brush competition for release of crop trees Management of the area along the Rogue River has and will likely require meeting a Visual Quality Objective (VQO's) of Retention.

Energy and Minerals

Activity in the form of exploration and development is low to nonexistent. While potential minerals likely occur, development is remotely possible. There are no active mines or mineral leases in the area. Prior rights have potential for conflict.

Cultural

The inventoried sites and other historic and prehistoric sites that may be found will be evaluated and provided for under the applicable laws and regulations for any proposed activity, whether unroaded or developed. The potential for discovery of additional archeological evidence is good, especially in areas close to the river.

Land and Use Authorization

Only those uses already noted exist. Few are expected under either a roaded or undeveloped scenario.

MANAGEMENT CONSIDERATIONS

Fire is a major management consideration. The potential for major conflagration does exist with the heavy fuels and dense brush on the southerly slopes above the river. Severe conditions exist, however, for a relatively short period due to coastal influence. Road positioning is favorable; being generally above the fuels. The greatest threat of ignition is posed by dispersed recreation use along the Rogue River, and private ownership land uses and development in the Agness vicinity. While risk is low due to few users within the high hazard areas and heaviest use being on the river, fire ignition at the wrong time could have major consequences. With road development, access and intensified treatment of activity fuels would considerably lessen fuel continuity and concentrations. But, even though probability of major losses of resources by wildfire would be reduced, the improved access also brings with it increased risks due to greater numbers of people in the woods.

The potential for insect and disease outbreaks within the coniferous forest exists. However, actual occurrences have been minor and localized. With road development, the potential for spread of *Phytophthora lateralis* root disease of Port-Orford-cedar will be increased.

NEED

OTHER AREAS AND PUBLIC USE

Within eight miles of Potato Mountain exists the designated Wild Rogue and Kalmiopsis Wildernesses and stretches of the Wild and Scenic Rogue and Illinois Rivers. A segment of the Wild and Scenic Rogue River is within the unroaded area and the Wild Rogue Wilderness is only one-half mile to the east Several other special Management Areas and blocks of unsuitable land surround Potato Mountain.

Recreation use of the unroaded area and nearby Wilderness is extremely light in consideration of their size. They share many of the same attributes of Potato Mountain, but are somewhat more rugged and diverse in geology and vegetation. Use in the surrounding undeveloped areas is concentrated, much like Potato Mountain, along rivers and trails.

Local users are more likely to utilize Potato Mountain than recreationists from major population centers six to ten hours away via automobile. Recreation oriented travelers from the metropolitan areas would normally seek areas closer and of higher quality in terms of views and experiences.

ECOSYSTEM REPRESENTATION

The major ecotypes within Potato Mountain are well represented in other undeveloped areas in addition to the adjacent Wilderness and Wild and Scenic River areas. The designated Wild and Scenic River segment within this unroaded area, along with potential Supplemental Resource Area in the lower reaches of Morris Rodgers Creek (Copper Canyon), provide a permanent share of the more diverse ecosystems of this area.

PUBLIC INVOLVEMENT

Public input on a few selected roadless areas on the Forest has been extensive. Potato Mountain, however, has not received much attention or advocation for protective status. Substantive comments were received during public review of the Rogue-Illinois Land Management Plan in 1979. The majority of respondents supported the multiple use concepts, management prescriptions, and land use allocations proposed for this area Several letters stated a Wilderness preference (Alternative B); four respondents specifically called for the preservation of Potato Mountain to protect the quality of the Rogue River and its tributaries for fisheries, and to protect the unique Rogue River canyon.

Both the public and Forest managers have had considerable interest and concern for the existing and future management of the larger unroaded areas. During RARE II, units of local and state government responded to the potential inclusion of Potato Mountain Roadless Area as Wilderness. They most often cited impacts associated with local economy and community stability, loss of timber receipts, and multiple use opportunities foregone. Most reasons for opposition were similar; the primary concern being the area's individual and cumulative effects on the critical timber supply of southwestern Oregon.

Since RARE II, the Potato Mountain area has been evaluated for development activities through site-specific project planning. Several projects have taken place and others have been planned within the unroaded portions that were inventoried. Public involvement has occurred, but there has been little concern relative to the issue of leaving the area in an unroaded state.

In the current Forest planning process, the unroaded question has remained a major issue. Public involvement, beginning with early public scoping in 1979 and continuing with public meetings, workshops, and other contacts in 1984 and 1985, has not surfaced additional concern for unroaded status of this inventoried area. Public review and response of the DEIS for the Forest Plan also failed to focus heavily on this area The concensus for long-term management of the unroaded area generally was oriented to

maintenance of quality views from the Rogue River, protection of the river environs, and a special allocation for the Morris Rodgers Creek area, which includes the rock cliffs.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Potato Mountain Roadless Area contains known and potential prehistoric and historic sites. Indian trails, vision quest sites and villages exist in the area along ridges and the Rogue River. Historic transportation routes include Lake O' Woods and Lower Rogue River Trails, both of which had prehistoric use.

All alternatives, except E and M, allow for development which requires intensive cultural resource inventory along any proposed activity area prior to approval. In this way, sites that may exist in the project area can be evaluated. Valuable sites can then be protected via avoidance or conserved via data recovery. Alternatives E and M, calling for an unroaded regime, minimize the need for cultural inventories

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for Potato Mountain. Acreages shown are subject to change due to current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-	1,100	1,100
High	-	-	700	700
Moderate	-	-	-	-
Low	-	-	4,100	4,100
Total	-	-	5,900	5,900

Improvements

Roads. The road system would follow ridge systems off the main roads on the boundary and would have midslope roads crossing the creeks and draws. Some full bench ground would be crossed by roads with much of the excavated material hauled to stable disposal sites. Many of the roads, especially those on ridges and in cut over units, would be visible from the Agness Road and the Rogue River. Access would be provided for timber management, roaded recreation, and fire suppression.

The 5,147 acres of land tentatively suitable for the production of timber could generate about 20 miles of new road for timber harvest. Roads for other purposes would be minor, if any All roads would be local roads built when needed to access timber harvest units. Most of these roads would be dead-end, but a possibility exists for a loop road, especially near the Rogue River corridor, which could provide access to portions of the north side of the river. Some mileage may be open to passenger cars, depending on the

alternative, but most of the roads would be open to only high clearance vehicles or closed between projects. The following chart shows the mileage of the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A and B	20	5	7	8
C	20	3	9	8
D	20	6	6	8
E and M	0	0	0	0
G	14	0	6	8
K	19	5	3	1
S	15	4	2	9

Trails. None of the alternatives would lead to construction of new trails within this area. The two existing trails are retained with some trail bridge replacements to provide for public safety; otherwise, no reconstruction is planned.

Developed Recreation Sites. One recreation site (Nail Keg Creek) is identified for construction under Alternatives B, D, D1, E, G, and M; the other alternatives construct none.

Wilderness Potential

The area has been inventoried according to ROS criteria and is in a natural appearing condition capable of providing approximately 3,000 acres each of Semi-primitive Motorized and Roaded Natural recreation opportunities. The carrying capacity for the area is estimated at approximately 8,700 RVD's. This figure is high since the coefficients used to calculate use from ROS categories was developed based on the assumption that roads were present. Current use is low (approximately 4,500 RVD's) and is attributed primarily to recreation activities on the Wild and Scenic Rogue River. The presence of motorized uses on the river and the surrounding road systems would preclude the ability of the area to provide a truly primitive recreation experience

Access into the area is limited to two trails. No new trails are programmed due to the low levels of use. Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning period.

The area is isolated from other roadless areas and designated Wilderness. The Potato Mountain Roadless Area is not recommended for Wilderness designation in any of the alternatives.

All alternatives, except E and M, would assign the area to multiple resource management objectives Under these alternatives, the Semi-primitive recreation opportunities currently available would shift to the Roaded Natural end of the opportunity spectrum. The change in the character of the landscape would result in the loss of any Wilderness potential.

Alternatives E and M would maintain the area in a roadless condition, thereby providing additional capacity for Roaded Natural and Semi-primitive Motorized recreation opportunities. Wilderness potential of the area would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time.

Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
E and M	6,000	6,000	6,000
All Other Alternatives	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

The Potato Mountain area is located in and adjacent to the Wild and Scenic Rogue River, much of which is visible from the river or from the Agness Road paralleling the river corridor. Allocation of the area to roadless management objectives will not affect the management of the Wild and Scenic River, however, the allocation may effect the quality of the recreation setting near the river. The recreation setting is currently maintained through the use of VQO's which were assigned to the area in response to both the designation of the Rogue River as Wild and Scenic and to the high levels of recreation use that occur on the river. Area within the designated Wild and Scenic River corridor is currently managed to achieve the Retention objective. Variations on land allocations are discussed by alternative below

Alternatives A and A-Departure would manage the area to achieve inventoried Visual Quality Objectives. Some modifications would result as the area is developed. Alternatives B, C, D, and D1 would reduce visual objectives outside of the designated Wild and Scenic River corridor Areas outside the 1/4 mile corridor would be managed for Partial Retention, resulting in visible harvest activities.

Alternatives G, K, and S would allocate the foreground area adjacent to the Wild and Scenic River to Supplemental Resource and would retain the essentially undeveloped character of the area. Alternatives E and M would allocate the area to roadless management objectives. There would be no adverse visual impact.

Soil, Water, And Fish

The impacts of assigning the area to development or nondevelopment are discussed by alternative groups. No soil, water, and fish impacts are associated with Alternatives E and M as existing conditions are maintained. All other alternatives assign all or part of the area to some degree of development.

The majority of the soil, water, and fish resources within the Potato Roadless Area are not significantly affected by timber harvest related activities. All the alternatives, other than E and M, are similar in the amount of soil disturbing activities proposed. The allocations in these alternatives would have a minor to negligible potential impact on these resources.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

The roadless area is a mixture of brushfields and old-growth Douglas-fir with a dense understory of brush. Though dead fuel loading is light over most of the area, the large amount of brush creates a high hazard. Fuels are continuous, with only a few natural breaks. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, fire hazard increases during timber harvest. As fuels are treated, the hazard is reduced. Over time, the continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives E and M, fuels would remain continuous over the entire area. In Alternatives G, K, and S, 45 to 49 percent of the area would be developed, creating a mosaic of fuels over time, while the remaining undeveloped area would be in 6-7 separate blocks. Alternatives A, B, C, and D would develop approximately 57 percent of the area. The remaining undeveloped areas would be broken into 3-5 separate blocks. Alternative NC would develop 63 percent of the area. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternatives G, K, and S, industrial operations would result in increased risk over 45 to 49 percent of the area, and risk from public use would be increased along the 14 to 19 miles of road. In Alternatives NC, A, B, C, and D, industrial operations would result in increased risk over 57 to 63 percent of the area, and risk from public use would be increased along 20 miles of road

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical Areas or RNA's are proposed. A few sensitive plants are present and will be managed under appropriate Standards and Guidelines.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding area is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning is considered. Total suspended particulates (TSP) is used as a measurement of the potential for regional haze. Alternatives E and M contribute no TSP. All other alternatives produce 32-40 tons of TSP per year.

The probability of a smoke intrusion from burning in the area impacting Roseburg or Grants Pass, both designated areas for air quality, is very low based on past performance. As the area is located in the Rogue River drainage, the probability of impacting the Wild Rogue Wilderness and Rogue corridor is moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. This roadless area contains significant habitat for bald eagle and osprey, with the most important area being the corridor along the Rogue River. Within the area, bald eagles use the river as a flight corridor, they probably feed on fish resources here, and may have even nested here in the past, and may nest here in the future. In a given year, five or more osprey pairs normally nest within the roadless area along the Rogue River. In any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and Wildlife Service 1986). Overall, prime habitat for eagle and osprey is maintained in alternatives which assign Potato Mountain to Backcountry Recreation (Alternatives E and M) or Supplemental Resource (Rogue River Visual--Alternatives E, G, K, and S).

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This would be especially true under Alternatives A through D1, which meets Management Requirements (MR's) for wildlife species dependent on mature/old growth, but otherwise develops most of the area. Alternative NC does not meet MR's; it contains no habitat allocated for wildlife species using mature/old-growth forests.

Except for Alternative NC, a mixture of habitat enclaves to meet MR's for mature/old-growth habitat is located within the roadless area: portions of two spotted owl habitat areas, one pileated woodpecker area, and one pine marten area. At present this unroaded area supports approximately three to five pairs of spotted owls, there would be no change under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels in all other alternatives, except for Alternative NC.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M. Snag habitat along the Rogue River would remain at or near 100 percent in all other alternatives which maintain the river corridor in a natural condition.

Black-tailed Deer/Roosevelt Elk. Big game opportunities would increase in alternatives which develop much of the area (all alternatives except E and M). Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. Five meadow areas are contained in the area (approximately 200 acres); Adams Prairie, located on the western boundary, is the most valuable meadow habitat on the Forest. The Morris Rodgers area, an important cliff/stream/forest habitat site along the Rogue River, is potential habitat for raptors. This site is specifically allocated as Supplemental Resource in Alternatives E through M, and as a Special Wildlife Site in Alternative S. General rock sites are allocated for wildlife use in Alternatives E through M, but would probably remain unaffected in Alternatives NC through D1. The potential for human disturbance of Special Wildlife Sites is reduced under Alternatives E and M. Among alternatives which assign all or part of the area to Management Areas which permit development, Alternative B, D, D1 and G, which utilize a Riparian Prescription C, provide the highest quality of riparian habitat protection for wildlife.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) are high on the River, and lower than average in the interior where hunters have poor access.

Visual Resource

The current inventory of Visual Quality Objectives (VQO's) is divided between the following three groups:

VQO	Acres
Retention	1,800
Partial Retention	3,300
Modification	800

The area is located within the Rogue-Illinois viewshed which is recognized for its high level of recreation use and attendant viewer concern for the scenery. Alternatives NC, A, and A-Departure would assign the area to management for inventoried VQO's, with maintenance of a natural/near natural landscape expected. Alternatives G, K, and S would also allocate the area to management for inventoried VQO's, but with the exception of the foreground area inventoried for Retention being removed from the programmed harvest in order to maintain the existing vegetative character of the river's shoreline.

Alternatives B, C, D, and D1 would assign the entire viewshed to management for a reduced level of visual objectives. Areas inventoried for Retention would be managed to achieve Partial Retention. Management activities would be evident to river users.

Alternatives E and M would maintain the roadless condition The area would be managed under the Preservation objective which exceeds the inventoried VQO's

Recreation Settings

Recreation use in the area is relatively light, most use being associated with the Wild and Scenic River. The area is heavily influenced by motorized use on surrounding road systems and the Rogue River. Projected levels of recreation demand indicate that the use will remain well within the carrying capacity over the planning period.

The isolated location will limit the ability of the area to provide a quality wilderness or primitive recreation experience. The significant value of the area with regard to the recreation resource is its beneficial effect on the recreation setting within the viewshed adjacent to the Wild and Scenic River corridor. The natural appearance of the landscape character will influence the quality of the recreation experiences available on the river.

All alternatives, except E and M, would allocate the roadless area to some degree of development. The area would be developed over time and the 3,000 acres capable of Semi-primitive Motorized recreation would shift to the Roaded Natural end of the opportunity spectrum. Access to the area and motorized opportunities would be enhanced as roads into the area are constructed. There would be a reduction in the natural appearance of the landscape character. A near natural/modified appearance is expected under Alternatives B, C, D, and D1. A natural/near natural appearance is expected in Alternatives NC, A, A-Departure, K, G, and S. In addition, Alternatives K, G, and S would remove the inventoried foreground from programmed timber harvest in order to protect the vegetative character and undeveloped river area through the roadless area.

Alternatives A, A-Departure, B, C, D, and D1 would retain the essentially undeveloped character on approximately 900 acres due to allocations to Designated Wildlife Habitat. Alternative NC would leave few acres in an undeveloped status. Alternative G, K, and S would retain undeveloped character on approxi-

mately 2,400 acres due to assignments to Supplemental Resource and Designated Wildlife Habitat These areas may or may not be contiguous, so the integrity of the unroaded areas may be compromised by the presence of motorized activities Alternatives E and M would maintain its current unroaded status. Recreation capacities would remain fixed since no new trail construction is programmed

Economic and Social

There are 5,147 acres of land identified as tentatively suitable for timber management in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,963 acres of the Rogue Roadless Area is 0.28 MMCF. The estimated LTSY would be 0.51 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and D1	26	48
A, A-Dep, C, and D	24	.44
B	29	53
E and M	.00	.00
G and K	17	31
S	15	28

For projecting effects, the alternatives are grouped as: (1) Alternatives E and M which maintain unroaded status; (2) Alternatives G, K, and S which develop over half the area; and (3) Alternatives NC, A, B, C, and D which develop most of the area.

	Alternatives		
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G, K, and S	NC, A, B, C, and D (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Reduction	No Change
Indirect Effects			
Jobs	-22	-6	0
Annual Income (MM $)	-0 50	-0 15	0
Annual Payments to Counties (MM $)	-0.12	-0.04	0
Cumulative Effects			
Social Attitudes in Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old Growth	+	+	0
Mining	-	0	0

The major direct economic effect is government expenditure for the timber and associated road construction program Alternatives E and M have the biggest reduction in the timber and road expenditures The other alternatives have insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area, Alternatives E and M have the biggest reduction while the other alternatives have little or no change in the number of jobs, amount of income, and payments to the counties Alternatives NC, B, and D1 have slightly greater benefits than Alternative A.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities Previous documentation is found in Chapters III and IV of the FEIS The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example in Alternative E, fishing interests are predicted to feel positive about Forest management while timber interests would tend to feel the Forest is not listening to their needs. Such gains and losses may create additional conflict

MITIGATION MEASURE

No additional mitigation measures have been identified.

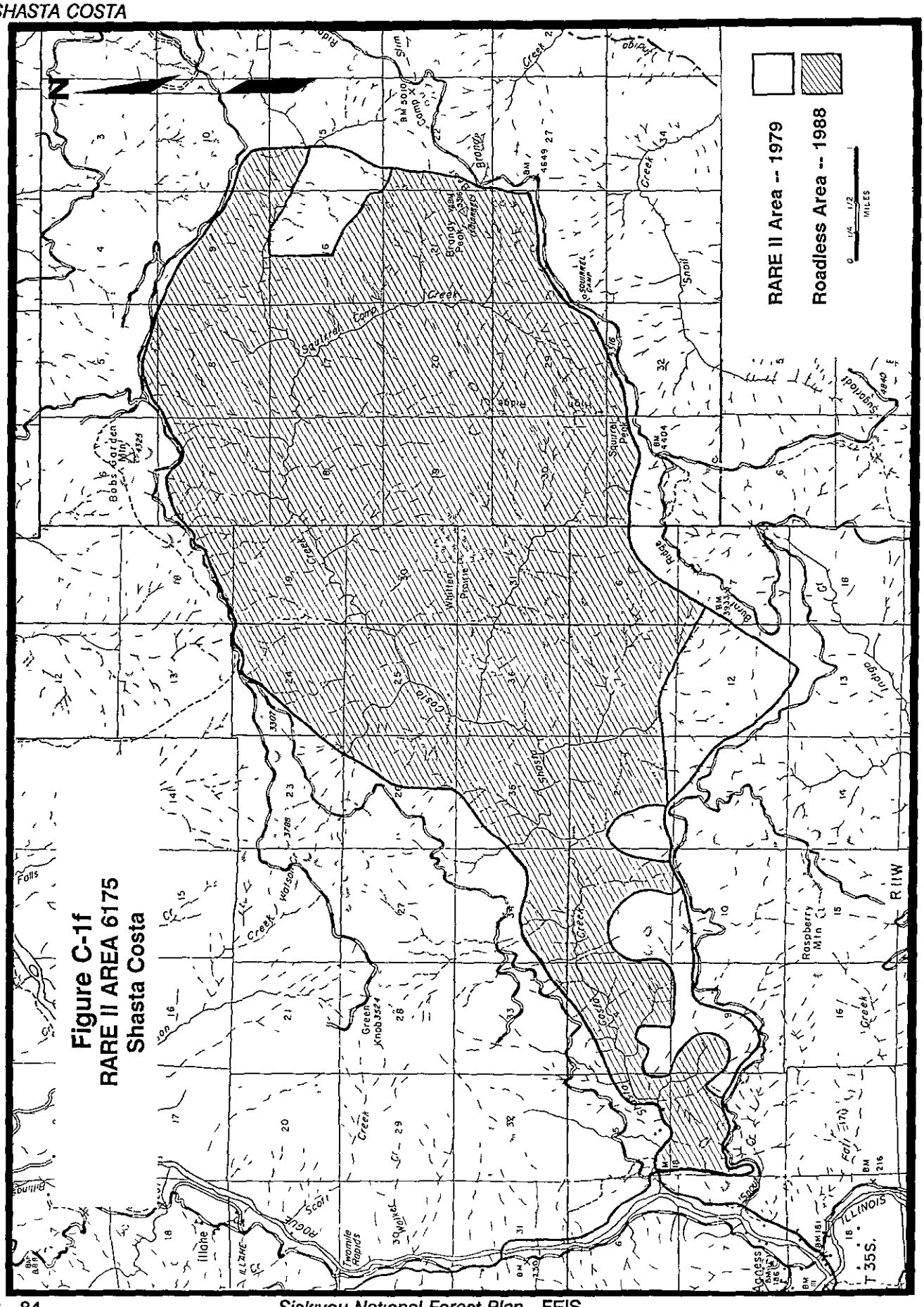
POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No additional conflicts have been identified.



Table C-5f. Shasta Costa Roadless Area No. 6175 (14,261 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	59	1,664	0	1,664	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	14,202	0	0	12,597	0
7-Supplemental Resource	788	788	1,344	1,167	1,344	0	1,531	1,387	0	1,387
8-Designated Wildlife Habitat	0	992	783	0	783	0	1,717	1,109	0	783
9-Special Wildlife Site	160	160	267	384	267	0	250	357	0	870
10-Scenic/Recreation River	21	21	11	11	11	0	0	0	0	0
11-Riparian	2,031	1,674	1,555	1,842	1,555	0	1,216	1,472	0	1,470
12-Retention Visual	4,123	3,891	0	0	0	0	1,853	404	0	399
13-Partial Retention Visual	7,038	6,639	1,388	1,521	1,388	0	5,935	9,425	0	9,246
14-General Forest	100	96	8,913	9,336	8,913	0	95	107	0	106
TOTAL	14,261	14,261	14,261	14,261	14,261	14,261	14,261	14,261	14,261	14,261
TOTAL UNDEVELOPED (MA 1-9)	948	1,940	2,394	1,551	2,394	14,261	5,162	2,853	14,261	3,040


N
RARE II Area -- 1979
Roadless Area -- 1988
0 1/4 1/2 MILES
Figure C-1f
RARE II AREA 6175
Shasta Costa
T 35S.
R11W

SHASTA COSTA No. 6175

(14,261 Acres)

DESCRIPTION

The Shasta Costa Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. At that time, it contained 16,312 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979. Since then, timber sales, predominately on the south side along the lower portion of Burnt Ridge, have reduced the unroaded portion to 14,261 acres. The entire area is National Forest System land.

The Land Management Plan for the Rogue-Illinois Planning Unit (FEIS, 1979) encompasses the Shasta Costa area Management direction allocates most of the drainage to coordinated resource management to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features. The only other management area within the drainage provides for a corridor on the main reach of Shasta Costa Creek to be managed in a near-natural condition.

Readers are directed to the Land Management Plan for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area All project activities have been analyzed under the the Plan's direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

Two timber sales were implemented between 1984 and 1988 that impacted the area The South Shasta Timber Sale along the southwest edge of the unroaded area, and the Squirrel Camp Timber Sale along the eastern portion of the area reduced the unroaded acres to approximately 14,261 (Refer to Figure C-1f). The remainder of the area remains as previously described.

LOCATION AND ACCESS

The Shasta Costa area is located in Curry County, Oregon, and includes most of Shasta Costa Creek drainage, which is tributary to the Rogue River one mile north of the community of Agness. Distance from the coast is approximately 20 miles. The unroaded portions of Shasta Costa Creek are completely encircled by roads. The two primary roads, Burnt Ridge and Bear Camp, are multi-purpose routes, serving heavy recreation, timber, and resource administration traffic.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area spans the boundary between the Klamath Mountains and the southern extremity of the Coast Range physiographic provinces in southwestern Oregon. Elevation varies from near 100 feet above sea level to 5,318 feet at Brandy Peak. Topography is very mountainous with generally steep slopes and deeply incised canyons. Most of the area is generally well timbered, but considerable variety occurs through brushfields, hardwood stands, and a few small open grassy sites (shallow sedimentary bedrock). Douglas-fir is the primary conifer species while tanoak, madrone, and canyon live oak are important hardwoods. The ecosystem is predominately mixed evergreen with the mixed conifer type at the higher elevations.

Soil variability is great within the basin Soils are generally moderate in productivity In the western portion, soils are generally moderately deep and stable Some inclusions of unstable soils occur along contacts and along stream undercut slopes. Rocky soil surface layers are common along ridgetops and inner gorge areas In the eastern portion, natural debris slide activity has occurred frequently. Steep, incised drainages have experienced frequent debris torrents. Oversteepened streambanks are sites for continued small failures At higher elevations, soils are often shallow with a frequent surface layer of talus. Soil depth, rockiness and stability are highly variable at midslope positions. Steep, shallow and rocky soils predominate, however, deep, productive soil pockets occur frequently along benches. At midslope positions, breaks in slopes at headwalls of ephemeral drainages are often sites for soil mass failure

Average annual precipitation varies from 90 to 120 inches; dry season rainfall (May through September) averages around 8 to 10 inches. The climate is mild and heavily influenced by marine air Fog in the summer period often extends inland to elevations near 1,500 feet. Summer temperatures often exceed 90 degrees Fahrenheit.

Black-tailed deer and black bear occur within the area. Elk frequent the Burnt Ridge area Both anadromous and resident fish are present. Chinook salmon utilize the lower two miles of Shasta Costa Creek while steelhead move upstream about six miles. No known threatened or endangered species inhabit the area, although near the Rogue River the northern bald eagle may utilize a flight corridor through the unroaded area A few sensitive species do occupy the area, notably the northern spotted owl and the plant, Oregon bensonia (*Bensoniella oregana*). Oregon bensonia occupies the moist edges of Douglas-fir/true fir stands. Two other sensitive plants in the roadless area are *Allium bolanderi* and *Iliamna latibracteata*. Two watch list plants are also present: *Trillium kurabayashii*, and *Vancouveria chrysantha* Burnt Ridge, from Squirrel Peak east, is a fine Botanical area and is considered and evaluated in various Plan alternatives (see Bear Camp Botanical Area in Appendix F).

RESOURCE USES

Limited minerals development has occurred in the past, but little activity other than surficial exploration is present today. Livestock grazing occurs in the western portion for two to three months of the year. Minor upland game and moderate big game hunting takes place on the fringes of the area; interior hunting is quite limited due to steep and brushy ground. Trout fishing takes place in the lower reaches of the drainage; limited access in the upper reaches of the drainage restricts fisherman use.

The scenic attributes of the area are apparent to users of the Bear Camp and Burnt Ridge roads. Recreational use within the area is low and primarily restricted to cross-country travel. The few trails have been abandoned While use figures are not collected for the more random recreational activities, estimates of use are low at between 200 and 300 recreation visitor days (RVD's).

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The look, or outward aspect, of the Shasta Costa watershed is that of a large "spoon-shaped" basin well clothed in conifers. Most of the east and northwest side of the watershed is developed. Distinguishing features are primarily those of heavily vegetated, steep, and highly dissected slopes with deep inner gorges. These physical details vary little with the exception of the lower reaches of Shasta Costa where open grassy areas with oak and other brush/conifer species intermix. The Squirrel Peak to Brandy Peak ridgeline (approximately two miles in length) is also open, rocky, and with widely differing vegetative types.

Conditions surrounding Shasta Costa do not vary greatly Vegetative type and landform is consistent. Man's activities have modified the environment on the ridgelines and local areas accessed for timber harvest and other purposes. The timber harvest entries have provided a mosaic of patch cuts where the new vegetation varies a few decades in age Large undeveloped areas exist a short distance to the north

and south. The upper portion of the watershed is moderately roaded and contains higher elevation true fir and a continuation of the rocky, open Burnt Ridge. Shasta Costa Creek empties into the Rogue River.

The predominant influences in this locale are heavily traveled roads. The Bear Camp Road, or Agness-Galice corridor, is the major east-west travelway through the Siskiyou. Secondly, timber harvest activities and their associated roads immediately border the unroaded area either on the same slope or immediately above along the ridgelines Fire, too, has played a major role over time in changing the vegetative mosaic of the area.

Primary attributes of Shasta Costa are proximity to the Rogue River and the community of Agness, contribution of high quality water to the Rogue, and the Burnt Ridge area. The Burnt Ridge area's scenic, floral, and geologic variety is easily accessible by good road. This higher elevation area contains sensitive and unusual plant life, open and rugged terrain, and interesting landforms The small basins just east of Brandy Peak in the Bear Camp area (outside the unroaded portions) appear to have been lightly glaciated Other than these, landscape variety is somewhat homogenous and generally reflects the features common to surrounding areas.

Shasta Costa Creek is important to the Rogue's salmonid fishery. The drainage contributes high quality water important to both onsite and offsite survival of juvenile salmon and steelhead

Elk frequent the Burnt Ridge area. Over the ridge a short distance to the north is the Wild Rogue Wilderness. The lower end of Shasta Costa is within the recreational segment of the designated Wild and Scenic Rogue River In this lower portion of Shasta Costa Creek a mile or so from the river is an early Forest Service Ranger Station site. Indians have occupied the lower reaches of Shasta Costa in both historic and prehistoric times.

CAPABILITY

MANAGEABILITY

The Shasta Costa area is so well defined and compact that there is no problem in maintaining or protecting the roadless character and values. The location does not allow complete screening from the sights and sounds of development activities. However, the size and shape of the basin is adequate to reduce off-site intrusion from adjacent roads, timber harvesting and associated noise of human activity The present boundary is suitable and recognizable on the ground. Terrain and vegetation along the boundary also provide some shielding of the interior environment from off-site sights and sounds.

NATURAL INTEGRITY AND APPEARANCE

Human influences have had little impact on the natural appearance or long-term ecological processes of Shasta Costa. The area is essentially free of disturbances. Natural balances, even where altered in the past, are intact and operating. These intangible values have been disrupted by past activity, but the activities were both minimal in extent and duration. Fire has been the factor with the greatest actual or potential for changing the area's character. Fire is the key to the long-term ecological changes and vegetative succession of the area Effects can vary by intensity and extent; duration would be limited to the period of vegetative recovery.

There are several mineral prospects located in the western portion of the area. There has been no current activity. Man's activities here are noticeable, but natural recovery has occurred on disturbed sites. An old, narrow mining road leading into the area has essentially been reduced to a trail by natural processes.

Several abandoned trails exist up Shasta Costa Creek to the falls, on High Ridge to Whitten Prairie, and along Bear Camp Ridge. None are maintained; most have nearly returned to a natural state.

The Shasta Costa Creek Falls, about a mile and a half upstream from the Rogue, presented a complete barrier to anadromous fish passage The falls are carved in bedrock and are quite scenic. In 1979, a fish ladder was constructed which allowed bypass of the falls by steelhead and fall chinook salmon.

Water quality and sedimentation from site specific sources, namely old road failures and poor drainage control, have had a minor effect on natural processes. These source areas are quite limited in extent Most have either been corrected or are returning to stable conditions.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

With highly broken topography and dense vegetation existing over most of the unroaded area, the natural screening provides ample opportunity for localized solitude and primitive experience The Recreation Opportunity Spectrum (ROS) inventory is split between Roaded Natural on the fringe (5,500 acres) and Semi-primitive Non-motorized (8,800 acres) in the heart of the drainage.

Size and the inferior position (physically lower) of the core of the unroaded area limits external, nonconforming sights and sounds. Conditions which constrain a totally primitive experience would be noise, dust, and minor views of activities on the borders of area Specifically, the Bear Camp Road and, to some degree, the Burnt Ridge Road compromise the area's overall naturalness.

Use of the area as a quality primitive setting is limited due to density of vegetation and steepness. Whereas few trails are maintained to promote access to the interior areas, sufficient openings exist to permit cross country foot travel. Most of the unique, interesting, or challenging features exist in the higher Burnt Ridge area and alongside Shasta Costa Creek. Due to limited recreation use and physical attributes, walking into the area a short distance would provide a feeling of solitude, adventure, and awareness of untrammeled conditions. However, the experience would not be unique as it is quite similar adjacent areas.

Recreational usage is highly dispersed. The unconfined types of recreation are camping, hunting, fishing, hiking, photography, swimming, nature study, and other miscellaneous forms. If the area remained unroaded, this type of recreational activity would remain essentially the same. Use would increase along with general trends for recreation, but would not exceed general trends A more beneficial aspect, though, is the availability of the area for recreation during the winter period.

SPECIAL FEATURES

The ridgeline of Burnt Ridge could contribute to outdoor education and/or scientific study and are is generally compatible with current activity and management direction for the locale

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

Dispersed Other than what is provided above, the opportunity for measurable change in type or use is limited even though there is some potential for increase in total use. Trail construction, for example, could greatly increase RVD's. Capacity is not limiting.

Developed The potential for increased RVD's is greatest under a roaded environment where uses other than existing would occur. Even with motorized usage, capacity is not likely to be exceeded

Wildlife

Under unroaded conditions, wildlife numbers would remain constant unless specific management practices such as prescribed fire were implemented. As timber harvest occurs over time, elk and deer populations will increase in response to the development of forage areas Varying stages of vegetation in harvest units and along roads would promote expansion of existing herds. Populations of old-growth dependent wildlife would decrease. They would not be eliminated, however, because considerable habitat would remain along the river corridor, tributary streams, and in areas unsuitable for timber production.

Fisheries

The steelhead and salmon fisheries are extremely important to Rogue River recreational businesses and commercial fishermen Although few people actually fish Shasta Costa itself, the creek is a highly important contributor to downriver fisheries. Maintenance of the habitat through good resource management practices is essential. Enhancement of fish habitat has some potential to increase juvenile yields. This opportunity exists under either scenario, but has greater likelihood of implementation with improved access

Water

There are no man-made impoundments or diversions either existing or proposed. The fish ladder on Shasta Costa Creek provides an additional 3.5 miles of anadromous fish habitat. The potential for small hydroelectric power development may exist on the steeper tributaries of Shasta Costa Creek. There is no demand for augmenting flow. The greatest needs expressed have been for maintenance or improvement of water temperature in summer. Quality aspects for this drainage are of far greater importance than water use or development due to the high value fishery and recreational usage of the Rogue River.

Livestock

Grazing of livestock could be maintained, increased, or decreased. The small existing allotment is not critical to the permit holder's overall operations. The potential for increased use exists, but accessibility, range management, and roundup is extremely difficult. With improved access, greater utilization of transitory range would occur. Timber harvest would create temporary openings, providing increased forage.

Timber

The unroaded area contains approximately 11,370 acres of land tentatively suitable for the production of timber. The standing volume of timber is estimated at 262 MMBF. Site productivity is mostly moderate. The area is reasonably stable and can be harvested using presently available logging systems. Because of heavy vegetative competition and steep slopes, management for timber production would utilize various methods to reduce brush competition for release of crop trees.

Energy and Minerals

Activity in the form of exploration and development is low to nonexistent. An old coal mine is located outside the western boundary; it has been inactive since the 1930's. A thin layer of coal is suspected to extend into the western portion of the unroaded area. The limited extent, thinness of seam, and remoteness of markets reduces the commercial significance of this resource. Low percentage mineralizations of copper, silver, and gold are known to be present in some metavolcanic rocks within the area. The potential for other minerals exists. The area may warrant further investigation. Development of locatable minerals is unlikely in the near future. Keeping the area unroaded would limit exploration. Development of timber resources would improve road access, which could result in increased mineral activity.

Cultural

For any activity, sites will be evaluated and provided for under the applicable laws and regulations

Land Use Authorization

None existing; few expected.

MANAGEMENT CONSIDERATIONS

Ownership, including subsurface rights held by others, is not a problem. The potential for insects and disease outbreaks exists within the coniferous forest. However, actual occurrences have been minor and localized. Natural factors and management actions have substantially reduced this treat.

Fire, on the other hand, remains the most serious management consideration. The potential for major conflagrations definitely exists. If the Shasta Costa area is developed, access and intensified treatment of activity fuels would considerably lessen continuity and concentrations, reducing the probability of major resource losses. However, access also brings increased risks due to industrial activity and greater number of people in the woods. The area's dense fuels and heavy use of roads do present a management situation where considerable resource loss could occur and the character of the setting could be greatly altered. Favorable aspects are the climate, i.e., conditions are severe for a relatively short period due to coastal influences, and positioning - heavy use areas being generally above the fuels. The greatest threat, however, occurs from dispersed recreation use deep within the unroaded area. While risk is low due to few users, fire ignition at the wrong time could be disastrous.

NEED

OTHER AREAS AND PUBLIC USE

Within ten miles of Shasta Costa exist the Wild Rogue and Kalmiopsis Wildernesses, and stretches of the Wild and Scenic Rogue and Illinois Rivers. The Wild Rogue Wilderness lies immediately to the north, essentially bordering the watershed divide of Shasta Costa. To the south, the large unroaded area of the North Kalmiopsis (88,582 acres) adjoins the Kalmiopsis Wilderness (179,850 acres) and unroaded areas immediately to the south (another 142,000+ acres). The undeveloped areas south of Shasta Costa encompass an area approximately 15 miles in width and 40 miles deep. Shasta Costa connects these areas with the undeveloped and designated lands to the north. Only the two major roads which swing to both sides of Shasta Costa and associated timber harvest dissect this large unroaded land mass.

Recreation use of the unroaded areas and Wildernesses is extremely light considering the acreage involved. These areas share many of the same attributes of Shasta Costa, but are generally far more rugged and diverse in geology and vegetation (particularly areas to the south). Use in the surrounding unroaded areas is very much like Shasta Costa, most being concentrated in and along the rivers, trails, and more open and higher elevation sites.

Local users are more likely to utilize Shasta Costa than recreationists from major population centers, five to ten hours away by automobile. The coastal communities in Curry County and the interior Grants Pass and Medford areas are the most probable sources of frequent users of the area. In terms of views and experience, recreation-oriented travelers from the metropolitan areas would normally seek closer and higher quality areas.

ECOSYSTEM REPRESENTATION

The major ecotypes within Shasta Costa are well represented in other areas and the Kalmiopsis and Wild Rogue Wildernesses. The higher elevation true fir ecosystem along Burnt Ridge is not extensively repre-

sented in this locale While limited in area here, it is not unique as the ecosystem is widespread further east on the Forest and common in the western states.

PUBLIC INVOLVEMENT

Both the public and Forest managers have considerable interest and concern for the existing and future management of the larger unroaded tracts of land. For this specific area, involvement in evaluation of alternative management options for Shasta Costa began in the early 1970's. Between 1977 and 1979, the RARE II process was being finalized. Public preferences at that time indicated two-thirds of the respondents favored non-Wilderness allocation versus Wilderness; few requested the area be placed in a "further planning" status. Since RARE II, the area has been evaluated several times for development through site specific project planning and broad-area analyses (still project level).

All units of local and state governments responding have cited the effects on local economy and community stability, loss of timber receipts, and multiple uses that would be foregone if allocated to unroaded status. Most respondents voiced the same reasons for opposition. Few environmental groups have taken a hard position on this area based on it's unroaded attributes Not until the latter half of the 1980's have groups seriously suggested all inventoried roadless areas be carried in their undeveloped state; even then, Shasta Costa ranked relatively low in priority.

The Rogue-Illinois Land Management Plan again addressed the unroaded Shasta Costa area. Several responses from the public stated a Wilderness alternative preference; five specifically called for protecting the fishery and water quality values of Shasta Costa Creek through preservation The majority theme of input, though, was to direct management toward multiple use with a quality emphasis.

In the current Forest Planning process, the unroaded area question has remained a major issue. Beginning with "scoping" in 1979 to public meetings and workshops through 1985, public input about this specific area has been requested. Comments on several of the inventoried roadless areas on the Forest has been extensive. Shasta Costa, however, did not receive the same intensity of concern or advocation of protective status as several adjacent areas. This may have been due more to the early assessments and personal preferences of the area's characteristics than a thorough analysis of it's attributes.

Immediately before and after release of the Forest Plan DEIS, the roadless area question and potential for Wilderness moved to a new theatre. Beginning in 1986, there was a movement to tie the Wild Rogue Wilderness and all contiguous unroaded areas to the south (including Shasta Costa) with the large Kalmiopsis Wilderness. This large block of land was promoted by several individuals and organizations as a potential National Park As discussed in Chapter II of the FEIS, the proposal was not entertained as an alternative evaluated in detail.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Shasta Costa Roadless Area has both historic and prehistoric sites within its boundaries, some requiring evaluation by an archaeologist. The area had prehistoric use by Indians along the Shasta Costa drainage. Hunting, gathering and fishing activities were pursued here. Historically, the area has been used by homesteaders. An abandoned homestead site is located in Whitten Prairie in the center of the area

Alternative NC has the greatest amount of roading, thereby the highest potential for disturbing cultural resources. Valuable sites, though, can then be protected via avoidance or conserved via data recovery. Alternative E and M calls for an unroaded regime which minimizes the need for cultural resource inventory

Energy and Minerals

The following table summarizes the estimated mineral potential and access limitations The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications·

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	100	100	200
High	-	-	-	-
Moderate	-	-	-	-
Low	-	300	13,800	14,100
Total	-	400	13,900	14,300

Improvements

Roads The 11,370 acres tentatively suitable for timber production could generate about 51 miles of new road for timber harvest. Roads for other purposes would be minor, if any All the roads would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC and A	48	12	17	19
B	47	12	16	19
C	51	8	23	20
D	47	14	14	19
E and M	0	0	0	0
G	40	0	16	24
K and S	47	12	7	28

Alternatives E and M would have minimal effect as no roads are built. Alternate G would have the least miles built of the roaded options, but would not maintain any roads open for passenger cars Alternatives NC, A, B, C, D, K, and S would be mostly roaded Alternate C, with none of the Supplemental Resource areas, would have the highest mileage Alternatives G, K, and S have 60 percent of the roads closed

The road system would follow ridges off the main roads on the boundary or extend existing midslope roads. The ridge roads would change to midslope roads as the ridges steepen. The midslope roads would cross small creeks and draws None of the roads would be expected to cross the main Shasta Costa Creek nor the main laterals where inhabited by fish Some full bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites. Many of the roads, especially those on ridges and in harvested units, would be visible from the Bear Camp Road.

Trails. No trail construction is programmed.

Developed Recreation Sites. No construction is programmed.

Wildlife and Fish Habitat Structural Improvements. All alternatives, except E and M, would facilitate the installation of structures by providing better access into the area.

Wilderness Potential

The Shasta Costa area has been inventoried according to ROS criteria and is capable of providing 8,800 acres of Semi-primitive Non-motorized recreation opportunities and 5,500 acres of Roaded Natural recreation opportunities The carrying capacity for the area is estimated at 10,600 RVD's. This figure is high since the coefficient developed for Roaded Natural is based on the assumption of presence of roads. Current use is very low and is attributed primarily to local users.

No trails are programmed for construction due to the low levels of use reported. Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning period.

All alternatives, except E and M, would assign the area to multiple resource management objectives. Under these, the area would be developed over time and Semi-primitive recreation opportunities currently available would shift to the Roaded Natural end of the opportunity spectrum. The change would result in loss of Wilderness potential. Alternatives E and M would maintain the area in a roadless condition, providing additional capacity for the existing ROS recreation opportunities The Shasta Costa Roadless Area, however, is not recommended for Wilderness designation in any alternative.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep and NC	0	0	0
B, C, D and D1	0	0	0
E and M	14,300	14,300	14,300
G	5,200	5,200	5,200
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness.

Wild and Scenic Rivers

Some of the area near the mouth of Shasta Costa Creek is visible to river users. The upper end of the area is visible to river users returning to Grants Pass via the Bear Camp Road. The assignment of the area to roaded or roadless management objectives will not effect the management of the Rogue Wild and Scenic River or recreation experience of river users The recreation setting is currently maintained through the use of VQO's which were assigned to the area in response to both the designation of the river as Wild and Scenic and to the high level of recreation use that occurs on the river.

Alternatives NC, A, A-Departure, and G would not maintain the area in a roadless condition, but would manage the area to achieve inventoried visual objectives, resulting in some modifications in the area which may be visible to river users Alternatives B, C, D, and D1 would assign the area to a reduced scheme of visual objectives. The lower end of the area would be managed to achieve Partial Retention in response to river use. The upper area would be managed to achieve the Modification visual objective, resulting in limited visible alterations to the landscape in the background as seen from the river

Alternatives K, and S provide for no programmed harvest of the foreground areas adjacent to the Rogue River. It would be managed under the Supplemental Resource area; the VQO is assigned in response to high levels of recreation use on the river The rest of the area would be managed to achieve the Partial Retention objective, resulting in some modifications to the Forest setting as the area is developed. Alternatives E and M would assign the area to roadless management objectives

Soil, Water, and Fish

No impacts are associated with Alternatives E and M because no soil disturbing activities will occur All other alternatives allocate all or part of the area to Management Areas which permit development. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS

The risk of degrading the soil, water, and fish resource increases with more timber harvest and road building The soils of the Shasta Costa area have a moderate to high hazard associated with road construction impacts Sensitive soils and difficult terrain indicate that there is a moderate risk to the soil, water, and fish resources from allocations found in Alternatives A, A-Departure, B, D, D1, K, and S. Alternatives NC and C have slightly more activity, thus a slightly higher potential for impact. Alternative G, with a reduced level of development, should result in a slightly lower potential impact.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels

Fuel types in the Shasta Costa area quite variable due to aspect differences and a wide range of elevations. Fuels are continuous over the entire area, except for a few breaks on ridge tops. A large part of this area is old-growth Douglas fir with moderate to heavy understories of brush and hardwood. On more southerly slopes, stands of pure hardwood are numerous, with a large number of snags intermixed Fuel loadings are light to moderate

In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is higher suppression costs and increased resource losses. In a developed scenario, the fire hazard increases at the time of timber harvest. As fuels are treated, the fire hazard is reduced. Over time, the continuity of fuels is broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access, reduces the potential for large, high intensity fires The result is lower suppression costs and less resource damage.

In Alternatives E and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area In Alternative G, 42 percent of the area would be developed, creating a mosaic of fuels over time, while the remaining undeveloped area would be in 5 separate blocks. Alternatives NC, A, B, C, D, K, and S would develop 66 to 79 percent of the area. The remaining undeveloped areas would be broken into 4-9 separate blocks.

In undeveloped areas, the risk of ignition is low due to the low levels of human use As development occurs, risk increases with road construction, timber harvest, and treatment of the activity slash. As access improves, the level of dispersed recreation and other public use increases, with an increased risk of human-caused fires Both developed and undeveloped areas will have similar risk levels for lightning fires.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternative G, industrial operations would result in increased risk over 42 percent of the area, and risk from public use would be increased along the 40 miles of road. Alternatives NC, A, B, C, D, K, and S would result in increased risk over 66 to 79 percent of the area, and risk from public use would be increased along the 47 to 51 miles of road in the area.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

Alternatives G and M include the Bear Camp Botanical Area, Option #4, most being included in the unroaded area Three sensitive plants and two monitor list plants are found in the Shasta Costa area. Sensitive plants are protected through application of appropriate Standards and Guidelines. For more detail on the proposed Bear Camp Botanical Area, see Appendix F.

Botanical Areas, by Alternative *1/* (Tentatively suitable for timber production)

Area Name	*Tentatively* Suitable (Acres)	Alternative (Acres) Priority Ranking	NC, A, B, C, D, E, K, and S	G and M
Bear Camp Option 4	1,539	10	-	2,314

1/ Total acres for Option 4 are shown Only a portion of Option 4 is actually within the Shasta Costa Roadless Area

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only impacts on alternatives from prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP. Alternatives NC, A, B, C, D, G, K, and S would produce 46-60 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Grants Pass, a designated area for air quality, is very low, based on past performance. The probability of impacting the Wild Rogue Wilderness or the Rogue corridor is low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. Bald eagles and osprey may occasionally use the lower Shasta Costa drainage as a flight corridor In any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and Wildlife Service 1986). Overall, alternatives which allocate the Shasta Costa Roadless Area to Backcountry Recreation (Alternatives E and M) or Supplemental Resource (all alternatives except C) would maintain current habitat values near the Rogue River.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This would be especially true under Alternative C, which meets Management Requirements (MR's) for mature/old-growth wildlife species, but otherwise allocates most of the area to timber management (no Supplemental Resource areas allocated). Alternative NC does not meet MR's; it contains no habitat allocations for wildlife species using mature/old-growth forests.

Except for Alternative NC, mature/old-growth habitat would remain at present levels under Alternatives E and M Wildlife species, which do best in secluded areas, such as cougar, would be best served by these alternatives, both alternatives also provide a corridor of mature/old-growth habitat linking the other roadless areas to the Kalmiopsis and Wild Rogue Wildernesses.

Except for Alternative NC, a mixture of habitat enclaves to meet MR's for mature/old-growth habitat are located within the roadless area: two for pileated woodpeckers and one for pine marten. This area presently supports approximately five pairs of spotted owls No change will occur under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels (no spotted owls) in other alternatives. In Alternative NC, habitat would be reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M

Black-tailed Deer/Roosevelt Elk Big game management opportunities would increase under development (all alternatives except E and M). Opportunities for habitat improvement projects for game animals would also be greater. Meadow habitat in the western portion of the area is used extensively by deer and elk, and would be maintained under all alternatives, although meadow buffers are not protected in Alternatives NC, A, and A-Departure.

Wildlife Habitats. Six meadow areas, mostly on the western side, occur within the unroaded area (approximately 375 acres) A few cliff/rock sites area present in the area (165 acres). Meadow/cliff habitat will be maintained under all alternatives, although potential for human disturbance is reduced under Alternatives E and M, which maintain the unroaded status. Among the alternatives which allocate all or part of the area to Management Areas which permit development, Alternative B, D, D1, and G, which utilize a Riparian Prescription C, provide the highest quality of riparian habitat for wildlife. Alternatives B, D, D1, G, K, and S also allocate Shasta Costa Creek as a Supplemental Resource area

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are low because human use of the area is less than in roaded areas. Fewer hunters use unroaded areas and non-hunters generally stay on the few trails Alternatives E and M produce fewest WFUD's

Visual Resource

The following is the current Visual Quality Objective (VQO's) inventory based on visibility of the area from major recreation travel routes or use areas (specifically, the Rogue River and the Bear Camp Road):

VQO	Acres
Retention	5,600
Partial Retention	8,500
Modification	100

Alternatives NC, A, A-Departure, B, and G would assign the area to management for inventoried visual objectives and would impact the visuals less intensively than allocations to a reduced visual scheme. The area is in a natural appearing (undisturbed) condition. Under these management alternatives, the area would appear as slightly altered within the first decade. A near natural/modified appearance is expected in Alternatives NC, A, A-Departure, and G; a modified Forest setting is expected in Alternative B

Alternatives C, D, and D1 would assign the entire viewshed to management with a reduced level of visual objectives. Areas inventoried for Retention and Partial Retention would be managed to achieve the Visual Quality Objective of Modification. The viewshed would appear heavily altered within the first decade. Alternatives K, and S would also assign the area to management for a reduced level of Visual Management. However, the entire Bear Camp viewshed would be managed to achieve the Partial Retention objective in response to high levels of recreation traffic on the Bear Camp Road. The area would appear as slightly altered-altered at the end of the first decade.

Alternatives E and M would manage the area above the inventoried VQO's. The visual objective of Preservation would be achieved, the area retaining a natural appearing condition over the planning period.

Recreation Settings

Recreation use is very light. Projected levels of recreation demand indicate that the use will remain well within the carrying capacity over the planning period. The influence of management activities on adjacent lands limits the area's ability to provide a quality wilderness or primitive recreation experience.

Under Alternatives NC, A, A-Departure, B, and G, approximately 8,800 acres capable of Semi-primitive Non-motorized recreation would shift to the Roaded Natural end of the opportunity spectrum Access to the area and motorized opportunities would be enhanced as roads into the area are constructed.

Under Alternatives C, D, and D1, the inventoried Semi-primitive Non-motorized condition would shift to Roaded Modified by the end of the first decade. Alternatives K, and S would shift the inventoried Semi-primitive Non-motorized condition to the motorized end of the opportunity spectrum Roaded recreation opportunities would be enhanced as a result of timber-related road construction. Any Wilderness potential would be lost.

Alternatives A and A-Departure would retain the essentially undeveloped character on 1,900 acres, with Alternative NC retaining the least (900 acres). Alternatives K, and S would retain essentially undeveloped character on 2,800 and 3,000 acres, respectively. Approximately 2,400 acres in the D alternatives would remain undeveloped. Alternative G would retain an undeveloped character on 5,200 acres due to allocations to Botanical, Supplemental Resource, and Designated Wildlife Habitat. These areas may or may not be contiguous, so the integrity of the roadless area may be compromised by the presence of adjacent motorized activities (See **Wilderness Potential**). Alternative E and M would remain unchanged, no new trails would be constructed. Any wilderness character would be maintained.

Economic and Social

There are 11,370 acres of land identified as tentatively suitable for timber management in this unroaded area The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the entire inventoried 14,261 acres of the Shasta Costa Roadless Area is 0.63 MMCF. The estimated LTSY would be 1.14 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC	59	1 10
A, A-Dep, C, and D1	.54	98
B	.63	1 23
D	.52	95
E and M	00	.00
G	40	73
K and S	50	.90

For projecting effects, the alternatives are grouped into three areas: (1) Alternatives E and M, as unroaded; (2) Alternatives G, which develops over half the area; (3) Alternatives K and S, which develop much of the area; and (4) Alternatives NC, A, B, C, and D, which develop most of the area.

Effects (Changes Compared to Alternative A)	Alternatives			
	E and M (Unroaded)	G	K and S	NC, A, B, C and D (Roaded)
Direct Effects				
Timber and Road Expenditures	None	Reduced	Minor Change	No Change
Indirect Effects				
Jobs	-49	-13	-4	0
Annual Income (MM $)	-1.13	-0.29	-0 08	0
Annual Payments to Counties (MM $)	-0 27	-0 07	-0 02	0
Cumulative Effects				
Attitudes of Communities in the Local Area				
Timber Related	-	-	-	0
Primitive Recreation	+	0	0	0
Fisheries	+	+	+	0
Wildlife Related				
Hunting	-	-	0	0
Old-Growth	+	+	0	0
Mining	-	-	0	0

The major direct economic effect on government expenditures of the alternatives is insignificant except for expenditures for the timber and associated road construction program. Alternatives E, G, and M have the biggest reduction in the timber and road expenditures. The other alternatives have insignificant changes in budget expenditures

The indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while the Alternatives G, K, and S have small decreases compared to Alternative A, while Alternative NC and B have slight benefits.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive to a particular interest while a negative sign indicates a social feeling of the Forest not being responsive to the particular interests as listed. For example, in Alternative E, interests concerned with preserving old-growth are predicted to feel positive about forest management while timber interests are predicted to feel the Forest is ignoring their interests. Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures have been identified beyond those already listed for each alternative.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No additional conflicts have been identified.

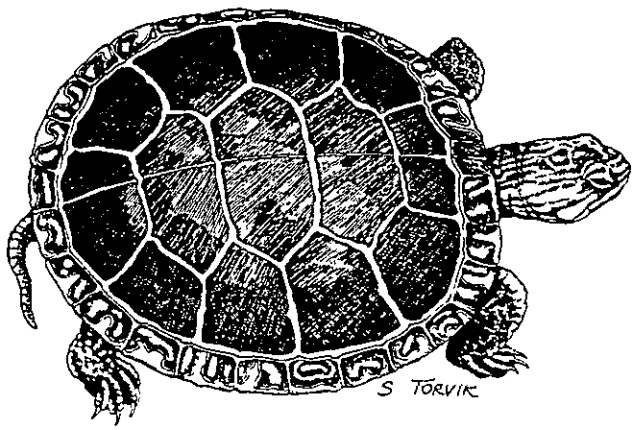


Table C-5g. North Kalmiopsis Roadless Area No. 6176 (88,582 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	1,972	1,972	1,782	1,782	1,782	1,972	1,972	1,782	1,972	2,645
3 Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	859	859	880	880	880	1,456	3,708	924	3,708	1,237
5-Unique Interest	0	0	101	101	101	528	373	528	373	912
6-Backcountry Recreation	0	0	0	0	0	84,626	56,923	12,123	82,511	37,483
7-Supplemental Resource	9,076	9,076	3,264	385	3,264	0	1,461	10,457	0	3,038
8-Designated Wildlife Habitat	0	5,738	5,807	6,581	5,807	0	2,967	4,869	0	2,784
9-Special Wildlife Site	448	442	783	800	783	0	479	2,026	0	2,011
10-Scenic/Recreation River	976	732	527	527	527	0	21	112	0	112
11-Riparian	12,669	10,984	11,710	12,497	11,710	0	3,244	8,365	3	6,001
12-Retention Visual	9,159	8,245	1,070	0	1,070	0	860	951	15	364
13-Partial Retention Visual	22,584	21,415	7,220	8,378	7,220	0	6,591	6,501	0	5,249
14-General Forest	30,839	29,119	55,438	56,651	55,438	0	9,983	39,944	0	26,746
TOTAL	88,582	88,582	88,582	88,582	88,582	88,582	88,582	88,582	88,582	88,582
TOTAL UNDEVELOPED (MA 1-9)	12,355	17,645	11,834	9,729	11,834	88,582	67,404	30,683	88,564	50,110

Table C-5g (Cont'd). Kalmiopsis Addition Roadless Area No. 6183 (1,166 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	1,166	0	0	1,166	0
7-Supplemental Resource	0	0	0	0	0	0	0	0	0	0
8-Designated Wildlife Habitat	0	0	0	0	0	0	463	32	0	0
9-Special Wildlife Site	0	0	0	0	0	0	0	0	0	32
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	215	215	215	215	215	0	41	192	0	192
12-Retention Visual	49	49	0	0	0	0	49	0	0	0
13-Partial Retention Visual	788	788	837	837	837	0	548	49	0	49
14-General Forest	114	114	114	114	114	0	65	893	0	893
TOTAL	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166	1,166
TOTAL UNDEVELOPED (MA 1-9)	0	0	0	0	0	1,166	463	32	1,166	32

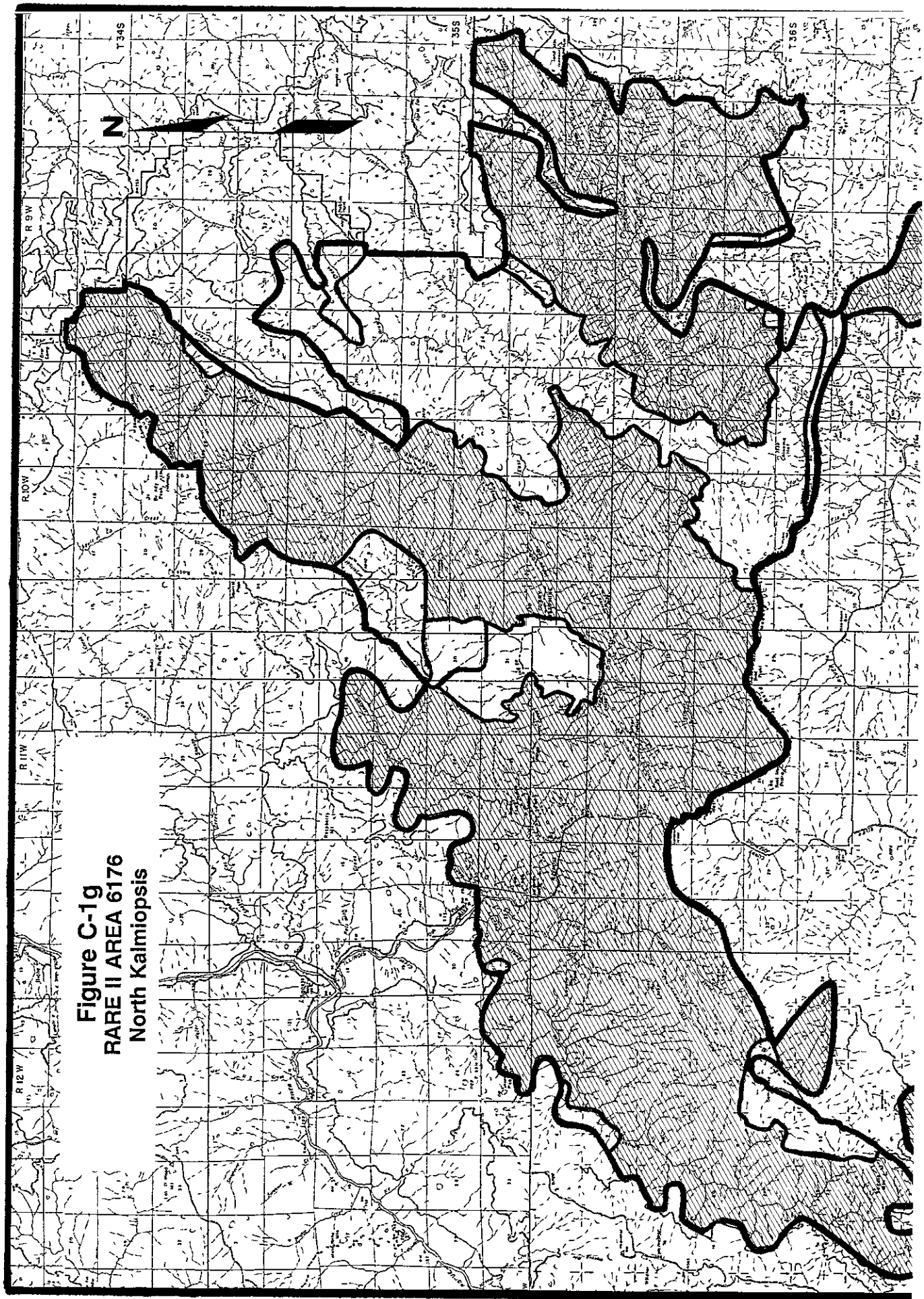


Figure C-1g
RARE II AREA 6176
North Kalmiopsis

Figure C-1g
RARE II AREA 6183
Kalmiopsis Addition

NORTH KALMIOPSIS No. 6176
and
KALMIOPSIS ADDITION No. 6183

(88,582 + 1,166)

(Total - 89,748 Acres)

DESCRIPTION

STATUS OF ROADLESS AREAS

This narrative describes both the North Kalmiopsis and Kalmiopsis Addition Roadless Areas. Discussion of the North Kalmiopsis also pertains to the Kalmiopsis Addition, unless noted otherwise.

The North Kalmiopsis and Kalmiopsis Addition have similar characteristics and are located in close proximity to each other. They were inventoried for study as potential additions to the Kalmiopsis Wilderness during the RARE II process. Originally inventoried at 113,254 and 1,178 acres, respectively, they were allocated to non-Wilderness use by the RARE II decision in January, 1979. The North Kalmiopsis has been revised to 88,582 acres because of timber sales and associated roading. Most of the roadless area is National Forest System land; only the old homestead properties in the lower Illinois River area at Indian Flat, Conners Place, and Briggs Ranch are in private ownership (110 acres total) The Kalmiopsis Addition has not changed in size.

In the late 1970's, the Chetco-Grayback and Rogue-Illinois Land Management Plans were finalized (FEIS, 1979) Management direction from these documents allocated these areas to largely coordinated resource management (Management Area 1) to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features The following Management Areas (2, 5, 6, 8, and 10) contain direction for other, more specialized land allocations:

Management Area 2 essentially covers the viewshed along the lower Wild section of the designated Wild and Scenic Illinois River just outside the Kalmiopsis Wilderness. Dispersed recreation is the primary theme, with other resource uses and development consistent with this goal. The area covers over 5,700 acres on both sides of the Illinois River for approximately 5 miles (to Oak Flat).

Management Area 5 was managed as a Wild River. In 1984, the Illinois River was designated as a National Wild and Scenic River; this reach remains classified and managed as a Wild River.

Management Area 6 contains stream corridors of an average 1/8 mile horizontal distance from each bank designed to protect or enhance fishery habitat, water quality, and old-growth forest characteristics These supplemental fisheries/watershed areas have been extended to stream reaches on Silver, Lawson, Briggs and Indigo Creeks, and along the Chetco River.

Management Area 8 of 400 acres is a scenic area containing Silver Creek Falls. Management is oriented to preserving the primitive character and outstanding scenic attractions for recreation.

Management Area 10, the Big Craggies Botanical Area (860 acres outside of the Wilderness), is managed to preserve the area's primitive character and outstanding botanical features.

Complete descriptions of these management areas can be found in the two Land Management Plans. Readers are directed to these documents for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since implementation of the Land Management Plans in 1979, all project activities, e.g., timber harvest, fishery enhancement, etc , have been analyzed under their direction and NEPA requirements/process

CHANGES BETWEEN DRAFT AND FINAL

During the period from 1984 to 1988, the inventoried North Kalmiopsis Roadless Area was significantly impacted by the Silver Fire in 1987, and to a lesser extent by various timber sales (Refer to Figure C-1g) This reduced the unroaded area to approximately 88,600 acres. Approximately 2,000 acres of the difference is attributable to timber sales not associated with the 1987 fire. The balance of 19,000 acres was a direct result of the Silver Fire Recovery Project FEIS and Record of Decision (1988).

Preparation of a salvage project of fire-killed timber and other resource recovery projects followed a few months behind the 96,540 acre fire. The fire burned burned 41,100 acres in the unroaded North Kalmiopsis and 53,000 acres in the Kalmiopsis Wilderness. While proposed new roading was limited to 20 miles, a Congressional rider on the 1989 Appropriations Act reduced actual road construction to 13 miles (stopping construction from extending west and accessing the lower slopes of Bald Mountain). Whereas little roading is involved, mostly helicopter and some skyline salvage units created nonconforming features on the undeveloped landscape.

Tremendous efforts were taken to involve the public in that decision-making process. News media and public meetings continually kept the public informed. The final decision was a balance between the eight issues raised during the scoping process, and the rapid recovery of the area. The area's Wilderness potential and characteristics were evaluated in the project analysis.

Due to the important interaction between the Silver Fire and the inventoried North Kalmiopsis Roadless Area, a detailed description of the fire's impact to the unroaded areas character and resources, by alternative, was provided in the Silver Fire Recovery Project FEIS. This project FEIS is incorporated by reference here to complement the description and analysis of this area.

The impacts of the fire on the resources within the North Kalmiopsis and its unroaded character were discussed in the Silver Fire Recovery Project FEIS, and have been updated in this discussion of Alternatives NC through S. This approach will facilitate the comparison of alternatives in Appendix C. An analysis of the fire impacts to the Forest's unroaded areas is further discussed in the Siskiyou National Forest Land and Resource Management Plan FEIS (1988), of which this appendix is a part, and under the heading **1987 FIRES** in this section the appendix.

As a result of the Omnibus Oregon Wild and Scenic Rivers Act of 1988, Chetco River was added to the National Wild and Scenic Rivers System. The new designation affects the acreage array and, to a limited degree, discussion throughout the text. The reach of the Chetco River from the Wilderness boundary downstream to Mislatnah Creek lies within the inventoried roadless area This reach was Congressionally classified as a Wild segment from the Wilderness to Boulder Creek, and Scenic from there to Mislatnah. Due to the very recent passage of the Act, Management Area acreages (Table C-5a) and analysis have not been updated to reflect the changes. Alternative S is slightly different than the Congressional classification in that the entire reach is carried as a Wild River Management Area. Any alternative selected in the Record of Decision and displayed in the Forest Plan will display the new designation.

LOCATION AND ACCESS

The North Kalmiopsis is located in Josephine and Curry Counties, Oregon. The area is a large meandering area that is in five principal parts (See Figure C-1g). These five surround the north half of the Kalmiopsis Wilderness. The northern, and largest part, contains four important tributaries to the Illinois River: Silver, Indigo, Lawson, and Horse Sign Creeks. The western portion drains to the Chetco River; the eastern part faces into the middle Illinois River The Kalmiopsis Addition is on the west side of the Kalmiopsis Wilderness and slightly south of the Chetco River. It contains part of the headwaters of Boulder Creek which flows back into the Wilderness to join the Chetco River.

The North Kalmiopsis area is accessed from the west through the Oregon coastal towns of Gold Beach and Brookings, and from the Grants Pass and Cave Junction communities from the east Travel time by vehicle is about one to two hours from these local communities. Several roads within the Siskiyou National Forest provide access to the fringes of portions of the unroaded areas. Several trails also lead deep into the interior of the northern portion.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

Physical location of the area is on the western side of the coast range (Klamath Mountain Geologic Province) in southwestern Oregon. Elevation varies from about 200 feet at Oak Flat near Agness to slightly over 5,000 feet at Pearsoll and Fish Hook Peaks. The area is extremely mountainous and has steep, highly dissected slopes with large, deep canyons.

Vegetation varies from well-forested lands to brushfields, hardwood stands, grassy prairies, and sites with only scattered trees and sparse cover due to chemical imbalance of soils derived from ultramafic rock. The ecosystem is primarily mixed evergreen with small areas of mixed conifer at higher elevations. Tree species in the area include: Douglas-fir, sugar pine, Port-Orford-cedar, white fir, tanoak, Pacific madrone, canyon live oak, Jeffrey pine, knobcone pine, incense cedar, and western white pine.

Soil variability is pronounced within the North Kalmiopsis. Silver and Indigo Creek watersheds are dominated by soils derived from Dothan sandstone. Deep soil areas, primarily found in the upper slope positions, are extremely productive Shallower soils and steeper slopes become more prominent in middle and lower slope positions Rock outcrops and evidence of debris slide activity also increase downslope. Talus rock is often accumulated in swales and draws Areas just above stream channels are generally greatly oversteepened and consist of either rock bluffs or talus and slide material Much of this high risk site is currently within the supplementary fisheries/watershed area.

Upper portions of Silver Creek contain soils of intrusive-igneous origin which are less productive than the Dolthan soils. These soils are very unstable with very large slides occurring frequently along the lower inner-gorge stream channels Much of this land is classified as unsuitable for timber production

Soils west of the Illinois River and largely within the Lawson and Horse Sign Creek drainages are not as oversteepened and dissected as the Silver and Indigo watersheds. However, considerable mass movement activity is occurring along toe slope positions within the drainages, generally where stream meanders have undercut sensitive slopes. With the exception of serpentine and rock outcrop areas, the soils are moderately productive.

In contrast, the lower reaches of Panther Creek and Briggs Creek on the east side of the roadless area, and the Mislatnah portion on the west side, have soils of low to moderate productivity. Productivity is limited by the occurrence of ultramafic parent material or extremely shallow, rocky soils. In addition, a high percentage of the land area is actively unstable Much of these areas have been removed from the suitable land base.

Annual precipitation ranges from 90 to 120 inches, but reaches 140 inches in the southwestern portion An average 9 to 16 inches occurs during the dry season (May through September). Summer temperatures in the lower elevations get quite warm, occasionally attaining 100 degrees Fahrenheit along the lower Illinois River. For the most part, the climate is fairly mild and heavily influenced by marine air, the Pacific being only 15 to 30 miles west.

Populations of black-tailed deer, Roosevelt elk, and black bear occur within the area. Both anadromous and resident fish are present Steelhead and salmon utilize most of the area's major streams and many of their tributaries.

An active peregrine falcon nest is located within the roadless area. It is possible that bald eagles utilized potential habitat along the Illinois and Chetco Rivers. An active osprey nest is located on the Illinois River in the southeast corner of the area; other potential nesting sites exist along the Illinois and Chetco Rivers Old-growth forests provide habitat for dependent animals such as the northern spotted owl.

The following sensitive plants are known to occur in the North Kalmiopsis: *Arabis Koehleri var. stipitata*, *Arctostaphylos hispidula*, *Bensoniella oregana*, *Carex scabriuscula*, *Brodiaea ida-maia*, *Cypripedium californicum*, *Cypripedium fasciculatum*, *Erigeron cervinus*, *Monardella purpurea*, and *Sophora leachiana*. Uncommon plants in the area include: *Arabis aculeolata*, *Calypso bulbosa*, *Iris Innominata*, *Iris chrysophylla*, *Horkelia sericata*, *Lomatium howellii*, *Phacelia corymbosa*, *Saxifraga howellii*, *Trillium rivale*, *Vancouveria planipetala*, *Eburophyton austinae*, *Darlingtonia californica*, *Kalmiopsis leachiana*, and *Pellaea brachyptera*.

RESOURCE USES

Cultural background for the area indicates that Native Americans inhabiting the Illinois River basin occupied or had activities in numerous sites, particularly on the river and stream benches, and alongside natural prairie openings. Several vision quest sites also were used. Summer camps and use areas have been identified on high ridge areas. Sites along the creeks indicate that specialized activities of toolmaking and ritual sweating were carried out, rather than long-term habitation. Use of these sites were abandoned by 1856 following the Rogue River Indian wars. At that time, all of the surviving Indians of southwestern Oregon were removed to reservations at Siletz and Grand Ronde, Oregon.

Shortly after the Indian Wars, settlers began filtering into the area. The first records on the Nancy Creek Cabin and mine date back to early 1890's. Thereafter (primarily in the 1910-20 period), additional cabins were constructed. Only the Nancy Creek Cabin remains. This cabin is now occupied by a volunteer to provide needed maintenance, although former squatters have altered the historical integrity of the building The Briggs Ranch has been in continuous homestead from settlement to this day.

Mining has occurred in the past, but little activity other than surface exploration is present today. Mining activity is moderate in the eastern portion of the area and low to negligible in the western portion. Current claims are concentrated in Silver and Indigo Creeks, and southeastern drainages of the Illinois River.

Minor upland game and moderate big game hunting takes place, but is limited to the fringes of the area because of the steep, brushy terrain. Fishing is also quite limited due to tough access.

Recreation use is primarily dispersed recreation, most being associated with the Illinois River and with the adjacent Wilderness. Use consists primarily of fishing, backpacking, floating the Illinois, hiking, and swimming. There is camping on private land at Indian Flat. The Illinois River Trail and lesser trails receive various levels of use; most, though, is light. Use figures are not collected for the more dispersed recreational activities However, estimates of recreation visitor days (RVD's) are in a low range of 5,000 to 8,000 RVD's, the use being very low relative to the size of area. The Recreation Opportunity Spectrum (ROS) is split

between Roaded Natural on the fringe, Semi-primitive Non-motorized further in, and Primitive Non-motorized deep in the heart of the area (lower Silver Creek).

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

Except for the Silver Falls part, all of the unroaded area borders the Kalmiopsis Wilderness The Silver Falls portion is noteworthy for its extremely rugged terrain of knife ridges, white igneous cliffs, and deep inner gorges The primary attribute of the unroaded area is the relation to the Wilderness and Wild sections of the Illinois and Chetco Rivers. Other than these relationships and rivers, landscape variety is somewhat similar in surrounding areas The highly valuable fisheries and timber resources are also key

The northern portion is a large body of land approximately 10 to 15 miles wide and from 4 to 8 miles in depth Only on the fringes can man's activities be found. This larger area is bisected by the northerly-flowing Illinois River The large drainages of Indigo and Silver Creek flow into the Illinois from the east These two watersheds are characterized by heavily vegetated, steep, and highly dissected slopes with deep inner gorges Physical details vary little with the exception of some open meadows in the Silver Peak and Indian Flat areas, and some high open ridges of rock or low brush. The lower slopes of Indigo and Silver Creek contain sizeable areas of unstable soil which have been removed from the suitable land base Geology is very complex; features of extremely youthful landform are most pronounced in the inner gorges of Silver Creek near it's headwater. Man's activities, predominately timber harvest and associated roading, have occurred only on the northern and eastern edges, and predominately in the upper slope and ridge areas.

The area west of the Illinois River is largely within the Lawson and Horse Sign Creek drainages. It is vegetatively diverse with a mixture of openings, forest, and brush. Considerable geologic instability occurs throughout this portion, particularly in the lower slope position. Compared to Indigo and Silver Creek drainages, the terrain is not as steep nor relief as dramatic. Transportation systems and timber harvest units lie well within the Lawson Creek drainage and on all sides except those bordered by the Wilderness and Illinois River.

The east side contains the lower reaches of Briggs, Panther, and Labrador Creeks, and several other small streams which drain directly to the Illinois River. With the exception of Panther and Labrador Creek watersheds, this area is characterized by open and low brush. Past mining activity is noticeable on much of the area. Roads bordering the area are primarily for timber harvest, mining, and recreation.

The two portions on the west side of the Kalmiopsis Wilderness drain into the Chetco River This area is also highly dissected, with isolated stands of old-growth forest. Land instability and ultramafic rock (parent material for serpentine and peridotite-derived soils) measurably reduce the suitable land base in the Mislatnah portion These two narrow tracts are sandwiched between the Kalmiopsis Wilderness and roaded terrain to the west.

CAPABILITY

MANAGEABILITY

The North Kalmiopsis area is so irregular in shape as to make the boundaries difficult to manage as now drawn The large size of the area, though, inherently maintains or protects the roadless character and values of the interior environment and adjoining Wilderness. The location does not totally allow for the complete screening of the fringes from the sights and sounds of development activities on adjacent lands. The terrain and vegetation along the boundary does provide some shielding, though. The interior portions and portions adjacent to the Kalmiopsis Wilderness and Illinois River are generally well screened from off-site sights and sounds.

NATURAL INTEGRITY AND APPEARANCE

Human influences have had little impact on the natural appearance or long-term ecological processes of the North Kalmiopsis. The area is essentially free of disturbances, and natural balances, even where altered in the past, are intact and operating. Fire has been and most likely will continue to be the factor with the greatest potential for impacting the area's naturalness. Fire has, and will continue to play a major role in the long-term ecological changes of the area.

Mining activity has occurred in several portions of the roadless area. Some old mining roads can still be found in the vicinity of Horse Sign Butte, Nancy Creek, Red Dog Creek, Briggs Creek, around Salmon and Lightning Creek, and the headwaters of Silver Creek. These roads have had limited impact on the area's naturalness due to limited excavation when built. Lack of use in recent years has allowed them to return to near natural conditions.

Several maintained trails traverse the area; however, the extent and degree of disturbance is very limited. Old, abandoned trails exist, but many have nearly returned to natural conditions.

Man's activities outside the unroaded area have had little impact other than the aforementioned visual change. The area's natural processes are intact The most notable change, though, is attributable to water demands during the summer period. The Illinois River's natural low flow is measurably diminished by irrigation and domestic uses miles upstream in the Illinois and Deer Creek valleys.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

With topography highly broken and dense vegetation covering most slopes, natural screening provides ample opportunity for localized solitude and primitive experience. The overall opportunity is judged as moderate on the fringes not bordered by Wilderness, and high in the interior, particularly for the large northern portion. The lower half of Silver Creek drainage is totally screened from external sights and sounds

Use of much of the area is limited because of vegetative density and steepness of slope. Some open areas along the Illinois River provide opportunities for cross country hiking. Recreation use is mostly concentrated along the Illinois River and the main trail systems of the Kalmiopsis Wilderness A feeling of solitude, remoteness, and self-reliance is available to users leaving the established trails

If current unroaded conditions are maintained, dispersed forms of recreation activity would remain the same or increase along with the general trends for the adjacent Wilderness. Most of the parcels of the North Kalmiopsis can provide for primitive and unconfined types of recreation such as camping, hiking, fishing, hunting, nature study. The river areas can provide additional water-based recreation of a dispersed and primitive form; uses, though, will not vary from the current types, e.g., rafting, kayaking, swimming, etc.

SPECIAL FEATURES

Most notable features are the Congressionally designated lands within and adjacent to this unroaded area The Kalmiopsis Wilderness, along with the Wild segments of the Wild and Scenic Illinois and Chetco Rivers, focus considerable attention on these contiguous lands. Other special features may be those associated with both the size of the unroaded portion north of the Wilderness, and the extremely rugged nature of the mature/old-growth forested terrain.

Prehistoric use along the Illinois River adds to the archeological potential. Early homesteading and historic mining activities along the Illinois provide some of the richer cultural resources within the Forest. Several other mining locations, lookout sites, cabins, and trails contribute to the scattered evidence of earlier activities of man

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

Undeveloped. Refer to previous discussion for present situation The opportunity for change in type of recreation is limited. Potential for total use should increase along the same trend as for the Kalmiopsis Wilderness and Illinois River. Trail construction could aid in increasing RVD's. Recreational use of the Illinois River is concentrated during the spring (March-May) when river flows are ideal for rafting and kayaking. While use of the river could substantially increase with its recent Wild and Scenic River designation and notoriety, the Illinois River Management Plan (1986) does establish use limitations to maintain the environment in accord with goals of the Wild and Scenic River Act. Use of the Illinois River Trail is normally split between motorbike use outside of the Wilderness (before mid-May and after mid-September) and other forms of trail use. Trail hikers constitute most of the use; they generally utilize this trail from April through October. Horseback riding is confined to trails and limited by availability of feed. Capacity is not limited during the planning period.

Develop. The potential for increased RVD's is greatest under a roaded environment where many of the existing uses would increase along with the added opportunities for motorized forms of recreation. Capacity is not likely to be exceeded.

Wildlife

Under unroaded conditions, wildlife would remain constant unless specific management practices such as habitat improvement or prescribed fire were implemented. As development occurs over time, elk and deer populations will increase in response to the development of forage areas. Varying stages of vegetation in harvest units and along roads with adequate hiding cover would promote expansion of existing herds Populations of old-growth dependent wildlife species would decrease. They would not be eliminated, however, because considerable habitat would remain along the river corridors, tributary streams, and in areas unsuitable for commercial purposes Endangered, threatened, and sensitive species would be protected through applicable Standards and Guidelines.

Fisheries

The anadromous steelhead and salmon fisheries are very important to the Rogue, Illinois, and Chetco River recreational businesses and sport and commercial fishermen. At least 30 miles of the Illinois and Chetco Rivers and their tributaries contribute to some of the most important native spawning and rearing habitat for anadromous fish in western Oregon.

The principal tributaries of the lower Illinois, namely Silver, Indigo, Horse Sign, and Lawson Creeks, provide over 20 miles of excellent habitat Also important is the offsite influence on the survival of salmonids in the lower reaches of the Illinois River system The contribution of water quantity and lower stream temperatures on the Illinois River, particularly at the confluence of these tributaries, greatly benefits the wild fish populations of this system Maintenance of this excellent habitat is essential. Enhancement of this habitat has potential to increase juvenile yields.

Water

There are no man-made impoundments or diversions existing or planned for the area. A small hydroelectric power development was proposed for the lower section of Briggs Creek, but has since been abandoned. There is no demand to augment flow. The greatest needs have been for maintenance or improvement of water temperature in the summer Water quantity and quality aspects for these drainages are of far greater

importance than water use or development due to the high value fishery and recreational usage of the Rogue, Illinois, and Chetco Rivers.

Livestock

A grazing allotment in the Indigo Ridge area does affect the area. There is limited potential for additional grazing allotments. Development would allow improved access for utilization of transitory range. Timber harvesting would create temporary openings where forage availability would be increased.

Timber

The unroaded area contains approximately 55,256 acres tentatively suitable for the production of timber Standing volume is estimated at 1,092 MMBF. Site productivity varies from low to high, but is mostly moderate. Areas that would be considered for timber harvest vary from stable to unstable, and most can be accessed and harvested using systems currently employed on the Forest today. Because of heavy vegetative competition and steep slopes, management of the area for timber production would utilize various treatment methods to reduce brush competition for release of crop trees

Energy and Minerals

Activity in the form of exploration and development is low at the present time. Mineral deposits are present, especially on the east side of the area. Chromite, nickel, gold and silver have been mined in the past. Keeping the area in an unroaded state would limit exploration; development of a road system would likely increase activity. Energy development is unlikely. The area has a large number of mining claims primarily concentrated in Silver Creek, Indigo Creek, and the southeastern drainages of the Illinois River.

Cultural

The potential for discovery of additional archeological sites is good. Sites will be evaluated and provided for under the applicable laws and regulations where activities are planned.

Land Use Authorization

Few are existing or expected Designation of the Wild and Scenic Rivers restricts many forms of withdrawals Outstanding mineral rights are most likely along streams and in the Silver Creek headwaters

MANAGEMENT CONSIDERATIONS

Ownership, including subsurface rights held by others, is not a problem. Several private ownerships in and around the roadless area are currently being occupied; these include camping at Indian Flat, the Briggs Ranch, Conners Place, and a parcel owned by Al Pierce Lumber Company at the mouth of Lawson Creek.

Fire remains the most serious management consideration. The potential for major conflagration definitely exists. Dispersed recreation use along the Illinois River and trails contributes to the greatest risk of fire. Increased use would contribute to higher probability of man-caused fires.

Development activities with improved access and intensified treatment of fuels would considerably lessen continuity and concentrations. Major loss of resources by wildfire would be reduced. However, improved access also brings increased risks due to greater activity and number of people in the woods.

Both the hazard and risk of wildfire ranges from moderate to high on portions of the area Natural fuel loadings range from 6-20 tons per acre. The areas of dense fuels present a management situation where considerable loss of resources could occur and the undisturbed setting could be greatly altered. The

greatest threat is from dispersed recreation use deep within the unroaded area. A reduction in treat is attributable to the climate, conditions are severe for a relatively short time due to ameliorating coastal influences. While risk is low due to few users, fire ignition at the wrong time could have dire consequences.

The potential for insects and disease outbreaks within the coniferous forest exists. Actual occurrences have been minor and localized. Natural factors and management actions have reduced this threat Areas adjacent to the Wilderness are at higher risk.

NEED

OTHER AREAS AND PUBLIC USE

Within 10 miles of the North Kalmiopsis exist two designated Wildernesses (Wild Rogue and the adjoining Kalmiopsis), stretches of four Wild and Scenic Rivers (Rogue, Illinois, Chetco, and North Fork Smith), and nine other inventoried roadless areas. The extent of unroaded/undeveloped areas surrounding or adjoining the North Kalmiopsis is impressive when viewed in total. Combined, the above unroaded areas total more than 278,000 acres; the designated Wilderness acres total over 210,000 acres The composite area covers the heart of the Forest, being approximately 40 miles in length from north to south (into California) by 15 miles in width from east to west.

Approximately 34,000 acres of the inventoried roadless area is unsuitable for timber production, thereby remaining predominately in an undisturbed condition. Except for the possibility of limited mineral exploration and development, activities on these lands would be either very light or nonexistent.

Recreation use is both light and concentrated along the Illinois River and trail. Major portions of interior areas receive little or no use. The same use patterns exist for the adjacent Kalmiopsis Wilderness; use is very light and mostly concentrated in a few areas, namely rivers, trails, and the more open and high elevation sites.

The Illinois Wild and Scenic River serves as a primary destination for visitors from major population centers such as Portland and San Francisco (6 to 10 hours away by car). Most frequent river use, though, comes from nearby communities. However, growing notoriety of the extremely rugged and wild nature of the Illinois River may attract river rafters from great distances during the spring period.

ECOSYSTEM REPRESENTATION

Major ecotypes within the North Kalmiopsis are well represented in the Kalmiopsis and Wild Rogue Wildernesses, and the Illinois and Chetco Wild and Scenic River corridors. Additionally, the large amount (34,000 acres) of area unsuitable for timber production is inherently protected. Other unique ecosystems or areas that are currently allocated, or are being evaluated for inclusion as special management areas within the various alternatives, should also complement the ecosystems coverage.

PUBLIC INVOLVEMENT

Both the public and Forest managers have an unusually strong interest and concern for the existing and future management of this large unroaded tract Involvement in evaluation of alternative management options began prior to the 1970's.

The northern slope of Bald Mountain and Silver Creek is thought by some to be Wilderness in its own right. The conflict posed by divergent views has persisted. Arguments were heated during the passage of the Endangered American Wilderness Act of 1978, but compromise was reached on the present boundaries of the Kalmiopsis Wilderness. As a result, the size of the Kalmiopsis Wilderness was increased from 76,000 acres to 179,850 acres. The northern boundary was drawn along Bald Mountain ridge.

Between 1977 and 1979, the Roadless Area Review and Evaluation RARE II process was being finalized RARE II (FEIS, 1979) recommended the area for neither Wilderness or further study; the North Kalmiopsis was allocated "non-Wilderness." Tremendous local involvement and specific input occurred during this formal study. Public preference was heavily in favor of allocating the area to a "multiple use" designation.

At the same time, the Forest released two FEIS's for Land Management Plans ("Unit Plans"). Public input and responses were documented. The issue of maintaining the existing wilderness character of the area was covered one of the Draft documents; however, direction followed which left the decisions for recommending unroaded areas for Wilderness to the RARE II process. In consideration of the area's values and characteristics, the Land Management Plan decisions allocated most of the area to coordinated resource management, i e , open to development activities of roading and timber harvest, among other things. Refer to the introductory discussion titled **STATUS OF ROADLESS AREAS**

In early 1981, the first major timber sale (Bald Mountain) in the North Kalmiopsis was approved; the project provided for road access into the area. A great deal of public interest was elicited from industry, environmental groups, local government, Congressmen, and others. Their input is a matter of record. Although numerous issues and concerns surfaced, the common denominator has been development of the unroaded area north of the Kalmiopsis Wilderness.

Following approval of the Bald Mountain Timber Sale as documented in the Environmental Assessment, the Bald Mountain road was designed, the construction contract awarded, and construction initiated. Shortly after beginning road construction, the project was taken to U.S. District Court by the Sierra Club, et al, and a temporary injunction was granted. In 1983, final judgement was made ruling against the plaintiff. The Environmental Assessment for the project was deemed adequate.

Shortly thereafter, Earth First, et al, reentered the U.S. District Court using inadequacies of the RARE II analysis (*California v Block*) as the basis for halting further activity on Bald Mountain. This was upheld and activity again ceased. Due to the changed circumstances in law brought about through the Oregon Wilderness Act of 1984, the judgement was vacated and the injunction preventing entry into the North Kalmiopsis dissolved.

Immediately before and after release of the Forest Plan DEIS, the roadless area issue and additions to the Wilderness System moved to a new arena. As a result of the release and sufficiency language contained in the Oregon Wilderness Act of 1984, the option for adding the remaining inventoried roadless areas to the Wilderness System was measurably thwarted. However, beginning in 1986 there was a movement to tie the Wild Rogue Wilderness, and all contiguous roaded unroaded areas in between (including the North Kalmiopsis), to the large Kalmiopsis Wilderness. At first, the idea was tied to the call for a "Wild Rivers National Park " When this failed, other creative options filled the void. This large block of undeveloped, mature and old-growth forest ecosystem was strongly promoted by several individuals and organizations as an ideal area for creation of a National Park. As discussed in Chapter II of the FEIS, the proposal was not entertained as an alternative evaluated in detail.

Tens of thousands of public comments as to the appropriate management for the North Kalmiopsis were received in response to the Forest Plan DEIS. After listening to the public and other agencies, the suggestions remained consistent with prior public involvement efforts The intensity of feelings was no less Notoriety of the area had blossomed.

Considerable documentation of issues, concerns, and recommendations relative to the North Kalmiopsis has been made through letters, public meetings and field trips, project planning and implementation, newspaper articles, the RARE II process, unit plans, and current Forest planning efforts. Primary concerns expressed to date span a broad range of subjects; the following are some of the more prevalent views:

- It is vital as a connector between the two designated Wildernesses in order to maintain their primitive character.
- The high quality water should be maintained in a pristine state; it's contribution to the quality of the rivers is essential to recreation and fishery values and interests.
- The importance of spiritual values and solitude offered.
- Timber resources are substantive and extremely important to community stability, dependent industries, and local governments.
- Old-growth habitat for dependent wildlife is critical.
- The ecosytem is well represented in adjacent Congressionally designated areas.
- The risk of wildfire may be increased.
- The pristine viewshed of the Wild and Scenic Illinois River may be impacted by sights of man's activity
- Activities might adversely effect wildlife and rare plants.
- Development adjacent to the Kalmiopsis Wilderness may adversely impact it's values and the Illinois River Trail.
- The location of the Kalmiopsis Wilderness boundary addition in 1978 was completely thrashed out by Congress; it was the intent of Congress to allow entry and development in this area north of the Wilderness - this notion being reinforced when Congress decided not to include the area in the Oregon Wilderness Act of 1984.
- Primitive recreational experiences in the area would be irreversibly lost by the construction of roads.
- The area should be managed on a multiple-use basis for recreation, timber, minerals, wildlife and fisheries.
- High cost roads and economic returns from investments are questioned.
- The area is very sensitive in terms of slope stability and soil erosion; with a potentially high risk for loss of site productivity and fishery damage.
- A high potential for minerals exists; restrictions on minerals exploration and development is probable if the area is allocated to unroaded management.
- Existence of huge tracts of adjacent Wilderness areas offer like experiences; no need for more.
- Very limited use of area by recreationists, nor does much use occur in the adjacent designated Wilderness having similar characteristics
- Not utilizing the area's forests would have a critical impact on local and State timber supplies.

The importance of this area to various interests has always been hotly contested. Viewpoints generally are very polarized. Environmental groups desire most or all of the North Kalmiopsis be left in an unroaded state; industry and local governments request that most of the area be developed for multiple uses. As a focal point of the Forest Plan, this area and issue becomes one of the toughest and most complex elements requiring resolution.

1987 SILVER FIRE

During the public review period for the Forest Plan DEIS, lightning ignited several major fires in southwestern Oregon. Beginning August 30, 1987, and continuing for weeks and even months later, these fires swept over 110,087 acres of Siskiyou National Forest land. During this period, several of the fires burned together to form the Silver Fire Complex.

Wide variation in burn intensity was characteristic throughout the area. Large areas within the fire perimeters were left unburned or merely underburned without killing the trees, leaving a mosaic of live and dead vegetation. The environmental components most affected included soil and water, vegetation, fish, wildlife, visual resources, and the recreation settings. The discussion presented here concentrates on elements of these environmental components that specifically relate to the unroaded North Kalmiopsis.

The most important resource changes relative to the planning analysis are changes in the land base tentatively suitable for timber production, the timber inventory, the potential for changes in fish habitat and water quality, and changes in wildlife habitat suitable for mature and old-growth dependent species. Other important considerations are the changes in other wildlife habitat and the recreation setting.

For a full disclosure of the affected areas, a description of the resources impacted, site-specific management options considered in treating the resources and salvage of fire-killed trees, please refer to the Silver Fire Recovery Project FEIS and ROD (1988); these documents are available in the Planning Records.

Vegetation

The perception of the importance of the changes created by the fires based on the total fire area is quite misleading in terms of change in the timber resource. Much of the area within the fire perimeter did not burn long or hot enough to kill the standing trees. In addition, many of the areas burned were not suitable for timber production.

In total, the Silver Fire covered 96,540 acres (all but 300 acres being lands of the Siskiyou National Forest). While a very large area was involved, only 22,400 acres of tentatively suitable lands were burned. The remainder was either unsuitable for the production of timber (20,500 acres), or unavailable within the Kalmiopsis Wilderness (53,340 acres). Most of the suitable lands are within the inventoried North Kalmiopsis Roadless Area.

The intensity of the burn and the degree of change in the vegetation are important when assessing impacts on the timber resource. Approximately 13,500 acres of tentatively suitable land burned at medium and high intensity. Of this, 9,300 acres are mature timber and 3,900 acres are immature stands and plantations. The following table displays the suitable acres within the fire perimeters by fire intensity, with a breakdown by vegetation class.

	Silver Fire		
Silver Fire.	High	Medium	Total
Old-Growth/Mature	1,800	7,500	9,300
Immature-Small Timber	100	100	200
Immature-Poles	700	1,800	2,500
Seeds and Saps	100	200	300
Hardwoods	300	1,000	1,300
TOTAL	3,000	10,600	13,600

Wildlife

The recent fires were an agent of positive change in wildlife habitat diversity. Although some areas were severely burned, many were not. The fires have created a mosaic of habitats which has markedly increased habitat diversity. Populations of species dependent on older forest stages are expected to decrease (spotted owls, hermit warblers, red tree voles). Populations of species that utilize younger forest habitat (bluebirds, brush rabbits, blacktail deer, elk) should increase. Resetting of the cycles in meadows and creation of more openings will benefit many species. Forage quantity and quality will increase in burned areas with deer and elk as the major beneficiaries. Overall, populations of wildlife species do not appear to be seriously affected, either positively or negatively by the fires.

Of particular concern in light of the planning issues are the changes in habitat suitable for wildlife dependent on mature and old-growth forest. As part of the Forest Planning process, a network of suitable habitats has been identified for spotted owls, pileated woodpeckers, and pine martens Where identified habitat areas within the network no longer contain suitable habitat as a result of the fires, opportunities for adjustment of areas within the network have been evaluated All necessary adjustments have been made and will have only minor effects on the alternatives considered. One Spotted Owl Habitat Area (SOHA) and four pileated areas within the North Kalmiopsis area are still suitable habitat.

Sensitive Plants

The fire did not eliminate any sensitive species or affect their viability. On the contrary, these plant communities evolved with fire and most of the sensitive species benefit from the reduction in competition from shrubs and trees. With many being pioneer species, the fire may in fact be beneficial to maintaining species diversity within given locations.

Fisheries/Watersheds

Much of the vegetative shade on perennial streams is still in place. Many small streams in the upper reaches of the watershed and a few principal tributaries to Silver and Indigo Creeks, however, were severely burned and the vegetative canopy lost. These changes will impact both stream temperatures and sedimentation as they affect the primary beneficial use, fish habitat. Critical summer stream temperatures are expected to increase by one to several degrees Fahrenheit in some stream reaches This will affect fish habitat capability to some extent since these streams currently reach temperatures exceeding 70 degrees The projected increase resulting from the fire may push temperatures to near critical thresholds. Regrowth of streamside vegetation has already begun; full recovery is expected in 10 to 20 years on smaller streams, with larger streams requiring more time.

Sediment delivered to some of the severely burned streams is expected to be as much as triple pre-fire base levels The significance of increased sedimentation was evaluated relative to characteristics of the specific watersheds involved. Silver and Indigo Creeks are steeper gradient systems with high flow energy capable of moving large amounts of material during winter storms. Even with the increase in sediment production, significant channel aggradation or siltation of anadromous fish spawning gravels is not expected to occur. Resident trout populations in upper reaches of some streams could be impacted, particularly where large areas of the watersheds are severely burned or local stream gradients are subject to sediment deposition. Most of these streams are quite remote and receive scant fishing use.

Cumulative effects analysis of the Silver Fire area estimates a first year post-fire reduction of approximately 6,500 steelhead smolt from the Silver and Indigo Creek drainages. The anticipated loss represents only a fraction of the area's fishery, further, the loss would be temporary as full recovery will occur within a decade.

Recreation Settings

Adjacent to the North Kalmiopsis, large areas of the Wilderness burned, changes in the vegetative character will be obvious to recreationists. However, these changes do not affect the primitive nature of the experience and may, over time, enhance the visual variety through creation of snags and openings, and rejuvenation of meadows. The view along the Wild segment of the Illinois River has changed slightly, but management options are essentially unaffected. The mosaic of vegetative changes in the North Kalmiopsis has also been changed, but again this will not have any appreciable long-term effect on the nature and type of recreation opportunity.

While the fires themselves did not appreciably change the recreation opportunities, the proposed salvage logging and associated road construction of the Silver Fire Recovery Project will affect the roadless area and unroaded recreation opportunities. The Selected Alternative of the Silver FEIS and Record of Decision, as amended by the 1989 Appropriations Act, schedules construction of approximately 13 miles of road in selected parts the 42,000 acres burned in the unroaded North Kalmiopsis. The decision affected change in the inventoried unroaded boundaries, with impacts on acres of Primitive and Semi-primitive Non-motorized recreation opportunities as noted in the table below.

With the roads having been built in the Bald Mountain and Indigo Creek areas, the inventoried North Kalmiopsis Roadless Area was reduced to 88,582 acres. The decision to road and salvage portions of the Silver Fire contributed approximately 19,000 acres to this reduction.

ROS Class	1984 Inventory (Acres)	1988 Inventory (Acres)
Primitive 1/	14,300	10,200
Semi-primitive Non-motorized	45,800	41,700
Semi-primitive Motorized	42,000	16,600
Roaded Natural	8,000	20,000
Total	110,100	88,500

1/ The 1988 inventory of Primitive ROS acres was based on the Silver Fire Recovery Project decision, but was adjusted through a Congressional rider to the 1989 Appropriations Act. With the restriction of the extending the Bald Mountain Road west, the inventoried area is considerably greater than 10,200 acres.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

Alternatives NC, A, A-Departure, B, C, D, D1, and K provide for development of substantial portions of the area. Intensive cultural resource inventory will be required along any proposed road alignment prior to approval. Sites that may exist in the project area can thereby be evaluated. Valuable sites can then be protected via avoidance or conserved via data recovery.

Alternatives E, G, M, and S call for an unroaded regime minimizing the need for cultural resource inventory and limiting the potential for disturbance of existing cultural resources.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and access limitations for the North Kalmiopsis and Addition. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

Access Restrictions	Mineral Potential (Acres)			
	High	Moderate	Low	Total
Withdrawn	300	900	6,100	7,300
High	-	-	-	-
Moderate	-	<100	100	200
Low	2,700	23,800	55,700	82,200
Total	3,000	24,700	62,000	<89,700

Improvements

Roads. The 55,256 acres of tentatively suitable land could generate about 223 miles of new road for timber harvest. A few roads for other purposes could be expected, but the mileage would be minor. Included in this mileage would be four collector roads of 46 miles. All other roads would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC and A	201	50	71	80
B	217	54	76	87
C	223	33	101	89
D	217	65	65	87
E and M	0	0	0	0
G	68	0	27	41
K	176	44	26	106
S	131	33	19	79

With no roads being built, Alternatives E and M would have minimal effect on this area. Alternative G would have the least miles built of the roaded options, followed by Alternative S. Only Alternative G would not maintain any roads for passenger car use. Alternatives NC, A, B, C, D, K and S would be mostly roaded except for varying amounts of Wild River, Botanical, and Supplemental Resource areas and varying portions of the area remaining unroaded in Alternative K and S. Alternative C would have the highest mileage of the alternatives. Alternatives G, K, and S would close approximately 60 percent of the roads.

In some alternatives new construction would be primarily extensions of existing roads at the head of Lawson Creek, north of Indigo Creek, the Bald Mountain Road, and from the end of the Onion Camp Road. Lawson Creek would be crossed by a collector road to access the south side of Horse Sign Creek. Indigo Creek near the confluence of the North Fork would be crossed by a collector road to access Silver Peak Ridge. Other stream crossings would be minor and most likely not inhabited by fish where crossed Full bench ground (ground too steep for stable fills) would be encountered on most new construction. The excavated soil and rock would be hauled to a stable waste site or used where road fills are feasible.

Roads would not be visible from any arterial system nor from any highway, but could be visible from the Kalmiopsis Wilderness rim and, to a very limited degree, from the Wild and Scenic Illinois River. Access would be provided for timber management, roaded recreation, fire suppression, and miners

Trails. Alternative S would provide for construction of 30 additional trail miles. Five miles of trail construction is identified under Alternatives B, C, D, and D1; 10 miles under Alternative E; 11 miles under Alternatives NC, A, and A-Departure; and 16 miles under Alternatives G, K, M, and S. From 3 to 29 miles of trail reconstruction occurs under various alternatives.

Developed Recreation Sites. No recreation site construction is identified for this area under all alternatives

Wildlife and Fish Habitat Structural Improvements. Alternatives with various levels of roading would facilitate installation of any fish structures by providing better access into the area.

Wilderness Potential

There are 232,495 acres within five designated Wildernesses on the Siskiyou National Forest. Recreation demand projections indicate that the Forest has the capacity to sustain projected levels of use in these areas until approximately the fifth decade. There are no additions to the existing Wilderness System recommended under any of the alternatives.

The assignment of all or parts of the North Kalmiopsis to unroaded objectives can affect management in the Kalmiopsis Wilderness. Wilderness potential would be foregone in those alternatives that assign the area to development.

Alternatives NC, A, and A-Departure would assign the entire North Kalmiopsis to multi-resource management objectives. Current management policies will continue. Currently unroaded portions of Silver Creek will be entered for timber harvest, subjecting Wilderness users to the influence of road construction, harvest units, and motorized recreation. Quality of the wilderness recreation experience in the peripheral areas would be degraded as a result.

Alternatives G, K, and S allocate varying amounts of the North Kalmiopsis to Backcountry Recreation Management. Moderate levels of trail construction would expand the capacity for Non-motorized recreation opportunities in the adjacent Wilderness.

Alternatives B, C, D, and D1 would not assign any of the North Kalmiopsis to unroaded management objectives. To offset the impacts to non-motorized recreation opportunities that are foregone in the General Forest, the Forest would implement an aggressive trail construction program in the Kalmiopsis Wilderness, adding approximately 70 miles to the existing system.

Alternatives E, and M would assign essentially all of the North Kalmiopsis to unroaded objectives, thereby maintaining the quality of the recreation experience inside the Kalmiopsis Wilderness through peripheral buffers. The Kalmiopsis Wilderness would be maintained in its current condition since the Forest would have the capacity to sustain demand for non-motorized recreation activities in non-Wilderness areas.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/ 2/		
	1	2	5
NC, A, and A-Dep	14,200	13,000	13,000
B, C, D, and D1	4,200	3,000	3,000
E and M	89,700	89,700	89,700
G	64,200	63,000	63,000
K	23,200	22,000	22,000
S	43,400	42,300	42,300

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness
2/ The acres shown include both the inventoried North Kalmiopsis and North Kalmiopsis Addition Roadless Areas

Wild and Scenic Rivers

The North Kalmiopsis includes the lower six miles and one mile of the upper Wild section of the Illinois Wild and Scenic River. A Wild segment and Scenic segment of the Chetco Wild and Scenic River is also within the North Kalmiopsis. Land allocations outside of the one-quarter mile boundary of the river corridor will not effect the management policy on the rivers nor the land within the designated Wild sections.

The lower Illinois River is considered to be one of the most pristine rivers in the western United States. The river canyon is essentially devoid of the influence of humans from Pine Flat to the end of the Wild section near Nancy Creek. Allocation of lands within the river viewshed to harvest activities could affect the quality of the Wild river experience currently available between the Kalmiopsis Wilderness boundary and Nancy Creek.

Alternative NC, A, and A-Departure would not effect the management of the Illinois River. Lands within the viewshed adjacent to the lower six miles of the Wild section of the Illinois River would be managed under the guidelines established for Management Area 2 in the Rogue-Illinois Land Management Plan Under these alternatives, management activities are permitted provided the Retention Visual Quality Objective is achieved in areas visible from the river.

Alternatives B, C, D, and D1 also would not effect the management of the Illinois River. However, lands within the viewshed adjacent to the last six miles of the Wild section would be managed under General Forest guidelines. Portions of the Rogue-Illinois and Upper Illinois viewsheds would be assigned to varying schemes of visual management Management activities within the river viewshed would be visible to river users in the middle and background distance zones. The pristine quality of this section of the river would be modified, thereby effecting the quality of the recreation experience.

Alternatives E, G, K, M and S would not effect the management of the Illinois River. Under these alternatives, the lands within the viewshed adjacent to the lower six miles of the Wild section of the Illinois River would be managed under Preservation guidelines, maintaining the pristine character of the river. Backcountry Recreation allocation of the viewshed adjacent to the River in the lower six miles affects approximately 5,400 acres

Approximately four miles of the Chetco River in the western portion of the North Kalmiopsis is included as Wild and Scenic River Alternatives B, D, and K provide similar management through the Supplemental Resource Management Area prescription. Alternative C provides no special Management Area assignment other than as Riparian Beside discussion and analysis in the FEIS, Appendix E of the DEIS has covered the management alternatives and attributes of the Chetco River in considerable detail.

Under Alternative S, the Chetco River is designated as a Wild and Scenic River, maintaining the area in a condition which meets the requirements of the Wild and Scenic Rivers Act. This alternative, however, carries the Wild segment of the Chetco to Mislatnah Creek confluence, or the portion mostly included in

the inventoried North Kalmiopsis Roadless Area. The Omnibus Wild and Scenic River Act of 1988 designates the Wild segment as extending from the Wilderness down to Boulder Creek; from Boulder Creek downstream the Chetco is classified as Scenic.

Soil, Water, and Fish

Allocating the North Kalmiopsis to any alternative has management consequences. The indirect effect upon salmonid fish habitat capability is especially critical as this area represents some of the most productive salmonid habitat on the Forest in terms of both on-site capability and contribution to off-site, downstream fish production

Management activities have the potential to adversely effect the soil and water resources in the form of increased turbidity and sedimentation, side slope failures, reforestation, and deposition of large rock material into streams. However, due to large areas having been removed from the suitable land base on the most hazardous soil types and landforms, coupled with Standards and Guidelines, best management practices, and project-specific management requirements and constraints, the success and quality of any development activity hinges on application of these in all phases of planning, design, implementation, and monitoring.

Negligible soil, water, and fish consequences are associated with Alternatives E, G, M, and S due to the limited management activities. Alternatives NC, A, B, C, D, and K assign all or part of the area to Management Areas which permit some degree of development. The effects of timber harvest and road construction are discussed in Chapter IV of the FEIS.

Alternatives NC, A, A-Departure, B, C, D, and D1 have a potential for moderate adverse risk. Large acreages of highly sensitive soils have been eliminated from the suitable land base and, thereby, will substantially reduce the potential impacts. Risks still exist, however, due to the complex and difficult nature of the terrain and the high hazard potential for road and forest regeneration impacts on some of the remaining suitable lands.

The magnitude of road-related activity is decreased in Alternative K and S. In addition, basin timber harvest constraints have been applied to these two alternatives. Alternative G further reduces activities, thereby greatly decreasing potential risks on unstable soil types.

Inclusion of over 8,300 acres as Supplemental Resource areas in Alternatives NC, A and K considerably lessens the potential for adverse impacts to the riparian habitat, particularly for the inner gorge areas. Application of the Riparian Prescription C to the smaller, non-fish bearing streams in Alternatives B, D, and G also lessens risks of degradation. Finally, control applied to the timing, spacing, and intensity of potential timber harvest operations and associated road construction would partially mitigate adverse impacts. Other mitigating measures that could be used in this area are discussed in Chapter IV of the FEIS.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease that will be created in the fire hazard and risks. Risk is defined as the probability that an ignition will occur Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels

Fuels in the North Kalmiopsis are extremely variable. In the area east of the Illinois River, fuels are very continuous, with moderate fuel loadings. For the most part, this area is heavily timbered. In the area west ot the Illinois River, fuels are generally light and less continuous, with less timber and more pure brush stands. Fuels in the Kalmiopsis Addition are primarily light, with very continuous stands of hardwood and brush.

In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase The conditions east of the Illinois River and in the Kalmiopsis Addition lend themselves to large, high intensity fires. The area west of the Illinois River would produce lower intensity fires Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs, and increased resource losses.

In a developed scenario, the hazard increases during timber harvest. As fuels are treated, the fire hazard is reduced. Over time, the continuity of fuels are broken up, creating a mosaic of fuels and vegetative development This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs, and less resource loss due to fire

In Alternative E and M, nearly all the area remains undeveloped with fuels remaining continuous over the entire area. In Alternative G, 20 percent of the area would be developed, creating a mosaic of fuels over time; the remaining area would remain undeveloped. Alternative S would develop 37 percent of the area and Alternative K would develop approximately 54 percent of the area. The remaining undeveloped areas would be broken into 58 separate blocks. Alternative A would develop 66 percent of the area, while Alternative NC would develop 71 percent. The remaining undeveloped areas would be in 23 separate blocks. Alternatives B, C, and D would develop approximately 73 percent of the area, and the remaining undeveloped area would be broken into 23 separate blocks. In large parts of the North Kalmiopsis, development would be minimal due to a large areas unsuitable land. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction and timber harvest, and with the treatment of the activity slash from these operations. As access improves, the level of dispersed recreation and other public uses increase, with a corresponding increase in the risk of human-caused fires. Both scenarios have similar risk levels for lightning fires.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternative G, industrial operations would result in increased risk over 20 percent of the area, and risk from public use would be increased along the 45 miles of road. In Alternative K, industrial operations would result in increased risk over 54 percent of the area; risk from public use would be increased along the 175 miles of road. In Alternative NC and A, activities would result in increased risk over 66 to 71 percent of the area; risk from public use would be increased along 199 miles of road. In Alternatives B, C, and D, industrial operations would result in increased risk over 73 percent of the area, and risk from public use would be increased over roughly 220 miles of road. In Alternative S, industrial operations would result in increased risk over 37 percent of the area; risk from public use would increase along 175 miles of road.

Another source of ignition in this area could be the planned use of naturally occurring fire in the Kalmiopsis Wilderness, adjacent to the area. If fires are allowed to burn, there is a chance of fire escaping from the Wilderness boundaries.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

Research Natural Areas There are no existing or proposed RNA's within the North Kalmiopsis.

Botanical. The existing Big Craggies Botanical Area is partially within the roadless area (the major portion is part of the Kalmiopsis Wilderness). Portions of four of the Forest's 24 candidate Botanical areas for sensitive plants are also within the area (following Table). Alternatives E, G, K, M and S include many of the sensitive plant areas as Botanical areas (see Appendix F for more detail on individual sites).

A variety of sensitive and rare plants are present (See **PHYSIOGRAPHIC AND BIOLOGIC FEATURES** section); under all alternatives sensitive plants would be protected through application of appropriate standards and guidelines.

Botanical Areas, by Alternative *1/* (Tentatively suitable for timber production)

Area Name	Tentatively Suitable (Acres)	Priority Ranking	Alternative (Acres) NC/A	B/C/D	E	G/M	K	S
SENSITIVE PLANT AREAS								
Bear Camp Option 1	177	4	--	--	244	244	244	244
Bear Camp Option 3	2611	7	--	--	2,983	2,983	--	--
Chrome Ridge	430	7	--	--	1,014	1,014	--	590
Sourgame	533	6	--	--	--	1,094	--	571
Sourgame Addition	1,470	7	--	--	--	2,546	--	--
Windy Collier	115	9	--	147	--	147	--	--
EXISTING BOTANICAL AREAS								
Big Craggies	0	-	3,803	3,803	3,803	3,803	3,803	3,803

1/ Total acres for Option 4 are shown Only a portion of Option 4 is actually within the Shasta Costa Roadless Area

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only impacts on alternatives from prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP. Alternative G would generate 78 tons; Alternative K, 271 tons. Alternatives NC, A, B, C, D, and S would produce 321-337 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Grants Pass or Medford, both designated areas for air quality, is very low based on past performance. The probability of impacting the Rogue River corridor is low, and low to moderate for both the Illinois River canyon and Kalmiopsis Wilderness, a Class 1 area.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. One active osprey nest is located within the North Kalmiopsis The area contains potential habitat for both osprey and bald eagles along the Illinois and Chetco Rivers In any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and

Wildlife Service 1986). Overall, existing or potential habitat for eagle and osprey is maintained if the river corridors are protected from disturbance.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under Alternatives NC, A, A-Departure, B, C, D, D1, and K, habitat for mature/old-growth indicator species would be considerably reduced over time Mature/old-growth habitat would remain at present levels under Alternatives E and M; Alternatives G and S leave 64 and 42 percent of the area, respectively, unroaded and preserve much of this habitat type Wildlife species such as the cougar, which do best in secluded areas, would be best served by Alternatives E, G, M, and S. Except for S, these alternatives also provide a corridor of mature/old-growth habitat linking the Kalmiopsis and Wild Rogue Wilderness.

Except for Alternative NC, a mixture of habitat enclaves to meet MR's for mature/old-growth habitat are located within the roadless area· two for spotted owls, eight for pileated woodpeckers, and six for pine marten. This area presently supports approximately 15 pairs of spotted owls No change will occur under Alternatives E and M. Alternative G could probably support 10 to 12 owl pairs indefinitely, and five to six pairs under Alternative S. Mature/old-growth habitat would ultimately be reduced to MR levels in Alternatives A, B, C, and D. Habitat would eventually be reduced below MR levels in Alternative NC.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E, G, and M. Snag habitat along the Chetco River would remain near 100 percent in Alternatives NC, A, and A-Departure; even though these alternatives assign a significant part of the area to General Forest, the river corridor is maintained in a natural condition.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase in Alternatives NC, A, A-Departure, B, C, D, D1, and K, which open up much of the area through timber management Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. Meadow habitat in the western portion of the area is used extensively by deer and elk This habitat would be maintained under all alternatives, although meadow buffers are not protected in Alternatives NC, A, and A-Departure.

Wildlife Habitats The North Kalmiopsis contains approximately 700 acres of meadow habitat (including buffers) concentrated mainly on the western half of the area. Some 15 separate meadow sites are included. Meadow habitat is allocated in all alternatives, although meadow buffers are not protected in Alternatives NC, A, and A-Departure. The North Kalmiopsis contains over 2,000 acres of rock bluffs and cliff sites Rock bluffs/cliffs are allocated for wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC through D1. The roadless area contains one active peregrine nest. The nest site is managed in accordance with an existing site management plan. Overall management of peregrine habitat on the Siskiyou National Forest will conform to direction in the Recovery Plan for Peregrine Falcon (USDI-Fish and Wildlife Service 1982). A 250-acre band-tailed pigeon area is located on the eastern boundary, and is allocated in Alternatives E through M.

More than half of the Fishhook Peak meadow/forest edge complex is within the North Kalmiopsis; this area is important for wildlife, especially elk. It is included in Alternatives E, G, and K as a Supplemental Resource area, and Alternative S as a Special Wildlife Site.

The potential for human disturbance of Special Wildlife Sites is reduced under alternatives which maintain most or all of the area as Backcountry Recreation (Alternatives E, G, M, and S) Among the alternatives which allocate all or part of the area to Management Areas which permit development, Alternative B, D, D1, and G which utilize a Riparian Prescription C would provide the highest quality of riparian habitat for wildlife.

Although a gray wolf was trapped on the Forest in the late 1970's, the species was most likely eliminated from this area many years ago The potential for reintroduction of this species in the Kalmiopsis Wilderness and the unroaded North Kalmiopsis has not been evaluated Alternatives A, B, C, D, and K, which assign a large portion of the area to development, provide a smaller land base for potential reintroduction.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are low because human use of the area is less than in roaded areas Fewer hunters use unroaded areas and non-hunters generally stay on the few trails. Alternatives E and M produce fewest WFUD's.

Visual Resource

The following is the current Visual Quality Objective (VQO's) inventory based on visibility of the area from major recreation travel routes or use areas:

VQO	Acres
Retention	16,900
Partial Retention	31,300
Modification	39,500

Areas inventoried as Retention and Partial Retention respond to recreation use and attendant viewer sensitivity form the Wilderness access route to Game Lake, the Illinois Wild and Scenic River, and the Illinois River, Silver Peak, and Hobson Horn trail systems. Recreation use is occurring primarily on the river while use on the trail systems is low. Areas identified for visual objectives are primarily foreground and middle ground distance zones located adjacent to situations identified above.

Alternatives NC, A, and A-Departure manage the area for the current inventory throughout the roadless area, except for the area visible from the Illinois River Trail in the vicinity of Bald Mountain and Chinaman Hat peak The Illinois River Trail would be relocated to the south from its present locations so that areas formerly visible would be topographically screened from the view of recreation users. This would change the visual inventory, resulting in a reduction of the visual objectives in the Silver Creek drainage to Modification. Also, the Bald Mountain Road would be constructed and the Silver Creek drainage entered for harvest within the first planning decade. Management activities that are subordinate to the character of the landscape (Retention, Partial Retention) would be visible in the background from the last six miles of the Wild section of the Illinois River.

Alternatives B, C, D, and D1 emphasize development and, thereby, would assign most of the area to management under Modification objectives. Visual objectives would be allocated only to the unroaded areas within the Rogue-Illinois viewshed in response to recreation use on the Illinois River. Areas adjacent to Wilderness routes and trail systems would be allocated to Modification objectives.

Alternative K would allocate over 30,000 acres to roadless objectives. The area is comprised of the selected ground in the Silver Creek drainage and lands within the viewshed adjacent to the Wild section of the Illinois River. The inventoried VQO's are assigned to those areas adjacent to the Game Lake access road and to areas within the Upper Illinois viewshed The remaining area would be managed under the Modification objective.

Alternatives D, G, M, and S would maintain or exceed the current visual inventory under the Preservation objective in areas allocated to Backcountry Recreation management. Alternatives E and M would upgrade the inventory of all the area to Preservation. Alternative G and S would allocate approximately 57,000 acres and 37,500 acres, respectively, to Backcountry Recreation. In Alternative G, the area not allocated to Backcountry Recreation would be managed to achieve inventory VQO's. In Alternative S, the area not

allocated to Backcountry Recreation would be managed to achieve the Modification objective, although approximately 5,500 acres would be managed to achieve Retention and Partial Retention objectives.

Recreation Settings

Most of the roadless area is capable of offering Semi-primitive Non-motorized opportunities. the area identified as Semi-primitive Motorized falls in this category due to current management policy which provides for the use of trail bikes and motorcycles on trail systems within the area If motorized use is restricted, these areas would shift to the non-motorized end of the opportunity spectrum. Recreation use is light, the entire roadless area only has an estimated 6,000 RVD's. And, the majority of this recreation use is occurring within the Illinois River corridor between Silver Creek and Nancy Creek

The area inventoried as Primitive is located within the lower Silver Creek drainage, a small area of Primitive recreation opportunity also exists above Boulder Creek on the Chetco River. These are the only areas in non-Wilderness status on the Forest which offer Primitive recreation opportunities. Recreation use is light, being estimated at 700 RVD's. Use in the area is limited both in opportunity (it's hard to get to) and access (there are no trails within the large Silver Creek Primitive portion of the roadless area). projected levels of recreation demand indicate that the use will remain well within the carrying capacity over the planning period The influence of management activities on adjacent lands limits the area's ability to provide a quality wilderness or primitive recreation experience.

Alternatives NC, A, A-Departure, B, C, D, and D1 would not assign any of the area to Backcountry Recreation management. Under these alternative, the area would be developed and all inventoried Primitive and Semi-primitive Non-motorized recreation opportunities outside of designated Wilderness would be lost The area would lose its pristine character and present a roaded modified forest setting to the recreation user Portions of existing trail systems would also be lost as a result of road construction Except for alternative C, these alternatives would also retain over 12,600 acres in essentially undeveloped condition due to Wild River, Botanical, Supplemental Resource, and Designated Wildlife Habitat Management Areas. These areas are generally not contiguous, so the integrity of the roadless area is compromised by the presence of motorized activities around them.

Alternatives E, G, and M would allocate most or all of the area to unroaded management objectives, thereby maintaining all of the inventoried Primitive area. The alternatives would result in an expanded capacity for Semi-primitive Non-motorized opportunities as motorized use on trail systems would be restricted in favor of non-motorized recreation opportunities

Alternative S would allocate 37,500 acres to Backcountry Management. The allocation would include lands within the viewsheds adjacent to the last six miles of the Wild section of the Illinois River, and the area within the Silver Creek drainage that is capable of providing Primitive opportunities. The area would be managed to provide Primitive, Semi-primitive Non-motorized and Motorized recreation opportunities. Under this alternative, the essentially undeveloped character would be retained on approximately 50,100 acres of the roadless area due to allocations to Botanical, Supplemental Resource, and Designated Wildlife Habitat.

Alternative K would assign approximately 12,000 acres to Backcountry Recreation, and include lands within the viewshed adjacent to the last six miles of the Wild section of the Illinois River. The close proximity of harvest activities and associated road construction would result in the loss of Primitive opportunities. the reduction of Semi-primitive opportunities would be the same as those effects identified for Alternatives NC, A, B, C, and D. The essentially undeveloped character of the area would be maintained on an additional 17,000 acres. These areas may or may not be contiguous, so the integrity of the roadless area may be compromised by the presence of adjacent motorized activities (See **Wilderness Potential**).

Economic and Social

There are 55,256 acres of land identified as tentatively suitable for the production of timber in the two unroaded areas (54,233 acres in the North Kalmiopsis; 1,023 acres in the North Kalmiopsis Addition). The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

These above figures are based on the 1984 land base updated with the roadless area boundary changes to 1988. They do not account for the inventory changes resulting from the Silver Fire Recovery Project field survey. Incorporating these adjustments, the tentatively suitable land would be reduced 4,080 acres (North Kalmiopsis being 50,153 acres; the total for the two areas being 51,176). The outputs and effects in this section, therefore, are approximately eight percent greater than values adjusted for the Silver Fire area.

The estimated potential ASQ from the inventoried 89,748 acres of both roadless areas is 3.04 MMCF. The estimated LTSY would be 5.53 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from these areas under each alternative:

Alternative	ASQ	LTSY
NC and D	2.61	4.77
A	2.44	4 44
A-Dep	2 34	4.61
B	3.19	5 80
C	2 71	4 92
D1	2.87	5 23
E and M	00	00
G	0.75	1 35
K	2 00	3 64
S	1.34	2 44

For projecting effects, the alternatives are separated into five groups: (1) Alternatives E and M, which leave the area as unroaded; (2) Alternatives G, which leaves much of the area unroaded; (3) Alternative S, which develops less than half the area; (4) Alternative K, which develops much of the area; and (5) Alternatives NC, A, B, C, and D, which develop most of the area.

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E, G, and M have the biggest reduction in the timber and road expenditures. Alternatives NC, B, C, and D have a slight increase in expenditures, while Alternative K and S have a small to moderate decrease. Alternative A has no change and provides the reference from which to gage other alternatives.

The indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E, G, and M have the biggest reduction while Alternatives NC, B, C, and D have the highest level of employment, income, and payments to counties. Alternative K and S have intermediate effects.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed For example, in Alternative E, people interested in old-growth habitat are predicted to feel positive about forest management while timber interests are predicted to feel the forest is not responsive to their interests. such gains and losses may create additional conflict.

	Alternatives				
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G	S	K and D (Roaded)	NC, A, B, C,
Direct Effects					
Timber and Road Expenditures	None	Largely Reduced	Moderate Change	Minor Change	No Change
Indirect Effects					
Jobs	-222	-154	-100	-40	0
Annual Income (MM $)	-5 12	-3 55	-2 31	-0 92	0
Annual Payments to Counties (MM $)	-1 22	-0 85	-0 55	-0.22	0
Cumulative Effects					
Attitudes of Communities in the Local Area					
Timber Related	-	-	-	-	0
Primitive Recreation	+	+	+	0	0
Fisheries	+	+	+	0	0
Wildlife Related					
Hunting	-	-	-	0	0
Old-Growth	+	+	+	+	0
Mining	-	-	-	0	0

MITIGATION MEASURES

In general, mitigation measures are the same as for the Forest as a whole (See Chapter IV, FEIS). In some cases, individual management plans will be devised for specific species, such as *Bensoniella oregana*, a plant found within the roadless area, which could be affected by timber management activities.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

Timber harvest has occurred on BLM lands in the headwaters of the Silver Creek drainage The Forest Service and BLM will need to coordinate management plans to consider the potential for cumulative effects.

Table C-5h. Quosatana Roadless Area No. 6177 (5,097 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	5,097	0	0	5,097	0
7-Supplemental Resource	5	5	5	0	5	0	1,882	325	0	325
8-Designated Wildlife Habitat	0	661	661	661	661	0	421	725	0	677
9-Special Wildlife Site	95	95	170	170	170	0	16	154	0	265
10-Scenic/Recreation River	36	5	5	5	5	0	0	0	0	0
11-Riparian	976	934	922	922	922	0	542	763	0	759
12-Retention Visual	800	491	0	0	0	0	160	434	0	434
13-Partial Retention Visual	1,011	908	876	881	876	0	478	377	0	377
14-General Forest	2,174	1,998	2,458	2,458	2,458	0	1,598	2,319	0	2,260
TOTAL	5,097	5,097	5,097	5,097	5,097	5,097	5,097	5,097	5,097	5,097
TOTAL UNDEVELOPED (MA 1-9)	100	761	836	831	836	5,097	2,319	1,204	5,097	1,267

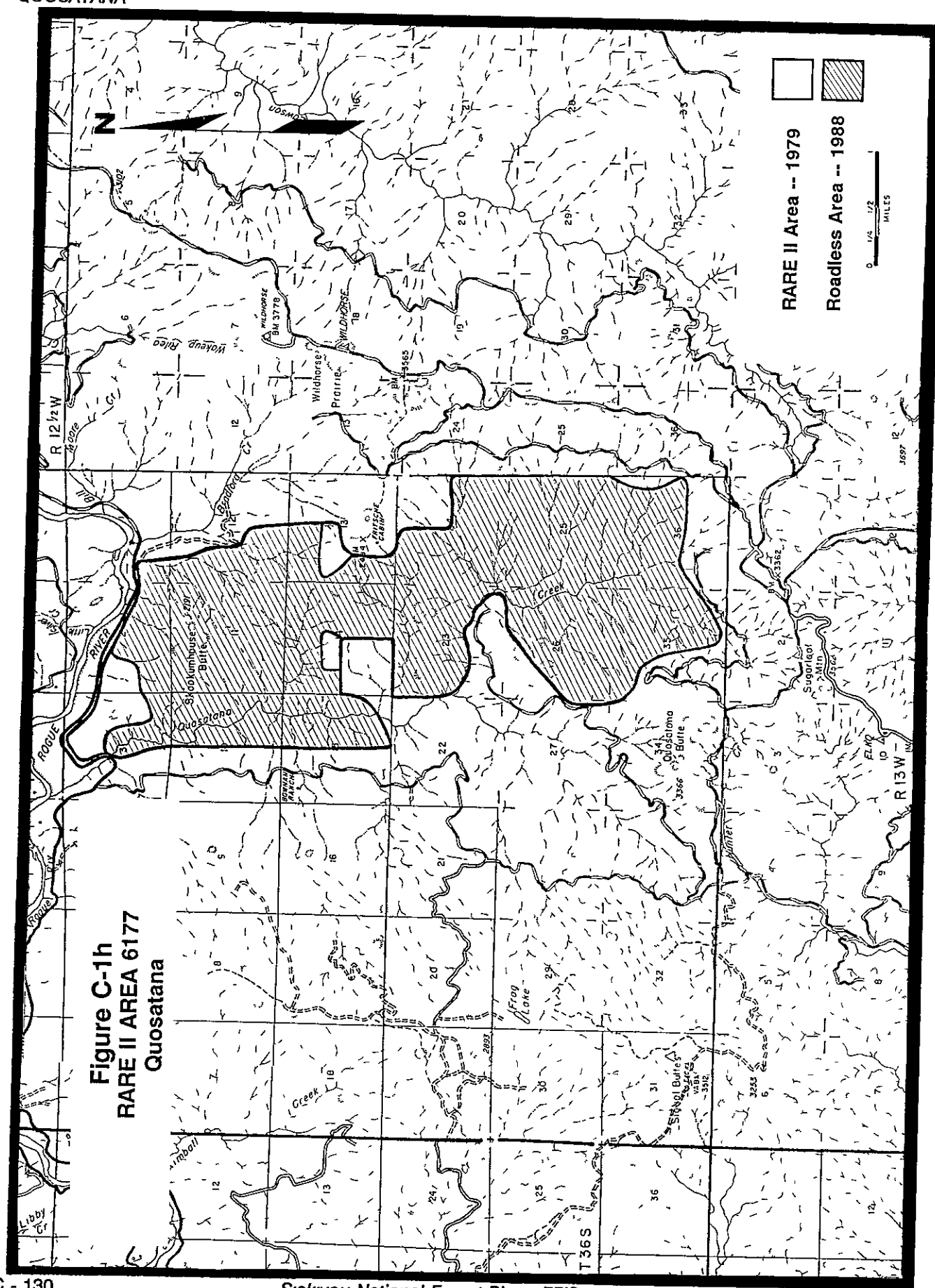


Figure C-1h
RARE II AREA 6177
Quosatana

QUOSATANA No. 6177

(5,097 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Quosatana Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. At that time, it contained 5,514 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979. Since then, timber sale activities have reduced the area to 5,097 acres. The roadless area contains approximately 20 acres of private land; the rest is National Forest System land

The Rogue-Illinois Land Management Plan (FEIS, 1979) allocated the Quosatana Roadless Area to coordinated resource management, with the exception of a small part of the Recreation segment of the Rogue Wild and Scenic River. Direction for the coordinated resource management area is designed to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features.

Management direction for the Recreational river corridor along the Wild and Scenic Rogue River is designed to: provide opportunities for a wide range of river-oriented recreational activities; maintain or improve the quality of the water which enters the river; improve the fish and wildlife habitat; maintain or enhance the quality of the scenery; and utilize other resources and permit other activities to the extent that they do not significantly lower the quality of the river's values.

Please reference the Land Management Plan for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since completion of the Land Management Plan, all project activities have been analyzed under its direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

During the period between 1984 and 1988, three timber sales have reduced the inventoried roadless area An area in the northern portion and two small pieces in the Fritsche Cabin vicinity modified unroaded area (Refer to Figure C-1h). The remainder of the area is as described.

LOCATION AND ACCESS

The Quosatana area is located in Curry County, Oregon, and includes a large portion of Quosatana Creek drainage and portions of several small drainages tributary to the Rogue River. The area is approximately 10 miles from the coast and the community of Gold Beach. The area is completely encircled by roads; these include Agness, Quosatana Creek, Wildhorse, and Hunter Creek. They are multi-purpose routes, serving *heavy recreation, timber haul, and administrative traffic.*

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is on the western side of the coast range (Klamath Mountain Geological Province) in southwestern Oregon. Elevation varies from 200 to 2,800 feet. Topography is very mountainous with steep slopes and deeply incised drainages Most of the area is generally well timbered except for Quosatana Creek bars and Skookumhouse Butte. The timbered areas have moderate variety

due to some hardwood stands and brushfields Douglas-fir is the primary conifer species with associated species being Port-Orford-cedar. Tanoak, Pacific madrone, and canyon live oak are important hardwoods components. The ecosystem is predominately mixed conifer and mixed evergreen types They are characterized by a mixed forest of evergreen needle-leaved trees in the upper strata and evergreen broad-leaved trees in the lower strata.

Highly variable soil conditions occur within the Quosatana area. Deep, clayey, moderately productive to very productive soils are common. The rolling, undulating topography which characterizes the area is a result of a series of large, deep-seated landflows which have occurred over geologic time Some landflow activity is still occurring, especially in the lower slope positions. Steep areas along drainages have experienced considerable mass movement activity, most notably in areas of water concentrations. Large blocks of soils are experiencing soil creep, particularly in the confluence of small tributaries Soils in the upper Quosatana area demonstrate less active landslide activity.

Average annual precipitation varies from 100 to 110 inches; dry season rainfall (May through September) averages 11 inches The climate is mild and heavily influenced by marine air. Fog in the spring and summer often lies in the Rogue River corridor. Summer temperatures can exceed 80 degrees Fahrenheit.

Populations of black-tailed deer, Roosevelt elk, black bear, and wild pigs occur within the area. Large runs of anadromous salmon and steelhead use Quosatana Creek as spawning and rearing habitat. Bald eagles frequent that portion of the Rogue River just north of the area. The roadless area contains potential nesting and roosting habitat for both bald eagle and osprey. A pair of northern spotted owls (sensitive species) were located in the extreme southwestern part of the unroaded area in 1983 One sensitive plant species (*Erigeron cervinus*) has been found in the area.

RESOURCE USES

No mineral development has occurred in the past and no activity is expected in the future. There are no grazing allotments in the area. Minor upland game and moderate big game hunting on the fringes of the unroaded area takes place; interior hunting is very limited due to steep and brushy ground.

Quosatana Creek is now, and is expected to continue to be, a popular dispersed use camping area for local residents. This is responsible for the relatively high level of recreation use (estimated to be 2,100 RVD's). Quosatana Campground is located adjacent to the north boundary.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

An environmental analysis prepared for a Skookumhouse planning area in 1983 encompasses the majority of the roadless area This document describes the landforms within the area as composed of sharply dissected, angular ridges with slopes of 60 percent or greater. The dominant landform and focal point within the area is Skookumhouse Butte which rises to an elevation of 2,191 feet. The area is covered by an essentially unbroken vegetative canopy consisting of varying combinations of conifers, hardwoods, mixed stands of conifer and hardwoods, and brushfields. Old-growth Douglas-fir with a strong deciduous understory is very much in evidence in the immediate foreground within the river corridor The coniferous stands are consistent, though not truly continuous as they are broken intermittently by hardwood stands.

Several natural openings occur within the area, but are not readily visible from along the Agness Road Openings from past harvest activity are evident on adjacent private lands The most dominant of these is a long rectilinear opening on the east side near Bradford Creek. The opening is in sharp contrast to the surrounding landscape and is very evident to recreationists on the Rogue River. The Rogue River, bordering the area on the north, is another major landform affecting the area. The river and it's corridor are part of the National Wild and Scenic River System.

The greatest influence on the area is the heavily traveled Agness Road along the north fringe of the area. It is the primary east-west access to the community of Agness and is part of the principal east-west route through the Siskiyou National Forest. Secondly, timber harvest activities and their associated roads immediately border the area. Adjoining private lands have also been heavily logged in the recent past.

CAPABILITY

MANAGEABILITY

The location, shape, and size of the area makes it subject to the sights and sounds of activities outside the area The boundary is not easily definable nor recognizable on the ground. Terrain and vegetation provide some shielding of the interior from off-site sights and sounds

NATURAL INTEGRITY AND APPEARANCE

While the area is roadless, it is not easily recognized as such because of surrounding activities. Consequently, the area has the appearance of being managed for uses other than Wilderness.

An old trail leads from Fritsche Cabin site to the Rogue River. It is not maintained and has only minimal effects on naturalness. Boating on the Rogue River does cause noise. A power line right-of-way located beside the Agness Road is quite apparent. Periodic maintenance of the right-of-way is necessary. The boundary could be adjusted to exclude it and the private land without significant reduction in the area's size.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The Quosatana area has been inventoried in the Recreation Opportunity Spectrum (ROS) as Roaded Natural, and would not change under any land allocation. The opportunity for a truly primitive recreation experience does not exist.

The area consists of a highly dissected drainage with extremely dense vegetation which promotes a degree of solitude However, the same factors tend to negate cross country travel so that recreation use is limited to Quosatana Creek itself; encounters with other people, thereby, are relatively common. The proximity of timber harvest activity, logging roads, Agness Road, and river use contribute as external sources to limiting solitude. Other activities are within close sight and sound.

SPECIAL FEATURES

The Recreation section of the Wild and Scenic Rogue River is the most notable feature. The bluffs of Skookumhouse Butte, quite noticeable from the roads and river, also provide some diversity in background scenery. The bluffs also provide excellent habitat for various wildlife species.

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

Undeveloped/unroaded The opportunity for measurable change in type or use is limited due to its size and topography. Use today is below capacity, and pressure for more use is expected to increase very little in the future. Quosatana Creek bed receives a good share of the total use of the area; much of this is attributable to local area residents. The bluffs of Skookumhouse are seldom used for climbing, but are important to the visual quality of the river users experience.

Developed. Potential for increased use is greatest with roaded development. Roads would provide access for hunting, dispersed camping, and other forms of motorized recreation.

Wildlife

Under unroaded conditions, wildlife would remain essentially unchanged unless specific management practices such as habitat improvement and prescribed fire were implemented As development occurs over time, elk and deer population levels would increase. Varying stages of vegetation in harvest units and along roads with adequate hiding cover would promote expansion of existing herds Populations of wildlife dependent on old-growth habitat would decrease in number. They would not be eliminated, however, because considerable habitat would remain along the river corridor, Quosatana Creek, tributary streams, and in areas unsuitable for timber management purposes. Sensitive species will be protected through applicable Standards and Guidelines.

Fisheries

The anadromous fisheries of the Rogue River are extremely important for inland recreation plus offshore sport and commercial fishermen. Quosatana Creek provides excellent habitat for anadromous fish. Many smaller tributaries contribute cold, clear water to Quosatana Creek and the Rogue River salmonids, but are too steep for fish movement.

Water

There are no man-made impoundments or diversions either existing or proposed. The potential for small hydroelectric power development is very limited. A small increase in water yields would result as a consequence of timber harvesting. However, the greatest demand for water is directed toward maintenance of Rogue River water temperature in the summer and fall periods. Quality aspects for the tributary streams are of far greater importance than water use or development due to the high value fishery and recreation of the Rogue River and Quosatana Creek.

Livestock

There is no livestock grazing within the area now. Very little potential for livestock grazing exists.

Timber

The unroaded area contains approximately 3,844 acres of land tentatively suitable for the production of timber. Standing volume is estimated at 85 MMBF. Site productivity is relatively high. The suitable area is reasonably stable and could be logged using skyline cable systems that are in common use on the Forest. Because of heavy vegetative competition and steep slopes, management for timber production would utilize various methods to reduce brush competition for release of crop trees Management in view of the Rogue River requires meeting a Visual Quality Objective (VQO's) of Retention.

Energy and Minerals

Exploration and development is nonexistent. While potential minerals may occur, development is highly improbable. There are no active mines or mineral leases.

Cultural

No cultural sites have been inventoried Potential is low except for benches along Quosatana Creek

Land Use Authorization

Other than the power line right-of-way, none exist. Few are expected.

MANAGEMENT CONSIDERATIONS

Fire is the most serious management consideration. The potential for major conflagration does exist with the heavy fuels and dense brush. Conditions, however, are severe for a relatively short period of time due to coastal influence on climate. The greatest threat of ignition occurs from dispersed recreation use along Quosatana Creek While use is is concentrated on the creekbed, fire ignition at the wrong time could have major consequences

The potential for insect and disease outbreaks within the coniferous forest exists. Actual occurrences have been minor and localized. With road development, the spread of *Phytophthora lateralis* root disease of Port-Orford-cedar may be increased.

The private land parcel located in the northwest corner of the area was logged several years ago and the vegetation is well established. The vegetation along the Agness Road appears natural; restraints on maintenance activities for both the road and power line right-of-way provide for visual considerations.

NEED

OTHER AREAS OF PUBLIC USE

The Wild Rogue and Kalmiopsis Wildernesses and stretches of the Rogue and Illinois Wild and Scenic Rivers exist within 11 miles of this roadless area. A portion of the Wild and Scenic Rogue River is located within and along the north boundary.

Recreation use of the unroaded area and adjacent undeveloped areas is extremely light considering the acreage involved. The nearby designated Wilderness and Wild and Scenic River areas share many of the same attributes of Quosatana, but are generally more rugged and diverse. Use in the surrounding undeveloped areas is concentrated, much like Quosatana, along rivers and trails. Local people utilize Quosatana more than recreationists from major population centers hours away by automobile. Recreation oriented travelers from the metropolitan areas would normally seek areas closer and of higher quality in terms of views and experiences.

ECOSYSTEM REPRESENTATION

The major ecotypes within Quosatana are well represented in other undeveloped or designated areas.

PUBLIC INVOLVEMENT

Public input on several of the inventoried roadless areas on the Forest has been extensive. Quosatana, however, has not received much advocation for protective status. Of the 55 letters received during public review of the Rogue-Illinois Land Management Plan, only two specifically stated Quosatana should be designated as Wilderness. Reasons for designation were related to greater fisheries protection.

Both the public and Forest managers have had considerable interest and concern for the existing and future management of the larger unroaded areas During RARE II, local and state government units responded to the potential inclusion of Quosatana as Wilderness. Most often cited were the adverse

impacts associated with local economy and community stability, loss of timber receipts, and multiple use opportunities foregone Many individuals voiced similar concerns for the area's individual and cumulative effects on the critical timber supply of southwestern Oregon.

Since RARE II, Quosatana has been evaluated for development through site-specific project planning. Essentially no public concerns or input has been received.

In the current Forest Planning process, the unroaded area question has remained a major issue. Public involvement, beginning with early public scoping in 1979 and continuing with public meetings, workshops, and other contacts into 1985, has not surfaced any additional concern or movement to seek unroaded allocation of this inventoried roadless area Comments received on the Forest Plan DEIS in 1987 and 1988 also have not added any new insight or concerns as to management of this unroaded area

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The roadless area is known to contain prehistoric and historic sites, some of which require evaluation by a professional archaeologist. The area supported aboriginal hunting and fishing endeavors, while Skookumhouse Butte was the site of other Indian activities during pre-contact times. The area has moderate potential for yet undiscovered cultural resources

Alternatives which call for development requires intensive cultural resource inventory along proposed roads prior to approval. In this way, sites that may exist in the project area can be evaluated. Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M, leaving the area unroaded, would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for the Quosatana area.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-	200	200
High	-	-	100	100
Moderate	-	-	-	-
Low	-	-	4,800	4,800
Total	-	-	5,100	5,100

Improvements

Roads The 3,844 acres of tentatively suitable land could generate about 13 miles of new road for timber harvest Roads for other purposes would be minor, if any. All the new roads would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A and B	13	3	5	5
C	13	2	6	5
D	13	4	4	5
E and M	0	0	0	0
G	10	0	4	6
K and S	12	3	2	7

Alternatives E and M would have minimal effect on this area due to no roads being built. Alternate G would not maintain any roads open for passenger cars. Alternatives NC, A, B, C, and D would be completely roaded Alternatives G, K, and S would have a Supplemental Resource area which reduce mileage. Alternatives G, K, and S would close 60 percent of the roads.

The road system would follow on or near ridges where possible. Some roads would be on the midslopes once ridges became too steep or where shorter reaches for logging were needed. These midslope roads would cross small creeks and draws which could result in some decrease in water quality from the road construction and use. None of the roads would cross streams inhabited by fish. Some full-bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites. Some of the roads would be visible from the Rogue River and parts may be seen from sections of the Agness Road. Access would be provided for timber management, roaded recreation, and fire suppression.

Trails. None of the alternatives schedule construction of trails within this area.

Developed Recreation Sites. No recreation site construction is identified under any alternative.

Wilderness Potential

The Quosatana Roadless Area has been inventoried according to ROS criteria and is capable of providing 5,100 acres of Roaded Natural recreation opportunities The carrying capacity for the area is estimated at approximately 8,200 RVD's. This figure is high since the it is based on coefficients which assume the presence of roads. Current use is low and is attributed primarily to dispersed motorized day use in the Quosatana Creek drainage. The presence of motorized uses on the Rogue River, on the surrounding road systems, and within the area itself would preclude the ability of the area to provide a truly primitive recreation experience. The roadless area is isolated from other roadless areas and designated Wilderness.

Access to the area is limited to surrounding road systems and the Quosatana creekbed. Cross country travel is difficult due to the prolific vegetative understory and steep terrain. Recreation demand projections indicate that levels of use will remain well within the carrying capacity throughout the planning period

All alternatives, except E and M, assign the area to multiple resource management objectives. Roaded Natural recreation opportunities currently available would be enhanced by timber-related road construction. The change in character of the landscape would result in loss of Wilderness potential Alternatives E and M would maintain the area in a roadless condition, thereby providing additional capacity for Roaded Natural recreation opportunities Wilderness potential of the area would be maintained

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater.

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	5,100	5,100	5,100
G	0	0	0
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

Approximately one half of the area is visible to river users. The allocation of the area to roadless management objectives will not effect the management of the Rogue Wild and Scenic River. However, the allocation could effect the quality of the recreation setting near the river. The recreation setting is currently maintained through the use of inventoried VQO's which were assigned to the area in response to both the designation of the river as Wild and Scenic and to the high levels of recreation use that occur on the river. Area within the designated Wild and Scenic River corridor is currently managed to achieve the Retention objective, which is the minimum. Alternatives NC, A and A-Departure would manage the area to achieve inventoried visual objectives, resulting in some modifications to the area as it is entered for timber harvest Alternatives E and M would maintain the current conditions.

Alternatives B, C, D, and D1 would allocate the area outside of the designated Wild and Scenic River corridor to a reduced scheme of visual objectives. Areas outside the 1/4 mile river corridor currently inventoried for Retention would be managed for Partial Retention and Modification visual objectives, resulting in visible harvest activities to river users. The quality of recreation settings is most impacted under these alternatives.

Alternatives G, K, and S would manage the foreground areas of the Rogue River for Preservation visual objective in response to the high levels recreation use on the river. There would be no programmed harvest in these foreground areas. The rest of the area would be managed to achieve the inventoried visual objectives, resulting in some modifications to the forest setting as the area is entered for harvest

Soil, Water, and Fish

No direct impacts on soil, water, and fish are associated with Alternative E and M as no soil disturbing activities will occur All other alternatives assign all or part of the area to Management Areas which permit development The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS

Alternatives NC, A, B, C, and D have a moderate potential of adversely affecting the soil, water, and fish resources in the area Soils in the area have demonstrated a high potential hazard for impacts from both harvest and road-related increases in landslides. Harvest and road-related activities have been minimized on some more hazardous soils; however, because of the large extent and complex nature of the unstable areas in the lower area of Quosatana Creek, a moderate potential for significant adverse impact exists Alternatives G, K, and S reduce overall activities and, thereby, share less risk and impacts.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels

Fuels in the area are generally light, though most of the area is hardwood stands and brush, creating a high hazard. Fuels are very continuous on steep terrain with few natural openings In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to relatively poor access The result is larger fires, higher suppression costs and increased resource losses.

In a developed scenario, fire hazard increases during timber harvest. As fuels are treated, fire hazard is reduced. In the long term, continuity of fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires The result is smaller fires, lower suppression costs and less resource damage.

In Alternatives E and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area. In Alternatives G, 44 percent of the area would be developed, creating a mosaic of fuels over time while the remaining undeveloped area would be in 3-5 separate blocks. Alternative K would develop approximately 61 percent of the area. The remaining undeveloped areas would be broken into 9 separate blocks. Alternatives A, B, C, D, and S would develop approximately 60 to 67 percent of the area, while Alternative NC would develop 78 percent. The remaining undeveloped areas would be in 3-4 separate blocks. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction and timber harvest, and with the treatment of the activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases, with an increase in the risk of human-caused fires. Lightning fire risk levels are similar for scenarios.

In Alternatives E and M, risk from human-caused ignition would be limited primarily to the area's periphery due to limited access. In Alternatives G, industrial operations would result in increased risk over 44 percent of the area; risk from public use would be increased along 10 miles of road. In Alternative K, operations would result in increased risk over 61 percent of the area, and risk from public use would be increased along the 12 miles of road. Alternatives A, B, C, D, and S would result in increased risk over approximately 60 to 67 percent of the area, and Alternative NC would be over 78 percent; risk from public use would be increased along 12 to 13 miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical areas or RNA's are proposed. One sensitive plant species is present. Under all alternatives, sensitive plants will be protected through appropriate Standards and Guidelines

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only the effects of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP, all other alternatives would produce 17-26 tons of TSP per year.

The probability of a smoke intrusion from burning in this area impacting Grants Pass, a designated area for air quality, is very low based on past performance. Because the area is in the Rogue River drainage, the probability of impacting the Rogue River corridor is moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey The northern portion of the roadless area is potential roosting and nesting habitat for bald eagle and osprey An active osprey nest is located just outside of the roadless area and bald eagles sometimes roost near the mouth of Quosatana Creek (a feeding site). Both birds undoubtedly use the area as a flight corridor. In any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and Wildlife Service 1986). Overall, habitat for eagle and osprey is maintained in Alternatives E and M which allocate Quosatana to Backcountry Recreation. Alternative G, which allocates Supplemental Resource areas, also helps maintain habitat.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This would be especially true under Alternatives A through D1 which meet Management Requirements (MR's) for mature/old-growth wildlife species, but otherwise allocate most of the area to development (no Supplemental Resource areas assigned) Alternative NC does not meet MR's; it contains no habitat assigned for wildlife species using mature/old-growth forest.

Except for Alternative NC, one habitat enclave for pileated woodpecker has been established in the area to meet MR's for mature forest habitat This area presently supports approximately two to three pairs of spotted owls (there is a specific sighting location in the northeast corner of the roadless area). There would be no change under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels in all other alternatives In Alternative NC, habitat would eventually be reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M High snag levels would be maintained in Alternatives E through S.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase in all alternatives, except E and M, which open up much of the area to timber management. Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats Five meadow areas are contained in the Quosatana area (approximately 200 acres) Meadow habitat is allocated in all alternatives, although meadow buffers are not protected in Alternatives NC, A and A-Departure. Potential for human disturbance of wildlife in meadow areas is minimized in Alternatives E and M which maintain the unroaded status The bluffs of Skookumhouse Butte provide excellent habitat for various wildlife species; the Butte and surrounding habitat would be maintained as at present in Alternatives E, G, and M. Alternatives B, D, D1, and G which utilize Riparian Prescription C provide the highest quality of riparian habitat.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to Quosatana are average to slightly less than average for the General Forest Management Area. Slightly fewer WFUD's would be produced in Alternatives E and M.

Visual Resource

The following three objectives are attributable to the current visual inventory based primarily on the river and highway usage·

VQO	Acres
Retention	900
Partial Retention	1,300
Modification	2,900

Alternatives NC, A and A-Departure assign the area to management for inventoried visual objectives Some management activities would be evident to viewers on the Agness Road and river. In general, the area visible from the road and river would present a slightly altered appearance, while those areas not visible would present a modified appearance to users on secondary road systems.

Alternatives B, C, D, and D1 would assign the area to management for a reduced level of visual objectives Areas inventoried for Retention would be managed to achieve Partial Retention. Management activities would be evident to river users in the foreground. In general, the area visible from the road and river would present a slightly altered-altered appearance, while those areas not visible would present a modified appearance to users on secondary road systems.

Alternatives G, K, and S would allocate the area to management for inventoried VQO's The exception is the foreground area adjacent to the Rogue Wild and Scenic River. Inventoried for Retention, it would be managed for Preservation; there would be no programmed timber harvest In general, the area visible from the road and river would present a natural appearing-slightly altered appearance, while areas not visible would present a modified appearance to users on secondary roads.

Alternatives E and M would be managed to achieve the Preservation objective. The entire area would remain in a natural appearing condition throughout the planning period.

Recreation Settings

The area is surrounded by Forest road systems and is heavily influenced by the sight and sound of motorized users. In addition, the Recreation section of the Wild and Scenic River borders the northern edge

of the roadless area. Motorized use, in the form of ORV's driving up the Quosatana Creek drainage for approximately 1-2 miles to utilize the stream bottom for swimming, picnicking, and other day use activities also occurs. The isolated location and existing patterns of motorized uses limits the ability of the area to provide a quality wilderness or primitive recreation experience.

All alternatives except E and M provide for some degree of development Roaded Natural recreation would be modified somewhat; however, not enough to cause any further shifts in the opportunity spectrum Access to the area and motorized opportunities would be enhanced as roading occurs over time. Management activities will be evident to river users, particularly toward the northern end of the area, and may effect the quality of the river recreation experiences. Alternatives E and M would maintain the area in its current status. Recreation capacities remain fixed

Alternatives A, A-Departure, C, D, and D1 would retain the essentially undeveloped character on 800 acres of Designated Wildlife Habitat. Alternative S would retain the essentially undeveloped character of the area on approximately 1,300 acres. Alternative NC would essentially develop the entire area Alternative G and K would retain the essentially undeveloped character on 2,400 acres and 1,300 acres, respectively, due to allocations to Supplemental Resource and Designated Wildlife Habitat. These areas may or may not be contiguous, so the integrity of the roadless area is mostly compromised by the presence of motorized activities.

Economic and Social

There are 3,844 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,097 acres of the Quosatana Roadless Area is 0.21 MMCF. The estimated LTSY would be 0 38 MMCF Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and B	.21	.37
A, C, and D	18	32
E and M	00	00
G	.11	21
K and S	.16	.29

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E and M have the biggest reduction in the timber and road expenditures. The other alternatives have insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while the other alternatives have little or no change in the number of jobs, amount of income, and size of payments to the counties. Compared to Alternative A, Alternatives NC and B have slightly positive effects.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative

indicates a social feeling of the Forest not being responsive to particular interests as listed For example, in Alternative E, fishing interests are predicted to feel positive about forest management while timber interests would tend to feel the forest is not listening to their needs. Such gains and losses may create additional conflict.

	Alternatives		
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G	NC, A, B, C, D, K, and S (Roaded)
Direct Effects			
Timber and Reduced Road Expenditures	None	Reduced	No Change
Indirect Effects			
Jobs	-16	-6	0
Annual Income (MM $)	-0 38	-0 15	0
Annual Payments to Counties (MM $)	-0 09	-0 04	0
Cumulative Effects			
Social Attitudes of Local Communities			
Rural and Urban Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old Growth	+	+	0
Mining	-	0	0

MITIGATION MEASURES

No additional mitigation measures have been identified beyond those already listed for each alternative through the application of the Standards and Guidelines.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

Conflicts with adjacent landowners may occur over access.

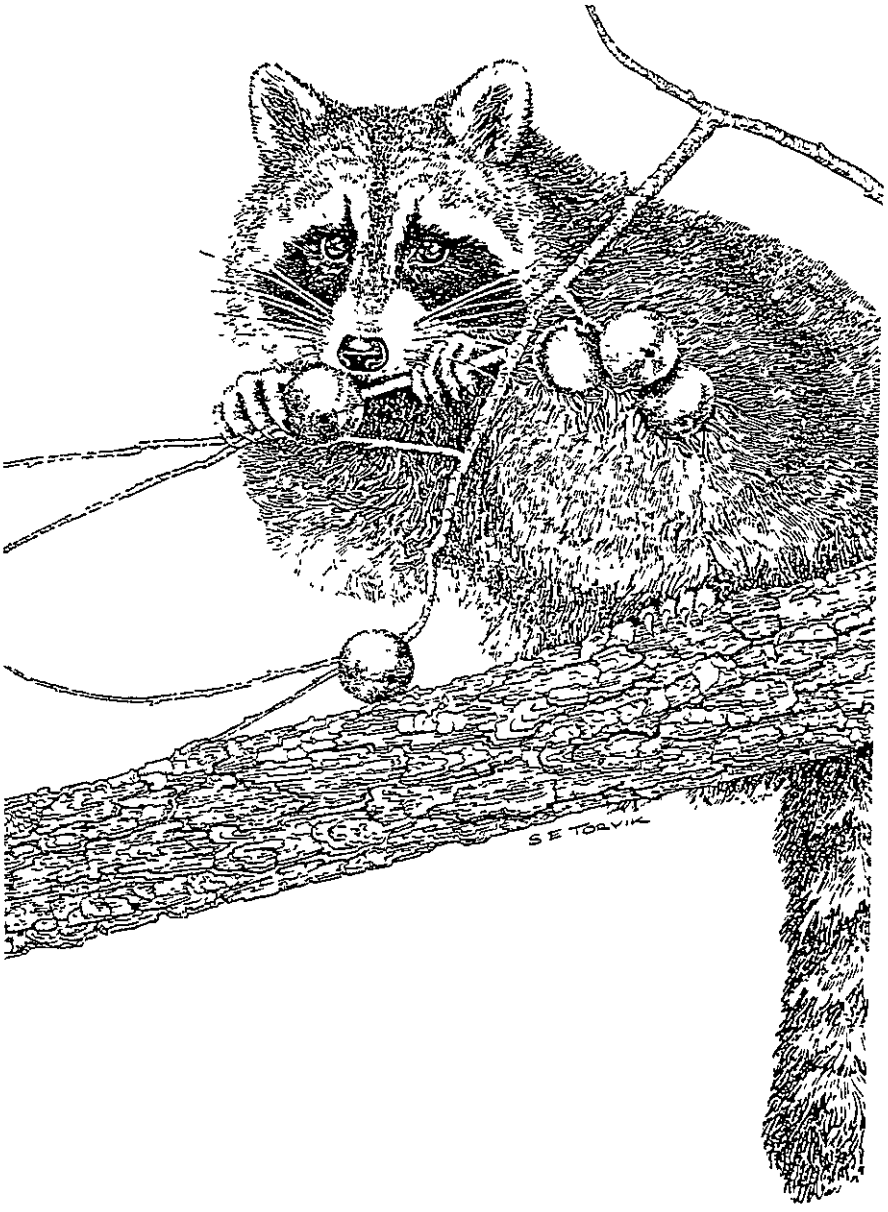
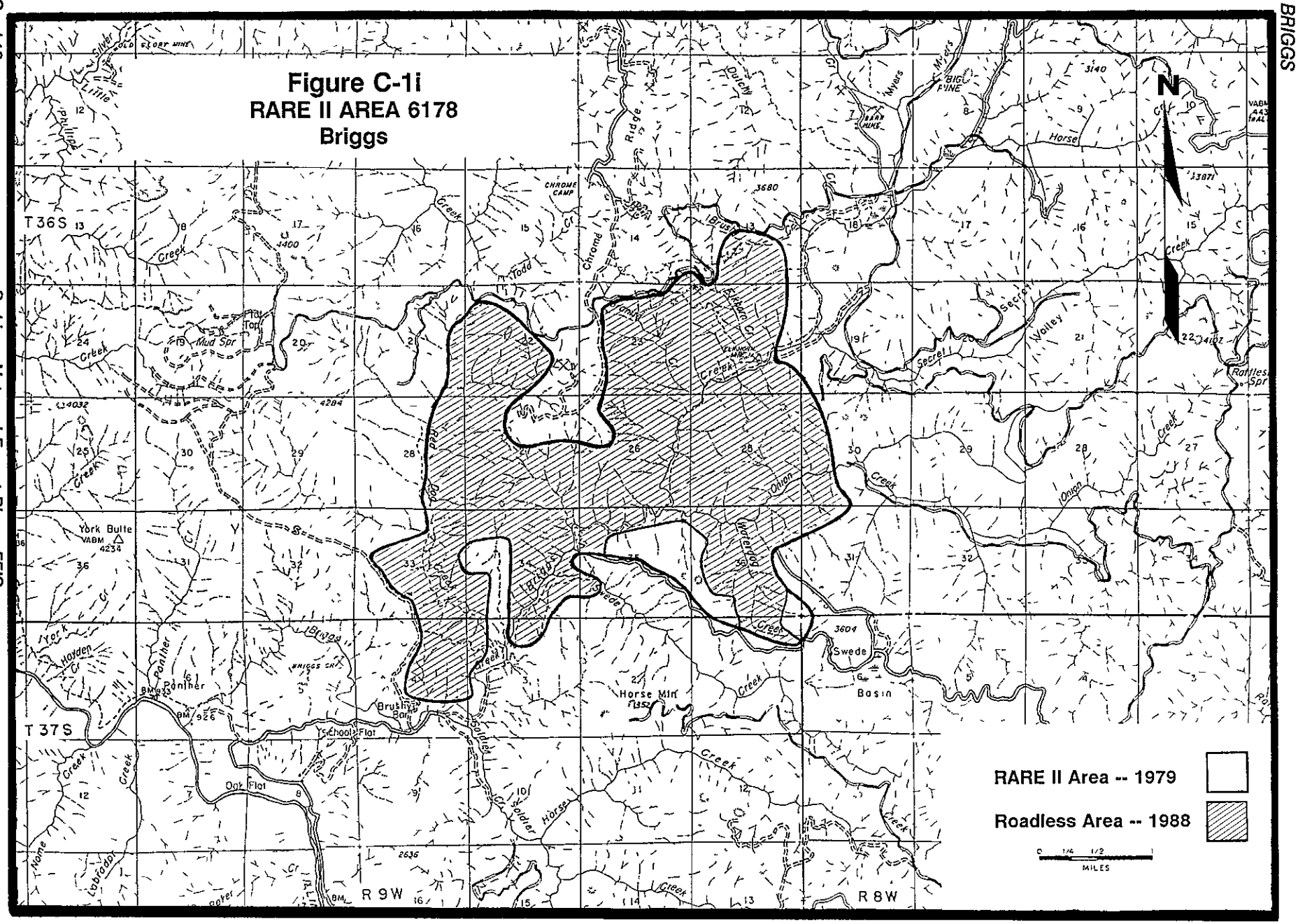

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Table C-51. Briggs Roadless Area No. 6178 (5,544 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreatio	0	0	0	0	0	5,544	0	0	5,544	0
7-Supplemental Resource	0	0	0	0	0	0	672	0	0	0
8-Designated Wildlife Habitat	277	810	810	810	810	0	1,264	1,082	0	810
9-Special Wildlife Site	0	0	0	0	0	0	48	48	0	321
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	964	840	841	841	841	0	511	797	0	797
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	278	278	0	0	0	0	278	41	0	41
14-General Forest	4,025	3,616	3,893	3,893	3,893	0	2,771	3,576	0	3,575
TOTAL	5,544	5,544	5,544	5,544	5,544	5,544	5,544	5,544	5,544	5,544
TOTAL UNDEVELOPED (MA 1-9)	277	810	810	810	810	5,544	1,984	1,130	5,544	1,131


Figure C-1i
RARE II AREA 6178
Briggs
N
T36S
T37S
R9W
R8W
RARE II Area -- 1979
Roadless Area -- 1988
0 1/4 1/2 1
MILES

BRIGGS No. 6178

(5,544 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Briggs Roadless Area was inventoried for study as a potential Wilderness during the RARE II process At the time it contained 5,762 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979. Since that time it has been reinventoried to contain 5,544 acres. The entire area is National Forest System land

The Rogue-Illinois Land Management Plan (FEIS, 1979) encompasses the Briggs area. The entire Briggs area was allocated to Coordinated Resource Management to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features.

Readers are directed to the Land Management Plan for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since the completion of this Land Management Plan, all project activities have been analyzed under it's direction and NEPA requirements/process

CHANGES BETWEEN DRAFT AND FINAL

During the period from 1984 to 1988, the Onion Bowl Timber Sale in the southern portion of the area changed the inventoried status by approximately 200 acres (Refer to Figure C-1i). **Note:** Approximately 500 acres of the Chinaman Hat Timber Sale (1985) was not deleted from the unroaded portion west of Red Dog Creek during the 1988 inventory update. This adjustment would be applicable to all alternatives; the change is not shown on the map (Figure C-1i). The remainder of the area is as previously described.

LOCATION AND ACCESS

The Briggs area is located in Josephine County, Oregon, approximately 20 miles west of Grants Pass, and contains a portion of the Briggs Creek drainage which is tributary to the Illinois River. The Briggs area is accessed from the north by the Flat Top Road, from the east by the Onion Creek and Swede Basin roads, and from the south by the Six Mile Road. These roads are multi-purpose routes serving timber hauling, recreation, and administrative traffic.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is in the coast range mountains (Klamath Mountain Geologic Province) and is typical of the eastern portion of the Siskiyou National Forest. The ecosystem is predominately mixed conifer with an intermingled mixed evergreen type. The topography is characterized by steep slopes, sharp ridges, and numerous small drainages. Elevation varies from about 1,500 feet to 3,860 feet

Part of the area is well forested. Average annual precipitation varies from 70 to 100 inches. Douglas-fir, sugar pine, and tanoak occur on soils derived from diorite and metavolcanics. Unproductive and relatively barren serpentine derived soils also occur There are proven deposits of critical and non-critical minerals present in the area

Soil and landtype features are highly diverse. The Red Dog Creek area contains moderately deep, generally productive soils in midslope areas; however, much of the area is in the serpentinite-peridotite parent material which is either low in productivity or unsuitable for the production of timber. Toe slopes are oversteepened and show evidence of numerous debris slide activity, especially in areas of stream undercutting. The lower Briggs area contains very steep convex slopes and soils are generally very thin and extremely rocky. Large inputs of rock and talus are annually deposited into the stream system. The Granite Creek, Elkhorn Creek, Waterdog Creek, and Onion Creek drainages contain some productive deep soils along benches throughout these areas However, the majority of the soils have low to moderate productivity, a function of serpentine influence and high surface rock fragment contents. Contacts between serpentine and other geologic types, and abrupt changes vegetation and slopes nassociated with previous mass movement activity are common.

A variety of wildlife species utilize the area Briggs Creek is an important anadromous fish stream. While no known threatened or endangered species inhabit the area, a few sensitive species have been identified These are the northern spotted owl and western sophora (*Sophora leachiana*), a sensitive plant. The spotted owl is associated with the old-growth timber stands. Uncommon plants present are *Darlintonia californica* and *Lilium vollmeri* Other sensitive and uncommon plants are likely to be found in the area, the area has not been extensively inventoried.

RESOURCE USES

Mineral development has occurred over much of the area in past Small dredging and panning for gold are currently being operated in Briggs Creek and several tributaries. Big game hunting takes place primarily on the fringes of the area. Briggs Creek receives light fishing, but is limited by access. Recreational use is light. The Briggs Creek and Red Dog trail system is currently maintained and provides good access along the streams.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The appearance of the Briggs watershed is one of a steeply incised valley primarily covered with conifer vegetation. The western portion of the area does contain a broad ridge of serpentine soil with open or low brushy areas. The stream bottoms are generally more heavily timbered than the ridges

The area is surrounded by roaded areas and associated timber harvests on all sides but the southwest corner. The Kalmiopsis Wilderness is located approximately four miles west Briggs Valley and Big Pine Campground are two miles to the northeast.

Primary attributes of Briggs are the main streamcourse with the associated trails and fisheries. The serpentine bands contain unusual plant life and open, interesting landforms.

CAPABILITY

MANAGEABILITY

The area is irregular in shape and form. Much of area's character can be easily maintained and protected. The location does not allow for the complete screening from the sights and sounds of development activities of adjacent lands, however the interior portions of the area would be well screened.

Risk of wildfire is low to moderate from lighting Dense fuels and heavy use of roads on the boundary present a management situation where considerable loss of resources and character of the setting could be greatly altered The risk from miners and recreationists is moderate Control of a wildfire situation would be relatively easy due to adjacent excellent road access.

Mining activity may affect the character of the area. Claims have existed in the area for nearly a century and mineral examinations indicate that gold and chrome are available.

NATURAL INTEGRITY AND APPEARANCE

Human influences have had limited impact on the natural appearance or long-term ecological processes of the Briggs area. The area has considerable history of fire and mining activity Fire has been a key to the long-term ecological changes and vegetative succession. Mining has had an impact on the area's naturalness Examples of past hydraulic mining can be seen in most of the drainages. Old piping and other remnants of the activities can be seen today. Most of the streambanks have revegetated partially or totally since the original hydraulic activities Some mining roads are in the area, but are revegetating

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The broken topography and dense vegetation provide natural screening and the opportunity for localized solitude and primitive experience. Overall opportunity is judged as low to moderate because of the area's small size. Both size and the inferior position (physically lower) of the core of the unroaded area limits external sights and sounds. Detractions from a totally primitive experience would be noise, dust, mining activities, and some view of adjacent activities.

Use of the area as a quality primitive setting is limited due to the density of vegetation and steepness. Trails exist to promote access to the interior and sufficient openings exist on many of the ridges to permit cross country foot travel. Most of the unique, interesting or challenging features exist along the higher ridges and alongside Briggs Creek. Due to limited recreation use and physical attributes, entering the area a short distance would provide a feeling of solitude, adventure, and awareness of primitive conditions; however, the experience would not be unique or particularly memorable.

Recreational usage is highly dispersed. The unconfined types of recreation are camping, hunting, fishing, hiking, and other forms. If the established trends in recreational activity remain the same, use would be expected to increase. A greater increase is not expected because of the area's inherent characteristics.

SPECIAL FEATURES

The area is quite typical of many other places in southwest Oregon and contains no special features which would enhance its value.

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

Undeveloped. The opportunity for measurable change in type or use is limited, although there is some potential for increase in total use. Increased trail maintenance and construction could increase visitor days.

Developed. The potential for increase in visitor use is greatest under a roaded environment where opportunities for both motorized and non-motorized forms of recreation are possible. Capacity is not likely to be exceeded.

Wildlife

Under unroaded conditions, wildlife would remain essentially unchanged unless specific management practices such as habitat improvement and prescribed fire were implemented. As development occurs, deer and elk populations will increase as a result of an increase in forage Populations of old-growth

dependent wildlife would likely decrease in number. Considerable vegetative variety and area would remain along streams and on land unsuitable for timber management to provide old-growth habitat. Sensitive species would be protected through applicable standards and guidelines.

Fisheries

The anadromous steelhead and salmon fisheries are extremely important to Rogue River recreation and commercial businesses Briggs Creek provides valuable spawning and rearing habitat for steelhead, resident trout, and a few salmon Enhancement of fishery habitat has considerable potential to increase juvenile yields. This opportunity would be enhanced by improved access

Water

Other than mining ditches and mine buildings, there are no man-made improvement or diversions. There have been two proposals in the last decade to create dams on Briggs Creek. These proposals were for hydroelectric power and recreation. Both proposals have been just outside the unroaded area, but would have had impacts on it. The greatest demand for water has been in maintaining the summer stream temperatures for fisheries.

Livestock

There are no grazing allotments; none are anticipated.

Timber

The area contains approximately 4,070 acres of land tentatively suitable for the production of timber. Standing volume is estimated at 61 MMBF. Productivity is moderate. The area is reasonably stable and can be harvested using logging systems in common use on the Forest without adverse consequences. Because of heavy vegetative competition and steep slopes, management for timber production would need to utilize various methods to reduce brush competition for release of crop trees.

Energy and Minerals

There has been extensive mineral exploration for gold, and to a lesser extent chromite. Energy exploration has been low or nonexistent. If the area is developed, mineral development would increase, especially on the stream benches.

Cultural

Most activity has centered on historical mining activity, which includes Chinese mining. There are remnants of an old tramway which which crossed the area Historic and prehistoric sites will be evaluated and provided for under applicable laws and regulations. The archeological potential is moderate.

Land Use Authorization

None are existing or expected.

MANAGEMENT CONSIDERATIONS

Ownership, including subsurface rights held by others, is not considered a problem. Fire remains the most serious management consideration. The potential for major conflagrations definitely exists The potential for insects and disease outbreaks within the coniferous forest exists. However, actual occurrences have been minor and localized. Natural factors and management actions have substantially reduced this threat.

NEEDS

OTHER AREAS AND PUBLIC USE

Within ten miles of the Briggs area exists the Kalmiopsis Wilderness and the Wild and Scenic Illinois River Recreation use of the unroaded areas and Wilderness is light considering the acreage involved The major use of these areas is concentrated along the trails and waterways. Major population areas are six to ten hours away by automobile. Local users from Grants Pass and Medford are about one to two hours away and are the more likely users of the area due to limited outstanding or high quality features.

ECOSYSTEM REPRESENTATION

The major ecotypes within the Briggs area are well represented in the nearby Kalmiopsis Wilderness.

PUBLIC INVOLVEMENT

Both the public and the Forest managers have had considerable interest and concern for the existing and future management of these larger unroaded tracts of land. For this specific area, involvement in evaluation of alternative management options for Briggs began in the early 1970's. Between 1977 and 1979, the RARE II process was being finalized. Since RARE II, the area has been reevaluated several times through site specific project planning and broader area analyses. In the current Forest Planning process, the unroaded area question has remained a major issue. The analysis included herein is a compilation of information beginning with early public scoping in 1979 to public meetings and workshops through 1985.

Public input on several of the Forest's inventoried roadless areas has been extensive Briggs, however, has not received the same intensity of concern or advocation of protective status as several adjacent areas. Local and State governments that responded have cited effects on the local economy and community stability, loss of timber receipts, and multiple uses that would be foregone if the area remains undeveloped. The majority of respondents voiced the same reasons. Local citizens have not suggested Briggs as an area to be maintained as roadless or recommended for Wilderness inclusion. Few environmental groups have taken any position on this area for selection based on its unroaded attributes.

Since 1986, public and other agency input has not surfaced any additional substantive concern or desire for an unroaded allocation of this inventoried area. Comments received on the Forest Plan DEIS in 1987 and 1988 also have not added any new insight or concerns as to management of this unroaded area.

ENVIRONMENTAL CONSEQUENCES

The Briggs Roadless Area has abundant mining activity dating from historic times to the present. Evidence of Chinese mining from the late 19th century exists. The potential for archaeological resources is moderate, with the higher probability being along the Briggs Creek drainage.

SIGNIFICANT EFFECTS

Cultural Resources

Alternatives which development all or part of the area require intensive cultural resource inventory along any proposed road prior to approval. In this way, sites that may exist in the project area can be evaluated Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is summarizes the estimated mineral potential and accessibility limitations for Briggs The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

Access Restrictions	Mineral Potential (Acres) High	Moderate	Low	Total
Withdrawn	-	-	-	-
High	-	-	-	-
Moderate	-	-	-	-
Low	2,000	3,500	-	5,500
Total	2,000	3,500	-	5,500

Improvements

Roads The 4,070 acres of tentatively suitable land could generate about 17 miles of new road for timber harvest All would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use depending on alternative; other roads would be open to only high clearance vehicles or closed between projects. Roads for other purposes would be minor, but some mining roads could be expected. The following table shows road mileage by alternative.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A and B	17	4	6	7
C	17	3	7	7
D	17	5	5	7
E and M	0	0	0	0
G	15	0	6	9
K and S	17	4	3	10

Alternatives E and M would have minimal effect on this area as no roads are built. All other alternatives would be mostly roaded, except for some Supplemental Resource areas in Alternative G. Alternatives G, K, and S would close 60 percent of the roads.

The road system would follow ridges off the main roads on the boundary and build midslope roads as the ridges steepen to reach timber units. The midslope roads would cross small creeks and draws, but none of these are inhabited by fish where crossed. None of the roads would be expected to cross Briggs Creek, but the crossing would be possible if ties to other system roads are needed Some full bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites New roads would not have a visual impact from the Illinois River nor from Briggs Valley, but logging and associated roads would be seen from portions of the Briggs Valley Road to the east, a distance of five miles or more Access would be provided for timber management, roaded recreation, and fire suppression

Trails None of the alternatives provide for construction of trails. Existing trails are retained.

Developed Recreation Sites. No recreation sites proposed.

Wildlife and Fish Habitat Structural Improvements. No sites are specifically identified for structural improvements Alternatives that provide development would facilitate access for installations and maintenance Alternatives E and M retain the existing access limitations.

Wilderness Potential

This area and the Kalmiopsis Wilderness are similar in character and recreation opportunities The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 3,200 acres, and a Semi-primitive Motorized experience on the remaining 2,300 acres Carrying capacity for the area is estimated at approximately 8,200 RVD's. This figure is high since Roaded Natural and Semi-primitive Motorized coefficients were developed based on the assumption of presence of roads Current use is low (300 RVD's annually) and is expected to remain low over the planning period.

The roadless area is near the Kalmiopsis Wilderness, but is not contiguous Maintenance of the roadless area would expand the carrying capacity for Semi-primitive recreation opportunities However, the quality of the experience is suspect due to the close proximity of roads and management activities and the likelihood of similar activities in the future.

Access is limited to trails adjacent to the streams. No new trails are programmed for construction due to the low levels of use reported in the area. Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning period.

All alternatives, except E and M, provide for development. Semi-primitive recreation opportunities currently available would shift to the motorized end of the opportunity spectrum. The change in the character of the landscape would result in the loss of Wilderness potential in the area. Alternatives E and M allocate the area to roadless management objectives and maintain the availability of roadless recreation opportunities. Wilderness potential is maintained

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	5,500	5,500	5,500
G	0	0	0
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

The area is located within the viewshed adjacent to the Illinois Wild and Scenic River, however, it is not readily seen from the river and therefore has little effect on the area's visuals. Briggs Creek flows into the Illinois River and is considered important with regard to contribution of high quality water to the beneficial uses of the Illinois Wild and Scenic River. Allocation of the area to roaded or unroaded management will have no effect on the management of the designated Wild and Scenic River, but will have a very limited effect on the recreation settings in the adjacent viewshed and quality of the recreation experiences.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated with Alternatives E and M because no soil disturbing activities will occur All other alternatives assign all or part of the area to Management Areas which permit timber harvest and road building. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

A large proportion of the soils in the roadless area have a high hazard potential for road-related impacts and are less sensitive to regeneration-related impacts Some of the most severe hazards related to roads are located within areas inventoried as unsuitable for the production of timber; thereby, the need for road access is eliminated Alternatives NC, A, A-Departure, B, C, D, D1, K, and S have a slight to moderate risk of impacting the soil, water, and fish resource, especially where activities may be planned on the lower one-third of the slope. Alternative G poses slightly less risk because road construction is reduced.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

In the Briggs Creek area, fuels are light to moderate with a large amount of continuous brushfields Timber is scattered in pockets throughout the area. In the serpentine areas, fuel and brush loadings are lighter and less continuous In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. The result is higher suppression costs and increased resource losses. In a developed scenario, the fire hazard increases at the time of timber harvest. As fuels are treated, the fire hazard is reduced Over time, the continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives E and M, all of the area would remain undeveloped with fuels remaining continuous over the entire area In Alternative G, 55 percent of the area would be developed creating a mosaic of fuels over time, while the remaining undeveloped area would be in three separate blocks Alternatives NC, A, B, C, D, K, and S would develop approximately 65 to 78 percent of the area. Remaining undeveloped areas would be in one block In all alternatives, some of the high priority natural fuels accumulations will be treated

In undeveloped areas, the risk of ignition is low due to the low levels of human use As development occurs, risk increases with road construction and timber harvest, and with the treatment of the activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases with an increase in the risk of human-caused fires. Both developed and undeveloped areas will have similar risk levels for lightning fires

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access In Alternative G, industrial operations would result in increased risk over 55 percent of the area, and risk from public use would be increased along the 15 miles of road. In Alternatives NC, A, B, C, D, K, and S, industrial operations would result in increased risk over 65 to 78 percent of the area, and risk from public use would be increased along the 17 miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical areas or RNA's are proposed. At least one sensitive plant is known to exist in the area. Under all alternatives, sensitive plants will be protected through application of appropriate Standards and Guidelines.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning To determine the impacts of each alternative, only the effects of prescribed burning is considered The effect of smoke is a temporary reduction in visibility in an area. The total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP. All other alternatives would produce 15-19 tons of TSP per year.

Based on past performance, the probability of a smoke intrusion from burning in the area impacting Grants Pass or Medford, both designated areas for air quality, is very low. The probability of impacting the Kalmiopsis Wilderness, a Class I area, is very low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. The area is not considered habitat for bald eagle or osprey. These birds may occasionally overfly the area near the mouth of Briggs Creek (an active osprey nest is in this general area of the Illinois River).

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This would be especially true under Alternatives A through D1, K, and S which meets Management Requirements (MR's) for mature/old-growth dependent wildlife species, but otherwise assigns most of the area to development Alternative NC does not meet MR's; it contains no habitat allocated for wildlife species using mature/old-growth forests.

Except for Alternative NC, one habitat enclave for spotted owl has been established in the Onion Creek area to meet MR's for old-growth forest habitat (this is one of the best habitat sites on the Forest--data has been gathered here continuously since 1974). At present this area supports approximately two or three pairs of spotted owls; there would be no change under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels in all other alternatives In Alternative NC, habitat would eventually be reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent under Alternatives E and M.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase in alternatives which open up much of the unroaded area to development (all alternatives except E and M). Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats. No meadows are known; 70 acres of rock bluffs are identified. Rock areas are allocated to wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC through D1. Riparian areas would continue to serve as valuable habitat. Alternative G, which manages the area under a Riparian Prescription C and assigns Briggs Creek to Supplemental Resource, comes close to maintaining natural conditions

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the roadless area are somewhat below average. Fewer hunters use unroaded areas and non-hunters generally stay on the few trails. Alternatives E and M produce fewest WFUD's; other alternatives generate more.

Visual Resource

The current inventory indicates that the area is located where it is not visible to major recreation travel routes or use areas. The area consists of approximately 300 acres of Partial Retention and 5,200 acres of Modification The Partial Retention objective was assigned in response to recreation use on the Flattop Road and the unique variety in the character of the landscape relative to the rest of the Forest. Viewer sensitivity is low, as indicated by the low levels of recreation use attributed to the area.

Alternatives NC, A, and A-Departure would assign the area to management under inventoried visual objectives. Since the majority of the area is inventoried as Modification, this would change the existing natural appearing character to a modified (altered) forest setting within the first two decades.

Alternatives B, C, D, D1, and K assign the area to management under the modification visual objective Alternative S would allocate nearly all of the unroaded area to the Modification objective. The existing natural appearing character would become a modified (altered) setting within the first two decades.

Alternatives E and M would be managed to achieve the Preservation objective. The natural appearance of the area would be maintained over the planning period.

Recreation Settings

The area is influenced by the sight and sound of motorized users. Recreation use in the area is very light and originates from local communities for the most part. The isolated location will limit the ability of the area to provide a quality non-motorized recreation experience whether the area is maintained in a roadless condition or not. The area could provide 2,200 acres of Semi-primitive Non-motorized opportunities if the existing trail system were closed to motorized uses

All alternatives, except E and M, would allocate the area to development, resulting in the shift of Semi-primitive recreation opportunities to the motorized end of the opportunity spectrum. Access to the area and motorized opportunities would be enhanced as roads into the area are constructed

Alternatives A, A-Departure, B, C, D, and D1 would retain the essentially undeveloped character on 800 acres, and Alternatives K and S on 1,100 acres due to allocation to Designated Wildlife Habitat. Alternative NC would essentially develop the entire area Alternatives G would retain the undeveloped character on 2,000 acres due to allocation to Supplemental Resource and Designated Wildlife Habitat areas These

areas may or may not be contiguous, so the integrity of the area would be compromised by the presence of motorized activities (See **Wilderness Potential**).

Alternatives E and M would maintain the area in its current status with recreation capacities fixed since no new trail construction is programmed.

Economic and Social

There are 4,070 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,544 acres of the Briggs Roadless Area is 0.22 MMCF. The estimated LTSY would be 0.41 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and D1	21	39
A, A-Dep, C, D, K, and S	.19	35
B	.23	.42
E and M	00	00
G	.14	26

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E and M have a reduction in the timber and road expenditures. The other alternatives have insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while the other alternatives have little or no change in the number of jobs, amount of income, and size of payments to the counties Alternatives NC, B, and D1 have slightly greater benefits than Alternative A.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities (See FEIS Chapters III and IV). The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E, fishing interests are predicted to feel positive about forest management while mining interests would tend to feel the forest is not listening to their needs. Such gains and losses may create additional conflict.

Effects (Changes Compared to Alternative A)	Alternatives		
	E and M (Unroaded)	G	NC, A, B, C, D, K, and S (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Little Change	No Change
Indirect Effects			
Jobs	-17	-5	0
Annual Income (MM $)	-0 40	-0 11	0
Annual Payments to Counties (MM $)	-0 09	-0 03	0
Cumulative Effects			
Social Attitudes of Local and Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old Growth	+	+	0
Mining	-	0	0

MITIGATION MEASURES

No additional mitigation measures have been identified.

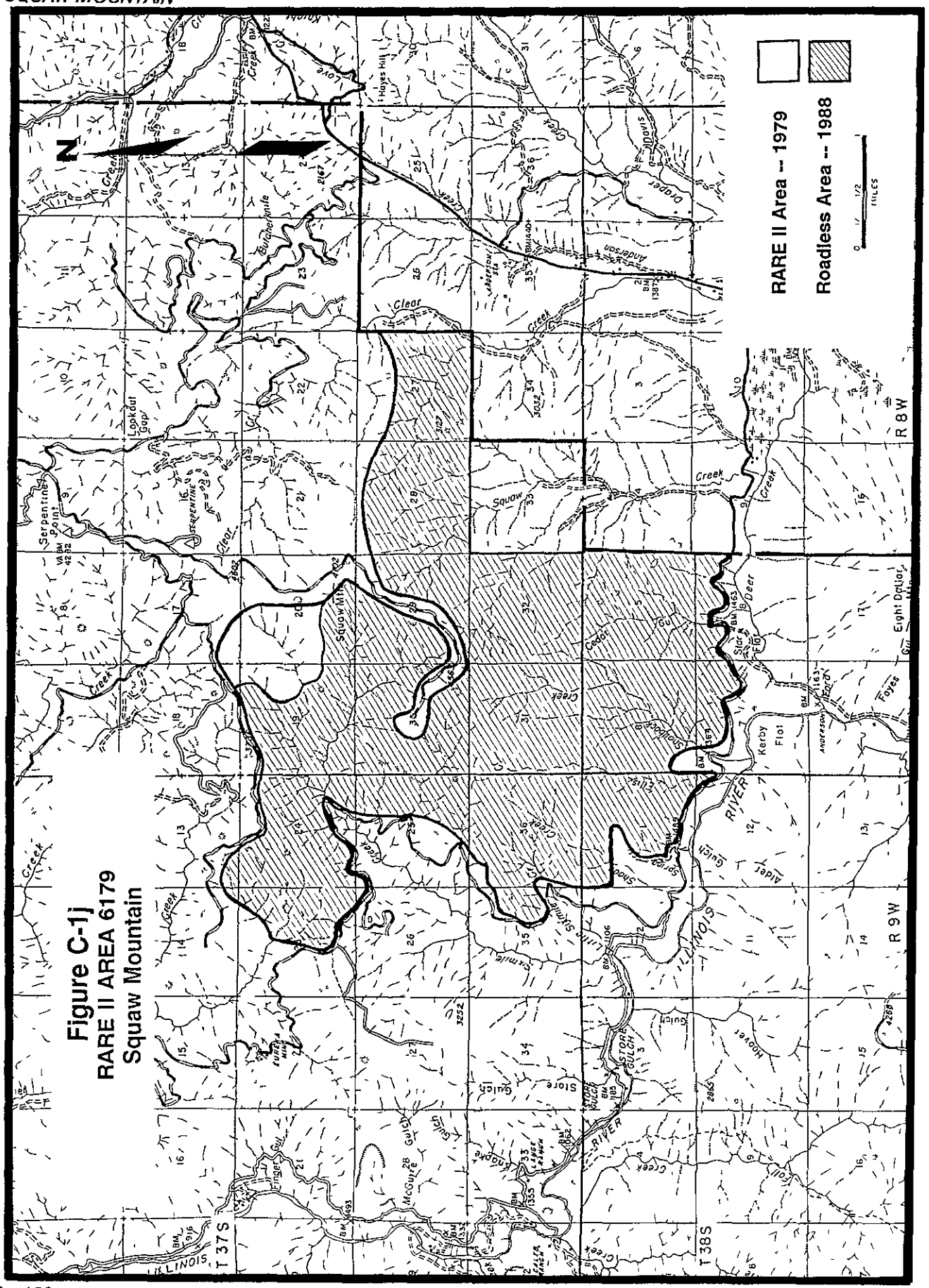
POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No additional conflicts with other jurisdictions have been identified.



Table C-5j. Squaw Mountain Roadless Area No. 6179 (7,704 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	442	0	442	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	7,704	0	0	7,262	0
7-Supplemental Resource	0	0	0	0	0	0	0	0	0	0
8-Designated Wildlife Habitat	0	390	390	390	390	0	860	849	0	390
9-Special Wildlife Site	0	0	0	0	0	0	421	521	0	981
10-Scenic/Recreation River	53	53	53	53	53	0	48	48	0	48
11-Riparian	1,067	976	976	977	976	0	827	850	0	850
12-Retention Visual	476	476	476	0	476	0	331	454	0	454
13-Partial Retention Visual	3,207	2,912	2,912	3,387	2,912	0	2,404	2,543	0	2,543
14-General Forest	2,901	2,897	2,897	2,897	2,897	0	2,371	2,439	0	2,438
TOTAL	7,704	7,704	7,704	7,704	7,704	7,704	7,704	7,704	7,704	7,704
TOTAL UNDEVELOPED (MA 1-9)	0	390	390	390	390	7,704	1,723	1,370	7,704	1,371


RARE II Area -- 1979
Roadless Area -- 1988
Figure C-1j
RARE II AREA 6179
Squaw Mountain
T 37S
T 38S
R 8W
R 9W
ILLINOIS RIVER
Squaw Mtn
Lookout Gap
Serpentine Point
Hayes Hill
Kerby Flat
Eight Dollar Mtn
Squaw Creek
Clear Creek
Cedar Creek
Store Gulch
McGuire Gulch
Finger Gulch
Silver Creek
Hooker Gulch
Alder Gulch
Butcherknife Creek
Anderson Creek
Davis Creek
Draper Creek
Foyes Creek
Deer Creek
Lower Creek
Serpentine Creek

SQUAW MOUNTAIN No. 6179

(7,704 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Squaw Mountain Roadless Area was inventoried for study as a potential Wilderness during the RARE II process The original inventoried area contained 8,064 acres and was allocated to non-Wilderness use by the RARE II decision in January, 1979. Since then, timber sale activity has reduced the unroaded portion to 7,704 acres. The entire area is National Forest System land

The Land Management Plan for the Chetco-Grayback Planning Unit (FEIS, 1979) encompasses the Squaw Mountain area Management direction allocated most of the area to Coordinated Resource Management to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features.

Other management direction provides for a Scenic River corridor on the Illinois River to be generally managed to meet Scenic River objectives. This part is now under the River Management Plan direction for the designated Illinois Wild and Scenic River (1984).

Readers are directed to the Land Management Plan for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since the completion of this Land Management Plan, all project activities have been analyzed under it's direction and NEPA requirements/process

CHANGES BETWEEN DRAFT AND FINAL

Between 1984 and 1988, the inventoried area was reduced as a result of timber sale activity north of Squaw Mountain.

LOCATION AND ACCESS

The Squaw Mountain area is located in Josephine County, Oregon, and includes several small drainages of the Illinois River adjacent to the Forest boundary in the Illinois Valley. It lies approximately four miles northwest of Selma, Oregon The area is bordered by the Illinois River Road on the south, the Six Mile Road on the west, the Snailback and Spalding Mill Roads on the north, and the National Forest boundary on the east The Illinois River Road is a multi-purpose route, serving heavy recreation, timber hauling, administrative and some residential traffic.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is on the northwestern side of the Illinois Valley in southwestern Oregon. Elevation varies from about 1,500 feet near the Illinois River Road to 4,702 feet on Squaw Mountain. Topography is very mountainous with steep slopes and deeply incised canyons

There is a major geologic contact that bisects the area into two major bedrock types. The northwest half of the roadless area is of the Jurassic-Galice formation; the southeast half is from a serpentine and peridotite intrusion. The vegetation strongly reflects differences in geology. On the Galice Formation,

Douglas-fir is the primary conifer species, but incense-cedar, Port-Orford-cedar, sugar pine, Jeffery pine and some knobcone pine can be found. Tanoak, Pacific madrone, and canyon live oak are major hardwood species. On serpentine-peridotite derived soils, Jeffery pine is the primary conifer; major hardwood species are white oak and canyon live oak.

The serpentine area contains extremely clayey soils that are often poorly drained Some deep-seated soil creep is evident on the lower one-third of the slope. High intensity storms often result in heavy runoff and the occurrence of numerous springs at the soil surface. The location of these springs is often variable from year to year. Soils derived from the Galice Formation have better drainage and productivity Inclusions of extremely rocky soils are present in some locations and have decreased productivity and a higher occurrence of brush species. Landslide activity levels are not particularly high in the roadless area, although some evidence of debris slide activity does occur along the contact between serpentine and metavolcanic parent materials.

Average annual precipitation varies from 50 to 70 inches; dry season rainfall (May through September) averages around 7-8 inches Summer temperatures often exceed 100 degrees Fahrenheit.

A variety of wildlife species utilize the area, including of black-tailed deer. The lower elevations are important winter range. The serpentine areas contain large numbers of Jeffery pine snags; pileated woodpeckers are frequently sighted here.

No known threatened or endangered species of animals or plants are known to inhabit the area; however, there are a number of sensitive and uncommon plants growing on the serpentine soils. Serpentine drainages, such as Snailback Creek and Cedar Gulch, are dotted with seeps and wet spots which harbor a variety of rare plants

RESOURCE USES

The geologic contact zone is mineralized and there has been mining activity in the past. Limited exploration and assessment work is continuing today. Although some mineralization does occur, it does not appear that the deposits are of commercial value.

Permitted livestock grazing has occurred in the past. There has not been a demand for this allotment in the past 15 years.

Recreational use is, at best, occasional and of a "cross country" type. The one nonsystem trail is low standard and has not been maintained for many years. While use figures are not collected for the more random recreational activities, estimates would place Recreation Visitor Days (RVD) in the low range.

APPEARANCE, SURROUNDINGS, AND ATTRACTIONS

The look, or outward aspect, of the Squaw Mountain area is that of a series of six small drainages facing into the Illinois River. It lies north of the junction of Deer Creek and the River. Distinguishing features are primarily those of heavily vegetated, steep, and highly dissected upper slopes. Lower slopes are sparsely vegetated, typical of the serpentine areas.

Conditions surrounding Squaw Mountain do not vary greatly. Vegetative type and landform is consistent Man's activities have modified the environment to the southwest near Selma; local areas have been accessed for mining, timber harvest, and other purposes.

Influences most predominate in this area are activities and development in the Selma area, the Illinois River, and Eight Dollar Mountain to the south The southwestern edge of the area overlaps (for two miles) the Scenic segment of the Illinois River.

The area does not contain any unique or special features that set it apart from the surrounding area It does contain several small perennial streams and one waterfall in the headwaters of Snailback Creek that is quite spectacular during high water.

CAPABILITY

MANAGEABILITY

The Squaw Mountain area is bounded by roads, private land, the National Forest Boundary, and a ridge. To effectively manage and protect the unroaded characteristics, the following would have to be resolved: Several access points to the area through private land are not controlled by the Forest Service; existing roads and trails would have to be closed to motorized vehicles; plans exist for a timber sale in the northern portion and roads have been constructed; and off road motorbikes could enter the area in several places.

NATURAL INTEGRITY AND APPEARANCE

Human influences have not had a noticeable impact on the natural appearance or the long-term ecological processes of the disturbances. Past fire and grazing have undoubtedly altered the species composition on the area, but natural balances have been re-established and are operating.

The evidence of old mining roads, waste dumps, adits, and equipment is recognizable, but not obtrusive, to the roadless character. Although small scale, there are fresh tailings dumps, new excavations and motorbikes being used within the area.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

Solitude can be found in the canyons and other areas that limit vision and hearing to the immediate surroundings. When on the ridges or hillsides, the sparse vegetation allows frequent views of roads, developed residential areas and agricultural activities. The center of the area is only four miles from the community of Selma and U.S. Highway 199, so noises are obvious unless in a locally protected environment Recreationists seeking solitude would probably not utilize the Squaw Mountain area because other nearby areas offer much greater opportunities for both solitude and a wilderness experience. Present recreation use is very light and limited to a few hearty hikers, hunters, prospectors or those involved in nature study.

SPECIAL FEATURES

The area is quite typical of many other places in southwest Oregon and contains no special features which would enhance its value.

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

Characteristics of the area are low to moderate in quality for recreation. There is virtually no use of the area for recreation purposes at this time. An unroaded designation would provide less than 200 RVD's (current use); expected increase in use would be less than the trends due to the inherent nature of the area Roaded, there would be increased use in motorized forms of recreation, particularly in fall hunting

Wildlife

Under unroaded conditions, wildlife would remain essentially unchanged. With development, the greatest change would be in increased numbers of deer. Varying stages of vegetative habitat over time would promote expansion of existing herds. Populations of old-growth dependent wildlife would decrease They would not be eliminated, however, because considerable undisturbed habitat will remain in areas determined unsuitable for timber management, in stream gorges, and within much of the Illinois River corridor.

Sensitive Plants

The area offers the casual visitor or botanist a unique experience. There are a number of sensitive and uncommon plants growing on the serpentine soils. Pitcher plants (*Darlingtonia*) are common The following list is a beginning; future inventories will undoubtedly bring new discoveries:

Sensitive Plants	Uncommon Plants
Allium bolanderi	*Arabis aculeolata*
Arabis koehleri var. stipitata	*Castilleja elata*
Balsamorhiza sericea	*Castilleja brevilobata*
Cypripedium californicum	*Darlingtonia californica*
Gentiana bisetaea	*Dicentra formosa ssp. organa*
Lewisia leana	*Horkelia sericata*
Lewisia oppositifolia	*Lilium vollmeri*
Thlaspi montanum var. siskiyouense	*Lomatium howellii*
	Phacelia corymbosa
	Sarcodes sanguinea
	Sidalcea malveflora ssp. elegans

Fisheries

The anadromous fisheries of the Illinois River are extremely important. The tributary streams are generally blocked to fish passage by steep gradients and do not support a fishery; they are also quite small and dry up in the late summer period Their incremental contribution of cool, clear water, though, is beneficial. Roaded or unroaded, there would be little impact.

Water

There are no impoundments or diversions either existing or proposed The potential for small hydroelectric power development does exist on the small tributaries for the periods of flow Water quality aspects are important to the fisheries and recreation use of the Wild and Scenic Illinois River

Livestock

The grazing season is very short and forage has low nutrient value Future demand for grazing is not expected.

Timber

The Squaw Mountain area contains 3,533 acres of land tentatively suitable for the production of timber. Standing timber volume is estimated at 63 MMBF. Site productivity is low to moderate. The area is reasonably stable and could be harvested using logging systems and road construction methods in

common use on the Forest The area is in a portion of the Forest that usually requires release treatments to maintain the growth of crop trees. If managed for timber production, a full range of treatment methods should be available.

Energy and Minerals

The roadless area does contain some mineral deposits. However, the chance that any commercial mining will take place in this area in the near future is quite remote.

MANAGEMENT CONSIDERATIONS

Land ownership around the perimeter of the area poses some interesting management situations should it be managed as a Wilderness or quality unroaded area. The mining claims may also pose some conflicting situations should development continue.

Heavily used roads and private land around much of the perimeter present a fire risk situation that may require special management attention to retain the unroaded character. While fire is a threat, fuels are generally light next to the roads. But, the potential for a major fire presents itself annually.

NEED

OTHER AREAS AND PUBLIC USE

The Kalmiopsis Wilderness is within 10 miles and the Wild and Scenic Illinois River lies at the foot of the area; both offer similar recreation opportunities, but in much greater quantity and quality.

ECOSYSTEM REPRESENTATION

The ecosystems represented in this area are also represented in surrounding undeveloped areas as well as in the nearby Wilderness.

PUBLIC INVOLVEMENT

Both the public and Forest managers have had considerable interest and concern for the existing and future management of these unroaded tracts of land. For this specific area, involvement in evaluation of alternative management options for Squaw Mountain began in the early 1970's. Between 1977 and 1979, the RARE II process was being finalized. Since RARE II, the area's unroaded attributes have been reevaluated several times through site specific project planning and broader area analyses

Public input on several of the inventoried roadless areas on the Siskiyou National Forest has been extensive. Squaw Mountain, though, has not received the same intensity of concern or advocation of protective status as several adjacent areas. In the current Forest Planning process, the unroaded area question has remained a major issue. Public involvement, beginning with early public scoping in 1979 and continuing with public meetings, workshops, and other contacts into 1985, has not surfaced any additional concern or movement to seek unroaded allocation of this inventoried roadless area. Comments received on the Forest Plan DEIS in 1987 and 1988 also have not added any new insight or concerns as to management of this unroaded area.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Squaw Mountain area is known to have prehistoric and historic sites along the Illinois River. Hunting, gathering and fishing activities by local Indians in pre-contact times in the area have left archaeological remains, most of which require evaluation by a professional archaeologist Historically, mining was the predominant activity in the area

All alternatives, except E and M, call for development which requires intensive cultural resource inventory and site evaluation along any proposed road prior to approval. Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for Squaw Mountain The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	<100	-	<100
High	-	-	-	-
Moderate	-	<100	-	<100
Low	-	7,600	-	7,600
Total	-	7,700	-	7,700

Improvements

Roads. The 3,533 acres of tentatively suitable land could generate about 16 miles of new road for timber harvest. All would be dead-end local roads built when needed to access timber harvest units. Roads for other purposes would be minor, but some mining roads could be expected. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows the expected road mileage.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A and B	16	5	5	6
C	16	3	7	6
D	16	6	4	6
E and M	0	0	0	0
G	16	0	6	10
K and S	16	4	2	10

Alternatives E and M would have minimal effect as no roads are built. All other alternatives would be roaded. However, Alternative G would not maintain any roads open for passenger car use Alternatives G, K, and S would close approximately 60 percent of the roads.

Roads would be located on or near ridges where possible as accessed from the upper road system Some roads would be in midslope positions once ridges became too steep or where shorter reaches for logging

were needed These midslope roads would cross small creeks and draws Some full-bench ground would be crossed with excess excavated material hauled to stable disposal sites. Some of the roads would be visible from the Illinois River; parts may be seen from sections of U.S. Highway 199 and the community of Selma. Access would be provided for timber management, recreation, and fire suppression.

Trails. No trails are planned.

Developed Recreation Sites. None are planned.

Wilderness Potential

The area has been inventoried according to ROS criteria and is capable of providing 2,500 acres of Semi-primitive Non-motorized recreation opportunities and 5,200 acres of Roaded Natural recreation opportunities. The carrying capacity for the area is estimated at approximately 9,000 RVD's This figure is high since the numbers are based on the assumption of the presence of roads. Current use is low (approximately 100-200 RVD's) and is attributed primarily to recreation activities such as hunting The presence of motorized uses on the river and the surrounding road systems would preclude the ability of the area to provide a truly primitive recreation experience. The roadless area is isolated from other roadless areas and designated Wilderness

Access within the area is limited to one unmaintained trail. No new trails are programmed due to the low levels of use. Recreation demand projections indicate that use levels will remain well within the carrying capacity over the planning period.

All alternatives, except E and M, would assign the area to multiple resource management objectives; Semi-primitive recreation opportunities currently available would shift to the Roaded Natural end of the opportunity spectrum The change in landscape character would result in the loss of any Wilderness potential. Alternatives E and M would provide additional capacity for Roaded Natural and Semi-primitive Motorized recreation opportunities. Wilderness potential would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	7,700	7,700	7,700
G	0	0	0
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

As the Squaw Mountain area is located adjacent to the Illinois Wild and Scenic River, much of the area is visible to river users The assignment of the area to roadless management objectives will not effect the management of the Illinois Wild and Scenic River. However, this allocation could have an effect on the quality of the recreation setting near the river. The recreation setting is currently maintained through the use of VQO's which were assigned to the area in response to both the designation of the river as Wild and Scenic and to the high levels of recreation use that occur on the river. Area within the designated Wild and Scenic River corridor is managed to achieve the Retention objective.

All alternatives, except C, would manage the area to achieve inventoried visual objectives, resulting in some modifications in the area as they are entered for timber harvest. The quality of the recreation experience of the river users would be maintained. Alternative C would assign the area outside of the designated Wild and Scenic River corridor to a reduced scheme of visual objectives. This area, inventoried for Retention, would be managed for Partial Retention resulting in visible harvest activities in proximity to river users The quality of the recreation experience of river users would be affected minimally because so little of the area is inventoried for Retention.

Alternatives E and M would be managed under the Preservation objective. This would maintain the natural appearance and the Wilderness potential over the planning period.

Soil, Water, and Fish

No consequences to the soil, water, or fisheries are expected under Alternatives E and M because no soil disturbing activities are planned. All other alternatives assign all or part of the area to Management Areas which permit development. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

The risk of degrading the soil and water resource increases with more timber harvest and road building. The sediment potential for road and regeneration related increases is low. Development alternatives are similar in the amount of soil disturbing activities proposed. Alternatives NC, A, B, C, and D, would have potential for slightly greater sediment outputs. The assignment of acres to development in this area would have slight to negligible effect on the soil, water, and fisheries resources.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels

The Squaw Mountain area is a patchwork of dense timbered stands, grassy areas, and brushfields. In the timbered sites, fuel loadings are light to moderate, and continuous. The areas of brush vary from sparse to dense, with dead fuel loadings generally light. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires Adding to this is the increased response time for initial attack forces due to poor access The result is larger fires, higher suppression costs and increased resource losses In a developed scenario, the fire hazard increases during timber harvest As fuels are treated, the fire hazard is reduced Over time, the continuity of fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives E and M, all of the area would remain undeveloped with fuels remaining continuous over the entire area. In Alternatives G, K, and S, approximately 62 to 71 percent of the area would be developed, creating a mosaic of fuels over time while the remaining undeveloped area would be in 10-13 separate blocks. Alternatives A, B, C, and D would develop approximately 82 percent of the area. The remaining undeveloped areas would be broken into two separate blocks. Alternative NC would develop 86 percent of the area. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In undeveloped areas, risk of ignition is low due to low levels of human use. As development occurs, risk increases with road construction, timber harvest, and with treatment of activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases with an increase in the risk of human-caused fires. Risk level for lightning fires is similar for both developed and undeveloped scenarios.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternatives G, K, and S, industrial operations would result in increased risk over 62 to 71 percent of the area, and risk from public use would be increased along the 16 miles of road. In Alternatives NC, A, B, C, and D, industrial operations would result in increased risk over 82 to 86 percent of the area, risk from public use would be increased along 16 miles of road

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

Portions of two of the Forest's 24 candidate Botanical areas for sensitive plants are within the area: one-half of Squaw Mountain and the "Addition" section of Eight Dollar Mountain. These two sites are allocated as Botanical areas in Alternatives G and M (see Appendix F for more detail on individual sites).

A significant group of sensitive and rare plants are present. Less than 50 percent of the area is tentatively suitable for timber production Most of the sensitive and uncommon plants are restricted to serpentine or peridotite derived soils. These areas are generally not suitable for timber harvest, and other than mining activities by private individuals, will remain relatively untouched between now and the next revision of the Forest Plan. There are no existing or proposed RNA's. Under all alternatives, sensitive plants will be protected by the use of appropriate Standards and Guidelines.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning will be considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E, L, and M would contribute no TSP to the annual total generated on the Siskiyou National Forest. All other alternatives would produce 23-25 tons of TSP per year.

Based on past performance, the probability of a smoke intrusion from burning in the area impacting Grants Pass air quality is very low. The probability of impacting the Kalmiopsis Wilderness, a Class 1 area, is also very low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. The area is not considered habitat for bald eagle or osprey. These birds may occasionally overfly that part of the roadless area near the Illinois River.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under all alternatives except E and M, habitat for mature/old-growth indicator species would be considerably reduced over time. This would be especially true under Alternatives A through D1, K, and S, which meets Management Requirements (MR's) for mature/old-growth wildlife species, but otherwise allocate most of the area to development. Alternative NC does not meet MR's; it contains no habitat allocations for wildlife species using mature/old-growth forests.

Except for Alternative NC, one habitat enclave for pileated woodpecker has been established in the area to meet MR's for old-growth forest habitat. At present, this area probably supports one or two pairs of spotted owls; there would be no change under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels in all other alternatives. In Alternative NC, however, habitat would reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent under Alternatives E and M which maintain roadless status.

Black-tailed Deer/Roosevelt Elk Big game management opportunities would increase in alternatives which open up much of the unroaded area to timber management (all alternatives except E and M). Opportunities for habitat improvement projects for game animals would also be greater.

Wildlife Habitats No meadows are known, however, almost 500 acres of rock-type habitat are located within the area Rock areas are allocated to wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC, A through D. Alternative G, which manages the area under a Riparian Prescription C, comes close to maintaining natural conditions

Wildlife Recreation Use Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are somewhat below average Fewer hunters use unroaded areas and non-hunters generally stay on trails Alternatives E and M, which leave the area in an unroaded condition, produce fewest WFUD's.

Visual Resource

The area has been inventoried based on visibility to major recreation travel routes or use areas. The visual resource inventory is shown as:
888888

VQO	Acres
Retention	650
Partial Retention	3,700
Modification	3,350

All alternatives, except E and M, would assign the area to management for inventoried VQO's. The natural appearance would be modified over time so that feature vistas would present a slightly altered appearance. Alternatives E and M would manage the area to achieve the Preservation objective; natural appearance is maintained

Alternative C would assign the area to a reduced level of visual objectives. Areas inventoried for Retention would be managed to achieve Partial Retention Management activities would be evident to river users in the foreground The natural appearance of the area would shift to a slightly altered-altered appearance as a result of management activities within the first two decades.

Recreation Settings

The area is surrounded by roads, thereby greatly influenced by the sight and sound of motorized users A portion of the Illinois Wild and Scenic River runs through the southern fringe of the area. The physical position of the area might limit it's ability to provide a quality wilderness or primitive experience.

All alternatives, except E and M, which would allow for development create a shift of Semi-primitive Non-motorized recreation to the Roaded Natural end of the opportunity spectrum. Access to the area and motorized opportunities would be enhanced as the area is roaded. Alternatives E and M would maintain the area as unroaded; any Wilderness potential would be maintained.

Alternatives A, A-Departure, B, C, D, and D1 would retain the essentially undeveloped character of the area on 400 acres, and Alternatives K and S on 800 acres due to Designated Wildlife Habitat. The entire area would be developed under Alternative NC. Alternative G would retain the undeveloped character on 1,300 acres due to assignments to Botanical and Designated Wildlife Habitat Management Areas. These areas may or may not be contiguous, so the integrity of the roadless area may be compromised by the presence of motorized activities.

Economic and Social

There are 3,533 acres of land identified as tentatively suitable for the production of timber in this unroaded area The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 7,704 acres of the Squaw Mountain Roadless Area is 0.19 MMCF. The estimated LTSY would be 0.35 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC, A, A-Dep, C, D, and D1	18	.33
B	22	41
E and M	00	.00
G, K, and S	.16	29

For projecting effects, the alternatives are grouped: (1) Alternatives E and M, which leave the area in an unroaded condition; (2) Alternatives G, K, and S, which develop much of the area; and (3) Alternatives NC, A, B, C, and D, which develop most of the area.

The major direct economic effect is government expenditure for the timber and associated road construction program Alternatives E and M have a reduction in the timber and road expenditures. The other

other alternatives have insignificant changes in budget expenditures. Alternative B has a minor benefit as compared to Alternative A

The indirect effects are associated with jobs, income, and payments to counties Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M reduce outputs while the other alternatives have little or no change in the number of jobs, amount of income, and size of payments to the counties.

The cumulative social effects of attitudes of people is summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests.

	Alternatives		
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	NC, A, B, C and D G, K, and S	G, K, S NC, A, B, C, and D (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Change	No Change
Indirect Effects			
Jobs	-16	-2	0
Annual Income (MM $)	-0 38	-0.04	0
Annual Payments to Counties (MM $)	-0 09	-0 01	0
Cumulative Effects			
Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	0	0	0
Wildlife Related			
Hunting	-	0	0
Old Growth	+	0	0
Mining	-	0	0

MITIGATION MEASURES

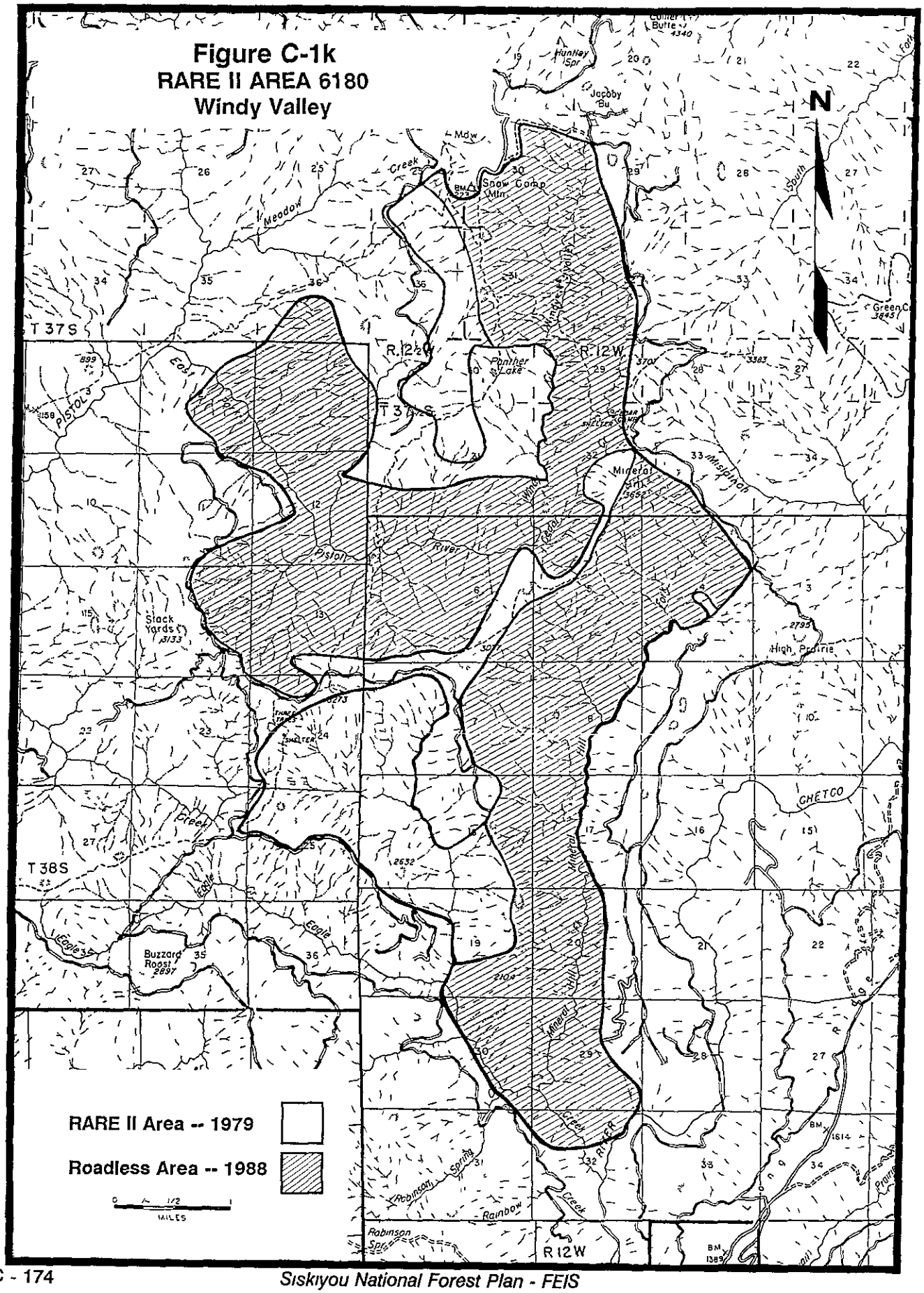
No additional mitigation measures have been identified.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No potential conflicts have been identified.

Table C-5k. Windy Valley Roadless Area No. 6180 (10,214 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	5	5	5	101	107	0	107	128
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	10,113	0	0	10,107	1,813
7-Supplemental Resource	1,936	1,936	27	0	27	0	2,235	1,936	0	0
8-Designated Wildlife Habitat	0	1,088	1,387	1,414	1,387	0	1,847	1,317	0	1,440
9-Special Wildlife Site	5	0	5	5	5	0	0	5	0	234
10-Scenic/Recreation River	101	47	0	0	0	0	37	0	0	47
11-Riparian	1,927	1,482	1,799	1,799	1,799	0	1,028	1,418	0	1,297
12-Retention Visual	12	12	0	0	0	0	11	0	0	0
13-Partial Retention Visual	2,832	2,488	1,223	1,223	1,223	0	2,321	11	0	133
14-General Forest	3,401	3,161	5,768	5,768	5,768	0	2,628	5,527	0	5,122
TOTAL	10,214	10,214	10,214	10,214	10,214	10,214	10,214	10,214	10,214	10,214
TOTAL UNDEVELOPED (MA 1-9)	1,941	3,024	1,424	1,424	1,424	10,214	4,189	3,258	10,214	3,615


Figure C-1k
RARE II AREA 6180
Windy Valley
N
T 37S
T 38S
R.12½W
R.12W
R12W
Snow Camp Mtn.
Panther Lake
Mineral Mtn.
Stack Yards
Buzzard Roost
High Prairie
CHETCO
Pistol River
Eagle Creek
Mineral Creek
Robinson Spring
Rainbow Creek
RARE II Area -- 1979
Roadless Area -- 1988
0 1/2 1
MILES

WINDY VALLEY No. 6180

(10,214 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

Windy Valley Roadless Area was inventoried for study as a potential Wilderness during the RARE II process It contained 13,491 acres at that time and was allocated to non-Wilderness use by the RARE II decision in January 1979. Since that time, road construction and timber sales have reduced the area to 10,214 acres. This activity also cut the roadless area into two parts. The entire roadless area is National Forest System land.

The Chetco-Grayback Land Management Plan (FEIS, 1979) encompasses the Windy Valley area This document allocated 2,413 acres of Windy Valley to dispersed recreation. Management direction for this portion of the inventoried roadless area states that the area will be managed to protect and retain the existing natural qualities, protect and preserve small areas which have exceptional features, to provide opportunities for primitive and semi-primitive recreational experiences and to protect other resources The remaining area adjacent (mostly south in Mineral Hill Fork and west in the East Fork Pistol River) to Windy Valley is allocated to Coordinated Resource Management designed to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features.

A small section of the roadless area within 1/8 mile horizontal distance from the Chetco River is allocated to a Recreation/Fisheries area (synonymous with the Supplemental Resource Management Area) Land within this area will be managed to provide opportunities for a wide range of recreational activities which are river oriented and enhanced by its free-flowing condition NOTE· Because this section is quite small relative to the overall inventoried Windy Valley Roadless Area, specific discussion will be limited Information and discussion of alternative management strategies are provided for in the FEIS.

Readers are directed to the Land Management Plan for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints considered and currently implemented for the area. Since the completion of the Land Management Plan, all project activities have been analyzed under it's direction and NEPA requirements/process

CHANGES BETWEEN DRAFT AND FINAL

The area remains as previously described No activity has occurred between 1984 and 1988 which reduced the inventoried roadless area (Refer to Figure C-1k).

The small portion of the southernmost tip of the roadless area that borders the Chetco River became classified as a Recreation segment under the Omnibus Oregon Wild and Scenic Rivers Act of 1988. Any alternative selected in the Record of Decision and disclosed in the Land and Resource Management Plan will treat this portion alike for its Congressionally designated values.

LOCATION AND ACCESS

The Windy Valley area is located approximately 20 miles northeast of the town of Brookings in southwest Oregon The area lays in the Chetco River and Pistol River drainages The area is surrounded by many

multi-purpose roads used for timber hauling, administration and recreation. The primary roads include the Chetco River, Panther Lake, Eagle Creek, and the Chetco Pistol roads The Cedar Ridge Road bisects the unroaded area.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The physical location of the unroaded area is on the western side of the coast range (Klamath Mountain Geologic Province) in southwestern Oregon Elevation ranges from about 1,000 feet to 4,200 feet on Snow Camp Mountain,;and between 300 and 3,650 feet in the southern part. Topography is mountainous with steep slopes and deeply incised canyons.

The area is well timbered with a mixed evergreen forest. Douglas-fir is the primary conifer species with Port-Orford-cedar, knobcone pine and white pine making up secondary components. Associated hardwood species include tanoak and Pacific madrone intermixed with the conifers. A dense understory of brush species is also present over most of the area.

Soil conditions, productivity, and hazards are highly variable within the area Soils in the area above Windy Valley are generally low in productivity, extremely cobbly, and derived from serpentine and peridotite parent materials. In contrast, coluvial soils derived from sedimentary rocks and alluvial soils at the valley floor are quite productive. No significant slide activity is occurring in this portion of the area.

Soils in the Pistol River portion of the area are generally deep and productive, formed by ancient landflow activity. Although some channel instability is evident along the Pistol River, the rate of activity has not been great The Mineral Hill portion, on the other hand, has experienced frequent, massive debris slide activity. Slopes are unstable with areas undercut by stream meanders and areas of water concentration receiving the most mass movement Much of this area has been removed from lands suitable for timber production due to the high mass instability hazard.

Average annual precipitation ranges from 130-150 inches per year. All but 12-15 inches of precipitation falls between October and April. The climate is mild and heavily influenced by marine air. Summer temperatures often exceed 80-90 degrees Fahrenheit.

A variety of wildlife species utilize the area. Populations of black-tailed deer and black bear are present. An elk herd frequents the Windy Valley and East Fork Pistol River areas. While no known threatened or endangered species inhabit the area, the bald eagle may utilize a flight corridor in the extreme southeast portion of the area in the Mineral Hill Fork and Chetco River drainages A northern spotted owl was heard in the area on one occasion but no nest were discovered.

Botanically, the Snow Camp and Windy Valley area is quite interesting Several sensitive plant species occupy the area· California lady's slipper (*Cypripedium californicum*), cascade sedge (*Carex scabriuscula*), Howells' streptanthus (*Streptanthus howellii*), Koehler's rock cress (*Arabis Koehleri* var. *stipitata*), Piper's bluegrass (*Poa piperi*) and long-stalked eriogonum (*Eriogonum pendulum*). Howell's streptanthus, Koehler's rock cress, Piper's bluegrass and long-stalked eriogonum occupy serpentine areas. California lady's slipper can be found in serpentine bogs and moist rocky places; Cascade sedge occupies open meadows and moist rocky areas A number of uncommon plants inhabit the area, such as Vollmer's lily (*Lilium vollmeri*), snow plant (*Sarcodes sanguinea*), California pitcher plant (*Darlingtonia californica*), and Siskiyou everlasting (*Antennaria suffrutescens*) Future inventories will likely result in the discovery of additional sensitive and uncommon plants.

Major streams in the area are Windy Creek, East Fork Pistol River, Mineral Hill Fork and Eagle Creek. Both anadromous and resident fish are present. Chinook salmon and steelhead can be found in Eagle Creek, while steelhead inhabit the lower East Fork Pistol River and Mineral Hill Fork. Trout can be found in all the

major creeks within the area, including Windy Creek. Most creeks containing salmonid populations are not easily accessible.

RESOURCE USES

The roadless area contains several chrome claims but little activity other than surface exploration is present today The Pistol River Range Allotment exists in the Snow Camp portion of the area but it is not currently being used.

Big game hunting occurs along the fringes of the area Hunting within the interior is limited to Windy Valley; in other areas, a heavy brush cover and steep ground discourages use. Use by fisherman is quite sparse.

Recreational use is highest within the Windy Valley portion, and consists of day hikers, overnight campers, horseback riders, and motorbike riders. Use is presently classified as Semi-primitive Motorized Other portions of the area get little recreation use

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The roadless area has been divided into two areas by new road construction; a long section of the Mineral Hill Fork drainage and the J-shaped East Fork Pistol/Windy Valley area. Distinguishing features of the Mineral Hill Fork and East Fork Pistol areas are heavily vegetated, steep, and highly dissected slopes with deep inner gorges, and rocky creek beds. The Windy Valley area is characterized by slopes lightly vegetated with knobcone pine and Port-Orford-cedar. The lower slopes and creeks are similar to the rest of the roadless area. A small meadow exists along Windy Creek. Snow Camp Mountain is a dominant rock point and the highest feature in (just outside) the area.

Conditions surrounding the roadless area do not vary greatly. Vegetative type and land form are consistent. Man's activities have modified the environment on the ridgelines and local areas accessed for timber harvesting and other purposes. Timber harvest entries have provided a mosaic of patch cuts where the vegetation varies in age.

Influences which predominate in this locale are primary and secondary roads which receive moderate use. Timber harvest activities and their associated roads immediately border the unroaded area either on the same slope or immediately above on the ridgelines. Fires, too, have played a major role in the past in changing the vegetative mosaic of the area.

The primary attribute of the roadless area is Windy Valley. The attractiveness of Windy Valley is in it's scenic, floral and geologic variety which is easily accessible by good road and maintained trails. This higher elevation area contains sensitive and unusual plant life, open and rugged terrain and interesting landforms. The landscape is homogenous over the rest of the area and generally reflects the features common to surrounding areas.

CAPABILITY

MANAGEABILITY

Portions of the Windy Valley area follow well defined topographic boundaries, however, much of the boundary is located on midslopes below recent road construction or timber harvest units. Poor boundary definition may complicate management efforts to maintain and protect the unroaded characteristics and values of the area. The principal concern would be escape fires from the disposal of logging slash Light recreation, along with hunting and very limited fishing, poses little risk of fire starts; however, fire ignition within the interior at the wrong time could result in a major conflagration. Favorable aspects from a fire

perspective are weather conditions ameliorated by coastal marine influences, and positioning - heaviest use being generally above the fuels.

The area would be difficult to manage due to its unconsolidated, narrow, and highly dissected nature. Conflicts could arise between existing or potential public uses outside which could result in a disturbance of the natural settings and values within the area. The boundary, in some cases, is not easily definable and recognizable on the ground As all locations are within 3/4 mile of the edge, few physical features or terrain exist to adequately shield the interior from the sights and sounds of civilization outside There is ample opportunity for access to nearly all the perimeter.

NATURAL INTEGRITY AND APPEARANCE

Although humans may have used fire to change vegetative patterns within the area in the past, today, long-term ecological processes are intact and operating. Fires may continue to be a factor in successional changes within the area. The area contains several features which effect its natural appearance. The Windy Valley portion contains the remnants of an old historical trail shelter and an old homestead where two buildings stood. Otherwise, little evidence remains to indicate man's presence.

Several maintained trails that are currently used by both backpackers, horseback riders, and motorbike riders. Some portions of these trails have been abandoned and have nearly returned to natural conditions

There is a range allotment in the Snow Camp/Windy Valley portion of the area which has been retained, but is not being used. There is little or no evidence of past grazing.

A small part of the area has been treated with herbicides in the past to retard the growth of hardwoods and encourage the growth of conifers. This treatment has altered the natural processes in favor of conifer growth, but is barely evident today.

The area contains several chrome claims. Pit holes were dug to uncover ore deposits and can still be seen today. Although they are present, their impact is negligible.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

Highly dissected topography, deep valleys and dense vegetation over most of the unroaded area provides natural screening and opportunities for localized solitude. Encounters with other people would be few within the interior of each portion of the roadless area Chances for solitude is rather limited due to narrow shape of the roadless area, noise, dust, and views of activities on the borders could be seen or heard.

Use of the area as a quality primitive setting is limited due to dense vegetation and steep terrain. Along with the few trails, sufficient openings exist to permit cross country foot travel to the interior area Opportunities for a quality primitive experience would be very limited due to the area's narrow shape and the high density of perimeter roads.

The Windy Valley portion of the area covers a good quality semi-primitive experience The meadow is the principle feature; it is surrounded by a natural vegetation screen and offers a good chance for solitude.

SPECIAL FEATURES

The Snow Camp/Windy Valley area is an interesting botanic and geologic area which could contribute to outdoor education and/or scientific study Educational use is generally compatible with current activity and management direction. Much of this area has been classed as unsuitable for timber production.

Snow Camp Lookout is a historic site located on the top of Snow Camp Mountain, just outside the roadless area boundary. The lookout was rebuilt on the 1950's and is operated during periods of high fire danger.

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

Undeveloped/unroaded. The opportunity for measurable change in type or use is limited even though there is some potential total use increases. New trail construction and trail improvements could increase RVD's. Capacity of use is great and is not likely to be exceeded.

Developed. There would be only slight increases in RVD's if development were allowed since there are few development opportunities. Windy Valley has the greatest potential for recreational development. Increased roading could increase use by hunters. The capacity is not likely to be exceeded.

Wildlife

Under unroaded conditions, wildlife populations would fluctuate with the natural changes in vegetative succession unless special habitat improvements were implemented. Under a roaded condition with timber harvesting, deer and elk populations would increase. The effect of timber harvesting on old-growth dependent species would be lessened by the habitat provided in the proposed pileated woodpecker and pine marten areas. Additional habitat variety would be provided by unsuitable areas.

Fisheries

The anadromous steelhead and salmon fisheries are extremely important to the local community. While this area contributes little to on-site catchables, maintenance of downstream rearing and spawning habitat is essential.

Water

There are no impoundments or diversions either existing or proposed. There is little potential for power development in the area. Management emphasis has been placed on protecting and maintaining water quality for fish habitat. An increase in water yields would result from timber harvesting activity.

Livestock

Grazing under the existing allotment could resume if new forage area were opened up by timber harvest activities or range improvement projects. Demand on this area for grazing is low. The potential for grazing outside the existing allotment is also low due to the lack of available forage.

Timber

The area contains 7,907 acres of land tentatively suitable for timber production. Standing timber volume is estimated at 130 MMBF. Site productivity is moderate. Soils in the some areas are unstable and will require harvest methods which minimize impacts. Some additional roads will be required. The area has a dense undergrowth of brushy type species, and reforestation after timber harvest operations will likely require vegetative release. Approximately 1,200 acres within the area has been placed in a proposed *special harvest site (separate suitability component) with a long rotation; the site productivity is generally* very low.

Energy and Minerals

Several mining claims exist within the area, although no mining activities are currently taking place. The potential for commercially valuable deposits of both critical (chrome) and non-critical minerals exists, but is low. These minerals are currently in low demand and the deposits are not of a particularly high grade. Mining is not expected to occur in the near future.

Cultural

Other than those noted, historic and prehistoric sites will be evaluated and provided for under applicable laws and regulations for any proposed activity.

Land Use Authorizations

None existing, few expected.

MANAGEMENT CONSIDERATIONS

Ownership, including subsurface rights held by others, is not considered a problem. The potential for insects and disease outbreaks with the coniferous forest exists. However, actual occurrences have been minor and localized Fire is the most serious management consideration The potential for major conflagrations exists.

NEED

OTHER AREAS AND PUBLIC USE

The Kalmiopsis Wilderness is approximately five miles east of the Windy Valley Roadless Area The Wilderness and adjacent unroaded/undeveloped areas are very different from Windy Valley and are discussed in separate documents. The Big Craggies Botanical Area, which contains many rare plants is located four miles east of Windy Valley.

Recreation use of this unroaded area is very light. Most of the use is by local people rather than by recreationalists from major population centers.

ECOSYSTEM REPRESENTATION

The major ecotypes within the Windy Valley area also occur in the Kalmiopsis Wilderness.

PUBLIC INVOLVEMENT

Both the public and Forest managers have had considerable interest and concern for the existing and future management of these larger unroaded areas For this area, involvement in evaluation of alternative management options for Windy Valley began in the early 1970's. Between 1977 and 1979, the RARE II process was being finalized. Since RARE II, the area's unroaded attributes have been reevaluated several times through site specific project planning. The analysis included herein is a compilation of information beginning with early public scoping in 1979 to public meetings and workshops through 1985

Public input on several of the inventoried roadless areas on the Siskiyou National Forest has been extensive. Windy Valley, though, has not received the same intensity of concern or advocation of protective status as several adjacent areas. Input by the public on the advisability of designating this area as either Wilderness, back country or some form of non-commodity management was divided between extremes. Local government and the timber industry were opposed while many individuals supported removing the area from timber production. Those opposed site economic needs of the local community and their belief

that other resources could be protected. Those desiring Wilderness designation generally believed that all other resources would be severely and adversely impacted by timber harvest activities. The most specific input and desire, though, were requests by individuals and some State personnel for the protection of Windy Valley, itself, and the immediate surrounding environs.

In the current Forest Planning process, the unroaded area question has remained a major issue. Since 1985, comments received on the Forest Plan DEIS have not surfaced any additional concern or movement to seek unroaded allocation of this area, with the exception of the Windy Valley/Snow Camp portion

ENVIRONMENTAL CONSEQUENCES

SIGNIFICANT EFFECTS

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

Cultural Resources

The Windy Valley area has some known prehistoric use, much of which requires evaluation by a professional archaeologist. Overall, its archaeological potential is low. Historic sites within the area are quite limited and are not significant All alternatives, except E and M, call for development which would require intensive cultural resource inventory and site evaluations along any proposed road prior to approval. Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for an inventory.

Energy and Minerals

The following table is a tabular summary of the estimated mineral potential and accessibility limitations for Windy Valley. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	<100	<100	-	<100
High	-	-	-	-
Moderate	-	-	-	-
Low	1,300	8,900	-	10,200
Total	1,300	8,900	-	10,200

Improvements

Roads. The 7,907 acres of tentatively suitable land could generate about 27 miles of new road for timber harvest. Roads for other purposes would be minor. All would be dead-end local roads built when needed to access timber harvest units. Some mileage would remain open to passenger car use, depending on the alternative; other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC and A	20	6	6	8
B	27	8	8	11
C	27	5	11	11
D	27	9	7	11
E and M	0	0	0	0
G	19	0	8	11
K and S	20	6	3	11

Alternatives E and M would have minimal effect as no roads are built. Of the roaded options, Alternatives NC, A, G, K, and S would have fewer miles built due to a Supplemental Resource allocation for Windy Valley, the Backcountry Recreation allocation in Alternative S, and a Botanical area in Alternative G. Alternatives B, C, and D would be completely roaded. Alternatives G, K, and S, would close nearly 60 percent of the roads.

The road system would follow ridges off the main roads on the boundary or extend existing midslope roads. Midslope roads would cross small creeks and draws, but none would be expected to cross the principal streams or other primary tributaries inhabited by fish. Some full bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites.

Trails. Alternatives NC, A, A-Departure, E, G, K, M, and S would provide for reconstruction of five miles of trail. Alternatives B, C, D, and D1 provide no additional improvements.

Developed Recreation Sites. None are programmed.

Wildlife and Fish Habitat Structural Improvements. The East Fork Pistol River, Eagle Creek and Mineral Hill Fork are excellent candidates for improvements applied on a Forest-wide basis

Wilderness Potential

The roadless area has a landscape character that is unique relative to the rest of the Forest and offers a wide array of recreation opportunities. The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 7,200 acres, and a Semi-primitive Motorized experience on the remaining 3,000 acres The carrying capacity for the area is estimated at 15,200 RVD's. This figure is high since Roaded Natural coefficients were developed based on the assumption of the presence of roads. Current use is low but consistent (500-1,000 RVD's annually) and is expected to remain low over the planning period.

The roadless area is near the Kalmiopsis Wilderness, but is not contiguous. Maintenance of the area would in effect expand the carrying capacity for Roaded Natural and Semi-primitive Motorized recreation opportunities. However, quality of the experience is suspect due to the proximity of roads and management activities. Alternatives E and M would provide additional capacity for Semi-primitive Motorized recreation opportunities. Wilderness potential of the area would be maintained

All alternatives, except E and M, assign the area to multiple resource management objectives; Semi-primitive recreation opportunities currently available would shift to the Roaded Natural end of the opportunity spectrum. The change in character of the landscape would result in the loss of Wilderness potential. Alternatives A, A-Departure, G, K and S would maintain 3,000 to 4,000 acres in a roadless condition as a result of assignments to Supplemental Resource and Designated Wildlife Habitat Management Areas. The

Supplemental Resource assignment is in response to the consistent level and type of recreation use reported in Windy Valley; no programmed harvest is planned here.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	10,200	10,200	10,200
G	0	0	0
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness.

Wild and Scenic Rivers

A small portion of the southernmost tip of the roadless area borders the Chetco River. In several alternatives, this area is treated as a Recreation segment of the National Wild and Scenic River System. With passage of the Omnibus Wild and Scenic River Act of 1988, the Chetco was designated Wild and Scenic and this section classified as Recreation. Protection of its values will be provided under all alternatives per recent Congressional designation.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated with Alternatives E and M because no soil disturbing activities will occur. All other alternatives assign all or part of the area to Management Areas which permit development The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

A low risk of degrading the water, soil, and fisheries resources in the Pistol and Windy Creek areas exists for all roaded alternatives. Soils in these areas do not display the potential for significant impacts as a result of management activities. The Mineral Creek area, however, has a moderate to high potential risk of impact to the soil resource These soils are highly sensitive to both harvest and road related impacts. Alternatives NC, B, C, and D propose roughly double the amount of soil disturbing activity over Alternatives A, G, K, and S. All alternatives, though, have eliminated extremely sensitive soils in the area, and particularly along the streamcourses, from the lands suitable for timber production. This mitigation greatly minimizes the potential for major adverse watershed impacts.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

The Windy Valley area is predominantly dense brush and hardwoods with a conifer overstory. Fuels are continuous over the entire area, and though dead fuel loadings are light, the large amount of brush creates a high hazard. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase These conditions lend themselves to large, moderate to high intensity fires Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, fire hazard increases during timber harvest. As fuels are treated, the hazard is reduced. Over time, continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss.

In Alternatives E and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area In Alternative G, 49 percent of the area would be developed, creating a mosaic of fuels over time, while the remaining undeveloped area would be in 11 separate blocks. Alternatives NC, A, K, and S would develop 51 to 61 percent of the area. The remaining undeveloped areas would be broken into six to seven separate blocks Alternatives B, C, and D would develop 68 percent of the area. The remaining undeveloped areas would be in two separate blocks.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and with treatment of activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases, with an increase in risk of human-caused fires. The risks of lightning fire is similar in both developed and undeveloped areas.

In Alternatives E and M, risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternative G, industrial operations would result in increased risk over 49 percent of the area, and risk from public use would be increased along the 19 miles of road Alternatives NC, A, K, and S would result in increased risk over 51 to 61 percent of the area; risk from public use would be increased along the 20 miles of road. In Alternatives B, C, and D, industrial operations would result in increased risk over 68 percent of the area, with increased risk from public use along 27 miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

Approximately 100 acres of the proposed Snow Camp Botanical Area is within the northern tip of the roadless area The Botanical area is allocated in Alternatives E, G, M and S (See Appendix F for more detail on the Snow Camp site). A significant number of sensitive and rare plants are present Under all alternatives sensitive plants would be protected through application of appropriate Standards and Guidelines There are no existing or proposed RNA's.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. To determine the impacts of each alternative, only the effects of prescribed burning is considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP. All other alternatives produce 34-50 tons of TSP per year.

The probability of a smoke intrusion from burning within the unroaded area impacting Grants Pass, a designated area for air quality, is very low. The probability of impacting the Kalmiopsis Wilderness, a Class 1 area, is low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. No bald eagle or osprey are known to inhabit the Windy Valley area. Bald eagle and osprey may use a flight corridor on the extreme southeast portion of Mineral Hill Fork and Chetco River drainages. Under any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan.

Spotted Owl/Pileated Woodpecker/Pine Marten. Under Alternatives B, C, D, and D1, habitat for mature/old-growth indicator species would be considerably reduced over time. In Alternatives NC, A, A-Departure, G, K, and S significant mature/old-growth habitat would be protected in the Windy Valley Supplemental Resource area, and Backcountry Recreation in the case of Alternative S Mature/old-growth habitat would remain at present levels under Alternatives E and M.

Except for Alternative NC, a mixture of habitat enclaves to meet Management Requirements (MR's) for mature/old-growth habitat are located within the roadless area: three for pileated woodpeckers, and three for pine marten (one of the marten areas is only partially within the area). This area presently supports approximately two pairs of spotted owls. There would be no change from present conditions under Alternatives E and M. Mature/old-growth habitat would ultimately be reduced to MR levels in all other alternatives. In Alternative NC, habitat would eventually be reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M. In areas not suitable for timber production, snag levels will remain high. Snag habitat would remain at high levels in alternatives which allocate the Windy Valley area as a Supplemental Resource area, or as Backcountry Recreation in the case of Alternative S.

Black-tailed Deer/Roosevelt Elk. Big game management opportunities would increase somewhat in all alternatives except E and M. All of these alternative would open up significant areas tentatively suitable for timber production. Opportunities for habitat improvement projects for game animals would also be greater in these alternatives.

Wildlife Habitats. The area contains approximately 55 acres of meadow habitat (including buffers) at two separate sites (one is Windy Valley). Meadow habitat is allocated in all alternatives, although meadow buffers are not protected in Alternatives NC, A, and A-Departure. Among the alternatives which allocate much of the area to General Forest, Alternatives C, D, D1, and S utilize a Riparian Prescription C which provides a higher quality riparian habitat for wildlife.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the roadless area are lower than average on the eastern portion of the area (away from roads and the Illinois River). User-days on the western portion of the area are assumed to be equal to or slightly less than the General Forest. Fewer hunters use unroaded areas and non-hunters generally stay on the trail system. Alternatives E, G and M produce fewer WFUDs; other alternatives would generate more

Visual Resource

The current visual inventory indicates that the area is in a location visible to recreation travel routes. The area consists of approximately 500 acres of Retention, approximately 5,300 acres of Partial Retention, and approximately 4,400 acres of Modification The Partial Retention objective was assigned in response to the recreation use on the Snow Camp Lookout Road, and the variety in the landscape that is unique relative to the rest of the Forest Viewer sensitivity is moderate as indicated by the consistent levels of recreation use attributed to the area.

Alternatives A, A-Departure, and G would assign the area to management under the inventoried visual objectives. Approximately 3,000 to 4,200 acres would be assigned as Supplemental Resource and Designated Wildlife Habitat Management Areas; no timber harvest would be programmed. The natural appearance of this portion of the roadless area would be maintained over the course of the planning period. The natural appearance of the remaining area would shift to a slightly altered-altered appearance depending on the visual objective.

Alternatives NC, B, C, D, and D1 assign the area to management under a reduced scheme of visual objectives. With the exception of 1,400 to 1,900 acres assign to Designated Wildlife Habitat, the remainder of the area would be managed under the Modification visual objective. The existing natural appearance of the area would shift to an altered-heavily altered appearance within the first two decades.

Alternatives E and M manage the area to achieve the Preservation objective. The natural appearance of the entire area would be maintained over the planning period.

Alternatives K and S would assign the area to management under a reduced scheme of visual objectives. Under these alternatives, all areas inventoried for Partial Retention would be managed to achieve the Modification visual objective. In addition, approximately 3,300 acres would be managed as Designated Wildlife Habitat and Supplemental Resource areas; timber harvest would not be programmed. The natural appearance of this area would be maintained while the remaining acres would shift to an altered-heavily altered appearance as a result of activities.

Recreation Settings

The Windy Valley area is accessed by several trails and is heavily influenced by Forest road systems surrounding the area. The isolated location will limit the ability of the area to provide a quality non-motorized recreation experience whether the area is maintained in a roadless condition or not.

All alternatives, except E and M, assign the area to development. Semi-primitive recreation would shift rapidly to the motorized end of the opportunity spectrum. Access to the area and motorized opportunities would be enhanced as the area is roaded over time. Alternatives E and M would maintain the area in its current status. Recreation capacities would remain fixed since no new trail construction is programmed.

Alternatives A and A-Departure would retain the essentially undeveloped character on 3,000 acres due to Supplemental Resource and Designated Wildlife Habitat areas. Alternatives NC, B, C, D, and D1 would retain undeveloped character on less than 2,000 acres. Alternative G would retain the undeveloped character on 4,200 acres due to assignments to Botanical, Supplemental Resource, and Designated Wildlife Habitat areas Alternatives K and S would retain the essentially undeveloped character on 3,000 acres (3,600 acres due to allocations to Supplemental Resource and Designated Wildlife Habitat areas). These areas may or may not be contiguous so that the integrity of the roadless area would be compromised by the presence of motorized activities (See **Wilderness Potential**).

Economic and Social

There are 7,907 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 10,214 acres of the Windy Valley Roadless Area is 0.43 MMCF. The estimated LTSY would be 0.79 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC, C, and D	37	68
A and A-Dep	.30	.56
B	45	82
D1	40	74
E and M	00	00
G	25	47
K and S	.28	.51

For projecting effects, the alternatives are grouped: (1) Alternatives E and M maintain the area in an unroaded status; (2) Alternatives A, G, K, and S, which develop approximately one-third of the area, and (3) Alternatives NC, B, C, and D which develop much of the area.

	Alternatives		
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	A, G, K, & S	NC, B, C, & D (Roaded)
Direct Effects			
Timber and Road Expenditures	*None*	*Minor Change*	*No Change*
Indirect Effects			
Jobs	-27	0	+6
Annual Income (MM $)	-0 63	0	+0.15
Annual Payments to Counties (MM $)	-0.15	0	+0 04
Cumulative Effects			
Social Attitudes of Local Communities			
Timber Related	-	0	+
Primitive Recreation	+	0	-
Fisheries	+	0	0
Wildlife Related			
Hunting	-	0	0
Old-Growth	+	0	-
Mining	-	0	0

The major direct economic effect is government expenditures for the timber and associated road construction program. Alternatives E and M have the biggest reduction in the timber and road expenditures The other alternatives have insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while the other alternatives have a small reduction or change in the number of jobs, amount of income, and size of payments to the counties. Slightly greater benefits than provided by Alternative A are achieved under Alternatives NC, B, C, and D.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E, fishing interests are predicted to feel positive about forest management while timber interests would tend to feel the forest is not listening to their needs. Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures have been identified.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

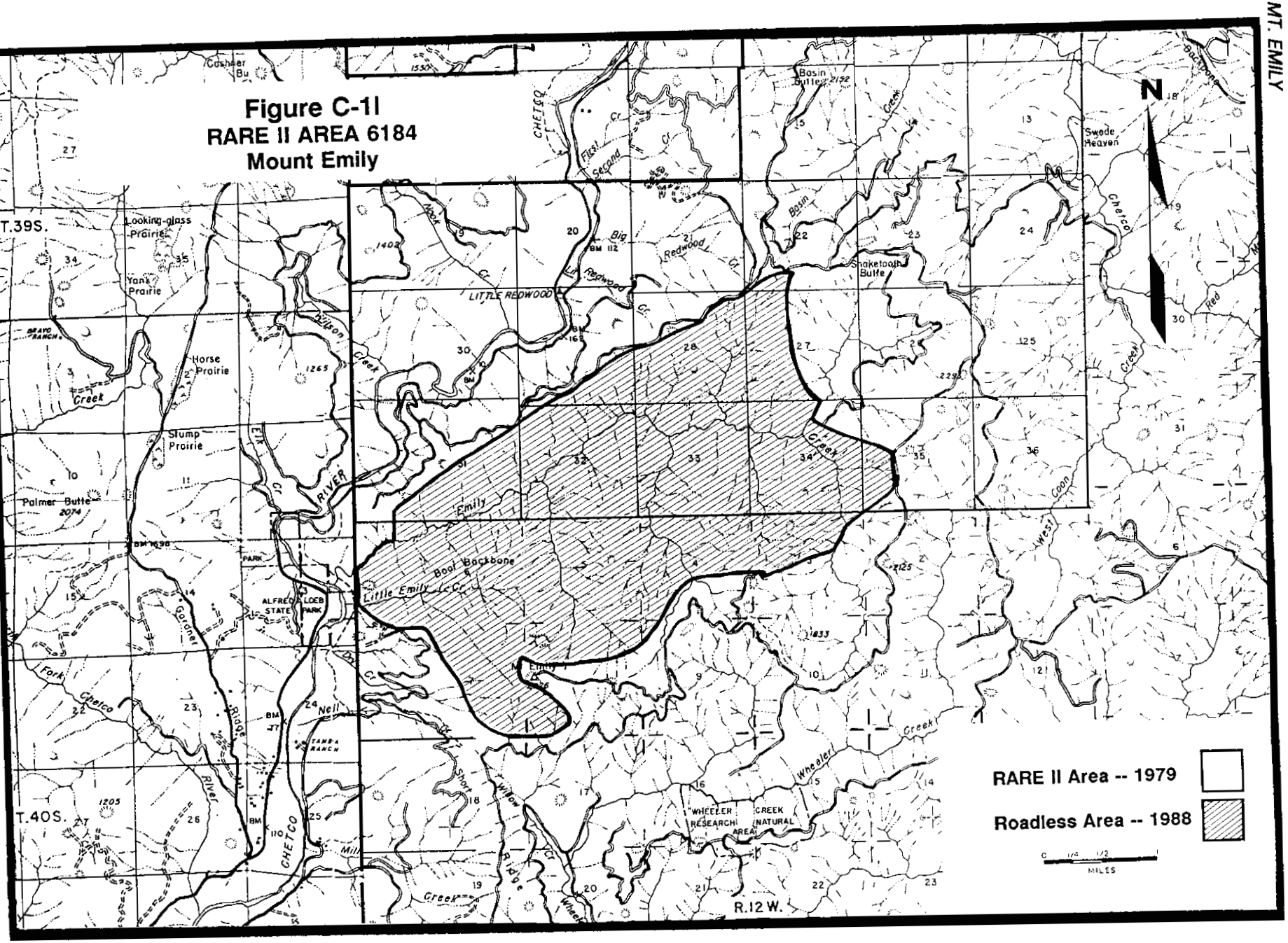
No additional conflicts with other jurisdictions have been identified



Table C-51. Mount Emily Roadless Area No. 6184 (5,945 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	5,945	0	0	5,945	0
7-Supplemental Resource	735	735	735	714	735	0	735	735	0	735
8-Designated Wildlife Habitat	228	1,456	1,456	1,477	1,456	0	2,593	2,593	0	1,456
9-Special Wildlife Site	0	0	0	0	0	0	21	21	0	1,157
10-Scenic/Recreation River	5	5	0	0	0	0	5	0	0	5
11-Riparian	784	488	488	488	488	0	297	297	0	297
12-Retention Visual	361	345	0	0	0	0	326	0	0	168
13-Partial Retention Visual	2,379	1,723	1,821	1,821	1,821	0	1,157	326	0	520
14-General Forest	1,453	1,193	1,445	1,445	1,445	0	811	1,973	0	1,606
TOTAL	5,945	5,945	5,945	5,945	5,945	5,945	5,945	5,945	5,945	5,945
TOTAL UNDEVELOPED (MA 1-9)	963	2,191	2,191	2,191	2,191	5,945	3,349	3,349	5,945	3,349

Figure C-1l
RARE II AREA 6184
Mount Emily



MT. EMILY No. 6184

(5,945 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Mt. Emily Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. It was allocated to non-Wilderness use by the RARE II decision in January 1979 No activities have taken place since that decision which have changed the area's wilderness characteristics The entire 5,945 acres is National Forest System land.

The Chetco-Grayback Land Management Plan (FEIS, 1979) includes the Mt. Emily area Management direction allocates most of the area to Coordinated Resource Management to obtain full timber yield consistent with land capabilities, while giving full considerations to other resource values. The area within one-eighth mile horizontal distance on each side of Emily Creek is allocated to Fisheries/Watershed *(synonymous with the Supplemental Resource Management Area). It is managed to maintain or improve* water quality, to maintain old-growth forest characteristics, and to protect or enhance spawning and rearing habitat for anadromous fish. Fisheries/Watershed areas are managed in a near natural condition, though management activities designed to improve water quality or fisheries habitat may be undertaken where appropriate.

Readers are directed to the Land Management Plan for a description of the affected environment, evaluation of resources, management alternatives, and other requirements and constraints. Since completion of the Land Management Plan, all project activities have been analyzed under it's direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

During the period between 1984 and 1988, no activity has occurred that would impact the area (Refer to *Figure C-1l). The area remains as previously described*

LOCATION AND ACCESS

The Mt. Emily Roadless Area is approximately nine miles northeast of the coastal community of Brookings, Oregon. It includes the lower four miles of the Emily Creek drainage and the Little Emily Creek drainage, both of which are tributaries to the Chetco River. The area covers most of the north and west slopes of Mt Emily. The roadless area is surrounded by ridge-top roads. These roads are used for timber hauling, administration and recreation. An old abandoned road enters the lower portion of the area and follows Little Emily Creek for about one mile. In its present state, it is little more than a trail.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The Mt Emily area is located on the western side of the coast range (Klamath Mountain Geologic Province) in southwestern Oregon. Elevation varies from near sea level to almost 3,000 feet. The topography is mountainous with steep slopes and deeply dissected canyons. Most of the area is covered by a mixed evergreen forest. Douglas-fir is the principle conifer species in association with tanoak and Pacific madrone hardwoods. The southern portion of the area contains many brushfields and rock outcrops.

Soil conditions are quite variable. Shallow soils with abundant surface rock and talus movement dominate ridgetop areas. Deeper, more productive soils are common along the mid to lower slopes. Evidence of streambank failures are not uncommon, especially on oversteepened slopes and in the contact area of dacite and sandstone parent materials. The majority of the area is relatively stable, however

Average annual precipitation is 110 to 120 inches per year. All but 10 to 15 inches falls between October and April. The climate is mild and heavily influenced by marine air. Fog is common during the summer.

Black-tailed deer, black bear, coyotes and many small animals common to the Forest occur within the area. Bald Eagles have been seen along the Chetco River but are not known to use the roadless area. Spotted Owls are present and two Spotted Owl Habitat Areas (SOHA's) are located within the roadless area A sensitive plant species, Howell's manzanita (*Arctostaphylos hispidula*), has been found in the southern portion of the area, near the summit of Mt. Emily. Another sensitive plant, Golden fleece (*Happlopappus arborescens*), is located in the Snaketooth Butte area.

Emily Creek has important runs of fall chinook salmon and winter steelhead. Resident trout and a small number of coho salmon also use the stream.

RESOURCE USES

There is an old mining site near the top of Mt Emily and a pit on the west slope. This mine has not been worked since the early part of this century. Recent mining activity (road construction and trench excavation) has occurred just south of the roadless area boundary.

Recreational use is low at approximately 100 RVD's. Some hunting and fishing take place People occasionally hike to the old lookout site at the top of Mt. Emily, just outside the roadless area boundary.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The Mt Emily area has highly dissected topography and is covered by a mixture of old growth, and second growth conifers, hardwood stands and brushfields. Rock outcrops also occur. The Chetco River, at the mouth of Emily Creek, and Mt Emily are the most prominent features. The view from within the roadless area is dominated by the high bluffs on the north side of Mt. Emily or by the forest itself, depending on the viewers position The Kalmiopsis Wilderness is approximately four miles east of the roadless area. The Snaketooth Road, near the northwestern boundary, and the Mt. Emily Road south of area, are major access routes within the Chetco Ranger District Trout fishing in Emily Creek and hunting along fringes of the area are the major attractions for recreationists.

CAPABILITY

MANAGEABILITY

The Mt Emily Roadless Area boundaries are well defined and follow topographic features It includes much of the Emily Creek drainage and could be managed in a roadless condition. Management as a roadless area would be compatible with management of the planned designated wildlife habitat Management Requirement (MR's) areas and with protection the valuable salmon and steelhead runs on Emily Creek.

Dense fuel loads and heavy use of roads near the boundaries create a situation where the potential for considerable loss of resources and the existing character of the area is high. While climate is favorable for minimizing wildfires, severe fire conditions do occur for relatively short periods. Ignition during one of these periods could be disastrous.

The ability to manage the area for its potential for Wilderness and accompanying values is limited by the area's size and proximity to roads. Though the nature of the drainage limits views to the natural conditions found within most of the area, motorized vehicles and equipment can often be heard.

NATURAL INTEGRITY AND APPEARANCE

The area is generally in a natural appearing condition. The old mining site near the top of Mount Emily has essentially returned to a forested condition. What little impact still exists is on the perimeter of the roadless area and could be removed from the area by a minor boundary adjustment.

Approximately 900 acres within the area was treated with herbicides during the 1950's and 1960's to reduce hardwood competition. This treatment altered the natural processes to favor the growth of conifers on the treated sites. Hardwoods have been reduced in number and size, but were not eliminated The effects of this treatment are no longer visible; the forest in the treated area appears to have developed naturally.

An old abandoned road enters the lower portion of the area and follows Little Emily Creek for about one mile It was no longer visible on aerial photographs taken 20 years ago. Its present state is a brushy trail.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The Mt. Emily area's steep, rugged topography and dense vegetation result in natural screening. People using the area are not to be aware of each other's presence. The major intrusion solitude is from the sound of activities outside the area.

Use of the area for primitive recreation is limited by the dense vegetation and steep terrain. Few trails exist to promote access to the interior areas, but sufficient openings exist to permit some cross country travel on foot. The most unique and physically challenging terrain exists on the north slopes of Mt. Emily. High rocky bluffs and deeply incised canyons make traversing that portion of the roadless area hazardous.

Large portions of Mt. Emily are covered by mining claims, though no mining activity is currently taking place within the area. If mining were to begin, it could have a significant impact on the roadless characteristics. Noise from the mining activities would impinge upon the feeling of solitude. Hiking near the summit of Mt. Emily would also be impeded. This section could be removed from the roadless area without destroying its integrity, however, noise generated within the drainage would have greater impacts than noise generated on the other side of the mountain

SPECIAL FEATURES

Mt Emily is the predominant feature. An old mine, lookout and archeological site exist on Mt. Emily. The other primary feature is the highly prized anadromous fishery of Emily Creek.

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

Present use is low and likely to remain so under unroaded conditions. Trail construction could increase use since it provide access to a roadless area close to town. The capacity the area for dispersed recreation is large and not likely to be exceeded. Under a roaded condition, hunting and other forms of dispersed recreation would increase significantly.

Wildlife

Since almost all of the old-growth in the roadless area is included in the designated wildlife MR areas, roading would have little effect on old-growth habitat. Some hardwood stands may be available for harvest under the roaded alternatives for several years. These openings would provide improved habitat for deer and other species requiring early successional stages for several years after harvest. The only effects on wildlife under the unroaded alternatives would be from the gradual successional changes which occur over decades or centuries. Fire would interrupt this successional pattern and improve habitat for early successional species These changes will gradually degrade habitat for old-growth dependent species as mature tanoak stands succeed Douglas-fir.

Fisheries

Emily Creek has important runs of fall chinook salmon and winter steelhead. It is one of the most valuable streams on the Forest for spawning adult salmonids and rearing of juveniles. Opportunities for enhancement exist under either scenario.

Water

The area contributes indirectly to the Brookings community water supply, but has little bearing on the delivered water quality or quantity. There are no impoundments or diversions either existing or proposed. Maintaining high water quality is a primary goal of the beneficial uses associated with Emily Creek and Chetco River.

Timber

Only 300 acres are classified as non-reforestable. The remaining 5,625 acres of land tentatively suitable for timber production contains approximately 104 MMBF. Much of the area is included in the designated wildlife MR areas. Land outside of wildlife areas is generally of low site productivity. Because of the dense undergrowth and the presence of sprouting hardwoods in existing stands, release treatments to establish and maintain conifer trees would likely be necessary in new plantations.

Minerals

Large portions of Mt. Emily are covered by mining claims. Exploration work has recently been done in the southwest portion of the area Road construction and trench excavation was done in the early 1980's on a claim which extends into the roadless area. The operation site is just outside the boundary, on the south side of the old lookout. Significant amounts of gold were removed from Mt. Emily in historic mining operations and the possibility of renewed mining activity within the drainage cannot be discounted.

Cultural

Historic sites in the vicinity include the old mine, as evidenced by 1930's era machinery and equipment, and Mt. Emily lookout just outside the boundary. Prehistoric use included a vision quest site near the summit of Mt. Emily. No other prehistoric sites have been found. If any are found, they will be evaluated and provided for under the applicable laws and regulations.

MANAGEMENT CONSIDERATIONS

The potential for insects and disease outbreaks within the coniferous forest exists. However, actual occurrences have minor and localized. Fire is the most serious management consideration. The potential for major conflagrations definitely exists. Under a developed scenario, access and intensified treatment of fuels would considerably lessen continuity and concentrations. The probability of major losses of resource by wildfire would be reduced. However, access also brings increased risks due to greater numbers of people in the woods.

NEED

OTHER AREAS AND PUBLIC USE

The Kalmiopsis Wilderness is approximately four miles east of the Mt. Emily Roadless Area. The Mt Emily area is very different in character from the adjacent unroaded areas and Wilderness. Recreation use of both Mt. Emily and the adjacent unroaded areas is extremely light. Most of the recreation use is by local people rather than by recreationalists from major population centers.

ECOSYSTEM REPRESENTATION

The major ecotypes within the Mt. Emily area also in the Kalmiopsis Wilderness.

PUBLIC INVOLVEMENT

Both the public and Forest managers have had considerable interest and concern for the management of the unroaded areas. For this specific area, involvement in evaluation of alternative management options for Mt. Emily began in the early 1970's. Between 1977 and 1979, the RARE II process was being finalized. Since RARE II, the area has been reevaluated several times through site specific project planning and broader area analysis. The analysis included herein is a compilation of information beginning with early public scoping in 1979 to public meetings and workshops through 1985.

Public input on several of the inventoried roadless areas on the Siskiyou National Forest has been extensive. Mt. Emily, though, has not received the same intensity of concern or advocation of protective status as several adjacent areas. Most input was prepared by State of Oregon agencies. Their suggestions centered on protection of the valuable fisheries, leaving productive areas in the timber base, and retaining the area in non-Wilderness status due to the known mineral deposits.

Input by the public on the advisability of designating this area as either Wilderness, back country or some other form of non-commodity management was divided between both extremes. Local government and the timber industry were opposed while many individuals supported removing the area from timber production. Those opposed site economic needs of the local community and their belief that other resources could be protected by proper multiple use management. Those favoring protection generally believed that all other resources would be severely and adversely impacted by timber harvest activities.

In the current Forest Planning process, the unroaded area question has remained a major issue. Comments received on the Forest Plan DEIS in 1987 and 1988 also have not surfaced any additional insight or concerns as to management of this unroaded area.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the DEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Mount Emily area has known prehistoric and sites. The area has moderate potential for finding additional archaeological sites.

All Alternatives, except E and M, call for development which requires intensive cultural resource inventory along any proposed road prior to approval. In this way, sites that may exist in the project area can be evaluated. Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a tabular summary of the estimated potential and accessibility limitations for Mt. Emily. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-	-	-
High	-	-	-	-
Moderate	-	-	-	-
Low	-	-	5,900	5,900
Total	-	-	5,900	5,900

Improvements

Roads. The 5,625 acres of tentatively suitable land could generate about 19 miles of new road for timber harvest. However, the Emily Creek Supplemental Resource area is included in all alternatives This would reduce the possible new roading to 16 miles. Roads for other purposes would be minor, with some possibility of mining activity in the vicinity of Mt. Emily. All would be dead-end local roads built when needed to access timber harvest units Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC,A,B,C	16	5	5	6
D	16	3	7	6
E and M	0	0	0	0
G	16	0	6	10
K and S	16	4	2	10

Alternatives E and M would have minimal effect due to no roads being built. Alternative G would not maintain any roads open for passenger cars. All other alternatives would be roaded except for the Supplemental Resource area. Alternatives G, K, and S will close 63 percent of the roads.

The road system would follow ridges off the main roads on the boundary and would change to midslope roads as the ridges steepen The midslope roads would cross small creeks and draws. None of the roads would be expected to cross Emily Creek nor the main tributaries inhabited by fish Some full bench ground would be crossed by roads with excess excavated material hauled to stable disposal sites. Some of the roads may be visible from a short stretch of the Chetco River Road, otherwise the roads would be largely hidden from high use routes.

Trails None are programmed.

Developed Recreation Sites. No construction is programmed.

Wildlife and Fish Habitat Structural Improvements. Emily and Little Emily Creeks are excellent candidates for improvements. Alternatives which provide for roading would facilitate implementation of structures by providing better access

Wilderness Potential

The roadless area has a landscape character that is steep, vegetated, and without exceptional features. The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 5,900 acres. The carrying capacity for the area is estimated at approximately 9,700 RVD's. This figure is high since Roaded Natural coefficients were developed based on the assumption of the presence of roads. Current use is low (100 RVD's annually) and is expected to remain low over the planning period.

The roadless area is near the Kalmiopsis Wilderness but is not contiguous. The maintenance of the roadless area would in effect expand the carrying capacity for Roaded Natural recreation opportunities. No trails are programmed for construction due to the low levels of use reported in the area. Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning period.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	5,900	5,900	5,900
G	0	0	0
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

All alternatives, except E and M, assign the area to multiple resource management objectives. The Roaded Natural recreation opportunities would remain available in a modified Forest environment. The change in character of the landscape would result in the loss of Wilderness potential. Motorized recreation opportunities would be enhanced as the area is roaded.

Except for Alternatives E and M, all alternatives, except NC, would maintain at least 2,200 acres in a roadless condition as a result of assignments to Supplemental Resource and Designated Wildlife Habitat Management Areas Timber harvest would not be programmed in these two areas Alternatives E and M would provide additional capacity for Semi-primitive Motorized recreation opportunities. The Wilderness potential of the area would be maintained.

Wild and Scenic Rivers

A portion of the area is located immediately adjacent to the Chetco River corridor with some portions being visible in the backround Alternatives NC, A, A-Departure, B, C, D and D1 would manage lands under varying levels of visual objectives. Alternatives K and S would manage the majority of the area for Modification and Partial Retention; some some limited effect on the quality of recreation settings may occur within or as viewed from the river corridor. Alternatives E and M would have no effect on the existing quality of the river experience.

Soil, Water, and Fish

No consequences to soil, water, and fish resources are with Alternatives E and M because no soil disturbing activities will occur. All other alternatives allocate all or part of the area to Management Areas which permit development. The environmental effects of timber harvest and road building are discussed in Chapter IV of the FEIS

The risk of degrading the soil, water, and fisheries resource increases with more timber harvest and road building All roaded alternatives slightly increase the potential for adverse impacts. Of these, Alternative NC would result in greatest potential for watershed impacts. The majority of the area, however, does not contain soils highly sensitive to management-related impacts. Inclusions of some soil conditions that have demonstrated hazards due to road construction activities are interspersed in the area as suitable lands. Therefore, some increased risk of adverse impacts does occur.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels

The Mt. Emily area is primarily second-growth Douglas-fir with moderate fuel loadings and a light brush understory. Pockets of brushfield are intermixed with the timber. Fuels are generally continuous over the entire area. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses In a developed scenario, the hazard increases during timber harvest. As fuels are treated, fire hazard is reduced. Over time, continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires The result is smaller fires, lower suppression costs and less resource loss due to fire.

All the area in Alternatives E and M would remain undeveloped, with fuels remaining continuous over the entire area. In Alternatives G, K, and S, 39 percent of the area would be developed, creating a mosaic of fuels over time; the remaining undeveloped area would be in one to two separate blocks. Alternatives A, B, C, and D develop approximately 55 percent of the area, while Alternative NC would develop 71 percent; the remaining undeveloped area being one block.

In undeveloped areas, risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and with treatment of activity slash from these operations. As access improves, the level of dispersed recreational and other public uses increases, with an increase in risk of human-caused fires Risk levels for lightning fires is similar in both developed and undeveloped areas.

In Alternatives E and M, risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternative G, K, and S, industrial operations would result in increased risk over 39 percent of the area, and risk from public use would be increase along the 16 miles of road. In Alternatives NC, A, B, C, and D, industrial operations would result in increased risk over 55 to 71 percent of the area; risk from public use would be increased along the 16 miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical Areas or RNA's are proposed. Two sensitive plants are present. Sensitive plants will be protected through appropriate Standards and Guidelines in all alternatives.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E and M would contribute no TSP. All other alternatives would produce 19-26 tons of TSP per year.

The probability of a smoke intrusion from burning in the area impacting Medford, a designated area for air quality, or the Redwood National Park and Kalmiopsis Wilderness, both Class 1 areas, is very low based on past performance.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. Bald Eagles and osprey have been seen along the Chetco River but are not known to use the Mt. Emily area. Under any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and Wildlife Service 1986).

Spotted Owl/Pileated Woodpecker/Pine Marten. Except for Alternative NC, almost all of the old growth in the area is included as Designated Wildlife Habitat to meet Management Requirements (MR's). Under Alternative NC, however, no mature/old-growth forest is assigned to wildlife; the area would not contribute to the MR network. Two Spotted Owl Habitat Areas (SOHA's) are within the area; owls were found in both SOHA's in 1988. In Alternatives K and S, blocks of hardwood stands interspersed among the old-growth stands are included as Special Wildlife Sites.

Woodpeckers. Snag habitat would remain near 100 percent habitat capability for woodpeckers under Alternatives E through S. Even in Alternatives A through D1, snag levels for the area would remain above average because of the allocations to Designated Wildlife Habitat and Supplemental Resource.

Black-tailed Deer/Roosevelt Elk Big game management opportunities would increase somewhat in Alternatives NC, A, A-Departure, B, C, D, and D1, which allocate a portion of the area to development. Opportunities for habitat improvement projects for game animals would also be somewhat greater.

Wildlife Habitats. The area contains 20 acres of rock habitat and no meadows. Rock bluffs/cliffs are allocated for wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC, A through D1. Among the alternatives which allocate a portion of the area to General Forest, C, D, and D1 are the only alternatives to utilize a Riparian Prescription C which provides a higher quality of riparian habitat for wildlife.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are lower than average because of the difficulty in traversing the steep, trailless terrain Fewer hunters use unroaded areas and non-hunters generally stay on trails. Alternatives E, K, M and S produce fewest WFUD's; other alternatives would generate more.

Visual Resource

The visual inventory consists of approximately 400 acres of Retention, 3,200 acres of Partial Retention, and 2,300 acres of Modification. The Partial Retention objective was assigned in response to the recreation use on the Chetco River Road and the variety in the landscape that is somewhat unique relative to the rest of the Forest. Viewer sensitivity is moderate, as indicated by the consistent levels of recreation use attributed to the area

Alternatives NC, A, A-Departure, and G assign the area to management under the inventoried visual objectives. The natural appearance of the Supplemental Resource area of 700 acres would be maintained over the planning period The remaining area would shift to a slightly altered-altered appearance

Alternatives B, C, D, and D1 allocate the area to management under a reduced scheme of visual objectives. The entire area would be managed under the Modification visual objective. The existing natural appearance of the area would shift to an altered-heavily altered appearance within the first two decades.

Alternatives E and M would manage the area to achieve the Preservation objective. The natural appearance of the entire area would be maintained over the planning period.

Alternatives K and S assign the area to management under a reduced scheme of visual objectives. Areas inventoried for Retention would be managed for Partial Retention; areas inventoried as Partial Retention would be managed to achieve the Modification visual objective. Approximately 700 acres would be managed as a Supplemental Resource area to protect Emily Creek, maintaining the natural appearance of the inner gorge area. The remaining area would shift to an altered-heavily altered appearance.

Recreation Settings

The area is heavily influenced by the sight and sound of users from adjacent activities. Recreation use in the area is very light. The isolated location and the influences of surrounding road systems and attendant activities will preclude the area from providing a quality primitive or semi-primitive recreation experience whether the area is maintained in a roadless condition or not.

All alternatives, except E and M, would assign all or part of the area to Management Areas which permit development. Roaded Natural recreation opportunities would shift rapidly to the motorized end of the opportunity spectrum. Motorized opportunities would be enhanced as the area is roaded over time.

Alternatives E and M would maintain current status Recreation capacities would remain fixed since no new trail construction is programmed. Wilderness potential would be maintained

Alternatives A, A-Departure, B, C, D, and D1 would retain the essentially undeveloped character on 2,200 acres, and Alternatives K and S on 3,300 acres due to allocations to Supplemental Resource and Designated Wildlife Habitat areas Alternative NC provides for only 1,000 acres. These areas may or may not be contiguous, so the integrity of the area would be compromised by the presence of motorized activities (See **Wilderness Potential**).

Economic and Social

There are 5,635 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,945 acres of the Mt. Emily Roadless Area is 0.31 MMCF. The estimated LTSY would be 0.56 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC and B	.24	42
A, A-Dep, C, D, and D1	20	35
E and M	.00	00
G, K, and S	.14	24

For projecting effects, the alternatives are grouped: (1) Alternatives E and M maintain the area in an unroaded status; (2) Alternatives G, K, and S develop less than one-half the area; and (3) Alternatives NC, A, B, C, and D develop much of the area.

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E and M have the biggest reduction in the timber and road expenditures. The other alternatives have minor to insignificant changes in budget expenditures.

Indirect effects are associated with jobs, income, and payments to counties Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the biggest reduction while the other alternatives have minor or no change in the number of jobs, amount of income, and size of payments to the counties. Alternatives NC and B have a slight benefit when compared to Alternative A.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed For example in Alternative E, fishing interests are predicted to feel positive about forest management while timber interests would tend to feel the forest is not listening to their needs. Such gains and losses may create additional conflict.

Effects (Changes Compared to Alternative A)	Alternatives		
	E and M (Unroaded)	G, K and S	NC, A, B, C, and D (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Change	No Change
Indirect Effects			
Jobs	-18	-5	0
Annual Income (MM $)	-0 42	-0 13	0
Annual Payments to Counties (MM $)	-0 10	-0 03	0
Cumulative Effects			
Social Attitudes of Local and Westside Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	0	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old-Growth	+	+	0
Mining	-	0	0

MITIGATION MEASURES

No additional mitigation measures have been identified.

POTENTIAL CONFLICTS WITH OTHER JURISDICTION

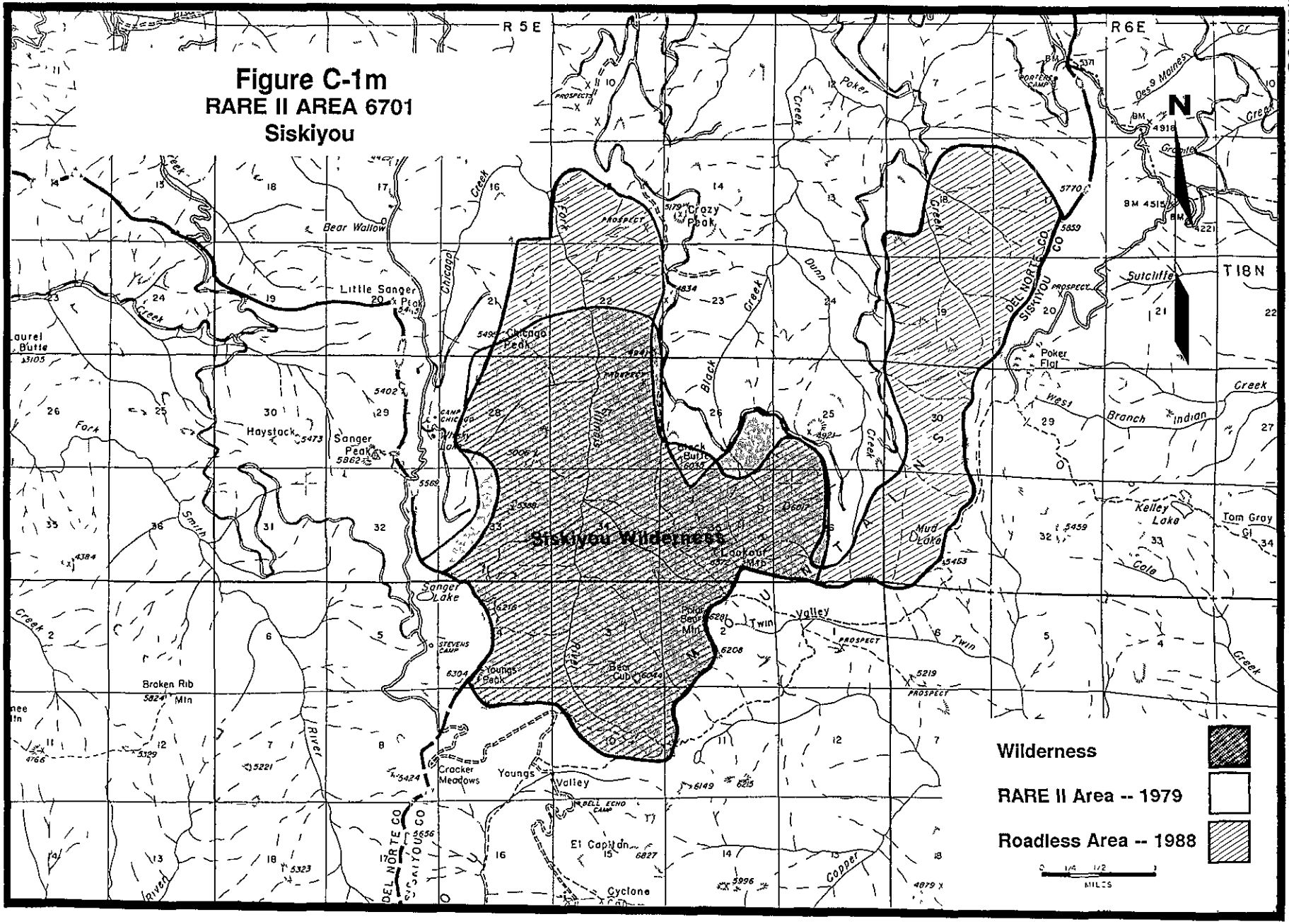
No additional conflicts with other jurisdictions have been identified.



Table C-5m. Siskiyou Roadless Area No. 6701 (3,284 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	3,284	3,220	0	3,284	628
7-Supplemental Resource	3,280	3,280	0	0	0	0	64	0	0	0
8-Designated Wildlife Habitat	0	0	372	372	372	0	0	527	0	320
9-Special Wildlife Site	0	0	5	5	5	0	0	262	0	406
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	0	0	260	260	260	0	0	209	0	135
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	0	0	5	0	5	0	0	1,414	0	1,007
14-General Forest	4	4	2,642	2,647	2,642	0	0	872	0	788
TOTAL	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284	3,284
TOTAL UNDEVELOPED (MA 1-9)	3,280	3,280	377	377	377	3,284	3,284	789	3,284	1,354

Figure C-1m
RARE II AREA 6701
Siskiyou



SISKIYOU No. 6701B

(3,284 Acres)

DESCRIPTION

STATUS OF ROADLESS AREAS

The Siskiyou Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. As a result of the California Wilderness Act of 1984, the area is now adjacent to the large Siskiyou Wilderness. The eastern portion on the Siskiyou National Forest also abuts the north end of the residual inventoried Siskiyou Roadless Area on the Klamath National Forest to the south.

These contiguous roadless portions were studied for Wilderness as a whole The Siskiyou National Forest portion was divided during the study into an "A" area of 4,950 acres and a "B" area of 3,284 acres The "A" area was allocated to recommended Wilderness by the RARE II decision in January 1979, and in 1984 it was designated as a Wilderness by the California Wilderness Act The "B" area was allocated to recommended non-Wilderness use by the RARE II decision in January, 1979 The "B" area was included in the California v. Block lawsuit which challenged the RARE II FEIS. No activities have taken place in any portion of the roadless area which would alter the wilderness characteristics covered by the judgment

The Chetco-Grayback Land Management Plan (FEIS, 1979) allocated the roadless area to dispersed recreation. Management direction emphasizes the protection and retention of existing natural qualities, including visual qualities; the protection of unique areas within; the protection of all resources, and development and utilization of recreation, timber, and the minerals resource potentials as consistent with the goals of essentially maintaining the existing natural values of the ecosystems.

This roadless area is surrounded totally by National Forest System lands The Siskiyou Wilderness divides the inventoried roadless area into two portions. Past management activities have been minimal, this is primarily due to the lack of commercial timber The area has not been roaded. Several trails exist within the area, but maintenance has been limited because of low recreation use.

There are several mining claims in the areas, however none have been developed to a noticeable extent. The area is within a livestock grazing allotment. The range condition and trend has been improving since 1976 as a result of a deferred rotation grazing system and fewer cows than the carrying capacity.

CHANGES BETWEEN DRAFT AND FINAL

During the period from 1984 to 1988, no activities occurred that impacted the unroaded area. The area is as previously described (Refer to Figure C-1m).

LOCATION AND ACCESS

The Siskiyou Roadless Area is located in Del Norte County, California. It is approximately 19 air miles south of the town of Cave Junction, Oregon, and approximately 6 air miles south of the Oregon-California state line The area contains the upper reaches of the East Fork Illinois River and Dunn Creek, a tributary of the East Fork.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

Prominent topographic features of the Siskiyou Mountains that surround the area include Black Butte, Crazy Peak, Mud Lake, and Chicago Peak Plant communities are diverse and interesting With the exception of drainage bottoms and lower slopes, most of the area is poorly forested Ridge tops are typically barren, being best described as subalpine in character

The area is part of the Siskiyou Mountain portion of the Klamath Mountain Geologic Province This geologic province is a steep, highly dissected mountainous area extending from northern California across southwestern Oregon. Elevations vary from about 3,000 feet in the East Fork Illinois River gorge to over 5,800 feet on the peaks.

Average annual precipitation averages approximately 60 inches, most coming in the form of snow in the elevations above 4,000 feet. In excess of 75 percent of the annual precipitation occurs during the months of November through March. Summer temperatures often exceed 80 and 90 degrees Fahrenheit.

Soils are of glacial origin and are typically shallow and mixed with rock outcrop. Soil productivity is low, a function of the shallow, rocky soil conditions and cold soil temperatures which shorten the growing season. Soils in the area along the East Fork Illinois River are also generally unproductive due primarily to influence by unfertile serpentine bedrock. Some previous mass soil movement is evident in this area

The ecosystem is predominately mixed conifer. The primary conifer species include Douglas-fir, Shasta red fir, and white fir, with only shrub forms of hardwood species.

A variety of fish and wildlife species utilize the area The lower half mile of the East Fork Illinois adjacent to the area is habitat for steelhead spawning and rearing. Black-tailed deer are present, but numbers are low due to limited forage in the area. No known threatened or endangered species inhabit the area The area contains a number of sensitive and uncommon plants.

RESOURCE USES

An old trail crosses the area, but use is light. Recreational activities in the area include hiking, fishing, and hunting. The management objective is directed to maintaining a high quality recreation experience. Approximately 50 RVD's can be attributed to the roadless area, itself. Water from the area is important to downstream domestic and irrigation interests.

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

This high elevation area is scenic and adjoins one of the most scenic locations on the Forest, the Siskiyou Wilderness. When combined with the existing Wilderness, this area does provide the opportunity for a high quality recreation experience. The roadless area is in a near-natural condition It contains attractions that are not common to the rest of the Forest, those being primarily open and subalpine characteristics.

CAPABILITY

MANAGEABILITY

Retention of this roadless area adjacent to the Siskiyou Wilderness could play an important role in the protection and management of both areas. The western portion, in particular, could serve as a logical topographic extension of the Wilderness which could aid in retaining the primitive character of both areas. The area may also serve as a natural screening tool.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The roadless area offers an opportunity for solitude because of the large undeveloped area to the south. The major intrusions are from highly visible activities outside the area The topographic and vegetative screening are relatively limited within the area, but it's open nature and subalpine peaks provide the feeling of solitude common to Wilderness. The area does not contain many features that are considered challenging to the primitive recreationalist, but the opportunity for a limited primitive recreation experience is present.

SPECIAL FEATURES

The area offers opportunities similar to those present in the adjacent Siskiyou Wilderness

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

The greatest resource potential that exists for this area is the fact that it could enhance the protection and management of the Siskiyou Wilderness The area can serve as a transition between the Wilderness and development activities. The setting is very conducive to high country dispersed recreation activities.

Wildlife

Under unroaded conditions, wildlife populations would remain about the same unless habitat improvement projects were initiated. Under roaded conditions, as units are harvested in the third of the area (mostly in the eastern portion) tentatively suitable for timber production, more forage will be available to deer in snow-free months of the year. Considerable habitat variety would remain under all alternatives because two thirds of the ground is unsuitable for development.

Sensitive Plants

The plant resources in the area contain several unusual species which provide a unique experience for both the casual visitor and botanist. The existing inventory indicates occurrence of the following species:

Sensitive Plants	Uncommon Plants
Eriogonum hirtellum	*Darlingtonia californica (nearby)*
Lewisia leana	*Dicentra formosa ssp oregana*
Pedicularis howellii (nearby)	*Erigeron bloomeri var nudatus*
	Lilium bolanderi
	Lilium washingtonianum
	Sidalcea malveflora ssp. elegans

Timber

Site productivity is low. Approximately 997 acres is tentatively suitable for timber production Standing volume is estimated at 16 MMBF

Minerals

The area has a moderate potential for both critical and non-critical minerals. Deposits do not appear to exist in quantities that will become commercially profitable in the foreseeable future

Livestock

The area is under a livestock grazing permit. Although actual use and forage capacity is low, these areas are important as travelways between pastures.

Cultural Resources

The area has some known historic mining sites and some prehistoric use, both of which need evaluation by an archaeologist. The ridgeline running through the area was likely an Indian trail, and subsequently, an historic transportation route. Overall, the area has low archaeological potential

MANAGEMENT CONSIDERATIONS

Fire occurrence has been low Fuel loadings range from low to moderate, with occasional heavy accumulations of natural fuels There are no known infestations of insects in the area, however the common and most significant disease is mistletoe.

NEED

OTHER AREAS AND PUBLIC USE

The area is bordered by the Siskiyou Wilderness Other large Wildernesses are within view (Red Buttes and Kalmiopsis). The extent of unroaded/undeveloped area adjoining the inventoried Siskiyou Roadless Area is significant. With the exception of the potential for minerals, management activities would be either very limited or nonexistent The current recreation use would continue as the dominate activity

The Siskiyou Mountains are an attraction for both vacationers and residents of nearby communities. The major population centers, such as Portland and San Francisco, are from six to ten hours away by car. However, summer recreation traffic between the coast and inland areas using U.S. Highway 199 pass very close to the area. Access from this major travel route is good.

ECOSYSTEM REPRESENTATION

The major ecotype is well represented in the adjacent Siskiyou Wilderness and other undeveloped or unsuitable lands nearby

PUBLIC INVOLVEMENT

Public input on this area and adjacent roadless areas has been substantial. For the Siskiyou Roadless Area and the portion that is now Wilderness, involvement in evaluation of management options began prior to 1970 In early 1970, RARE initiated a proposal for Wilderness RARE II followed closely in its tracks. With this "B" section of the roadless area being relegated to non-Wilderness, public input continued. The California Wilderness Act of 1984 created the adjoining Siskiyou Wilderness and released this area from further study through this round of Forest planning

The area was also evaluated in the Chetco-Grayback Land Management Plan However, this evaluation did not consider the area for Wilderness, but relied instead on RARE II outcome. As a result, the "B" portion was given a de-facto "backcountry" or "scenic" status After passage of the Wilderness Act, the residual unroaded portion has been only moderately sought after for inclusion into the Wilderness system Much

of the area is inherently protected due to the high percentage of nonforested land Public involvement has continued with meetings, workshops, and other contacts into 1985, and formal comments to the Forest Plan DEIS in 1987 and 1988. This input has not surfaced any new or additional concerns relative to allocation of this area as roadless. It is likely that the 1984 Wilderness Act resolved many of the concerns.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

Alternatives B, C, D, K, and S require some degree of which will require intensive cultural resource inventories along any proposed road prior to approval. Sites that may exist in the project area can be evaluated. Valuable sites can then be protected by avoidance or conserved through data recovery Alternatives NC, A, E, G, and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a summary of the estimated mineral potential and accessibility limitations Acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-	-	-
High	-	<100	-	<100
Moderate	-	-	-	-
Low	-	3,300	-	3,300
Total	-	3,300	-	3,300

Improvements

Roads. The 997 acres of tentatively suitable land could generate about four miles of new road for timber harvest. Other roads for mining are possible, but would be minimal. All would be dead-end local roads built when needed to access timber harvest units. All roads would be open to only high clearance vehicles or closed between projects. Alternatives B, C, D, K, and S would road part of the area; Alternatives NC, A, E, G, and M would not. That portion of Alternative S allocated to Backcountry Recreation has an insignificant affect on roading needs for timber harvest activities.

Existing roads on the boundary are local roads except for Road 4803 near the western boundary. This section of collector Road 4803 is maintained only for high clearance vehicles. The local roads are also high clearance vehicle roads. The road system would follow ridges or be midslope roads off the existing local system. Midslope roads would cross only small creeks and draws. Some full bench ground would be crossed with excess excavated material hauled to stable disposal sites.

Trails. No new trails are programed under any alternative.

Recreation Site Development. No construction is programed.

Wilderness Potential

The roadless area and the Siskiyou Wilderness are similar in character and recreation opportunities, however the roadless area is influenced by management activities on adjacent lands The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 3,300 acres. The carrying capacity for the area is estimated at approximately 5,300 RVD's. This figure is high since the Roaded Natural coefficients were developed based on the assumption of the presence of roads

Current use is low and is expected to remain low over the planning period. Maintaining the roadless area would expand the carrying capacity for the Siskiyou Wilderness. However, the recreation experience would be influenced by adjacent motorized activities so that the quality of the experience is suspect The area could be managed in a roadless condition under Semi-primitive objectives and provide some recreation opportunities, helping to insure the quality of experience in the adjacent Wilderness

Access is provided on several existing trails. The trails have not been maintained due to low levels of use and constrained budgets and are in various stages of deterioration. Recreation demand projections *indicate that levels of use will remain well within the carrying capacity over the planning period.*

Alternatives B, C, D, K, and S assign the area to multiple resource management objectives; the Roaded Natural recreation setting currently available would shift to a modified setting as a result The change in the character of the landscape would result in the loss of Wilderness potential.

Alternatives NC and A assign the area to Supplemental Resource management objectives; in essence, maintaining the area in a roadless condition Alternatives E, G, and M maintain the area in a roadless condition. The area would provide additional capacity for some Semi-primitive recreation opportunities. Wilderness potential would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater.

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	3,300	3,300	3,300
B, C, D, and D1	1,000	0	0
E and M	3,300	3,300	3,300
G	3,300	3,300	3,300
K	1,000	0	0
S	1,000	600	600

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic River

The area is far removed from any designated Wild and Scenic River Allocation of the area will have no effect on the downstream management of the designated Illinois Wild and Scenic River.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated with Alternatives NC, A, E, G, and M because no soil disturbing activities will occur. All other alternatives allocate part of the area to Management Areas which permit development. The environmental effects of timber harvest and road building are discussed in the Chapter IV of the FEIS.

The risk of degrading the soil, water, and fish resources in all roaded alternatives is negligible. The acreages proposed for road construction and timber harvest are limited in all alternatives. Areas in which these disturbing activities would occur do not demonstrate high risk for increased mass movement activity.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

Fuels in the Siskiyou area are quite variable. The lower elevations are dense, continuous stands of brush. At the higher elevations, brush areas are interspersed with open timber stands. Numerous natural openings are present at the higher elevations. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. The conditions at the lower elevations lend themselves to large, high intensity fires; at the higher elevations, lower intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, the hazard increases during timber harvest. As fuels are treated, fire hazard is reduced. Over time, continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives NC, A, E, G, and M, all of the area would remain undeveloped or have only very limited development, with fuels remaining continuous over the entire area. Alternatives B, C, D, K, and S develop between 55 and 81 percent of the area. The remaining undeveloped areas would be broken into two to six separate blocks. In all alternatives, some of the high priority natural fuels accumulations will be treated.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and treatment of activity slash. As access improves, the level of dispersed recreation and other public uses increase, with an increase in the risk of human-caused fires. Both developed and undeveloped areas will have similar risk levels for lightning fires.

In Alternatives NC, A, E, G, and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternatives B, C, D, K, and S, industrial operations would result in increased risk over 55 to 81 percent of the area, and risk from public use would be increased along the four miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical Areas or RNA's are proposed. A significant number sensitive and rare plants are present; others will likely be discovered. Sensitive plants will be protected through application of appropriate Standards and Guidelines.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning Only impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives NC, A, E, G, and M would contribute no TSP. Alternatives B, C, D, K, and S would produce six tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Cave Junction or Grants Pass, a designated area for air quality, is very low based on past performance. The probability of impacting the Oregon Caves National Monument or the Marble Mountains Wilderness, a Class 1 area, is very low The probability of impacting the Siskiyou Wilderness is moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. The area does not contain suitable habitat for bald eagle or osprey.

Spotted Owl/Pileated Woodpecker/Pine Marten. About a third of the roadless area is tentatively suitable for timber production. Under all alternatives, most of the area would maintained in its current condition, barring natural changes. Alternatives NC, A, E, G, and M would allocate the entire area to land classifications with no programmed timber harvest In all alternatives except NC, two habitat enclaves to meet Management Requirements (MR's) for mature/old-growth habitat are located within the area one for pileated woodpecker, and one for pine marten (the pileated's area is only partially within the roadless area) Because of the high elevation, it is questionable whether the area supports any spotted owls.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives NC, A, E, G, and M. In areas unsuitable for timber production, snag levels will remain high

Black-tailed Deer/Roosevelt Elk Elk are not present in the area. Management opportunities for deer would be increased in alternatives which open up areas suitable for timber production

Wildlife Habitats The area contains 200 acres of rock habitat and no meadows Rock bluffs/cliffs are allocated for wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC through D1.

Wildlife Recreation Use. Total estimated Wildlife/Fish User Days (WFUD's) currently attributed to the roadless area are lower than average Non-consumptive use may not be much less than average, but this is offset by low hunter use Hunting is not as prevalent due to the higher elevation and geographic fact that the area is in California (most the hunting use being from local hunters, and these hunters living and being licensed in Oregon). Alternatives NC, A, E, G, and M produce fewest WFUD's.

Visual Resource

The current visual inventory indicates that the area is in a location where it is visible to recreational users. The area is distinctly different in landscape character from the rest of the Forest, and offers some of finest scenery found on the Forest. The area inventory is listed below.

VQO	Acres
Retention	400
Partial Retention	1,600
Modification	1,300

Viewer sensitivity or concern for the visual quality of the area is high. However, recreation use in the area is extremely low. Retention and Partial Retention objectives were assigned in response to the high quality of scenic values. Alternatives E, G, and M would result in upgrading of the area to management under the Preservation visual objective. The natural appearance of the area would remain essentially unchanged Similarly, Alternative NC and A emphasizes management for inventoried visual objectives. The Supplemental Resource area assignment would preclude harvest and, in effect, upgrade visual objectives to management under the Preservation objectives.

Alternatives B, C, and D would assign the area to management under the Modification visual objective, resulting in a modified forest environment where management activities would be readily apparent. The existing natural appearance would appear slightly altered-altered since less than 1,000 acres of the area is considered tentatively suitable for timber harvest.

Alternatives K and S assign the area to management under a reduced scheme of visual objectives. Areas inventoried for the Retention would be managed under the Partial Retention objective. Management activities would be apparent but subordinate (less obvious) to the existing character of the landscape. The area's natural appearance would be modified somewhat so that some area would appear as slightly altered, with the exception of the 600 acres of the western portion assigned to Backcountry Recreation in Alternative S.

Recreation Settings

The area is surrounded on three sides by lands that have been modified by past activities, and thereby makes the area very susceptible to sight and sound of motorized users. The south half is contiguous to the Siskiyou Wilderness. The area could be managed in a roadless condition with Semi-primitive objectives and provide some recreational opportunities.

Alternatives B, C, D, K, and S currently provide a Roaded Natural recreation setting which would be retained in a near natural setting. Access to the area and motorized opportunities would be enhanced as the area is roaded over time. They also would retain the essentially undeveloped character on 400 to 500 acres due to assignments to Designated Wildlife Habitat. Alternative S allocates an additional 600 acres under Backcountry Recreation, thereby maintaining the western portion in an unroaded setting adjacent to the Wilderness.

Alternatives NC, A, E, G, and M would maintain current status. Recreation capacities remain fixed since no new trail construction would occur. Natural appearance of the area would be maintained.

Economic and Social

There are 997 acres of land identified as tentatively suitable for the production of timber in this unroaded area The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS

The estimated potential ASQ from the inventoried 3,284 acres of the Siskiyou Roadless Area is 0.05 MMCF The estimated LTSY would be 0.10 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC, A, E, G, and M	00	.00
B	.05	11
C, D, and K	04	.09
S	.03	06

For projecting effects, the alternatives are grouped: (1) Alternatives NC, A, E, G, and M leave the area unroaded; (2) Alternative S which develops much of the area; and (3) Alternatives B, C, D, and K develop most of the area.

	Alternatives		
Effects (Changes Compared to Alternative A)	NC, A, E, G and M (Unroaded)	S	B, C, D, and K (Roaded)
Direct Effects			
Timber and Road Expenditures	None	Minor Increase	Increased
Indirect Effects			
Jobs	0	+1	+4
Annual Income (MM $)	0	+0.02	+0.08
Annual Payments to Counties (MM $)	0	+0.00	+0.02
Cumulative Effects			
Westside Rural Communities			
Timber Related	0	+	+
Primitive Recreation	0	-	-
Fisheries	0	0	0
Wildlife Related			
Hunting	0	0	0
Old-Growth	0	0	-
Mining	0	0	+

All economic and social effects for all alternatives are insignificant because of the small amount of resources involved The amount of these resources indicate substitution of other resources could occur fairly easily resulting in little if any impact on the social and economic environment.

The direct economic effect is government expenditure for the timber and associated road construction program. Alternatives B, C, D, K, and S create a slight increase in timber and road expenditures over Alternative A. The other alternatives maintain the current condition.

Indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives B, C, D, K, and S slightly increase the levels of employment, income, and payments to counties.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Additional discussion is found in Chapters III and IV of the FEIS. The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E and M, fishing interests are predicted to feel positive about Forest management while timber interests as predicted to feel the Forest is ignoring their interests. An "0" indicates no change from current situation. Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures have been identified.

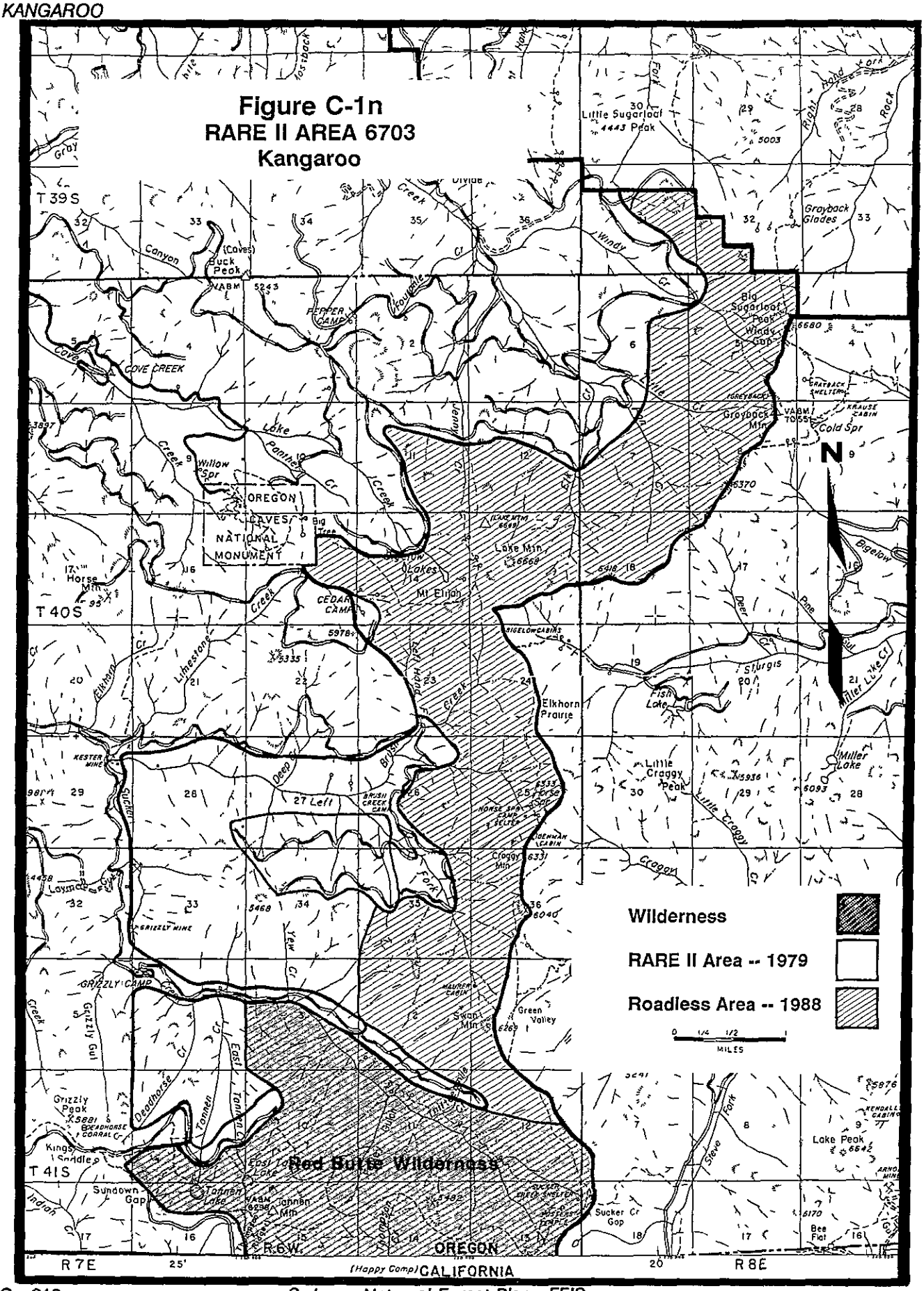
POTENTIAL CONFLICT WITH OTHER JURISDICTIONS

No additional conflicts with other jurisdictions have been identified.



Table C-5n. Kangaroo Roadless Area No. 6703 (6,651 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	101	101	101	101	101	101	101	101
4-Botanical	0	0	165	165	165	1,072	1,072	368	1,073	565
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	5,478	5,478	0	5,477	2,289
7-Supplemental Resource	2,939	2,939	0	0	0	0	0	3,136	0	0
8-Designated Wildlife Habitat	0	580	1,040	1,040	1,040	0	0	329	0	400
9-Special Wildlife Site	127	80	367	367	367	0	0	32	0	101
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	532	480	623	623	623	0	0	458	0	570
12-Retention Visual	403	174	166	0	166	0	0	0	0	0
13-Partial Retention Visual	838	731	37	203	37	0	0	32	0	32
14-General Forest	1,812	1,667	4,152	4,152	4,152	0	0	2,195	0	2,593
TOTAL	6,651	6,651	6,651	6,651	6,651	6,651	6,651	6,651	6,651	6,651
TOTAL UNDEVELOPED (MA 1-9)	3,066	3,599	1,673	1,673	1,673	6,651	6,651	3,966	6,651	3,456


Figure C-1n
RARE II AREA 6703
Kangaroo
Wilderness
RARE II Area -- 1979
Roadless Area -- 1988
MILES
Red Bluff Wilderness
OREGON CAVES NATIONAL MONUMENT
OREGON
CALIFORNIA
T39S
T40S
T41S
R7E
R6W.
R8E
Little Sugarloaf 4443 Peak
Big Sugarloaf Peak
Windy Gap
Grayback Mtn
Buck Peak
Cove Creek
Lake Mtn
Mt Elijah
Elkhorn Prairie
Little Craggy Peak
Miller Lake
Fish Lake
Grizzly Peak
Kings Saddle
Sundown Gap
Tannen Mtn
Lake Peak
Sucker Cr Gap
Bee Flat
Swan Mtn
Green Valley
Horse Mtn
Pepper Camp
Cedar Camp
Bigelow Cabins
Grayback Glades
Cold Spr
Willow Spr
Big Tree
Lake Panther
Deep Cr
Elkhorn
Limestone
Sturgis
Miller Lake Cr
Little Craggy
Craggy
Grizzly Gul
Deadhorse
Tannen
East Tannen Cr
Indian
Sucker
Stevo Fork
Yew Cr
Grizzly Camp Cr
Laymac Cr
Bigelow
Pine
Deer
Jenny
Windy
Rock
Right Hand Fork
Gray
Divide
Canyon
Cove
Panther
Creek
Lake
Fork
Cr
Gulch
Trail
Ridge
Mine
Cabin
Shelter
Camp
Spr
Lakes
Meadows
Flat
Gap
Peak
Mtn
Glades
Trail
Gulch
Ridge
Fork
Creek

KANGAROO No. 6703

(6,651 Acres)

DESCRIPTION

STATUS OF ROADLESS AREAS

The Kangaroo Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. It is comprised of three large parcels on the Siskiyou, Klamath and Rogue National Forests. Before the California and Oregon Wilderness Acts of 1984, it extended into both Oregon and California and totaled 100,453 acres. The Siskiyou parcel, which is the only one considered here, contained 14,192 acres of which all but 110 acres were allocated to non-Wilderness use by the RARE II decision of January 1979. Since then, it has been further reduced to 10,832 acres as a result of timber sales and nonconforming features existing prior to RARE II. The final unroaded acreage figure of 6,651 acres was established with the designation of 3,414 acres as the Red Buttes Wilderness via the Oregon Wilderness Act of 1984 The entire area is National Forest System land

A coordinated planning effort between the Klamath, Rogue River, and Siskiyou National Forests began in 1975 to study unroaded lands within the Kangaroo Roadless Area (locally known as Red Buttes) This effort, known as the North Siskiyou Planning Unit, was established as part of a 1976 legal agreement with an appellant group. The North Siskiyou Planning Unit DEIS (1979) was prepared for the area. A Final Environmental Impact Statement for the planning unit was not completed as it was superseded by the RARE II Roadless Area Review and Evaluation (FEIS, 1979). Unit planning was discontinued by direction of the National Forest Management Act of 1976 (NFMA).

Contiguous inventoried roadless area on the Rogue River National Forest adjoins the Siskiyou portion to the east. This large area (over 14,000 acres) of the Kangaroo lies in the headwaters of the Applegate River. The common border of the unroaded area extends from Grayback Mountain to the Red Buttes Wilderness. Management options for this area has been coordinated between the two Forests for several years. Project planning and special uses have coordinated at the District levels. For further information about the eastern part, please refer to the Rogue River National Forest Draft Forest Plan and, in particular, Appendix C of that document (DEIS, 1987).

All projects within or adjacent to the Siskiyou National Forest portion of the Kangaroo area are governed by the Illinois Valley Multiple Use Plan and Chetco-Grayback Land Management Plan (FEIS, 1979). These projects and land uses have been analyzed under National Environmental Policy Act (NEPA) requirements/ process.

CHANGES BETWEEN DRAFT AND FINAL

During the period between 1984 and 1988, a timber sale in the southwest portion of the area (Deadhorse and Tannen Creeks) reduced the available unroaded acreage by approximately 800 acres (Refer to Figure C-1n). The remainder of the area is as previously described.

LOCATION AND ACCESS

The Siskiyou National Forest portion of the Kangaroo Area is located in Josephine County, Oregon, and includes the headwaters of the Grayback and Sucker Creek drainages, both of which are major tributaries to the upper Illinois River system. It is located approximately 17 air miles east of Cave Junction, Oregon

Access to the unroaded portions is provided through extensive road systems on the Siskiyou, Rogue River, and Klamath National Forests. These multi-purpose routes serve recreation, timber haul, and administrative traffic in and adjacent to the area.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The area is part of the Siskiyou Mountain portion of the Klamath Mountain Geologic Province This geologic province is a steep, highly dissected mountainous area extending from Northern California across southwestern Oregon Elevations vary from about 4,000 feet to 7,055 feet at Grayback Mountain Most of the area is covered with dense forest, however the upper elevations offer considerable variety in patches of true fir forest, brush fields, large rock outcroppings, and open grassy meadows

Soils are generally very shallow and mixed with rock outcrop at the higher elevations and along ridgelines. Productivity is limited due to very sandy soil textures and shallow, rocky soils which have restricted ability to store water and nutrients. Cold soil temperatures also limit the effective growing season for plants. At lower elevations in glacial troughs where deeper soils are present and soil temperatures are warmer, soil productivity is greatly increased Wet, poorly drained soils scattered throughout the area are generally occupied by grasses, sedges or alders. Some signs of previous instability are present in the form of debris avalanche tracks within steep perennial streamcourses.

Average annual precipitation varies from 60 to 70 inches with the bulk of the precipitation occurring as snow in the elevations above 5,000 feet. In excess of 75 percent of the annual precipitation occurs during the months of November through March. Summer temperatures often exceed 80 and 90 degrees Fahrenheit

The area provides diverse habitat for a variety of wildlife species including blacktail deer, black bear, and various old growth dependent species While no known threatened or endangered species inhabit the area, several sensitive or unusual wildlife species are present or likely to be present. A sensitive species, the northern spotted owl, occupies old-growth habitat at elevations below 5,000 feet (approximately) The Siskiyou Salamander, another sensitive species, undoubtedly occurs in rock rubble habitat within the area.

A large variety of sensitive and uncommon plants is present in the crest zone of the area, especially in the Grayback Mountain and Bigelow Lakes areas Some of these plants occur at the northerly and westerly limits of their known range. Bigelow Lakes and Grayback Mountain, both noteworthy botanical areas, are being considered and evaluated in various alternatives of the FEIS. The Red Buttes Wilderness and the proposed Craggy Peak RNA also contain significant botanical resources (See Appendix F of the FEIS for a description of each proposed RNA and Botanical areas; plants are listed for each individual area).

RESOURCE USES

Limited minerals development and exploration occur in the upper reaches of the Sucker Creek drainage. Much of the area is included in the Illinois Valley Multiple Use Plan and receives a moderate amount of livestock grazing.

Recreational use is largely in the form of dispersed non-motorized and motorized use It occurs chiefly in the form of hunting, hiking, and trailriding on horseback and motorcycles The existing trail system is extensive and provides access to most of the unroaded lands The Boundary Trail has been designated as a National Recreation Trail and receives a moderate amount of use Current use estimates place Recreation Visitor Days (RVD's) in the range of 1,200 RVD's per year.

APPEARANCE, SURROUNDINGS, AND ATTRACTIONS

The appearance of the Kangaroo Area is characterized by moderately rugged, high elevation peaks with meadows, rock outcroppings and brush patches along the ridgetops and a heavy coniferous canopy down the slopes. Conditions surrounding the area vary greatly as the roadless area is a narrow stringer of land whose boundaries have been formed by man's activities along its eastern and western flanks A mosaic of patch cuts of various vegetative stages and ages exists adjacent to the boundary. The southern boundary joins with the Red Buttes Wilderness The mid-western edge abuts a corner of the 480-acre Oregon Caves National Monument.

The area contains Bigelow Lakes and a variety of smaller streams that eventually reach the Illinois River None of the streams within the roadless area support a fishery resource Blacktail deer and bear are the notable wildlife most common to the area.

CAPABILITY

MANAGEABILITY

The Kangaroo area is well defined and compact. Man's off-site activity affects the ability to manage the area in a natural state. The closeness of these roads and units precludes the opportunity for a primitive recreation experience

NATURAL INTEGRITY AND APPEARANCE

Human influences within the unroaded area are limited to old campsites and livestock grazing The impacts of grazing occur yearly as the higher elevations meadows are used as summer range for a Rogue River National Forest allotment One practicable way of lessening these impacts would be to eliminate the allotment

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The Siskiyou National Forest portion of the Kangaroo area is a narrow stringer of land bounded on the west by roads and harvest units Opportunities for solitude, thereby, are intruded upon by the sights and sounds of man's activities outside the area To the east of the ridgeline, the Rogue River National Forest portion of the unroaded area extends downslope and out higher ridges. Similar to the Siskiyou portion, roads and harvest units provide the demarcation of the roadless boundary at lower elevations.

The area does not contain many features that are considered challenging to the recreationalist seeking a primitive experience. There are few areas within the unroaded area where they can remain for long periods of time without being reminded of human activity.

SPECIAL FEATURES

Primary features include Mt. Elijah, and Swan, Craggy, Lake, and Grayback Mountains, plus a variety of lesser peaks, ridges, meadows and headwater basins, Bigelow Lakes, and the Oregon Caves National Monument (adjacent to the area). The high ridgetops provide a scenic character somewhat unusual to the Siskiyou. This ridgeline is traversed by the Boundary National Recreation Trail, and through various trails on the Rogue River and Klamath National Forests, provides a tie to the Pacific Crest Trail Sensitive plant communities dot the area, providing the casual visitor or botanists a unique opportunity of viewing unusual or uncommon species.

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

The present use occurs primarily in the form of hiking, trail riding on horseback and motorcycle, and hunting. Potential for recreation is increased under development, however, capacity is not likely to be exceeded. The area is quite conducive to through travel or day hikes, providing a higher elevation and scenic experience during various times of the year

Wildlife

Game and non-game wildlife populations will remain constant unless management practices are introduced. Development would promote expansion of deer populations. Old-growth dependent species would decrease in number. They would not be eliminated, however, because considerable habitat variety would remain along streams and unsuitable areas.

Sensitive Plants

A large variety of sensitive and uncommon plants is present in the crest zone of the area, offering the visitor a different experience Sensitive species will be protected in accordance with Standards and Guidelines. The following composite list for the entire roadless area is not complete, as plant inventories have been conducted in only part of the area:

Sensitive Plants	Uncommon Plants
Cupressus bakeri	*Allium siskiyouense*
Erigeron cascadensis	*Aster brickelliodes*
Erigeron cervinus	*Calypso bulbosa*
Eriogonum incanum	*Castilleja elata*
Eriogonum ternatum	*Darlingtonia californica*
Erythronium howellii	*Dicentra formosa spp. oregana*
Gentiana pleurisetosa (sp. nova)	*Eburophyton austinae*
Haplopappus whitneyi spp. discoideus	*Epilobium luteum*
Iliamna latibracteata	*Iris chrysophylla*
Lewisia leana	*Lewisia cotyledon var. cotyledon*
Lilium parvum	*Lilium bolanderi*
Monardella purpurea	*Lilium vollmeri*
Pedicularis howellii	*Lilium washingtonianum*
Polystichum lemmoni	*Lilium wigginsii*
Ribes marshallii	*Lomatium howellii*
Sidalcea setosa ssp setosa	*Pedicularis flavida*
Trifolium howellii	*Pedicularis flavida*
	Penstemon newberryi spp. berryi
	Rubus nivalis
	Saussurea americana

Water

There are no man-made impoundments or diversions either existing or proposed Increased water yields can and would result from increased timber harvest activity. The greatest demand for the water resource

has been directed toward the maintenance and improvement of downstream water temperatures in the hot summer period, along with providing undiminished flows for irrigation and domestic uses Management of this resource contributes directly to downstream fishery resources

Livestock

Grazing of livestock is an important historical use of the area The potential for increased use is not likely to occur without other resource degradation.

Cultural Resources

The area is known to contain historic and prehistoric sites, specifically aboriginal camps and historic cabins and mining evidence. Trail systems in the southern portion of the area have historic origin. Overall, the area has low archaeological potential.

Energy and Minerals

Activity in the form of exploration and development is low to nonexistent Although mineral occurrence is likely, commercial quantities and development are remote.

Timber

The unroaded area contains 3,702 acres of land tentatively suitable for timber production Standing volume of timber is estimated at 79 MMBF Site productivity is moderate The area is generally stable and can be roaded and harvested without significant adverse consequences by harvest methods common on the Forest.

MANAGEMENT CONSIDERATIONS

Fire occurrence, rated low to moderate, is of principal concern. Most fire occurrences are lightning caused Natural fuels are generally light to moderate with occasional heavy concentrations The greatest fire threat occurs from dispersed recreation use deep within the unroaded area. While risk is low due to use patterns, ignition during critical weather patterns could have dire impacts.

The potential for insect and disease outbreaks within the coniferous forest exists. However, actual occurrences have been minor and localized. Mistletoe is the most prevalent disease.

NEED

OTHER AREAS AND PUBLIC USE

The Kangaroo area abuts the Red Buttes Wilderness and lies in close proximity to many other unroaded areas on the Siskiyou, Rogue River, Klamath and Six Rivers National Forest.

Local users from the Cave Junction, Grants Pass, and Medford areas are more likely to utilize the Kangaroo area than recreationalists from major population centers, such as Portland or San Francisco. People from out of the local area are more likely to seek areas that are both closer and offer more in terms of a recreational experience However, users of the National Monument also hike the local trails. Heaviest use at present comes from the local counties.

ECOSYSTEM REPRESENTATION

The major ecotypes are well represented in other undeveloped Wilderness areas. The rather extensive occurrence of botanical features are evaluated for inclusion in special Management Areas in the FEIS and Appendix F of the FEIS.

PUBLIC INVOLVEMENT

Both the public and Forest managers have had considerable interest and concern for the existing and future management of the Kangaroo area. Public involvement can be traced back to development of the Craggy Mountain Scenic Area Plan of the mid-1960's to establishment of the North Siskiyou Planning Unit and finalization of the RARE II process Since then, extensive public involvement has been sought for site specific projects within the unroaded area. The Oregon Wilderness Act of 1984 provided more opportunity for input, the result was creation of the Red Buttes Wilderness which included much of the southern portion of the Kangaroo Roadless Area. In the current Forest Planning process, the unroaded area question remains a major issue.

The analysis herein is a compilation of input received from public meetings and workshops RARE II input was evenly divided between Wilderness and non-Wilderness interests. Over 7,600 responses were received In the North Siskiyou Planning Unit DEIS (not released), involvement was well represented by all factions.

The State Department of Fish and Wildlife recommended that any development activity be approached with great caution and that emphasis be placed on protection of water quality. The Department of Forestry did not place special emphasis on this area as critical to the State or area timber supply, instead indicate that the unit had attributes that could fill Wilderness system gaps.

The Southern Oregon Resources Alliance organization took the position that values of the area were best managed through a multiple use framework. Some of the smaller sites were suggested for set aside as special interest areas. The local Sierra Club chapter, heavily involved in the disposition of this area over many years, had been a prime mover for seeking Wilderness status for the area With much of the roadless area being incorporated into the Red Buttes Wilderness in 1984 legislation, interest in requesting further Wilderness status for the remaining inventoried portion has waned However, members and other local people are still quite interested in resolution of the Kangaroo Roadless Area through the Forest Planning process.

To date, and primarily as a result of early interest in the area's quality and attributes, it has been left in an unroaded status Public preference has leaned to multiple use, but with a bent toward protection of the more outstanding features and upper elevations. Comments received on the Forest Plan DEIS in 1987 and 1988 also have not added any new insight or concerns as to management of this unroaded area. Discussions now seem more oriented to where to draw the boundary and exactly what recreation management scheme should exist within the area.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

Alternatives NC, A, B, C, D, K, and S call for varying degrees of development which require intensive cultural resource inventory along any proposed road prior to approval. In this way, sites that exist in the project area can be evaluated and valuable sites protected by avoidance or conserved through data recovery. Alternatives E, M, and G call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table is a tabular summary of the estimated potential and accessibility limitations for Kangaroo. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM

Access Restrictions	Mineral Potential (Acres)			
	High	Moderate	Low	Total
Withdrawn	-	-	100	100
High	-	-	-	-
Moderate	-	-	-	-
Low	500	-	6,000	6,500
Total	500	-	6,100	6,600

Improvements

Roads The 3,702 acres of tentatively suitable land could generate about 17 miles of new road for timber harvest. Roads for other purposes would be minor. The Tannen Lake Road, Sucker Creek Road, and Bigelow Lakes Road access the area. All other new construction would be local roads. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative:

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC and A	12	3	4	5
B	17	4	6	7
C	17	3	7	7
D	17	5	5	7
E,G,&M	0	0	0	0
K	11	3	1	7
S	13	3	2	8

Alternatives E, G, and M would have minimal effect on this area due to no roads being built. Alternatives NC, A, B, C, D, K, and S would be roaded to varying degrees. Specific areas would not be roaded; these exceptions are the Botanical area and the much larger Craggy Mountain Supplemental Resource area in Alternatives NC, A, K, and the Backcountry Recreation area in Alternative S.

Since the area is in the headwaters of several streams, none of the proposed routes would cross streams inhabited by fish. Full bench ground would be crossed by roads with excess excavated material hauled

to stable disposal sites Much of the roading would be visible from the Boundary Trail and noise from project activities would be heard by hikers

Trails. None of the alternatives would cause construction or reconstruction of trails within this area, the existing trails are also retained in all alternatives.

Developed Recreation Sites. One new recreation site (at Bigelow Lakes) is identified for construction under Alternatives G and M; the other Alternatives provide for no additional sites.

Wilderness Potential

The roadless area and the Red Buttes Wilderness are similar in character and offer similar recreation opportunities. However, the roadless area is more influenced by management activities on adjacent lands. The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 3,500 acres and approximately 3,100 acres of Semi-primitive Motorized recreation opportunities. The carrying capacity for the area is estimated at approximately 8,800 RVD's This figure is high since Roaded Natural coefficients were developed based on the assumption of the presence of roads Current use is low (approximately 1,200 RVD's) and is expected to remain low over the planning period.

Maintaining the current status of the roadless area would, in effect, expand the carrying capacity for the Red Buttes Wilderness; however, the recreation experience would be influenced by adjacent motorized activities so that the quality of the experience is suspect The area could be managed in a roadless condition under Semi-primitive objectives and provide some recreation opportunities while helping to insure the quality of the experience in the designated Wilderness.

All alternatives except E and G assign the area to multiple resource management objectives Under these, approximately 40 percent of the area would be entered for developed and the Roaded Natural recreation setting currently available would shift to a modified setting as a result Alternatives NC, A, K, and S would assign approximately half the area to Supplemental Resource or Backcountry Recreation resulting in maintenance of roadless conditions for a good portion of the upper subalpine setting Retaining the area's Wilderness potential is not provided in Alternatives B, C, and D.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades, these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater.

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	3,600	3,600	3,600
B, C, D, and D1	0	0	0
E and M	6,600	6,600	6,600
G	6,600	6,600	6,600
K	4,000	4,000	4,000
S	3,500	3,500	3,500

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

The allocation of the area to roaded or unroaded management objectives will have no effect on the management of the Illinois Wild and Scenic River downstream

Soil, Water, and Fish

No impacts to soil, water, and fisheries are associated Alternatives E, G, and M as no soil disturbing activities occur. All other alternatives allocate all or part of the area to Management Areas which permit development The environmental effects of timber harvest and roading are discussed in the Chapter IV of the FEIS.

The risk of degrading the soil and water resource increases with more timber harvest and road building. Soil disturbing activities included in Alternatives B, C, and D could have a potentially minor to moderate adverse effect on these resources. Soil hazards of mass failure due to road construction and regeneration harvest are not great. However, disturbed soil areas are often slow to revegetate at these higher elevations and soils are sensitive to adverse impacts due to activities associated with site preparation. In Alternatives NC, A, K, and S, approximately half the area remains undeveloped, thereby reducing the potential impacts on fragile soils in the area. Alternative NC would have a slightly greater effect in that more acres are available for development.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. Risk is defined as the probability that an ignition will occur. Hazard is a description of the fuels complex in terms of kind, volume, arrangement, condition and location of the fuels.

The Kangaroo area is predominantly mature and old-growth Douglas-fir and true fir. Fuel loadings in these stands are moderate to high. On some south slopes, dense brushfields exist. Fuels are continuous over most of the area, with breaks found at the higher elevations. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Added to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, the hazard increases during timber harvest. As fuels are treated, fire hazard is reduced Over time, continuity of the fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires, resulting in smaller fires, lower suppression costs and less resource loss.

In Alternatives E, G, and M, all of the area would remain undeveloped, with fuels remaining continuous over the entire area. Alternatives NC, A, K, and S develop approximately 33 to 46 percent of the area. The remaining undeveloped area would be broken into five separate blocks. Alternatives B, C, and D would develop 65 percent of the area. The remaining undeveloped area would be in eight separate blocks. In all alternatives, some of the high priority natural fuels accumulations will be treated

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk of human-caused fires increase with the increased level of dispersed recreational and other public uses. In Alternatives E, G, and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternatives A, K, and S, industrial operations would result in increased risk over 33 to 46 percent of the area; risk from public use would be increased along the 12-14 miles of road. Alternative NC would increase risk over 46 percent of the area In Alternatives B, C, and D, operations would result in increased risk over 65 percent of the area, with increased risk from public use along 17 miles of road

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

The proposed Bigelow Lakes and Grayback Botanical areas are within the Kangaroo area. Both contain an interesting assemblage of sensitive and uncommon plants; plant resources at Bigelow are outstanding. For more detail on the attributes of the individual areas, including individual plant lists, see Appendix F. All alternatives, except NC, A and A-Departure, include at least one of the sensitive plant areas as a Botanical area (see following table).

A large group of sensitive and rare plants are present. Slightly over half of the roadless area is tentatively suitable for timber production; most of sensitive and uncommon plant resources are confined to the areas not suitable for timber management. Cattle grazing is permitted in part of the unroaded area; there is a potential for conflict between protection of plant resources and grazing, but there is no variation by alternative. Sensitive plants will be protected through application of appropriate Standards and Guidelines

Botanical Areas, by Alternative *1/* (Tentatively suitable for timber production)

Area Name	Tentatively Suitable (Acres)	Priority Ranking	Alternative (Acres) NC/A	B/C/D	E/G/M	K	S
SENSITIVE PLANT AREAS							
Bigelow Lakes	136	2	--	--	411	411	411
Bigelow Lakes Addition	160	4	--	--	560	--	--
Grayback Mountain	0	6	--	166	166	--	197
EXISTING BOTANICAL AREAS							
Craggy Peak	0	4	--	101	101	101	101

1/ Total acres for Option 4 are shown. Only a portion of Option 4 is actually within the Shasta Costa Roadless Area

The proposed Craggy Peak RNA is mostly within the inventoried Kangaroo Roadless Area. Two plant communities and 101 acres are on the Siskiyou National Forest are complemented by four more cells and approximately 1,100 acres are on the Rogue River National Forest. The portion of the RNA on the Siskiyou is recommended in all alternatives except NC and A.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only the impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze Alternatives E, G, and M would contribute no TSP. All other alternatives would produce 14-23 tons of TSP per year.

The probability of a smoke intrusion from burning in the roadless area impacting Cave Junction or Medford, a designated area for air quality, is very low based on past performance. The probability of impacting the

Oregon Caves National Monument is low. The probability of impacting the Red Buttes Wilderness, adjacent to the roadless area, is low to moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. The roadless area does not contain suitable habitat for bald eagle or osprey.

Spotted Owl/Pileated Woodpecker/Pine Marten Under Alternatives B, C, D, and D1, habitat for mature/old-growth indicator species would be considerably reduced over time. Mature/old-growth habitat would remain at present levels under Alternatives E, G, and M. Moderate impacts on old-growth habitat occur in Alternatives NC, A, K, and S.

Except for Alternative NC, a mixture of habitat enclaves to meet Management Requirements (MR's) for mature/old-growth habitat are located within the roadless area: parts of two spotted owl areas, part of one pileated woodpecker area, and three pine marten areas. At present, the fringes of this roadless area support part of the habitat needs for four to six spotted owl pairs (probably no spotted owl pair can meet all its habitat needs entirely within the roadless area). Mature/old-growth habitat would ultimately be reduced to MR levels in Alternatives B, C, D, and D1. Alternatives NC, A, K, and S would experience a moderate reduction in habitat capability over time, with NC changing the most. There would be no change from present conditions under Alternatives E, G, and M.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E, G, and M.

Black-tailed Deer/Roosevelt Elk. Elk are not present in the roadless area. Big game management opportunities would increase somewhat in all alternatives, except E, G, and M, due to timber harvest activity on suitable lands. Opportunities for habitat improvement projects for game animals would also be greater in these alternatives.

Wildlife Habitats. The Kangaroo contains approximately 500 acres of meadow habitat (including buffers) in nine separate areas. Much of this meadow habitat is subalpine in character. Meadow habitat is allocated in all alternatives, although meadow buffers are not protected in Alternatives NC, A and A-Departure. The area also contains over 1,000 acres of rock bluffs and cliff sites Rock bluffs/cliffs are allocated for wildlife use in Alternatives E through M, but would probably remain unaffected in Alternatives NC, A through D1. A 25 acre band-tailed pigeon concentration area is present; it is maintained in all alternatives.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the Kangaroo area are average or above average. Even though the Kangaroo is unroaded, access from surrounding roads is good and a variety of trails traverse the area. The unique habitats present draw people to the area, non-consumptive use probably is greater than consumptive (hunting). Alternatives B, C, and D, which assign a significant portion of the area to development, may actually produce fewer WFUD's in the future than at present.

Visual Resource

The current visual resource inventory indicates that the area is located in a position visible to recreational and other users. The area is distinctly different in landscape character from the rest of the Forest, and offers some of finest scenery found on the Forest. The area inventory is listed below
9999999

VQO	Acres
Retention	550
Partial Retention	3,400
Modification 1/	2,700

1/ Modification/Maximum Modification VQO

Based on public comment, viewer sensitivity or concern for the visual quality of the area is high. However, recreation use in the area is relatively low. Retention and Partial Retention objectives were assigned in response to the high quality of scenic values, and because of the designation of the Boundary Trail as a National Recreation Trail.

Alternatives NC, A, B, C, D, K, and S would assign the area to management under varying schemes of visual objectives Alternatives B, C, and D would assign the area to management under the Modification visual objective. Under these objectives, a modified environment would occur over time in which management activities would be readily apparent.

Alternatives NC and A emphasize management for inventoried visual objectives; also, 3,000 acres would be assigned to the Supplemental Resource Management Area which has no programmed harvest, and, in effect, upgrades visual objectives to Preservation. The rest of the roadless area would be managed for inventoried visual objectives, resulting in a slightly altered appearance within the first two decades.

Alternatives K and S would assign the area to management under the Modification visual objective. However, activities would not be apparent in over 3,000 acres assigned to Supplemental Resource and Botanical Management Areas. The natural appearance would be modified so that some areas would appear as altered.

Alternatives E, M, and G assign the area to roadless management, resulting in the upgrading of the area to the Preservation visual objective. The natural appearance of the area would remain essentially unchanged over the planning period.

Recreation Settings

While the area is located adjacent to a designated Wilderness, is surrounded on three sides by lands that have been modified by past management activities and, thereby, is very susceptible to the influence of motorized activities. All alternatives, except E, G, and M, would allow for some degree of development and the Roaded Natural recreation setting currently available would shift to a modified Forest setting Motorized opportunities would be enhanced as the area is roaded.

Alternative A would retain the essentially undeveloped character on 3,600 acres due to assignments to Supplemental Resource and Designated Wildlife Habitat areas. Alternative NC provides for 3,000 acres of Supplemental Resource area. Alternatives B, C, and D retain undeveloped character on 1,700 acres due to assignments to Research Natural, Botanical, and Special Wildlife Site areas. Alternatives K, and S would retain undeveloped character on over 3,400 due to the above allocations. Alternatives E, M, and G would

be managed to provide Semi-primitive recreation opportunities, maintaining the Wilderness potential over the planning period.

Economic and Social

There are 3,702 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 6,651 acres of the Kangaroo Roadless Area is 0.20 MMCF. The estimated LTSY would be 0.37 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC	11	20
A, A-Dep, and S	.09	17
B	18	34
C and D	.15	28
E, G, and M	00	00
K	.08	15

For projecting effects, the alternatives are grouped: (1) Alternatives E, G, and M leave the area in an unroaded status; (2) Alternatives NC, A, K, and S which leave approximately half the area as unroaded, and (3) Alternatives B, C, and D which develop much of the area for timber production.

	Alternatives		
Effects (Changes Compared to Alternative A)	E, G and M (Unroaded)	NC, A, K, and S	B, C, and D (Roaded
Direct Effects			
Timber and Road Expenditures	Reduced	No Change	Increased
Indirect Effects			
Jobs	-8	0	+5
Annual Income (MM $)	-0 19	0	+0 13
Annual Payments to Counties (MM $)	-0.05	0	+0 03
Cumulative Effects			
Social Attitudes of Local Communities			
Timber Related	-	0	+
Primitive Recreation	+	0	-
Fisheries	0	0	-
Wildlife Related			
Hunting	-	0	-
Old-Growth	+	0	-
Mining	-	0	0

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives B, C, and D have increases in the amount of timber and road expenditures over

the current direction as provided in Alternative A. Other alternatives have insignificant changes in budget expenditures

Indirect effects are associated with jobs, income, and payments to counties Assuming no substitution of reduced timber harvest within the area of influence, Alternatives B, C, and D have a moderate increase while the other alternatives have no significant changes.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters 3 and 4 of the FEIS The positive sign indicates a feeling by special interest groups that the Forest is responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative C, primitive recreationalists are predicted to feel negative about forest management while timber interests are predicted to feel the forest is serving their interests Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures have been identified.

POTENTIAL CONFLICT WITH OTHER JURISDICTIONS

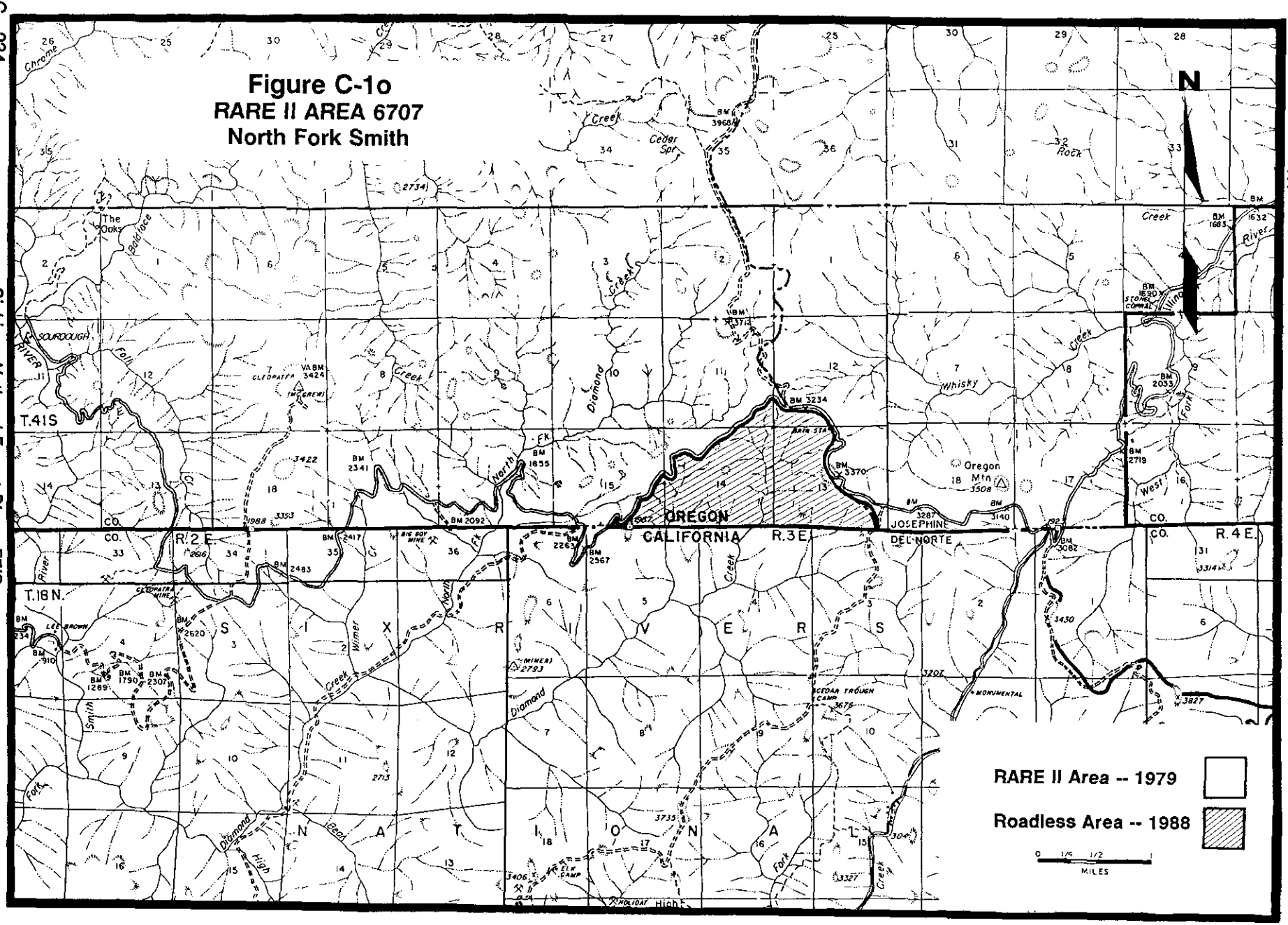
No additional conflicts have been identified.



Table C-5o. *North Fork Smith Roadless Area No. 6707 (952 Acres) Acreage in Management Area by Alternative*

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	0	0	0	0	0	0	0	0	0	0
3-Research Natural Area	0	0	0	0	0	0	0	0	0	0
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	952	952	0	952	0
7-Supplemental Resource	0	0	0	0	0	0	0	0	0	0
8-Designated Wildlife Habitat	0	117	117	117	117	0	0	117	0	117
9-Special Wildlife Site	0	0	0	0	0	0	0	0	0	0
10-Scenic/Recreation River	0	0	0	0	0	0	0	0	0	0
11-Riparian	79	72	72	72	72	0	0	72	0	72
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	607	503	0	0	0	0	0	0	0	0
14-General Forest	266	260	763	763	763	0	0	763	0	763
TOTAL	952	952	952	952	952	952	952	952	952	952
TOTAL UNDEVELOPED (MA 1-9)	0	117	117	117	117	952	952	117	952	117

Figure C-1o
RARE II AREA 6707
North Fork Smith



NORTH FORK SMITH No. 6707

(952 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The North Fork Smith Roadless Area was inventoried for study as a potential Wilderness during the RARE II process The National Forest parcel of 952 acres (in Oregon) is contiguous the 39,544 acre portion on the Six Rivers National (California). The RARE II decision of January, 1979, allocated the inventoried area of 39,950 acres to "further planning". The Six Rivers National Forest in California has the responsibility for evaluating the roadless area in it's entirety. **Only the Siskiyou parcel is considered here.** Boundaries of the area have not changed; the entire parcel is National Forest System land

The Chetco-Greyback Land Management Plan (FEIS, 1979) carried the RARE II allocation of further planning Pending consideration of all potential uses, including Wilderness, development activities that may reduce Wilderness potential were prohibited. The North Fork Smith Roadless Area was released from further planning status by the California Wilderness Act of 1984. Due to the small acreage involved, the effects of current status are negligible.

CHANGES BETWEEN DRAFT AND FINAL

During the period between 1984 and 1988, no activity has occurred that would impact the unroaded character of the area. The remainder of the area is as previously described (Refer to Figure C-1p). The unroaded area on the Six Rivers National Forest that is adjacent to the area is presently being considered for multiple use values.

LOCATION AND ACCESS

The North Fork Smith area is located in the headwaters of Diamond Creek, tributary to the North Fork Smith River. The state line divides the roadless area between the Siskiyou portion (952 acres) in Curry County, Oregon, and the remainder of the area immediately south in Del Norte County, California. Distance from the coast is 18 miles as the crow flys. Access is via the old Wimer Road which rims the north boundary The Wimer Road was used in much earlier periods to join the coastal community of Smith River, California, with the interior Illinois Valley at O'Brien.

PHYSIOGRAPHIC AND BIOLOGIC

Location of this area is within the coast range (Klamath Geologic Province). Terrain is mountainous with moderately slopes and dissected by small drainages. Elevation varies between 2,500 and 3,394 feet Vegetation is dense brushfields with scattered small knobcone pine. Half the area supports scattered old-growth trees; groups of conifers occur on the more favorable soils and aspects. The latter portion of the total roadless area is underlain by metagabbro parent materials; much of the balance of the roadless area in California is serpentine-peridotite.

Soils are derived from intrusive igneous parent material and are more productive than the barren, infertile materials which surround the area. Deep soils occur along the saddle area, soils becoming shallower and rockier downslope towards Diamond Creek No significant mass movement activity is present

Climate is heavily influenced by the Pacific Ocean and marine air. Summer temperatures may exceed 90 degrees Fahrenheit, but monthly mean temperatures are mild. Annual precipitation, mostly in the form of rain, averages 115 inches; dry season rainfall (May through September) averages 12 inches.

A variety of wildlife species utilize the area, although populations are not large. The roadless area is too high in the watershed to support anadromous or resident fish. No known threatened or endangered species of animals or plants inhabit the area. Several sensitive plants are present: *Antennaria suffrutescens*, *Castilleja elata*, *Lathyrus delnorticus*. Three unique plants are present: *Aster brickellioides*, *Darlingtonia californica*, *Lilium bolanderi*. Intensive plant inventories would probably turn up other sensitive and unique plants. Other than the stream zones, no wetland ecosystems are present.

RESOURCE USES

Minerals exploration is likely to have occurred, but little evidence exists of site disturbance The only activity common to the area is big game hunting along the upper fringes bordered by the road Recreation is of a "cross country" type Recreation user days is negligible (estimated at 10 RVD's). The recreation opportunity spectrum (ROS) is Roaded Natural.

APPEARANCE, SURROUNDINGS, AND ATTRACTIONS

This southerly-oriented watershed is moderately steep with, well-clothed slopes of brush and scattered trees. Other than it's unblemished nature, few distinguishing features exist. Physical details vary little from the surrounding terrain. Man's activities are not apparent except for the road bordering the north boundary and mining, limited timber harvest, and associated roads nearby. Fire may have played a major role in vegetative conditions existing today; incendiary fires during earlier periods were possibly the result of improving ease of access and exploration for minerals.

The contiguous unroaded area to the south and downstream offers the North Fork Smith River with it's more spectacular inner gorge scenery and recreational opportunities. This upper portion offers similar terrain that are somewhat homogeneous in landscape variety. Several historic mine sites and abandoned roads occur in the lower California portion of the roadless area, but are not seen or easily accessed from the headwaters.

CAPABILITY

MANAGEABILITY

Except for the State line across the southern edge (well monumented survey markers), the North Fork Smith portion on the Siskiyou is highly defined by the Wimer Road However, the roadless boundary of the whole area is relatively well defined by ridges and other features such as roads.

NATURAL INTEGRITY AND APPEARANCE

Human influences have had little impact on the natural appearance or long-term ecological processes This upper portion is free of disturbance. Fire, as part of the natural system, has been important in successional development of the vegetative mosaic.

OPPORTUNITY FOR SOLITUDE AND PRIMITIVE EXPERIENCE

Moderate topographic relief and light vegetative density limit natural screening so that the opportunity for localized solitude and a primitive experience is reduced. The lower position of the area relative to the road is advantageous, but the short distances to the road fail to mitigate the effects of both sight and sound of adjacent timber harvest units and traffic.

The area's primitive setting is limited. With no trails, access is by foot through brush and steep terrain There are no unique, interesting, or challenging features. The very light recreation use is confined to hunting, hiking, camping, and possibly nature study. Most use occurs alongside the road.

SPECIAL FEATURES

The area does not contain notable special features. The mining sites and North Fork Smith River canyon contribute, but are not easily accessed from this portion. The Wimer Road and Bain Station, an old stage road and stop, are the most unique features within the immediate environs. The Smith River and it's primary tributaries in California, including Diamond Creek, are designated Wild and Scenic Rivers; the presence of this classification has little bearing on the special nature of the area or it's use

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

The opportunity for measurable change in type or extent of use is limited. Under either dispersed or developed forms of recreation, the potential for increase use is negligible More recreation visitor use would be added under a roaded environment due primarily to hunter traffic in the fall period. Capacity will not be exceeded.

Wildlife

Unroaded, wildlife habitat would remain essentially unchanged. Use is low. Development would increase forage resources for deer. Populations of old-growth dependent wildlife would decrease in number. They would not be eliminated, however, because considerable area would remain in an undisturbed condition

Water

Quality is of greater importance to downstream anadromous fisheries of the Smith River system and it's Wild and Scenic River status than for development purposes Little or no diversion and use of water in this upper reach is foreseen.

Timber

The area contains approximately 399 acres of land tentatively suitable for timber production. Standing volume is estimated at 4 MMBF. Timber harvest can be done with methods in common use elsewhere on the Forest.

Minerals

Activity is low to nonexistent; potential for minerals in nickel laterite soils is moderate in the serpentinite and peridotite material. The metagabbro geology of the upper reaches of Diamond Creek that include most of the Siskiyou portion, though, may not contain significant mineral content. The total roadless area and adjacent lands do contain significant locatable deposits. Entry and development extends back to the 1850's

Cultural Resources

Historic sites mentioned exist on the fringe. No evidence has been found of prehistoric use, but historic usage associated with mining may be present. Activity will be evaluated and provided for under the applicable laws and regulations.

Land Use Authorization

None exist, none are expected except for potential minerals development and accessing.

MANAGEMENT CONSIDERATIONS

Only mineral entry and associated roads would be considered for management evaluation other than normal forest activity. Disease is not a serious problem. Fire history indicates a continued protection need for this area.

NEED

OTHER AREAS AND PUBLIC USE

Several hundred thousand acres of like terrain exist in the immediate vicinity. Because of the inherent low productivity serpentine-peridotite soils and associated economics, has not and likely will not be extensive Considerable area been placed into designated Wilderness and wild and scenic river status nearby (Smith River headwaters), while much of the remainder is inventoried as unsuitable for timber production The principal activities that have and could affect any specific site throughout this area is timber harvest and minerals exploration and development. The probability of roading, timber harvest, and mining is highly dependent on site capability and economics. The degree of roading throughout this area of both the Siskiyou and Six River National Forests generally detract from primitive experience levels.

ECOSYSTEM REPRESENTATION

The major ecotype of this roadless area is well represented in other undeveloped and Congressionally designated areas for air quality nearby.

PUBLIC INVOLVEMENT

For the North Fork Smith River Roadless Area, recent involvement by various public individuals and groups has been quite limited. Reasons for maintaining the area in unroaded status have centered on keeping all roadless all roadless areas intact and unchanged for their inherent values, and the possible occurrence of threatened, endangered, and/or sensitive plants

Both in RARE II and the unit planning completed in the late 1970's, far greater public involvement and subsequent input suggested either the area be allocated to non-Wilderness or placed into a further planning status (preference being a two to one ratio). Few suggested that the area be allocated to Wilderness Most input centered on the moderate mineral potential as well as some timber values and recreational potentials. Public responses were well mixed between individuals, interest groups, local and state governments.

After the Wilderness Acts of 1984 and the release-sufficiency language contained therein, the potential for Wilderness moved to a new theatre. Beginning in 1986, there was a movement to tie the Wild Rogue Wilderness and all contiguous unroaded areas to the the Kalmiopsis Wilderness and areas to the south (including large parts of the Smith River drainage). On the Siskiyou, this large block of land was promoted by several individuals and organizations as a potential National Park. Likewise, the Six Rivers National Forest has been party to a "Park" campaign from California-based interests. As discussed in Chapter II of the FEIS, the proposal was not entertained as an alternative evaluated in detail

Following release of the Forest Plan DEIS in 1987, input relative to the Siskiyou portion of the area has been quite limited. The only concerns expressed related to the addition of this and contiguous areas to create a large block of unroaded area from the Smith River to the Rogue. There were the suggestions for National

Park considerations as alternative management strategies for the National Forests; others suggested multiple use, including developing the area for timber where suitable.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The North Fork Smith area has known historic values At the present time, no archaeological sites are recorded, but this paucity of information is due to a lack of cultural resource survey in the area

All alternatives, except E, M, and G, call for development which, in turn, requires intensive cultural resource inventory along any proposed road prior to approval. Sites that may exist in the project area can be evaluated. Valuable sites can be protected by avoidance or conserved through data recovery Alternatives E, M, and G call for an unroaded regime which would minimize the need for cultural resource inventory

Energy and Minerals

The following table summarizes the estimated mineral potential access limitations for the Siskiyou portion of the North Fork Smith Roadless Area.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	-	-	-	-
High	-	-	-	-
Moderate	-	-	-	-
Low	200	700	-	900
Total	200	700	-	900

Improvements

Roads. The 399 acres of tentatively suitable land could generate about two miles of new road for timber harvest. All would be dead-end local roads built when needed to access timber. Roads for mining exploration and development could equal or exceed this amount All roads would be open to only high clearance vehicles or closed between projects. All alternatives, except E, M, and G, would road this area.

The Wimer Road on the northern boundary is a Forest collector road. The road is maintained for passenger cars only for one-half mile beyond Bain Station, at the very north point of the area. The road system would follow ridges off the Wimer Road or change to midslope roads as the ridges steepen. The midslope roads would cross only small creeks and draws.

Trails No trail construction programmed.

Developed Recreation Sites. No construction is programmed.

Wilderness Potential

The roadless area has a landscape character that is similar to character of the southern end of the Kalmiopsis Wilderness. The area has been inventoried according to ROS criteria and is capable of providing a Roaded Natural recreation experience on approximately 1,000 acres The carrying capacity for the area is estimated at approximately 1,500 RVD's, but this figure is high since Roaded Natural coefficients were developed based on the assumption of the presence of roads Current use is very low (10 RVD's annually) and is expected to remain low over the planning period Recreation demand projections indicate that levels of use will remain well within the carrying capacity over the planning horizon.

All alternatives, except E, G, and M, would assign the area to multiple resource management objectives; Roaded Natural recreation opportunities would remain available in a modified Forest environment. The change in the character of the landscape would result in the loss of Wilderness potential Motorized recreation opportunities would be enhanced as a result of road construction. Alternatives E, G, and M would provide additional capacity for Roaded Natural recreation opportunities. The Wilderness potential of the area would be maintained.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	0	0	0
B, C, D, and D1	0	0	0
E and M	900	900	900
G	900	900	900
K	0	0	0
S	0	0	0

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

The area is located above and tributary to the designated Wild and Scenic River within California. Assignment of the area to roaded or unroaded management objectives will have no effect on the management of the designated river.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated Alternatives E, G, and M because no soil disturbing activities will occur. All other alternatives assign most of the area to Management Areas which permit development. The effects of timber harvest and road building are discussed in the Chapter IV of the FEIS. The risk of degrading the soil, water, and fish resources in all roaded alternatives are negligible

due to the minimal activity planned for the area and the lack of sensitivity of the soils to impacts related to those activities.

Fire

The area is predominantly brush and knobcone pine Fuel loadings are light and fairly continuous. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to moderate intensity fires, resulting in larger fires, higher suppression costs and increased resource losses.

In a developed scenario, the hazard increases during timber harvest. As fuels are treated, the fire hazard is reduced. Over time, continuity of fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternatives E, G, and M, the area would remain undeveloped, with fuels remaining continuous over the entire area. All other alternatives would develop 80 to 91 percent of the area.

In undeveloped areas, risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and treatment of activity slash. As access improves, dispersed recreational and other public uses increases, increasing the risk of human-caused fires.

In Alternatives E, G, and M, risk from human-caused ignition would be limited to the periphery of the area due to limited access. In Alternatives A, B, C, D, K, and S, industrial operations would result in increased risk over 80 to 91 percent of the area; risk from public use would be increased along two miles of road. Risk would be spread over the total area in Alternative NC.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No Botanical Areas or RNA's are proposed A significant number sensitive and unique plants are present; others may be discovered. Under all alternatives sensitive plants will be protected through application of appropriate standards and guidelines.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning. Only impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area Total suspended particulates (TSP) is used as the measurement of local and regional haze. Alternatives E, G, and M would contribute no TSP. All other alternatives would produce three tons of TSP per year. Based on past performance, the probability of a smoke intrusion from burning in this area impacting a designated area for air quality or the Kalmiopsis Wilderness, a Class 1 area, is very low.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. The area does not contain suitable habitat.

Spotted Owl/Pileated Woodpecker/Pine Marten. Less than half of the area is suitable for timber production Except for Alternative NC, a pine marten habitat enclave has been installed in the roadless area to help meet Forest-wide Management Requirements (MR's) for mature/old-growth habitat. There is not enough suitable habitat in the roadless area to support a pair of spotted owls. Under all alternatives except E, G, and M, land tentatively suitable for timber production would be developed.

Woodpeckers. Snag habitat would remain at or near 100 per percent habitat capability for woodpeckers under Alternatives E, G, and M.

Black-tailed Deer/Roosevelt Elk Elk do not occur in the roadless area and the deer population is small Management opportunities for deer would increase somewhat in alternatives which open up areas for timber management.

Wildlife Habitats. No special wildlife sites inventoried.

Wildlife Recreation Use. Total estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are lower than average. Although access to the area is good, game populations are low and the area is not a primary destination point for people interested in non-consumptive uses of wildlife.

Visual Resources

The current visual resource inventory includes 650 acres as Partial Retention and 300 acres in Modification. Viewer sensitivity or concern for the visual quality of the area is low, based on low levels of recreation use Partial Retention objectives were assigned to the area in response to the quality of scenic values in the area, and the presence of a Wilderness access route nearby. However, reappraisal of the 1979 inventory based on the extremely limited use of this route may result in a downward classification.

Alternatives, with the exception of E, G, and M, provide for an unroaded management scheme resulting in the area's upgrading to the Preservation visual objective. The natural appearance of the area would remain essentially unchanged

Alternative NC and A manage for inventoried visual objectives. However, under these two alternatives, the existing natural appearance would shift to an slightly altered appearance within the first two decades Alternatives B, C, D, K and S assign the area to management under the Modification visual objective. Under these objectives, recreation users would be in a modified Forest environment where management activities would readily apparent. The existing natural appearance would appear slightly altered-altered since only 400 acres is considered available for timber harvest

Recreation Settings

The area is influenced by the sight and sound of motorized users. Recreation use in the area is light. All alternatives except E, G, and M would cause the Roaded Natural recreation setting currently available to shift to a modified Forest setting. Access to the area and motorized opportunities would be enhanced as the area roaded. Alternatives E, M, and G would maintain current status. The natural appearance of the area and the Wilderness potential of the area would be maintained.

Economic and Social

There are 399 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 952 acres of the North Fork Smith Roadless Area is 0.02 MMCF. The estimated LTSY would be 0.04 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative:

Alternative	ASQ	LTSY
NC, A, A-Dep, C, D, D1, K, and S	.02	.04
B	.02	05
E, G, and M	00	.00

For projecting effects, the alternatives are grouped: (1) Alternatives E, G, and M which leave the area in an unroaded status; and (2) all other alternatives would allow much of the area to be developed.

No significant social or economic effects are projected due to existing limited public use and low total potential for resource outputs. The indirect effects of Alternatives E, G, and M result in a slight reduction in jobs (2), and reduced annual income (0.04 MM $) and payments to the counties (0.01 MM $)

MITIGATION MEASURES

No additional mitigation measures have been identified.

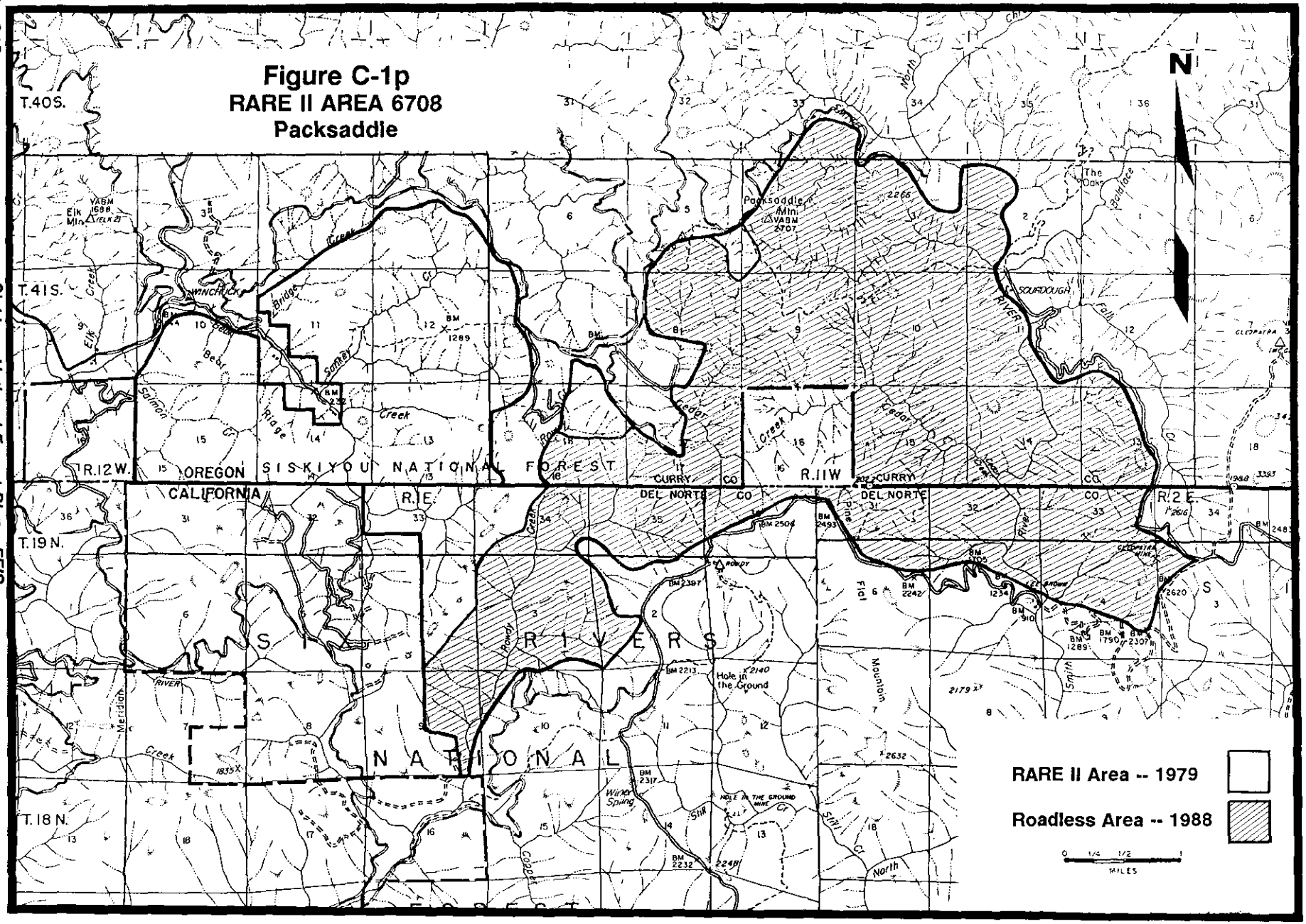
POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No additional potential conflicts have been identified.



Table C-5p. Packsaddle Roadless Area No. 6708 (5,289 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	661	661	0	0	0	661	661	0	661	666
3-Research Natural Area	0	0	0	0	0	981	891	901	891	816
4-Botanical	0	0	0	0	0	0	0	0	0	0
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	3,737	3,737	0	3,737	1,253
7-Supplemental Resource	74	74	303	0	303	0	0	303	0	0
8-Designated Wildlife Habitat	0	80	154	241	154	0	0	165	0	369
9-Special Wildlife Site	11	11	27	27	27	0	0	16	0	16
10-Scenic/Recreation River	149	149	0	0	0	0	0	0	0	224
11-Riparian	680	652	682	808	682	0	0	548	0	294
12-Retention Visual	0	0	0	0	0	0	0	0	0	0
13-Partial Retention Visual	2,467	2,442	0	0	0	0	0	0	0	5
14-General Forest	1,247	1,220	4,123	4,213	4,123	0	0	3,356	0	1,646
TOTAL	5,289	5,289	5,289	5,289	5,289	5,289	5,289	5,289	5,289	5,289
TOTAL UNDEVELOPED (MA 1-9)	746	826	484	268	484	5,289	5,289	1,385	5,289	3,120


Figure C-1p
RARE II AREA 6708
Packsaddle
N
T.40S.
T.41S.
T.19N.
T.18N.
R.12W.
R.11E.
R.11W.
R.12E.
OREGON
CALIFORNIA
SISKIYOU NATIONAL FOREST
CURRY CO
DEL NORTE CO
Packsaddle Mtn.
Elk Mtn.
WINCHUCK
Bridge
Elk Creek
Bear Creek
Salmon Ridge
Sawyer Creek
Cedar Creek
SOURDOUGH
Falls
RIVER
Pine Creek
Flat
Mountain
Smith River
Hole in the Ground
Wimer Spring
Still Cr.
North Fork
Coast
Meridian
Chetco River
Creek
RARE II Area -- 1979
Roadless Area -- 1988
0 1/2 1/2 1
MILES

PACKSADDLE No. 6708 and 5708

(5,289 Acres - Siskiyou National Forest)
(3,600 Acres - Six Rivers National Forest)

(Total - 8,889 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The Packsaddle Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. The roadless area straddles the Oregon-California State line which is also the common boundary between the Siskiyou and Six Rivers National Forests. The Packsaddle Area contained a total of 12,915 acres at the time of the RARE II study and was allocated to nonwilderness use by the RARE II decision in January 1979. Road construction and timber harvesting has reduced the area to its present 8,889 acres. The roadless area surrounds a section of State of Oregon land (approximately 640 acres). The roadless area is entirely National Forest System land.

The Chetco-Grayback Land Management Plan (FEIS, 1979) includes analysis of this unroaded area. Management direction assigns most of the area to Coordinated Resource Management to obtain full timber yield consistent with land capabilities, while giving full considerations to other resource values. The area within one-eighth mile horizontal distance from the North Fork Smith River was assigned to Fisheries/ Watershed. As a result of the Oregon Omnibus Wild and Scenic River Act of 1988, this corridor is now mostly within the Congressionally classified Wild River segment.

Readers are directed to the Land Management Plan for a description of the affected environment, evaluation of resources, management alternatives, and other requirements and constraints Since completion of the Land Management Plan, all project activities have been analyzed under it's direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

In the period between 1984 and 1988, timber sale activity on the west edge of the Siskiyou portion reduced the unroaded area by 350 acres (Refer to Figure C-1p). The remainder of the area is as previously described. The Six Rivers National Forest is currently in the process of determining land allocations and management direction for their portion of lands within and adjacent to the inventoried Packsaddle Roadless Area (Forest Plan DEIS, 1986).

As a result of the Omnibus Oregon Wild and Scenic Rivers Act of 1988, the North North Fork Smith River was added to the National Wild and Scenic Rivers System. This piece of the North Fork Smith River has been Congressionally classified as Wild. Prior to October 1988, the North Fork Smith River was carried as an inventoried Wild and Scenic River. The following alternative discussions, except for Alternative S, offer different river management options and have not been updated to reflect the new legislation. Any alternative selected in the Record of Decision and carried in the accompanying Siskiyou National Forest Land and Resource Management Plan will treat the eastern edge of this inventoried roadless area as part of the Wild and Scenic River System. For additional information of the description and resources in the river corridor, refer to Appendix E of the DEIS.

LOCATION AND ACCESS

The Packsaddle Roadless Area is located in Curry County, Oregon, and Del Norte County, California The area is approximately 11 air miles southeast of Brookings, Oregon, and eight air miles northeast of Smith River, California. Primary road access in Oregon is by the Winchuck-Chetco Road, and in California over the Wimer Road by way of Rowdy Creek.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

This area is mountainous with elevations ranging from 500 feet to 2,707 feet at Packsaddle Mountain. The eastern portion of the area is drained by the North Fork Smith River, while the western portion is drained by Rowdy Creek. The area is typified by rolling topography with convex sideslopes and deep canyons.

Precipitation averages approximately 120 inches per year. The climate is heavily influenced by marine air. Summer temperatures may exceed 90 degrees Fahrenheit, but month mean temperatures are mild.

Two basic soil types comprise the area. The most common soil is derived from serpentine and peridotite. These soils are shallow, rocky, infertile, and often have only scattered vegetative cover. They are generally stable with the exception of areas within the North Fork Smith Canyon where extremely steep slopes and channel cutting has produced very large natural failures into the streams. Due to a chemical imbalance, these serpentine soils provide a unique substrate which supports a proliferation of rare flowering plants in a climate that could produce lush forest. Serpentine bogs are present. Rare plants are especially abundant in Lemmingsworth Gulch, a proposed Research Natural Area (See Appendix F for additional site information).

Moderately productive soils derived from sandstone of the Dothan Formation occur in the western portion of the area. These soils are generally shallow with abundant rock fragments in the lower horizons. Slopes are moderately stable.

Various wildlife species use the area, but no known populations of threatened or endangered animals exist within the roadless area.

RESOURCE USES

Much of the area is highly mineralized and several old mines are located within the roadless area boundary. Potential locatable minerals include gold, copper, nickel, chromite, and cobalt. Claims covering ferro-nickle laterite deposits in the roadless area are held by CAL-ORE Mining Corporation and others. Plans to initiate mining operations on Gasquet and Pine Mountains, just outside the roadless area boundary, have remained indefinite for several years.

Recreation use of the area is low and generally limited to fishing. The proximity of roads and outside activities keeps the opportunity for wilderness recreation at a Semi-primitive level.

Much of the area has been designated as unsuitable for timber production. However, an area of approximately 3,000 acres in the total roadless area is capable of producing timber.

APPEARANCE, SURROUNDINGS, AND ATTRACTIONS

The distinguishing features of the Packsaddle area are the steep and incised draws and sparse vegetation which exists on the serpentine soils There are pockets and larger areas of typical coniferous forest, but the overall landscape projects an image of a hostile environment.

CAPABILITY

MANAGEABILITY

The Packsaddle area can be accessed by forest roads on all sides. Much of the area located in California has been modified by years of prospecting and mining activities. It is not uncommon for visitors to observe the effects of past mining activity. An exception is the northernmost drainage of the roadless area known as Lemmingsworth Gulch, an area under consideration for recommendation as a Research Natural Area (RNA). The majority of the area has been classified as non-forest, but approximately 3,000 acres are considered suitable for timber production.

The known deposits of critical and noncritical mineral deposits exist throughout the area. Surveys show them to be of commercial size and value. There is considerable interest in mining these deposits in the foreseeable future. Mining companies are planning to begin major operations adjacent to the area within the present decade. Once begun, these operations will last many years and likely spread to the deposits under claim within the roadless area boundaries.

Present recreation use is largely along the North Fork Smith River in the form of fishing. Few people hike the trail from Packsaddle Mountain to the Sourdough campsite on the bank of the North Fork

NATURAL INTEGRITY AND APPEARANCE

Humans have had some impact on the Packsaddle area, the most notably activity being mining. The dramatic variety in vegetative cover is due more to soil type changes than any other factor, natural or human. Fire has not had much impact on the majority of the area.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The Packsaddle area does provide some opportunity for solitude and primitive experiences, but dense brush, steep slopes and lack of hiking trails limit these to localized, short-term events. Opportunities for solitude are reduced by the area's small size, adjacent activities, and steep topography.

SPECIAL FEATURES

Unique features in the Packsaddle area include the Nationally designated Wild and Scenic North Fork Smith River. The river canyon is rugged, very scenic, and provides some wilderness amenities Old mining areas provide some points of historical interest. The North Fork Smith River and Cedar Creek are good salmon and steelhead fisheries. And, the various patches of unique and sensitive plants offer the visitor or botanists a different opportunity.

AVAILABILITY

RESOURCE POTENTIAL

Recreation Settings

Except for fishing, there appears to be little demand for recreation use in the area. Present use is about 200 RVD's per year.

Timber

The unroaded area contains approximately 3,000 acres of land tentatively suitable for timber production. Site productivity is low and moderate. On the Siskiyou portion, 1,891 acres are classed as tentatively suitable. The estimated standing volume on the Siskiyou National Forest portion is 25 MMBF.

Minerals

Demand for the known deposits is high. While development has been rather limited within the unroaded area, plans for similar deposits to the south has somewhat active.

Cultural Resources

The old mining sites are the primary cultural sites. The area could have had some prehistoric use, but nothing to substantiate this has been found.

Wildlife

There are no known threatened or endangered species living in this area. Black-tailed deer is the principal game animal. Habitat exists for Peregrine falcon but they are not known to inhabit the roadless area.

Sensitive Plants

The serpentine soils of the area support many rare plants. The experience afforded to the casual visitor or botanist would be unique. McDonald's rockcress, *Arabis macdonaldiana*, is found in the Packsaddle area. This Siskiyou population was thought to be identical to the *A macdonaldiana* growing on Red Mountain in Mendocino County, California, which is classified as endangered. The USDI Fish and Wildlife Service has since determined that the Siskiyou's version of the plant is an as-yet-undescribed member of the purple *Arabis* complex. The Siskiyou plants (*Arabis* sp. nov./in ed. ["macdonaldiana"]) are now classified sensitive by the Forest Service (Region 6). Plant inventories have been conducted in only part of the area; the following list is not complete:

Sensitive Plants	Uncommon Plants
Arabis "macdonaldiana"	*Angelica siskiyouense*
Castilleja elata	*Antenaria suffrutescens*
Cypripedium californicum	*Arabis aculeolata*
Epilobium rigidum	*Arnica cernua*
Eriogonum pendulum	*Arnica spathulata ssp. spathulata*
Eriogonum ternatum	*Castilleja brevilobata*
Gentiana bisetaea	*Darlingtonia californica*
Hieracium bolanderi	*Dicentra formosa ssp organai*
Monardella purpurea	*Erythromium revolutuma*
Streptanthus howellii	*Hieracium parryihi*
Thlaspi montanum var siskiyouense	*Horkelia sericataar. siskiyouense*
Viola occidentalis	*Iris bracteata*
	Lilium bolanderi
	Lilium vollmeri

Fisheries

The North Fork Smith River and Cedar Creek are important streams for anadromous populations of steelhead, sea run cutthroat trout and Chinook salmon. The streams also support local rainbow

Wild and Scenic Rivers

As noted, the Omnibus Oregon Wild and Scenic Rivers Act of 1988 added this the North Fork Smith River to the National System. This ties both the California and Oregon classified Wild River segments together

MANAGEMENT CONSIDERATIONS

Ownership, including subsurface rights held by others, is not a problem The State of Oregon does own a section surrounded by the Packsaddle area. Fire is not a major threat. Insect or disease infestations are not of significance.

NEED

OTHER AREAS AND PUBLIC USE

Part of the Packsaddle area abuts the Kalmiopsis Wilderness. In addition, the inventoried South Kalmiopsis Roadless Area is in near proximity to the eastern edge of the Packsaddle area

Recreation use of these unroaded areas and Wilderness is extremely light All share many of the same geologic and vegetative features. Most activities are centered along the road system, streams and trails. Local users tend to enter these areas more than recreationists living outside of the coastal communities

ECOSYSTEM REPRESENTATION

Major ecotypes of the Packsaddle area are well represented inside the Kalmiopsis Wilderness and surrounding lands.

PUBLIC INVOLVEMENT

The Packsaddle area has been the subject of public review many times, the last during RARE II planning There has been very limited recent input relative to either this inventoried roadless area or to projects bordering the area. Comments received during the RARE II effort are capsulized in the following State input. The Oregon Department of Fish and Wildlife recommended that a "special management" classification be established to protect the "back country" character, but permit judicious management of wildlife, timber, forage and minerals. The Oregon Department of Forestry listed the value of the Packsaddle area as intermediate in importance, having major impacts within local timbersheds and moderate impacts Statewide. The Department of Economic Development recommended that "there be no further reductions in the State's commercial forest base, especially where such actions would have adverse economic impacts on employment and income..." The Oregon Department of Geology and Mineral Industries noted that the Packsaddle area contains known deposits of strategic metallic mineral commodities.

Public involvement, beginning with early scoping in 1979 and continuing with public meetings, workshops, and other contacts into 1985, has not surfaced any additional concern or movement to seek unroaded allocation of this inventoried roadless area. Comments received on the Forest Plan DEIS in 1987 and 1988 also have not added any new insight or concerns as to the area's management. However, the Citizens Task Force did cite the "high botanic values in lieu of its low timber production" as reason for maintaining the Packsaddle area as roadless. Input by other individuals or groups has been very limited

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The Packsaddle area appears to have low to moderate archaeological potentials. Alternatives NC, A, B, C, D, K and S, which allow development, would require intensive cultural resource inventory along any proposed road prior to approval. Sites that may exist in the project area can be evaluated Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E, M, and G call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table summarizes the estimated mineral potential access limitations for Packsaddle for the Siskiyou National Forest portion only. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	<100	-	-	<100
High	-	-	-	-
Moderate	700	200	-	900
Low	2,200	400	1,800	4,400
Total	2,900	600	1,800	5,300

Improvements

Roads. The 1,891 acres of tentatively suitable land on the Siskiyou National Forest portion could generate about nine miles of new road for timber harvest All would be dead-end local roads built when needed to access timber harvest units Roads for other purposes would be minor, but some mining roads could be expected. Some mileage would remain open to passenger car use, depending on the alternative, and other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage by alternative.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A, B,and D	8	2	3	3
C	10	2	4	4
E, G, and M	0	0	0	0
K and S	7	2	1	4

Alternatives E, G, and M would have minimal effect on this area due to no roads being built. Alternative C approaches maximum roading. Road 1107 on the western boundary is the main collector in Oregon accessing the area for timber haul. The other collector road on the east boundary (Road 4402) is a low standard road suitable for only high clearance vehicles; this low standard road accesses very little timber. The Rowdy Creek Road (18N20), on the south boundary of the area in California, junctions with Road 4402 at the southeast corner of the unroaded area and serves as the easiest access to the eastern boundary.

The road system would be extensions of existing roads off of Road 1107 or would follow ridges when possible. Some roads would be on the midslopes once ridges became too steep to follow or where shorter reaches for logging were needed. These midslope roads would cross small creeks and draws, but probably above sections inhabited by fish. Roads would be visible to only the few people that travel to the North Fork for fishing and other recreation

Trails. No construction is programmed.

Developed Recreation Sites. No construction is identified.

Wilderness Potential

The roadless area has a landscape character that is similar to the southern end of the Kalmiopsis Wilderness, and to a major portion of the South Kalmiopsis Roadless Area. Current use is low and is expected to remain low over the planning period. Maintenance of the roadless area would expand the carrying capacity for Roaded Natural and Semi-primitive Non-motorized recreation opportunities. Alternatives E, G, M and S would provide additional capacity for Semi-primitive Non-motorized and Roaded Natural recreation opportunities. Wilderness potential would be maintained.

Alternatives other than E, G, M and S would assign the area to multiple resource management objectives; Semi-primitive Non-motorized recreation opportunities currently available would shift to the motorized end of the opportunity spectrum. Roaded Natural opportunities would be available in a modified Forest setting Wilderness potential of the area would be lost. Motorized recreation opportunities would be enhanced.

How much of the inventoried roadless area within the Siskiyou National Forest remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	5,300	0	0
B, C, D, and D1	5,300	0	0
E and M	5,300	5,300	5,300
G	5,300	5,300	5,300
K	5,300	0	0
S	5,300	3,100	3,100

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

A portion of the North Fork Smith River flows along the eastern edge of the area Recreation use is very low. Some of the roadless area would be visible to river users, however, the allocation to roadless management objectives should have little effect on the North Fork Smith River as to management for its Wild and Scenic River values.

Allocation to roaded uses would have a limited effect on the quality of the recreation setting in the river corridor. The recreation setting is currently maintained through the use of VQO's which were assigned to the area in response to presence of a Wilderness access route and an old campsite.

Soil, Water, and Fish

No consequences to soil, water, and fish are associated with Alternatives E, G, and M because no soil disturbing activities will occur. All other alternatives assign all or part of the area to Management Areas which permit development. The risk of degrading the soil, water, and fish resources increases with more timber harvest and road building. These impacts are about equivalent for alternatives which develop the area. On sensitive soils, a small portion of the roadless area has a high hazard for road-related impacts Alternative K and S also have a decreased potential for impact due to the fewer acres considered for management. In all development alternatives, however, the potential for adverse impact is limited because the majority of high hazard soils are removed the suitable land base. The effects of timber harvest and road building are discussed in the Chapter IV of the FEIS.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created The Packsaddle area is primarily brushfields, with pockets of timber with heavy brush understories. Fuels are fairly continuous most of the area, though brush loadings are sparse in many areas. In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase These conditions lend themselves to moderate intensity fires. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, the hazard increases during timber harvest. As fuels are treated, the fire hazard is reduced. Over time, continuity of fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire

In Alternatives E, G, and M, all the area remains undeveloped; fuels remain continuous over the entire area. Alternative S and K would develop 31 and 63 percent of the area, respectively. Alternatives NC, A, B, C, and D would develop 70 to 78 percent.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with timber harvest, road construction, and with treatment of activity slash. As access improves, the level of dispersed recreational and other public uses increases, accompanied by an increase in the risk of human-caused fires.

In Alternatives E, G, and M, risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternative K and S, industrial operations would result in increased risk over 31 to 63 percent of the area; risk from public use would be increased along the four to seven miles of road. In Alternatives NC, A, B, C, and D, industrial operations would result in increased risk over 70 to 78 percent of the area; risk from public use would be increased along eight to ten miles of road.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

No proposed Botanical Areas are contained within the roadless area. However, the Lemmingsworth Gulch area, a proposed RNA, contains a wealth of rare plants. A large group of sensitive and unique plants are present. Sensitive plants in the roadless area will be protected through application of appropriate Standards and Guidelines. On the Siskiyou portion, 40 percent of the area is tentatively suitable for timber production. Most of the sensitive and uncommon plants are restricted to the serpentine soils. These areas are generally not suitable for timber harvest and, other than mining activities by private individuals, will remain relatively untouched for many years.

The proposed 965-acre Lemmingsworth Gulch RNA is entirely within the Packsaddle Roadless Area This site is recommended for RNA status in Alternatives E through S. The Gulch contains an extensive array of sensitive and uncommon plants. Two large *Darlingtonia* bogs harbor many unusual plants.

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning Only impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates (TSP) is used as the measurement of local and regional haze Alternatives E, G, and M would contribute no TSP. All other alternatives would produce 7-11 tons of TSP per year.

The probability of a smoke intrusion from burning in the area impacting the Redwood National Park, a Class 1 area, is very low based on past performance. The probability of impacting the Kalmiopsis Wilderness, a Class 1 area, is low to moderate.

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole

Bald Eagle/Osprey. The area is not suitable habitat for bald eagle. It is marginal for osprey; an occasional individual may use the river as a flight corridor.

Spotted Owl/Pileated Woodpecker/Pine Marten Under all alternatives except E, G, and M, habitat for mature/old-growth indicator species would be considerably reduced over time Mature/old-growth habitat would remain at present levels under Alternatives E, G, and M, which continue the roadless status Except for Alternative NC, part of one habitat enclave for pileated woodpecker is present; it is part of the habitat network established to meet MR's for mature/old-growth wildlife habitat. In Alternative NC, habitat would eventually be reduced below MR levels. The Oregon portion of the area does not contain enough old-growth habitat to support a pair of spotted owls. The California portion of can support one or possibly two pair

Woodpeckers Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E, G, and M which assign the area to continued roadless status. In the large areas not suitable

for timber production, snag levels will remain high. Snag habitat near the North Fork Smith River would remain at or near 100 percent in all alternatives.

Black-tailed Deer/Roosevelt Elk. Big game opportunities would increase somewhat in all alternatives, except E, G, and M, which open up limited areas tentatively suitable for timber production.

Wildlife Habitats. The Packsaddle area contains approximately 25 acres of meadow habitat (including buffers) Meadow habitat is allocated in all alternatives.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the area are lower than average. Fewer hunters use unroaded areas; non-hunters generally stay on the trails Alternatives E, G, and M, produce fewer WFUD's.

Visual Resource

The current visual resource inventory indicates that the area is
in a location where it is visible to a Wilderness access route and an old campsite. Recreational use of the area is low, so viewer sensitivity is low. The character of the landscape is somewhat unique. The inventory for the Siskiyou portion includes 3,500 acres as Partial Retention and 1,800 in Modification.

Alternatives E, G, and M would be managed to achieve the Preservation objective. The natural-slightly altered appearance of the area would be maintained over the planning period.

Alternatives NC and A assign the area to management for inventoried visual objectives; character of the area would remain natural appearing for the most part, but some management activities would be apparent so that those area would appear as slightly altered. Alternatives B, C, D, K and S manage for a reduced level of visual objectives. Areas inventoried for Partial Retention would be managed to achieve the Modification objective. The existing natural-slightly altered appearance of the area would shift to a modified or altered appearance within the first decade of the planning period Alternative K and S, however, allocate the Lemmingsworth Gulch RNA, and Alternative S assigns another 1,200 acres to Backcountry Recreation. These allocations would maintain the roadless condition and management under a Preservation visual objective

Recreation Settings

Logging roads are located in the vicinity so that the area is influenced by the sight and sound of motorized users. In addition a portion of the North Fork Smith River runs through the area. Recreation use is very light. The area has been inventoried according to the ROS system and is capable of providing approximately 2,300 acres of Semi-primitive Non-motorized and 3,000 acres of Roaded Natural recreation opportunities The estimated carrying capacity for the area based on these figures is approximately 5,300 RVD's annually, the figure being high since the coefficient is based on roaded use. Projected recreational demand will remain well within the carrying capacity over the planning horizon.

All alternatives, except for E, G, and M, would result in some degree of development and acres capable of Semi-primitive Non-motorized recreation would shift to the Roaded Natural end of the opportunity spectrum. Motorized opportunities would be enhanced the area is roaded over time.

Economic and Social

There are 1,891 acres of land identified as tentatively suitable for the production of timber in the Siskiyou portion of the unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 5,289 acres of the Siskiyou National Forest portion of the Packsaddle Roadless Area is 0.10 MMCF. The estimated LTSY would be 0.19 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative

Alternative	ASQ	LTSY
NC, A, A-Dep, C, D, and K	08	.16
B and D1	.11	21
E, G, and M	.00	00
S	04	08

For projecting effects, the alternatives are grouped: (1) Alternatives NC, A, B, C, D, and K develop most of the area; (2) Alternative S develops about half of the area; and (3) Alternatives E, G, and M leave the area in an unroaded condition.

	Alternatives		
Effects (Changes Compared to Alternative A)	E, G, and M *(Unroaded)*	S	NC, A, B, C, D and K *(Roaded)*
Direct Effects			
Timber and Road Expenditures	None	Moderate Reduction	No Change
Indirect Effects			
Jobs	-7	-4	0
Annual Income (MM $)	-0.17	-0 08	0
Annual Payments to Counties (MM $)	-0 04	-0.02	0
Cumulative Effects			
Eastside Rural Communities			
Timber Related	-	-	0
Primitive Recreation	+	+	0
Fisheries	+	+	0
Wildlife Related			
Hunting	-	0	0
Old Growth	+	+	0
Mining	-	0	0

All economic and social effects for all alternatives are insignificant because of the small amount of resources involved. The amount of these resources indicate substitution of other resources could occur fairly easily resulting in little, if any, impact on the social and economic environment.

The direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E, G, and M have reduce timber and road expenditures; Alternative S has a moderate decrease.

The indirect effects are associated with jobs, income, and payments to counties. Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E, G, and M have the biggest reduction while Alternative S has a moderate reduction.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Additional discussion is found in Chapters III and IV of the FEIS The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed. For example, in Alternative E, fishing interests are predicted to feel positive about Forest management while timber interests as predicted to feel the Forest is ignoring their interests. An "0" indicates no change from current situation Such gains and losses may create additional conflict.

MITIGATION MEASURES

No additional mitigation measures have been identified.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No additional conflicts have been identified.



Table C-5q. South Kalmiopsis Roadless Area No. 6709 (104,620 Acres) Acreage in Management Area by Alternative

Management Area No.-Name	ALTERNATIVE									
	NC	A and A-Departure	B	C	D and D1	E	G	K	M	S
1-Wilderness	0	0	0	0	0	0	0	0	0	0
2-Wild River	80	80	1,269	0	1,269	80	75	0	80	80
3-Research Natural Area	1,269	1,269	0	1,269	0	1,269	1,269	1,269	1,269	1,269
4-Botanical	185	185	555	555	555	3,999	4,917	217	4,917	3,422
5-Unique Interest	0	0	0	0	0	0	0	0	0	0
6-Backcountry Recreation	0	0	0	0	0	99,267	49,626	1,493	98,304	54,213
7-Supplemental Resource	1,270	1,270	1,270	0	1,270	0	1,680	1,270	0	1,275
8-Designated Wildlife Habitat	10	5,829	5,829	6,161	5,839	5	3,450	7,692	5	2,885
9-Special Wildlife Site	27	16	32	37	32	0	107	960	0	1,962
10-Scenic/Recreation River	1,120	1,052	1,046	1,046	1,046	0	0	342	0	150
11-Riparian	15,507	13,999	13,993	14,393	13,993	0	5,970	13,257	3	6,509
12-Retention Visual	3,983	3,955	956	0	956	0	972	690	0	209
13-Partial Retention Visual	32,179	31,248	5,226	6,010	5,226	0	12,735	10,607	11	9,206
14-General Forest	48,990	45,717	74,777	75,149	74,434	0	23,819	66,823	31	23,440
TOTAL	104,620	104,620	104,620	104,620	104,620	104,620	104,620	104,620	104,620	104,620
TOTAL UNDEVELOPED (MA 1-9)	2,841	8,649	8,955	8,022	8,965	104,620	61,124	12,901	104,575	65,106

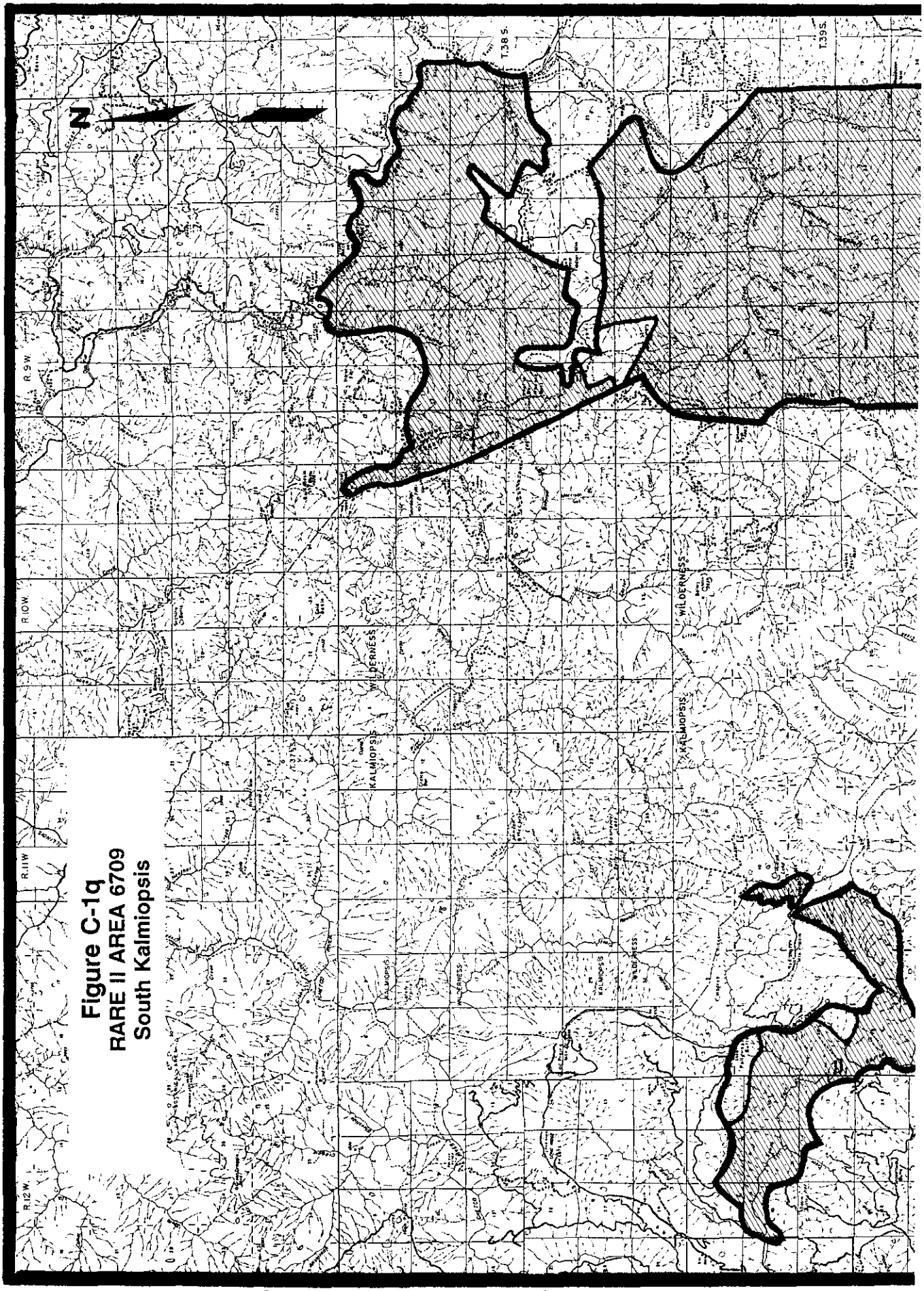
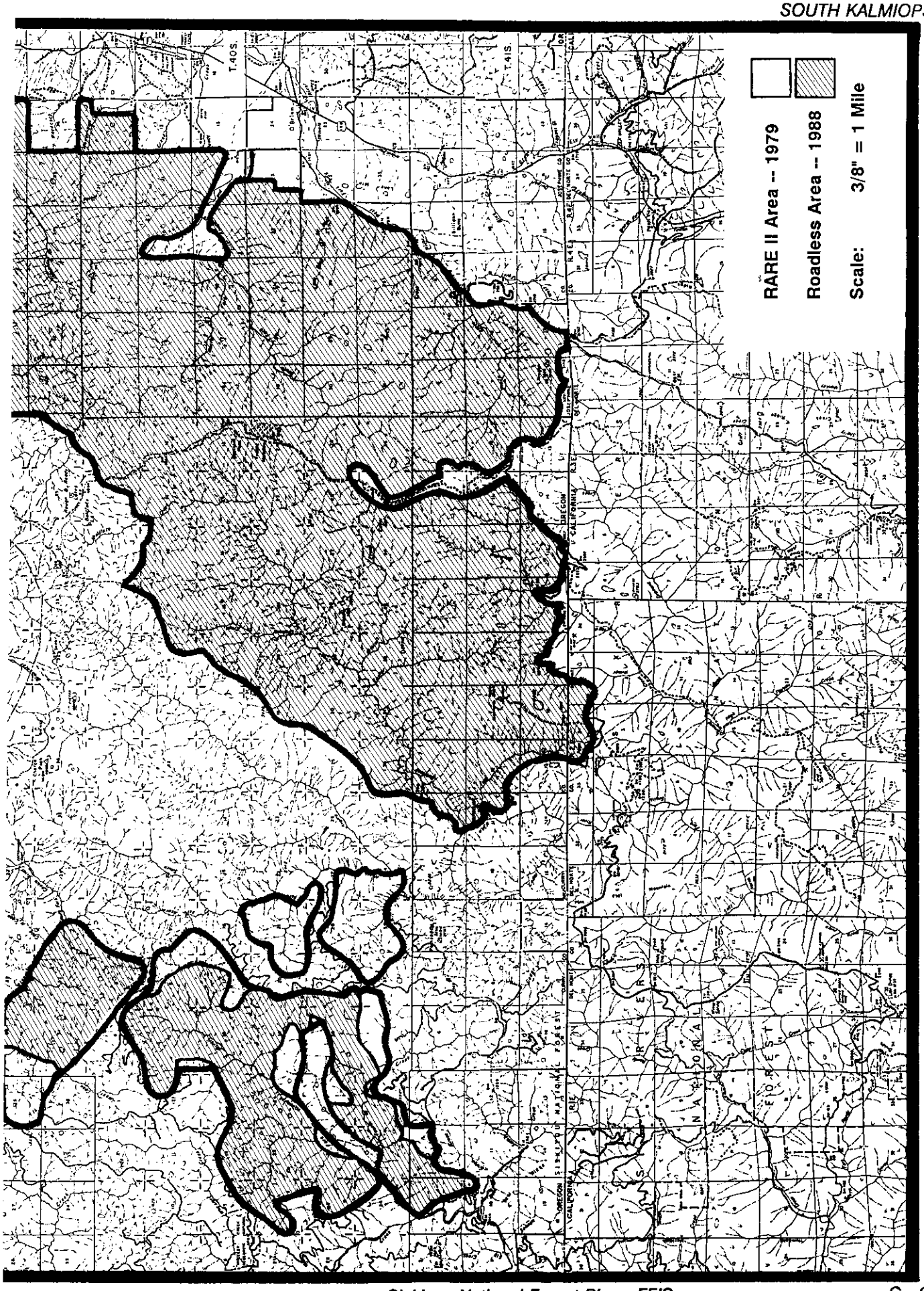


Figure C-1q
RARE II AREA 6709
South Kalmiopsis


RARE II Area -- 1979
Roadless Area -- 1988
Scale: 3/8" = 1 Mile

SOUTH KALMIOPSIS No. 6709

(104,620 acres - Siskiyou National Forest)
(280 acres - Six Rivers National Forest)

(Total - 104,900 Acres)

DESCRIPTION

STATUS OF ROADLESS AREA

The South Kalmiopsis Roadless Area was inventoried for study as a potential Wilderness during the RARE II process. The roadless area surrounds the southern half of the Kalmiopsis Wilderness. It is in four segments, the largest of which crosses the Oregon-California State line and includes a small area (280 acres) on the Six Rivers National Forest in California.

The South Kalmiopsis Roadless Area contained 111,515 acres and was allocated to non-Wilderness use by the RARE II decision in January 1979. Since that time, road construction and timber harvesting has occurred in several of the segments, particularly the western ones. The area has subsequently been reduced to 104,900 acres. Except for a small area in Mikes Gulch, all is National Forest System land

The Chetco-Grayback Land Management Plan (FEIS, 1979) allocates most of the area to Coordinated Resource Management (*Management Area 1*) to obtain full timber yield consistent with land capabilities and appropriate constraints, along with providing a high level of quality big game habitat and protecting small areas containing exceptional features Three other Management Areas (4, 6, and 9) contain direction for more specialized land assignments.

Management Area 4. Managed as a scenic river. In 1984 it was Congressionally designated as the Illinois Wild and Scenic River.

Management Area 6. River corridors averaging 1/8 mile horizontal distance from each bank are designed to protect or enhance fishery habitat, water quality, and old-growth forest characteristics for dependent wildlife species. These supplemental fisheries/watershed areas have been provided to reaches of the Winchuck and South Fork Chetco Rivers.

Management Area 9. This includes the proposed Hoover Gulch RNA. Primary emphasis has been given to the preservation of natural features for educational and scientific purposes.

Complete descriptions of these management areas can be found in the 1979 Land Management Plan Readers are directed to this document for a broad overview of the affected environment, evaluation of resources and management alternatives, and other requirements and constraints. Since implementation of the Land Management Plan, all project activities have been analyzed under the Plan's direction and NEPA requirements/process.

CHANGES BETWEEN DRAFT AND FINAL

During the period from 1984 to 1988, timber sale activity has occurred in the previously dissected, southwest corner of the unroaded area. This has reduced the area by 800 acres (Refer to Figure C-1q). Very little other activity has taken place, therefore, the area remains as previously described. The Six Rivers

National Forest is currently in the process of determining land allocations and management prescriptions for their 280 acres (refer to the Six Rivers Forest Plan DEIS, 1986).

As a result of the Omnibus Oregon Wild and Scenic Rivers Act of 1988, the North Fork Smith River was added to the National Wild and Scenic Rivers System. The new designation affects the discussion herein to a very limited degree as the inventoried South Kalmiopsis Roadless Area only contacts the classified Scenic River segment in the Sourdough area. Due to the very recent passage of the Act, the Management Area acreages (Table C-5a) and analysis have not been updated to reflect this change. Only Alternative S carries the adjustments. Any alternative selected in the Record of Decision will treat the Congressionally designated land the same in the Land and Resource Management Plan.

LOCATION AND ACCESS

The South Kalmiopsis Roadless Area is located in Josephine and Curry Counties, Oregon, and Del Norte County, California (the 280 acres portion of the Six Rivers National Forest). The two western segments are approximately 10 to 15 air miles east and northeast of the town of Brookings, Oregon. These very irregular shaped segments extend north-south for 12 miles and average about two to four miles in width. The northern portion borders the Kalmiopsis Wilderness. Both are in Curry County. Access is principally off numerous system roads tributary to the main routes from the Chetco River, Wheeler Creek, and Winchuck River.

The two eastern segments are positioned approximately two miles east of U.S. Highway 199 and border the Kalmiopsis Wilderness on the west. The east-west width varies from six to ten miles; the north-south distance is 21 miles.

The northern segment, all in Josephine County, is bordered on the north by the Illinois Wild and Scenic River. Access to this side is via the Illinois River Road. Timber harvest, mining, and Wilderness access serviced by the Onion Camp Road divides these eastern segments. The southern end of the largest segment is marked by the Wimer Road Approximately one-third of the southern segment is in Curry County, and includes the 280-acres portion of the Six Rivers National Forest is in Del Norte County; the remaining area is in Josephine County.

Numerous trails and low standard mining roads exist within the eastern segments, providing relatively good access into the deep interior. The southeast unit, and largest unit, presently has about 50 miles of low standard roads which were built as exploration roads for mining. Approximately eight miles are closed and the remaining miles are open for high clearance vehicles, with four-wheel drive required for access on most.

PHYSIOGRAPHIC AND BIOLOGIC FEATURES

The roadless area is very mountainous with elevations varying from approximately 500 feet along the rivers on the western side to 4,600 feet near Pearsoll Peak. The area drains into the Smith, Illinois, Chetco, and Winchuck River systems. Physical location is on the western side of the coast range within the Klamath Mountain Physiographic Province of extreme southwestern Oregon.

The northeastern portion of the roadless area consists of two major soil types. One soil is derived from serpentine and peridotite and is largely unproductive due to chemical imbalance. The second soil occurs along the band of metavolcanic rocks of the Rogue and Galice Formation that transects the area. This area is more densely forested than the barren surrounding serpentine area, and has low to moderate productivity. These soils are generally shallow with a high gravel or cobble concentration in the surface layer. Some limited mass soil instability has occurred, primarily along geologic contact areas and on over-steepened toe slope. Development activity is generally low.

The southeastern segment of the roadless area is dominated by serpentine and peridotite soils and rounded ridge tops broken by steep inner gorges. Soil productivity is low. Surface soil runoff is often abundant during intense storm periods, creating high natural peak flows.

The western segments have broken and steep topography with deep canyons. Generally, the area is within the marine sedimentary soils having moderate to high productivity. Vegetation is usually dense with Douglas-fir the dominate conifer species. Tanoak and Pacific madrone hardwoods are also present in this mixed conifer and evergreen ecosystem.

Shallow, rocky soils occur most often in ridgetop areas, with moderately deep soils often occupying the midslope areas. Lower slopes contain considerable stream channel instability, especially along the South Fork Chetco and North Fork Smith tributaries.

Annual precipitation ranges from 60 inches on the lower east side to 150 inches in the western portions. An average 5 to 18 inches occurs during the dry season (May through September) While snow is common to the higher areas, most precipitation occurs in the form of rain due to the proximity to the Pacific Ocean and frequent warm frontal storms during the winter. Temperatures, for the most part, are fairly mild and heavily influenced by marine air. However, summer highs may attain 100 degrees Fahrenheit.

Low to moderate populations of game and nongame wildlife species occupy the unroaded area Different use levels are highly related to the significant difference in the ecosystems. Populations of black-tailed deer and occasional black bear frequent the area. Although a peregrine falcon was sighted near Red Mountain in the autumn of 1968, no known populations of threatened or endangered species of wildlife occur within the unroaded area.

The South Fork Chetco, Winchuck, and North Fork Smith River and their tributaries are important salmon and steelhead streams. Resident trout fisheries exist in many of the other streams. Anadromous fish also utilize a few of the eastside streams, but the primary influence of these tributaries are their cooling effect on the Illinois River.

The serpentine soils of the South Kalmiopsis provide a unique substrate which supports a proliferation of rare flowering plants in a climate that could otherwise produce a lush forest. Serpentine bogs are present in a number of areas. Rare plants are especially abundant in five areas which have been evaluated for designation as Botanical Areas.

RESOURCE USES

Current and historic mining dominates use of the area. Both exploration and development has occurred over much of the area where known ore bodies exist or are likely to occur Nickel laterite deposits are located in the serpentine sites. Numerous pits and tailing piles and several active gold mines occur along Josephine Creek, Canyon Creek, and their tributaries where placer gold deposits are extensive Near the State line, at least two copper mines have produced significant amounts in the past. From this activity, the area is crisscrossed with many exploration roads and dotted with sample sites

Some timber harvest activity has taken place around much of the western segments and has entered several areas of the eastern portions. These actions are strongly related to the more productive sites on the sedimentary and metavolcanic soils, and accessing to the intrusive diorite area near Buckskin Peak Occasional entry has been made on the more heavily timbered pockets in serpentine soils. As noted, most of the recent harvest activity has been excluded from the revised unroaded area acreage.

Moderate big game and very minor upland game hunting takes place Most hunting is limited to fringe areas on the westside due to steep and brushy terrain. Fishing is also minor due to tough access Access

is considerably more open and mining roads and trails provide far better ingress to the interior on the eastside

Recreation use is dispersed and highly associated with the larger rivers and their tributaries, the small lakes, and trails. Most use concentrates along the Illinois River and in the adjacent Babyfoot and Vulcan Lake areas inside the Kalmiopsis Wilderness. Use consists primarily of fishing and hunting already mentioned, backpacking, hiking, floating and swimming in the Illinois River, nature study, recreational mining, and photography. Use figures have not been collected for these more dispersed activities, however estimates place recreation visitor days at about 400 to 500 for the westside segments, and from 4,000 to 5,000 along the eastern portions. Recreation use is quite low relative to the size of area involved

APPEARANCES, SURROUNDINGS, AND ATTRACTIONS

The appearance of the South Kalmiopsis is largely associated with the parent geology The serpentine sites contribute the most diversity to an otherwise heavily forested, steep, and mountainous country The serpentine terrain is atypical due to the more open and rounded terrain, especially considering the geologic and climatic factors heavily influencing landform and vegetative development in the Klamath Geologic Province.

The surroundings provide the greatest attractions. The Scenic section of the Wild and Scenic Illinois River and Kalmiopsis Wilderness are primary attributes on the eastside. Within, the serpentine soils, vegetation, and landforms provide an unusual and very pleasing setting Many locations are of particular botanical interest because of the large number of unique or sensitive plants. Historically, mining (Chinese included) adds more character to the area

The western portions of the South Kalmiopsis contain valued commodity resources. Salmon and steelhead fisheries provide a richness to an otherwise uneventful environment. Good stands of conifer cloth these coastal slopes, providing both the attraction and setting for timber harvest in the surrounding lands.

CAPABILITY

MANAGEABILITY

The ability to manage and protect the natural character of the South Kalmiopsis is highly affected by boundary locations and existing access. The eastern boundary abuts private property which has been developed. Numerous access points are located on private land and would be very difficult to control. Numerous roads within this area are used to access active mining claims These claims would likely remain active and include right of access under any land allocation. Most of the boundary, however, is well defined by ridgelines, the Illinois River, and roads.

The western segments present far greater management difficulties due to both their smaller size and highly irregular shape. Topographic boundaries, too, are ill defined. Ability to screen from sights and sounds of external activity is quite limited.

NATURAL INTEGRITY AND APPEARANCE

The South Kalmiopsis is generally in a near-natural condition. The major existing conflicts are:

At least 9,000 acres has extensive exploration and development for mining in the form of primitive roads, pits, mine shafts, old mining equipment, etc. The most concentrated of these workings are in Josephine Creek, Hanson Gulch, Rough and Ready Creek, Rock Creek, Spokane Creek and Woodcock Mountain. Several old cabins exist as part of the mining operation. The area is so large that overall effects of mining is minor on the naturalness of the area. Unless at a mine site, the area appears natural

A power line right-of-way extends across the area in the vicinity of the West Fork Illinois River and Rock Creek near the town of O'Brien The herbaceous vegetation has been left on the right-of-way corridor which minimizes the impact on the area's naturalness. The effect on the area's appearance is high, however, along the this corridor. This area could be removed from the roadless area by a boundary adjustment without changing the overall roadless area attributes.

Livestock grazing is permitted in the allotment covering the Days Gulch and Josephine Creek area. The effect on natural integrity is low; on natural appearance, negligible.

Improvements occur on private land in Mike's Gulch.

Man's activities from outside the eastside segments have had little impact on the interior portions except for some visual changes. The natural processes are mostly intact. On the west side, the midslope boundary for much of the unroaded area creates unfavorable conditions from activities above. Road construction and timber harvest have influenced the adjacent undisturbed terrestrial and aquatic habitats. The discontinuity of activities, i.e., the drainage basin being divided between pure and altered ecosystems, measurably reduces the potential integrity of natural processes and appearance.

OPPORTUNITIES FOR SOLITUDE AND PRIMITIVE EXPERIENCE

The South Kalmiopsis has very diverse topography and vegetation that varies from open to quite dense. Natural screening, thereby, is highly dependent on local features. The coastal and northeastern segments are far better screened than the southeastern area, but adjacent activities are much more pronounced The widest bodies of unroaded area adjacent to the Kalmiopsis Wilderness provide the highest degree of solitude and primitive experience. The overall opportunity is judged as poor to moderate on fringes not bordered by Wilderness, and high in the interior, particularly in the southeastern segment. Several areas drainages are totally screened from sights and sounds.

Use of much of the western area is limited due to vegetative density and rugged terrain. Moving off the roaded adjacent areas a short distance would provide a primitive experience if sound were not present. As recreation use is heavily concentrated, movement away from these sources would also improve the feeling of remoteness and self-reliance. Much of the South Kalmiopsis can provide for primitive and unconfined types of recreation.

SPECIAL FEATURES

The inventoried South Kalmiopsis Roadless Area has unusual and complex geology which includes a large portion of the Josephine ultramatic sheet. Transition zones are small, often as little as 20 feet. Wet serpentine bogs are also present in several areas. The serpentine soils provide for a unique setting of open and shorter vegetation in a climate that could produce lush conditions These inherent differences contribute to the special nature of the area Coupled with the large serpentine landforms, the designated Kalmiopsis Wilderness and Illinois Wild and Scenic River focus considerable attention on this area

AVAILABILITY

RESOURCE POTENTIALS

Recreation Settings

The opportunity for change in type of recreation under an undeveloped scenario is limited Potential for total use should increase similarly to the Kalmiopsis Wilderness and Illinois River However, use in most of the western portions will likely increase at less than the predicted trend due to it's vegetative, terrain, and adjacent uses. The present use of approximately 5,000 recreation visitor days is mostly in the form

of hikers and off-road vehicles. Much of this activity is related to accessing the Kalmiopsis via trails and low standard roads

The potential for increased recreation use is greatest under a roaded environment where many of the existing uses would occur along with the added motorized forms Much of this use would be sightseeing and hunting accessible by roads. In both the developed and undeveloped forms of recreation, capacity would not be exceeded. The most limiting element is Primitive Recreation Opportunity System (ROS); the Primitive type of recreation opportunity will approach capacity in several decades. It's area extent in the South Kalmiopsis is quite small and strongly associated with the Kalmiopsis Wilderness.

Wildlife

Game abundance is minimal throughout the area and would remain essentially unchanged under current practices. Timber harvest would benefit game animals by creating greater food resources through changes in vegetative stages Populations of old-growth dependent wildlife would decrease. They would not be eliminated, however, because considerable habitat would remain along the river corridors, tributary streams, and in areas unsuitable for timber management purposes. Sensitive species would be protected through applicable standards and guidelines.

Soil, Water, and Fish

There are no impoundments or diversions either existing or proposed within the unroaded segments A demand does exist for augmenting the flow of the Illinois River for fisheries. However, no reservoir sites have been proposed on this side of the valley. Current low flows are associated with geology and lowered water tables of the Illinois Valley from irrigation and domestic users. The greatest need to date has been the maintenance or improvement of summer water temperatures and increased minimum flows to sustain the natural steelhead, salmon, and resident trout populations. However, this roadless area, due to it's inherent characteristics, exerts little influence on enhancement of these resources.

The coastal streams for this unroaded area have high potential; substantial increases can be expected through instream and streamside shade improvements. Resident trout populations are stable and not expected to change under various alternatives. Most of this resident trout use occurs in the upper stream areas of the eastern segments.

Livestock

A small amount of livestock grazing takes place in the area. While this use is limited, it is important to the permittee. Development would allow for improved access and better utilization of transitory range.

Energy and Minerals

The area has large, proven deposits of critical and non-critical minerals. Nationally significant amounts of nickel, chrome, and cobalt, as well as potentially important sources of gold, copper, and iron, lie within the eastern segments of the South Kalmiopsis. These deposits appear to be commercially valuable. Mining companies have been intent on developing similar deposits a few miles to the south in Northern California

Cultural Resources

Archeological potential is low. Historic mining dominates the cultural setting on the eastern side. Some Indian use has occurred in the river bottoms and ridgelines of the western segments.

Sensitive Plants

The serpentine soils of the South Kalmiopsis support a great variety of rare flowering plants The area offers the visitor and botanists a unique experience. Rare plants are especially abundant in five areas which have been evaluated for designation as Botanical Areas (Cleopatra, Days Gulch, Oregon Mountain, Rough and Ready Flat, Vulcan (See Appendix F for a description of each area, including individual plant lists)

McDonald's rockcress, *Arabis macdonaldiana*, is found in the Cleopatra area. This Siskiyou population was thought to be identical to the *A macdonaldiana* growing on Red Mountain in Mendicino County, California, and is classified as endangered. It has since been determined by the USDI Fish and Wildlife Service that the Siskiyou's version of the plant is an as-yet-undescribed member of the purple *Arabis* complex The Siskiyou plants (*Arabis* sp. nov /in ed. ["macdonaldiana"]) are now classified sensitive by the Forest Service (Region 6). Many sensitive and uncommon plants occur within the area Plant inventories have been conducted in only a small part of the area; the following list is not complete:

Sensitive Plants	Uncommon Plants
Arabis koehleri var stipitata	*Antenaria suffrutescens*
Balsamorhiza sericea	*Arabis aculeolata*
Calochortus howellii	*Arabis oregana*
Cupressus bakeri	*Arenaria howellii*
Cypripedium californicum	*Arnica cernua*
Dentaria gemmata	*Aster brickelliodies*
Epilobium rigidum	*Castilleja elata*
Erigeron cervinus	*Castilleja brevilobata*
Eriogonum pendulum	*Darlingtonia californica*
Eriogonum ternatum	*Dicentra formosa ssp. organa*
Erythronium howellii	*Erigeron bloomeri var nudatus*
Fritillaria glauca	*Erythromium citrinum*
Gentiana bisetaea	*Gentiana affinis var affinis*
Hieracium bolanderi	*Haplopappus racemosus ssp congestus*
Lewisia oppositifolia	*Horkelia sericata*
Lewisia cotyledon spp purdyi	*Iris bracteata*
Lupinus tracyi	*Kalmiopsis leachiana*
Microseris howellii	*Lewisia cotyledon*
Monardella purpurea	*Lilium bolanderi*
Poa piperi	*Lilium kelloggii*
Sedum laxum spp. heckneri	*Lilium vollmeri*
Senecio hesperius	*Lomatium howellii*
Silene hookeri ssp pulverulenta	*Pinguicula marcroceras*
Streptanthus howellii	*Phacelia corymbosa*
Thlaspi montanum var siskiyouense	*Sanicula peckiana*
Viola occidentalis	*Sarcodes sanguinea*
	Sidalcea malveflora ssp. elegans
	Trifolium howellii
	Trillium rivale
	Vancouveria chrysantha

Land Use Authorization

Few exist or are expected; most will be related to ingress and egress for mining purposes.

Timber

The South Kalmiopsis area contains 28,312 acres of tentatively suitable land for the production of timber Most of the commercial forests are in the western and northeastern segments. Standing volume is estimated at 500 MMBF. Sites that would be considered for harvest vary from stable to moderately unstable; most can be accessed and harvested using systems presently in use on the Forest today Vegetative competition and steep slopes occur on portions of the area; management for timber production would utilize various methods to reduce brush competition for release of crop trees as site-specific conditions warrant.

MANAGEMENT CONSIDERATIONS

Fire occurrence has been low to moderate Most fires are lightning caused; few are man caused Natural fuels are rated light to moderate with scattered heavy concentrations. Most of the variance is due to inherent soil properties. Risk of wildfire also varies greatly; generally it is quite low on the serpentine areas and higher in the western segments and the northeastern area bordering the Illinois River The higher risks/hazards are are a combination of fuel characteristics, likely forest management activities, and greater recreational usage (particularly in the Illinois River corridor). Improved access in these areas would increase risks due to greater numbers and types of users, but would also break fuel continuity and provide for quicker and more efficient forms of suppression response. The western areas, while generally higher hazard, have reduced severity of weather for much of the year due to the maritime influence

Mining exploration and development, and associated access will continue to require close administration to avoid conflicts with other resources. If unroaded, the sensitivity relative to appropriate control of operations will be even greater.

The potential for insects and disease outbreaks within the coniferous forest exists However, actual occurrences have been minor and localized (mistletoe infection in pine species). Management actions can reduce this threat.

NEED

OTHER AREAS AND PUBLIC USE

The South Kalmiopsis surrounds the southern half of the Kalmiopsis Wilderness (179,560 acres). Segments of the area are also adjacent to another five inventoried roadless areas (North Kalmiopsis, Squaw Mountain, Packsaddle, North Fork Smith, and Mt. Emily) The total area of the five unroaded/undeveloped areas exceeds 108,000 acres. A section of the both the Illinois and North Fork Smith Wild and Scenic Rivers also contribute to area in Congressionally designated status.

Recreation use of the Wilderness and unroaded areas is light, most being concentrated along the Illinois River, adjacent roads, Wilderness access trails, and the small lakes. The east side of the South Kalmiopsis receives most use from the interior valley areas The western segments receive very little use; most that occurs is again local and from the nearby coastal communities As a primary attraction for distant population centers, the Illinois Wild and Scenic River is the drawing feature.

ECOSYSTEM REPRESENTATION

The major ecotypes within the South Kalmiopsis are well represented in the Kalmiopsis Wilderness and the Illinois Wild and Scenic River corridor. Additionally, several Botanical areas are being considered for allocation Within the area, over 70,000 acres is inherently protected from most activity due to the land base being largely unsuitable for the production of timber. The exception to non-entry of this land base is mining; however, even this is generally limited in extent.

PUBLIC INVOLVEMENT

Interest and concern for the existing and future management of this large unroaded area has been appreciably high for both the public and Forest managers. Involvement in evaluation of options for the South Kalmiopsis began in the early 1970's through the RARE study. Conflict posed by divergent views persisted into Congressional conference committees during the debate of the Endangered American Wilderness Act of 1978. After many meetings, compromise was reached on the present boundaries of both the North and South Kalmiopsis areas. The legislative process added 103,000 acres to the then existing 76,000-acre Wilderness.

RARE II neither recommended the South Kalmiopsis for Wilderness nor further study; it was allocated to "non-Wilderness" status Public preference for allocation was mostly unanimous for this designation. The involvement and input by individuals, interest groups, local and state governments was major.

Within the same period, the Chetco-Grayback Land Management Plan was underway (FEIS, 1979) Again public input and responses were received. The issue of maintaining the existing wilderness character of the area existed and was covered in the Draft EIS, but direction was received which left decisions for recommending roadless areas for Wilderness to RARE II. Considering both characteristics and values, allocations were made through the Land Management Plan to place most of the area in Coordinated Resource Management (i.e., open to development activities). This consideration and the prior attempts to establish Wilderness over much of the South Kalmiopsis area was strongly influenced by the high potential for strategic minerals.

Since 1979, only limited entry has been made to harvest timber. Some mining activity and associated roading has occurred. Public input into several proposed projects in the unroaded portions of the South Kalmiopsis have been mostly absent. However, limitation of activity is more related to the inherent conditions of the serpentine-peridotite sites and marginal economics than to expressed public objection.

The files provide substantial documentation of issues, concerns, and recommendations relative to the South Kalmiopsis. The form of public input has been through letters, public meetings, project planning and implementation, newspapers, the RARE II process, a Land Management Plan FEIS, and current Forest Planning efforts Primary views to date are:

- The mineral potential is very high; restriction on exploration and development is likely if allocated to an unroaded status.
- Timber harvest and associated roading costs are economically submarginal on much of the serpentine-peridotite areas
- Recreational use of the area is very limited; likewise, not much use occurs in the adjacent designated Wilderness of similar landtype, therefore no need for more when capacity hasn't been approached
- Huge tracts of Wilderness and Wild and Scenic River areas offer equal or better experiences.
- Timber resources are important to the dependent communities for economic stability and local government revenue.

- Old-growth habitat for dependent species is becoming threatened
- The ecosystem is well represented in the adjacent designated Wilderness.
- Protection should be afforded the unusual, sensitive, threatened and endangered plants that inhabit the area.
- The area should be managed on a multiple-use basis supporting recreation, timber harvest, minerals, wildlife, and fisheries.
- The Kalmiopsis Wilderness boundaries were defined through Congressional compromise; it was the intent of Congress to allow development in this area
- Development adjacent to the Wilderness or within the Chetco River watershed may adversely impact their values.
- The pristine viewshed of the unique Wild and Scenic Illinois River may be impacted by sights of management activities.

In the current Forest Planning process, the unroaded area question has remained a major issue Public involvement, beginning with early public scoping in 1979 and continuing with public meetings, workshops, and other contacts into 1985, has not surfaced any new insight or concerns as to management of this unroaded area other than a "Park" campaign.

Immediately before and after release of the Forest Plan DEIS, the roadless area question and potential for Wilderness moved to a new theatre. The option to push for additional Wilderness was essentially closed with the release/sufficiency language contained in the Oregon Wilderness Act of 1984 Beginning in 1986, there was a movement to tie the Wild Rogue Wilderness and all contiguous unroaded areas to the south (including the South Kalmiopsis) with the large Kalmiopsis Wilderness. This large block of land was promoted by several individuals and organizations as a potential National Park. As discussed in Chapter II of the FEIS, the proposal was not entertained as an alternative evaluated in detail.

The importance of the South Kalmiopsis to various interest is high. Mining, timber, and environmental groups desire specific portions of the area be left for purposes essential to their views or needs. Resolution may be possible; a mix of uses accompanied by appropriate management areas and prescriptions could bring about a mosaic of "best" options for all.

ENVIRONMENTAL CONSEQUENCES

The significant effects of each alternative are presented in Chapter IV of the FEIS. Additional site specific effects, mitigations, and potential conflicts are presented here. The Standards and Guidelines for each alternative were considered when evaluating the effects of implementation.

SIGNIFICANT EFFECTS

Cultural Resources

The South Kalmiopsis has abundant historic mining resources, however, archaeological potential of the area is rated as low. Additional inventory is necessary to substantiate this. Some aboriginal use is recorded for the Winchuck portion.

Alternatives A, B, C, and D allow development which, in turn, requires intensive cultural resource inventory along any proposed alignment prior to approval. Alternative NC calls for the greatest amount of development, exceeding all others in the amount of cultural inventory and evaluation needed. Sites that may exist in the project area can be evaluated. Valuable sites can then be protected by avoidance or conserved through data recovery. Alternatives E and M call for an unroaded regime which would minimize the need for cultural resource inventory.

Energy and Minerals

The following table summarizes the estimated mineral potential and access limitations for the Siskiyou National Forest portion of the South Kalmiopsis. The acreages shown are subject to change due to the current withdrawal review by the Bureau of Land Management (BLM), and differences found for site specific needs included in any subsequent withdrawal applications to BLM.

	Mineral Potential (Acres)			
Access Restrictions	High	Moderate	Low	Total
Withdrawn	500	1,500	-	2,000
High	-	-	<100	<100
Moderate	500	400	-	900
Low	33,700	52,100	15,800	101,600
Total	34,700	54,000	<15,900	104,600

Improvements

Roads. The 28,312 acres of tentatively suitable land could generate about 124 miles of new road for timber harvest These would be local roads built to access timber harvest units. Additional roads for mining activities could be expected, especially in the two eastern units where mineralization is present and there is active gold mining.

Only a few of the new timber sale roads which could provide access to the Kalmiopsis Wilderness would be considered for passenger car use. All other roads would be open to only high clearance vehicles or closed between projects. The following table shows road mileage in the area by alternative. Note: Figures shown do not include existing mileages.

Alternative	Total Miles	Miles Open to Passenger Car	Miles Open to High Clearance	Miles Closed
NC, A and B	123	6	68	49
C	127	4	72	51
D	123	7	67	49
E and M	0	0	0	0
G	74	0	30	44
K	115	3	43	69
S	98	3	36	59

Alternatives E and M would have minimal effect on this area due to no roads being built Alternatives B, C, and D would be mostly roaded except for two Botanical areas and Hoover Gulch RNA; the two Botanical areas would not be roaded in Alternative NC and A. Alternatives G, K, and S would close 60 percent of the roads

The new construction would be extensions of new or existing roads from the Winchuck-Chetco Road or Pollywog Butte Road on the two west portions, and from the Onion Camp Road or Wimer Road for the two east portions. Timber stands in the large southeast section are scattered requiring additional roading through unsuitable lands to reach timber. Although no major streams would be crossed, some crossings would be near streams inhabited by fish. Roads would not be visible from any Forest arterial system and probably not from any highway (some possibility of new roads being seen from part of State Highway 46 or U.S. Highway 199), but could be visible from the Kalmiopsis Wilderness rim and the Wild and Scenic Illinois River in the northeast portion of the area.

Trails. Alternatives G and M would provide for the construction of 15 miles of trail; Alternatives K and S for 13 miles; and Alternatives NC, A and E for eight miles. Alternatives B, C, and D would only construct 0 5 miles of trail. Alternatives K and S propose the reconstruction of six miles of trails

Developed Recreation Sites. No construction is proposed.

Wildlife and Fish Habitat Structural Improvements. The South Fork of Chetco and Winchuck Rivers and many of the larger creek systems, like Josephine, Canyon, Rough and Ready, Baldface, and Fourth of July Creeks are candidates for improvements. All alternatives except E, G, and M would facilitate construction of any fish structures by providing better access. Alternative G, however, would provide additional access over the above group. Alternatives E and M retain the existing access limitations

Wilderness Potential

There are 232,495 acres within five designated Wildernesses on the Siskiyou National Forest. Recreation demand projections indicate that the Forest has the capacity to sustain projected levels of use in these areas until approximately the fifth decade of the planning period.

Alternative NC assigns the area to multi-resource management objectives, exposing Wilderness users to the influence of road construction, harvest units, and motorized recreation users. The quality of a primitive recreation experience in the peripheral areas of the Forest would be degraded as a result. Basically the same effects are attributed to Alternatives A, B, C, and D. However, an aggressive trail construction program would be implemented in the Kalmiopsis Wilderness under Alternatives B, C, and D, adding approximately 70 miles to the existing trail system, to partially mitigate the impacts.

Alternatives G, K and S would assign varying amounts of the South Kalmiopsis to Backcountry Recreation management. The Backcountry Recreation assignment in Alternative S would provide for motorized uses designed primarily for ORV's in portions of the area (approximately 54,213 acres) allocated.

Alternatives E and M would allocate all of the South Kalmiopsis to unroaded objectives. The quality of the recreation experience inside the Kalmiopsis Wilderness would be maintained due to the presence of areas maintained in a roadless condition. The Kalmiopsis Wilderness would be maintained in its current condition since the Forest would have the capacity to sustain demand for Non-motorized recreation activities.

How much of the inventoried roadless area remains unroaded by alternative can be evaluated by either assessing a combination of Management Areas 1-9 (which retain essentially undeveloped conditions), or by viewing the spatial arrangement of blocks of undeveloped area at the end of a given period of time. Management Areas may or may not be contiguous, so the integrity of the roadless area as a whole may be compromised by management around them. The following table provides a spatial estimate of acres remaining unroaded at the end of specific decades; these figures differ from the Management Area 1-9 acres in that the minimum criteria is based on the area either (1) bordering designated Wilderness, or (2) being 5,000 acres or greater:

Alternative	Acres Remaining End of Decade 1/		
	1	2	5
A, A-Dep, and NC	75,000	70,000	65,000
B, C, D, and D1	75,000	70,000	65,000
E and M	104,600	104,600	104,600
G	91,000	80,000	80,000
K	75,000	70,000	65,000
S	80,000	76,000	76,000

1/ Minimum criteria is 5,000 unroaded contiguous acres or adjacent to designated Wilderness

Wild and Scenic Rivers

The North Fork Smith was added to the National Wild and Scenic River System through the Omnibus Oregon Wild and Scenic Rivers Act of 1988 (See **CHANGES BETWEEN DRAFT AND FINAL**). The new Congressional designation will have little effect on the South Kalmiopsis. The various management alternative evaluated herein also could have only a minor impact, at most, on the Scenic River segment in the Sourdough area of the Wild and Scenic River corridor.

Much of the northern end of the area adjacent to the Wild and Scenic Illinois River is visible to river users. The allocation of the area to roadless management objectives will not effect the management of the Illinois Wild and Scenic River. However, the allocation could effect the quality of the recreation setting near the river The recreation setting is currently maintained through the use of Visual Quality Objectives (VQO's) which were assigned in response to both the designation of the river as Wild and Scenic and to the high levels of recreation use that occur on the river. Area within the designated Wild and Scenic River corridor is currently managed to achieve a Retention objective, the minimum objective applied to the designated Wild and Scenic River.

Alternative NC and A would manage the area to achieve inventoried visual objectives and result in some modifications in the area as they are entered for timber harvest. The quality of the recreation experience of the river users would be maintained. Alternatives B, C, and D assign the area outside of the designated Wild and Scenic River corridor to a reduced scheme of visual objectives. Areas outside the 1/4 mile corridor currently inventoried for Retention would be managed for Partial Retention resulting in visible harvest activities in proximity to river users. The quality of the recreation experience of the river users would be minimally effected because so little of the area is inventoried for Retention.

Alternatives E and M would manage the area for the Preservation objective, thereby maintaining the natural appearance and the Wilderness potential of the area over the planning period. Alternatives G and S would maintain 65,000 and 61,000 acres, respectively, in a roadless condition Assignment of Backcountry Recreation to the area generally located between the Scenic segment of the Illinois River and the Kalmiopsis Wilderness would be more oriented toward protecting the quality of the wilderness experience rather than the river experience, as the Upper-Illinois viewshed is already assigned to the inventoried VQO's under these alternatives. Alternative K, on the other hand, assigns most of the 13,000 acres of selected Management Areas to provide some degree of buffering to the upper Illinois River corridor.

Soil, Water, and Fish

No consequences to soil, water, and fisheries are associated with Alternatives E and M because no soil disturbing activities will occur. All other alternatives assign all or part of the area to Management Areas which permit development. The effects of timber harvest and road building are discussed in Chapter IV of the FEIS.

The risk for soil, water, and fisheries degradation is negligible to slight for all roading alternatives for areas on the northeast and southeast side of the roadless area. Slight to moderate risk of degradation occurs for Alternatives NC, A, B, C, and D for areas on the westside of the roadless area. These soils have greater inherent sensitivity to road-related activities. Hazards of regeneration occur primarily on the lower slopes. Highest hazards soils have been eliminated from the suitable land base, lessening potential risk of degradation for these alternatives.

Alternative K increases the amount of unroaded acres, some of which have potential risks for adverse effect. With reduced acres subject to disturbance would be a decreased potential for adverse soil and water impacts Further reductions in a large number of developed acres in Alternative G and S result in negligible risks to the soil, water, and fisheries resources.

Fire

The effects of the alternatives from a fire standpoint are the increase or decrease in fire hazard and risk that will be created. The South Kalmiopsis contains extremely variable fuel types. The parts east of the Kalmiopsis Wilderness are primarily sparse brush with a very scattered timber overstory. Throughout the area are scattered pockets of denser timber, particularly in the northern portion. Fuel loadings are light and the continuity broken by rock outcroppings. These conditions tend to produce low to moderate intensity fires, except under extreme conditions. The area west of the Kalmiopsis Wilderness is a mixture of timbered stands with a heavy brush understory, and extensive brushfield and hardwood stands Dead fuel loadings are generally light and continuous, though the heavy brush loadings create a high hazard.

In an undeveloped scenario, fuel accumulations would increase and fuel continuity would remain the same or increase. These conditions lend themselves to large, high intensity fires. Adding to this is the increased response time for initial attack forces due to poor access. The result is larger fires, higher suppression costs and increased resource losses. In a developed scenario, the hazard increases during timber harvest. As fuels are treated, the hazard is reduced. Over time, continuity of fuels are broken up, creating a mosaic of fuels and vegetative development. This mosaic, combined with improved access for initial attack forces, reduces the potential for large, high intensity fires. The result is smaller fires, lower suppression costs and less resource loss due to fire.

In Alternative E, all the area would remains undeveloped, with fuels remaining continuous over the entire area. Less than one percent of the area developed in Alternative M. In Alternatives G and S, 31 to 36 percent of the area would be developed, creating a mosaic of fuels over time while the rest of the area would remain undeveloped. Alternatives NC, A, B, C, D, and K would develop 75 to 81 percent of the area. The remaining undeveloped areas would be in 18-44 separate blocks. In large portions of the area, development will be minimal due to a large amount of land in the unsuitable category.

In undeveloped areas, the risk of ignition is low due to the low levels of human use. As development occurs, risk increases with road construction, timber harvest, and with treatment of activity slash. As access improves, the level of dispersed recreational and other public uses increases, with an increase in the risk of human-caused fires.

In Alternatives E and M, the risk from human-caused ignition would be limited primarily to the periphery of the area due to limited access. In Alternatives G and S, industrial operations would result in increased risk over 31 to 36 percent of the area; risk from public use would be increased along the 124 to 148 miles of road. In Alternatives NC, A, B, C, D, and K, industrial operations result in increased risk over 75 to 81 percent of the area; risk from public use is increased along 165 to 177 miles of road. Another source of ignition in these areas could be the planned use of naturally occurring fire in the Kalmiopsis Wilderness adjacent to the area. If fires are allowed to burn, there is a chance of fire escaping from the Wilderness boundaries.

Vegetation

Effects on vegetation relative to diversity and age class distribution do not significantly differ from the effects on the Forest as a whole (See Chapter IV, FEIS).

Sensitive Plants

Half of the existing Babyfoot Lake Botanical Area is partially within the roadless area (the other half is part of the Kalmiopsis Wilderness). Portions of five of the Forest's 19 candidate Botanical areas for sensitive plants are also within the area (following Table). Alternatives B, C, D, E, M and S include sensitive plant areas as Botanical areas (See Appendix F for more detail on individual sites). The proposed Hoover Gulch RNA is within the South Kalmiopsis Roadless Area; it is recommended in all alternatives.

A large group of sensitive and unique plants are present under all alternatives; sensitive plants will be protected through application of appropriate standards and guidelines. Approximately 28 percent of the roadless area is tentatively suitable for production of timber. Most of the sensitive and uncommon plants are restricted to serpentine or peridotite soils. These areas are generally not suitable for timber harvest, and other than mining activities by private individuals, will remain relatively untouched for the near future.

Botanical Areas, by Alternative *1/* (Tentatively suitable for timber production)

Area Name	Tentatively Suitable (Acres)	Priority Ranking	Alternative (Acres)					
			NC/A	B/C/D	E	G/M	K	S
SENSITIVE PLANT AREAS								
Cleopatra	249	7	--	--	--	800	--	--
Days Gulch	0	2	--	987	987	987	987	1252
Oregon Mountain	117	3	--	--	4401	4401	--	2649
Rough and Ready Flat	0	4	--	934	--	934	--	1499
Vulcan	0	5	--	133	--	133	--	133
EXISTING BOTANICAL AREAS								
Babyfoot Lake	0	--	352	352	352	352	352	352

Air Quality

The principle agent impacting air quality in the forest environment and surrounding areas is smoke from wildfire and prescribed burning Only impacts of prescribed burning are considered. The effect of smoke is a temporary reduction in visibility in an area. Total suspended particulates, or TSP, is used as an indicator of potential impacts. The potential for regional haze is a function of TSP production over the surrounding areas. Alternatives E and M would contribute little or no TSP. Alternative G and S would produce 62-68 tons of TSP per year, while Alternatives NC, A, B, C, D, and K produce 131-149 tons.

The probability of a smoke intrusion from burning in the roadless area impacting Grants Pass, a designated area for air quality, or Redwood National Park, a Class 1 area, is very low based on past performance. The probability of impacting the Kalmiopsis Wilderness, a Class 1 area, or Cave Junction, is low

Wildlife

Unless specifically mentioned below, effects of the alternatives on wildlife indicator species and wildlife habitat in this roadless area are the same as for the Forest as a whole.

Bald Eagle/Osprey. No bald eagle or osprey are known to inhabit the South Kalmiopsis, except for the Illinois River corridor, there is little available habitat for these two species Under any alternative, management of eagle habitat would be governed by the Pacific Bald Eagle Recovery Plan (USDI-Fish and Wildlife Service 1986). All alternatives offer adequate protection to the Illinois River corridor

Spotted Owl/Pileated Woodpecker/Pine Marten. All alternatives, except E, G, M and S, would reduce habitat for mature/old-growth indicator species would be over time. Mature/old growth-habitat would remain at present levels under Alternatives E and M; Alternative G, which leaves half of the area unroaded, preserves most of this habitat type Alternative S preserves over half the area.

Except for Alternative NC, a mixture of habitat enclaves to meet Management Requirements (MR's) for mature/old-growth habitat are located within the roadless area: three for spotted owls, four for pileated woodpeckers, and ten for pine marten (one of the pileated and four of the marten areas are only partially within the roadless area). At present this unroaded area supports approximately eight pairs of spotted owls, mostly on the northwest and western portions of the area There would be no change from present conditions under Alternatives E and M. Alternative G and S could probably support four owl pairs indefinitely. Mature/old-growth habitat would ultimately be reduced to MR levels in all alternatives except E, G, and M. In Alternative NC, habitat would eventually be reduced below MR levels.

Woodpeckers. Snag habitat would remain at or near 100 percent habitat capability for woodpeckers under Alternatives E and M which allocate the area to continued roadless status. In areas not tentatively suitable for the production of timber, snag levels will remain high. Snag habitat along the Illinois River would remain at or near 100 percent all alternatives.

Black-tailed Deer/Roosevelt Elk. Big game opportunities would increase somewhat in Alternatives NC, A, A-Departure, B, C, D, D1, and K, which open up areas suitable for the production of timber. Opportunities for habitat improvement projects for game animals would also be greater in these alternatives.

Wildlife. The South Kalmiopsis contains approximately 80 acres of meadow habitat (including buffers) at four separate sites Meadow habitat is allocated in all alternatives, although meadow buffers are not protected in Alternative NC or A. Two pond areas/wet sites are assigned in all alternatives except NC and A. The area contains over 1,000 acres of rock bluffs and cliff sites. Rock bluffs/cliffs are allocated for wildlife use in Alternatives E through S, but would probably remain unaffected in Alternatives NC through D1.

Wildlife Recreation Use. Estimated Wildlife/Fish User Days (WFUD's) currently attributed to the South Kalmiopsis are lower than average on the eastern portion of the area (higher than average near roads and the Illinois River). User-days on the western portion of the area are assumed to be equal to or slightly less than the General Forest. Fewer hunters use unroaded areas and non-hunters generally stay on the trail system. Alternatives E, G, and M produce fewer WFUDs; other alternatives generate more.

Visual Resource

The South Kalmiopsis Roadless Area has been inventoried for its Visual Quality Objectives (VQO's); the estimated acreages for each is provided below:

VQO	Acres
Retention	5,800
Partial Retention	39,100
Modification 1/	59,600

1/ Modification/Maximum Modification VQO

Areas inventoried as Retention and Partial Retention respond to recreation use and attendant viewer sensitivity from the Wilderness access route to Babyfoot Lake, the Illinois Wild and Scenic River, and to some of the trails in the Kalmiopsis Wilderness and roadless area. Recreation use is occurring primarily on the Illinois River, with trail use being low to moderate. Areas identified for visual objectives are primarily foreground and middle ground distance zones located adjacent to the above locations.

Alternative NC and A would manage the area for the current inventory and provide that management activities subordinate to the character of the landscape (Partial Retention) be visible in the viewsheds adjacent to Wilderness access routes and trail systems and the Illinois River, resulting in a slightly altered-natural appearing landscapes. Areas inventoried for Modification would result in an altered appearing landscape except in those areas not suitable for timber harvest. Alternatives B, C, and D assign VQO's only to the roadless areas within the Upper-Illinois viewshed in response to recreation use on the Illinois River Areas adjacent to Wilderness routes and trail systems would be allocated to Modification objectives.

Alternatives E, G, and M maintain the current visual inventory or upgrade the inventory to management under the Preservation objective in areas allocated to roadless management. Alternative E and M upgrade the inventory of the entire roadless area to Preservation. Alternative G, with allocations of approximately 56,000 acres to Backcountry Recreation and other special Management Areas, would subsequently upgrade the inventory to management under the Preservation objective

Alternative K and S assigns part of the South Kalmiopsis to Backcountry Recreation Management The area is comprised of the lands generally located between the Scenic section of the Illinois River and the Kalmiopsis Wilderness Visual objectives are allocated to areas within the Upper Illinois viewshed. All other areas would be managed under the Modification objective However, the Backcountry Recreation allocation in Alternative S would maintain upgrade the visual objectives for major portions of the unroaded area to Preservation

Land allocations to roadless management discussed for the alternatives above are located on the east side of the Kalmiopsis Wilderness. Unless the entire South Kalmiopsis is assigned to roadless objectives, the area on the west side of the Wilderness has been assigned to roaded objectives.

Recreation Settings

The roadless area has been inventoried according to the Recreation Opportunity Spectrum (ROS). The inventory shows that the area has the ability to provide a full spectrum of recreation opportunities The inventoried acreage and the estimated carrying capacity for each ROS class is shown in the table below.

ROS Class	Acres	Capacity (M RVD)
Roaded Natural 1/	31,200	50 5
Semi-primitive Motorized 1/	31,000	41 0
Semi-primitive Non-motorized	41,200	8 7
Primitive	1,100	0 1

1/ Carrying capacity shown is based on a roaded recreation use coefficient and is misleading since the Roaded Natural and Semi-primitive Motorized classifications are based on the presence of motorcycles on trail systems accessing the area.

The area is capable of offering Semi-primitive Non-motorized recreation opportunities on approximately 42,000 acres located on both the east and west sides of the Kalmiopsis Wilderness. The area on the east side consists primarily of lands not suitable for the production of timber. For the most part the landscape is rocky with scattered stands of timber and brushfields. It is estimated that approximately 70,000 acres of this area will remain in a roadless condition regardless of the management alternative selected since no management activities would be programmed. The area could still be roaded under several alternatives if large scale mineral development were to occur.

The 31,000 acre area identified as Semi-primitive Motorized falls in this category because of current management which provides for the use of trail bikes and motorcycles on trail systems within the area, and due to the presence of mining roads (some of which are used on a regular basis). If motorized use is

restricted, these areas would shift to the non-motorized end of the opportunity spectrum. The majority of these areas are located on the east side of the Kalmiopsis Wilderness.

Recreation use is light in all four parts that comprise the South Kalmiopsis and is estimated at approximately 5,000 RVD's in the entire area. The majority of recreation use in the roadless area occurs within the Illinois River corridor at the northern end of the roadless area on the east side.

Alternatives A, B, C, and D, inventoried as Semi-primitive Non-motorized recreation opportunities except the 70,000 acres spoken to above, would be lost by the second decade of the planning period. The area would lose its pristine character and present a roaded modified Forest setting to the recreation user Roadless character and Wilderness potential would be lost as a result. Portions of existing trail systems would not be replaced as a result of road construction. These four alternatives retain the essentially undeveloped character on 8,000 to 9,000 acres due to allocations to Wild River, Research Natural, Botanical, Supplemental Resource, and Designated Wildlife Habitat Management Areas.

Under Alternatives E and M, all of the inventoried Semi-primitive Non-motorized area would be maintained. An expanded capacity for Semi-primitive Non-motorized opportunities would result as motorized use on trail systems would be restricted in favor of non-motorized recreation opportunities.

Alternatives G, K and S assign varying portions of the South Kalmiopsis to roadless management objectives. Under the Alternative K, 1,500 acres of the South Kalmiopsis would be assigned to Backcountry Recreation. The assignment would include the lands within the viewshed adjacent to the Scenic section of Illinois River. The essentially undeveloped character of the area would be retained on an additional 11,500 acres due to allocations to RNA, Botanical, Supplemental Resource, and Designated Wildlife Habitat Management Areas.

The proximity of harvest activities and related road construction to recreationists in much of the rest of the area would result in the reduction of Semi-primitive opportunities that would be the same as those identified for the A, B, C, and D alternatives, and more so with Alternative NC. The shift in the opportunity spectrum would occur within the first two decades of the planning period.

Under Alternative G, 61,000 acres would be allocated to roadless management. Under this alternative, Semi-primitive Non-motorized opportunities would be maintained at inventoried levels. The allocation would include the viewshed adjacent to the Scenic section of the Illinois River. Additional acres would retain the essentially undeveloped character due to allocations similar to those cited for Alternative K.

Under Alternative S, approximately 54,200 acres would be allocated to Backcountry Recreation Management. Under this alternative semi-primitive Non-motorized opportunities would be maintained at inventoried levels. The allocation would include the viewshed adjacent to the Scenic section of the Illinois River. Additional acres would retain the essentially undeveloped character due to allocations similar to those cited in Alternative G above.

Economic and Social

There are 28,312 acres of land identified as tentatively suitable for the production of timber in this unroaded area. The general effects on annual allowable sale quantity (ASQ) and long-term sustained yield (LTSY) of allocating these acres to uses that would include timber production are the same as those described in Chapter IV of the FEIS.

The estimated potential ASQ from the inventoried 104,620 acres of the South Kalmiopsis Roadless Area is 1.56 MMCF. The estimated LTSY would be 2.83 MMCF. Following are the estimates of the contribution to timber production (in MMCF) from this area under each alternative.

Alternative	ASQ	LTSY
NC and A-Dep	1 53	2 75
A, C, and D	1 43	2 60
B	1.73	3 13
D1	1 56	2 82
E and M	00	00
G	.65	1 18
K	1 37	2 48
S	59	1 07

For projecting effects, the alternatives are grouped: (1) Alternatives E and M leave the area in an unroaded status; (2) Alternatives G and S leaves over half the area undeveloped, (3) Alternative K develops much of the area; and (4) Alternatives NC, A, B, C, and D develop most of the area.

	Alternatives			
Effects (Changes Compared to Alternative A)	E and M (Unroaded)	G and S	K	NC, A, B, C, and D (Roaded)
Direct Effects				
Timber and Road Expenditures	None	Largely Reduced	Minor Change	No Change
Indirect Effects				
Jobs	-130	-76	-6	0
Annual Income (MM $)	-3 00	-1 76	-0 15	0
Annual Payments to Counties (MM $)	-0 65	-0 42	-0 03	0
Cumulative Effects				
Attitudes of Communities in the Local Area				
Timber Related	-	-	0	0
Primitive Recreation	+	+	0	0
Fisheries	+	+	+	0
Wildlife Related				
Hunting	-	0	0	0
Old-Growth	+	+	0	0
Mining	-	-	0	0

The major direct economic effect is government expenditure for the timber and associated road construction program. Alternatives E, G, M and S have large reductions in the timber and road expenditures Alternatives NC, B, and D1 have an increase in expenditures, while Alternative K has a slight

decrease Alternative A provides the reference from which to gage other alternatives; Alternatives C and D are essentially the same.

The indirect effects are associated with jobs, income, and payments to counties Assuming no substitution of reduced timber harvest within the area of influence, Alternatives E and M have the largest reduction while Alternatives G and S have mid-level reductions. Alternatives NC, B, and D have the higher levels of employment, income, and payments to counties than Alternative A, Alternative B being particularly greater during this planning period.

The cumulative social effects of attitudes of people can be summarized by examining the different interests of the adjacent communities. Previous documentation is found in Chapters III and IV of the FEIS The positive sign indicates a feeling by special interest groups of the Forest being responsive while a negative indicates a social feeling of the Forest not being responsive to particular interests as listed For example, in Alternative E people interested in old growth habitat are predicted to feel positive about forest management while timber interests are predicted to feel the forest is not responsive to their interests. Such gains and losses may create additional conflict.

MITIGATION

No additional mitigation measures have been identified beyond those already listed for each alternative in the DEIS.

POTENTIAL CONFLICTS WITH OTHER JURISDICTIONS

No conflicts are anticipated.

APPENDIX D

STANDARDS AND GUIDELINES

THAT DIFFER FROM THE FOREST PLAN



APPENDIX D

STANDARDS AND GUIDELINES

THAT DIFFER FROM THE FOREST PLAN

APPENDIX D

STANDARDS AND GUIDELINES THAT DIFFER FROM THE FOREST PLAN

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INTRODUCTION

Standards and Guidelines state the bounds or constraints within which all practices will be carried out in achieving the resource objectives of the alternatives. The management of the Forest is subject to all applicable laws and regulations. Standards and Guidelines are intended to help the manager achieve the goals and objectives, while staying within constraints prescribed by law. Some of the management activities on the Forest could have adverse effects on the environment; the Standards and Guidelines provide mitigating measures for these activities.

Two categories of Standards and Guidelines are applied to management of the Forest: (1) Forest-wide Standards and Guidelines applying to all Management Areas and (2) Standards and Guidelines specific to individual Management Areas The allocations to the Management Areas vary widely and do not follow those shown in the Forest Plan for other than the Preferred Alternative; however, the direction for the Management Areas differs little between alternatives. The Standards and Guidelines for the Preferred Alternative are found in Chapter IV of the Forest Plan. Most of the Standards and Guidelines in the Forest Plan are common to all alternatives and are not repeated here; the reader is referred to the Forest Plan document. The purpose of this Appendix (D) is to list those Standards and Guidelines for alternatives which are different from those found in the Forest Plan.

STANDARDS AND GUIDELINES THAT DIFFER FROM THOSE IN THE FOREST PLAN

The Forest-wide Standards and Guidelines and the Management-Area-specific Standards and Guidelines in Chapter IV of the Forest Plan are applicable to all alternatives with the exceptions noted below.

ALTERNATIVE NC (NO CHANGE)

The No Change Alternative would not adopt the Standards and Guidelines of the Forest Plan. The Standards and Guidelines for this alternative were established in the existing documents listed below. This direction has not been revised to comply with the National Forest Management Act (NFMA):

Powers Ranger District Multiple Use Plan, Siskiyou National Forest, April 1968

Illinois Valley Ranger District Multiple Use Plan, Siskiyou National Forest, April 1968

Land Use Plan for Rogue Planning Unit, Final Environmental Statement, Siskiyou National Forest, February 1975

Land Use Plan for the Mt. Butler-Dry Creek Planning Unit, Final Environmental Statement, Siskiyou National Forest, May 1976

Chetco-Grayback Land Management Plan, Final Environmental Statement, Siskiyou National Forest, December 1979

Rogue-Illinois Land Management Plan, Final Environmental Statement, Siskiyou National Forest, December 1979

Illinois Wild and Scenic River Management Plan, Siskiyou National Forest, October 1985

Rogue River Plan, Siskiyou National Forest, September 1969

ALTERNATIVE A (NO ACTION)

This alternative is based on the same direction and documents as the No Change Alternative except it also meets the direction of NFMA; specifically it incorporates standards to meet the Management Requirements and incorporates direction from the Regional Guide for the Pacific Northwest Region (1984) as amended by the Final Supplement to the EIS for Spotted Owl Guidelines (1988), as does the Forest Plan.

All riparian areas allocated to Management Area 11 would be managed under Riparian Prescription B.

ALTERNATIVE A-DEPARTURE

Same as Alternative A except that the nondeclining flow direction would not apply.

ALTERNATIVE B (RPA)

Snag levels would maintain 20 percent of woodpecker habitat capability.

The nondeclining flow direction would not apply.

Both Riparian Prescription B and C would be used for riparian areas allocated to Management Area 11, but the Planning Basins where they would be applied are different than the Forest Plan

ALTERNATIVE C

Snag levels would maintain 20 percent of woodpecker habitat capability.

All riparian areas allocated to Management Area 11 would be managed under Riparian Prescription B

ALTERNATIVE D

Snag levels would maintain 20 percent of woodpecker habitat capability.

Both Riparian Prescription B and C would be used for riparian areas allocated to Management Area 11, but the Planning Basins where they would be applied are different than the Forest Plan.

ALTERNATIVE D1

Snag levels would maintain 20 percent of woodpecker habitat capability.

Both Riparian Prescription B and C would be used for riparian areas allocated to Management Area 11, but the Planning Basins where they would be applied are different than the Forest Plan.

Minimum rotation age for General Forest areas managed for timber production would be two decades shorter than 95 percent of Culmination of Mean Annual Increment (CMAI).

ALTERNATIVE E

No timber harvest would be programmed from riparian areas.

ALTERNATIVE G

Riparian Prescription C would be used for all riparian areas allocated to Mangagement Area 11.

ALTERNATIVE K

Both Riparian Prescription B and C would be used for riparian areas allocated to Management Area 11, but the Planning Basins where they would be applied are different than the Forest Plan.

ALTERNATIVE M

Minimum rotation age for all areas managed for timber production would be 250 years.

No timber harvest would be programmed from riparian areas.

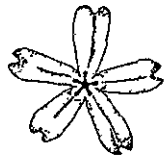
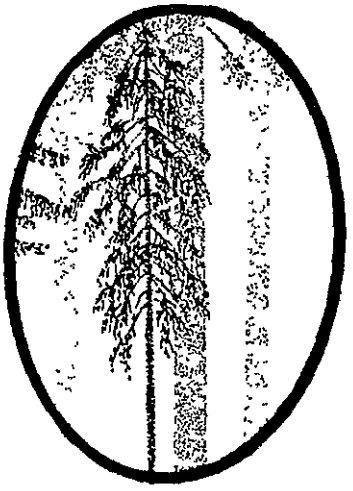
ALTERNATIVE S

The Forest Plan is based on Alternative S; all Standards and Guidelines in the Forest Plan apply.

APPENDIX F

BOTANICAL AND RESEARCH NATURAL AREAS



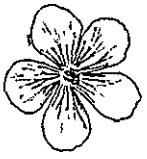


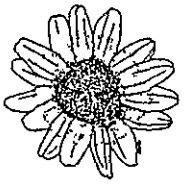

APPENDIX F

BOTANICAL
AND
RESEARCH NATURAL AREAS








APPENDIX F

BOTANICAL AND RESEARCH NATURAL AREAS

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INTRODUCTION

Appendix F provides the description and management options for each existing or potential Botanical area or Research Natural Area (RNA). In this appendix each area is treated separately; in the Final Environmental Impact Statement (FEIS) Botanical areas and RNA's are treated as an aggregate land assignment per alternative. In the body of the FEIS, the issues, analyses, and alternative ways of managing these areas are evaluated as part of a resource management scheme for the Forest as a whole

All proposed areas have sufficient values to warrant their consideration for establishment as RNA's or Botanical areas. However, not all areas have been recommended in the preferred alternative. Although complete inventories are not available for any of the sites, extensive inventory data is available for Bigelow Lakes, Cedar Log Flat, Days Gulch, Eight Dollar Mountain, Green Knob, Hoover Gulch, Iron Mountain, Lemmingsworth Gulch, and Oregon Mountain.

Inventory data are compiled from a variety of sources such as, local botanists (Veva Stansell, H. Robert Mansfield, Mary Paetzel, and others), the Oregon Rare and Endangered Species Task Force, the Oregon Natural Heritage Data Base, herbarium records, and field surveys by the Forest Service and other institutions Forest personnel who provided data were: Tom Atzet and David Wheeler (Forest Service Area Ecologists), Dennis Vroman (Silvicultural Technician), biologists, seasonal botanists, and a number of District employees. Except where otherwise noted in the text, this appendix was prepared by Lee Webb, Forest Wildlife Biologist

Each proposed area was first outlined on a U.S. Geological Survey (USGS) topographic map. Boundary lines were then transferred to the computerized Land Inventory Mapping System (LIMS), which was used to calculate acreage figures. The boundaries of any site proposed for RNA or Botanical area status would need to be accurately located on the ground. Ground truthing may show that actual boundary lines and acreage figures differ slightly from those listed in this report.

SENSITIVE PLANT BOTANICAL AREAS

The unique geologic and climatic history of southwest Oregon and northwest California is responsible for the occurrence of a number of rare plants not found elsewhere. The ranges of some of these plants are almost exclusively within the Forest boundaries. Two categories of rare plants receive special consideration from Siskiyou National Forest land managers:

1. Endangered or Threatened species which are Federally listed or proposed must be protected from adverse impact (presently, none are known on the Forest).

2. Sensitive species are those species identified by a Regional Forester for which viability is a concern, as evidenced by (a) significant current or predicted downward trends in population numbers or density or (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution. As of 1988, the Forest harbored 64 sensitive species, and an additional 30 species may occur here. Ten other species are potential candidates for the Region Six Regional Forester's list of sensitive plants (nine known to occur on the Siskiyou).

In addition to sensitive species, Forest personnel collect data on rare plant species which need to be monitored or inventoried further before their status can be accurately determined This is done as an informal cooperative effort with the Oregon Natural Heritage Data Base, Oregon Native Plant Society, and the California Native Plant Society.

Common and scientific names of all uncommon plants are listed in the current *Status List of Endangered, Threatened, Sensitive, and Rare Plants on the Siskiyou National Forest.* In addition, the Forest maintains a field *Guide to Sensitive Plants of the Siskiyou National Forest* (Webb 1988); Siskiyou employees and

volunteers use the guide as an aid to field identification These documents are available for public review at the Siskiyou National Forest headquarters in Grants Pass, or at the District offices

The Siskiyou has one of the most diverse floras of any National Forest. Concentration areas of sensitive plants occur frequently on the Siskiyou; many are outside existing wilderness and botanical areas Sensitive plants are clustered at a minimum of 22 sites on the Forest: 3 existing and 19 potential Botanical areas (Figure F-1). These concentration sites are individually described in the **Narratives** section of this appendix Concentration sites for sensitive plants encompass 35,596 acres (Table F-1).

The Siskiyou's sensitive plants occupy a variety of habitat types, but many are restricted to serpentine/peridotite soils. These soils are most prevalent in the southeast corner of the Forest, from Eight Dollar Mountain southwest to Oregon and Packsaddle Mountains, and including the southern third of the Kalmiopsis Wilderness. Serpentine/peridotite soils are also present in scattered locations such as Red Flat, Iron Mountain, Chrome Ridge, and Onion Mountain (Figure F-2).

Although the same general soil types occur at various geographic locations, the plant communities supported on individual sites are often quite different from one another because of local variations in topography and climate. Climatic variations are probably responsible for the localized and endemic flora of the Illinois Valley (Selma to Takilma). For instance, annual precipitation varies considerably from place to place on the Forest. The eastern edge of the Kalmiopsis Wilderness receives approximately 140 inches of rain yearly; Eight Dollar Mountain receives approximately 60 inches (Figure F-3).

Stereo aerial photographs (1979; 1:24,000 color) of the serpentine/peridotite areas of the Forest and adjacent lands were examined for the presence of large bogs (2 acres or larger). Bog habitat appears to reach maximum development on Eight Dollar Mountain, in terms of size and concentration. A few bogs smaller than those on Eight Dollar Mountain were located on aerial photographs of Cedar Log Creek, Josephine Creek, Tennessee Mountain, Woodcock Mountain, Oregon Mountain, and Lemmingsworth Gulch. Although many small *Darlingtonia* bogs are scattered throughout the serpentine/peridotite areas of the Forest, no bogs in the Kalmiopsis Wilderness were large enough to be visible on the aerial photographs.

Bog habitat in the Siskiyou Mountains contains a significant share of the area's rare plant species. However, drier habitats (both serpentine/peridotite and non-serpentine/peridotite substrates) also support a variety of rare plants. Specific sites on the Forest have unique values not associated with habitat available in the Kalmiopsis Wilderness For example, the Iron Mountain area contains a large number of plant species on the periphery of their ecological ranges; the Bigelow Lakes area, a non-serpentine site, contains a wide variety of rare plant species not found elsewhere on the Forest.

Rare plants are not unique to sensitive plant concentration sites; they occur in many parts of the Forest An extensive table was developed to display the known locations of the Forest's rare plants (Table F-2).

OLD GROWTH BOTANICAL AREAS

Five unique old growth sites on the Forest were identified as potential Botanical areas by Forest employees and others (Figure F-1). One site contains the northernmost stand of redwood trees. Another encompasses a group of outstanding redwood groves, and a third contains the world's largest Port-Orford-cedar. The other two sites are outstanding examples of old-growth Douglas-fir stands; the uniqueness of these areas lies in their individual large-diameter trees Most of sites have considerable recreation potential as outdoor education sites. The five old-growth sites encompass 1,321 acres (Table F-1). Individual sites are described in the **Narratives** section of this appendix.

RESEARCH NATURAL AREAS

The Siskiyou Mountains represent a complex pattern of vegetation across a base of varied geological types. White fir is the dominant climax species in much of the area. It is associated with Douglas-fir, ponderosa pine, sugar pine, and Shasta red fir, which are commonly seral to white fir but, together, make up the mixed conifer formation. Tanoak is also a major climax dominant, particularly on the coastal Districts. It is associated with redwood, Douglas-fir, madrone and oaks forming the mixed evergreen formation (Franklin and Dyrness 1973).

The Research Natural Area system has been set up to preserve examples of all significant natural ecosystems, such as those just discussed, for comparison with those influenced by man. RNA's are reserved for scientific and educational use. Many plant communities are not yet represented by RNA's The Siskiyou presently has three RNA's; four additional areas on the Siskiyou have been proposed by Forest Service researchers and others for inclusion into the RNA system (Dyrness and others 1975).

The Port Orford Cedar and Coquille River Falls Research Natural Areas, both on the Powers Ranger District, were established in 1937 and 1945 respectively. The Wheeler Creek Research Natural Area on the Chetco Ranger District was established in 1972. The four proposed sites on the Siskiyou are Hoover Gulch, Lemmingsworth Gulch, Cedar Log Flat, and Craggy Peak. The Cedar Log Flat and Lemmingsworth Gulch areas also contain a number of sensitive plant species. Figure F-1 displays the locations of existing and proposed RNA's. The individual sites are described in the **Narratives** section of this appendix.

In May 1981, the Forest Supervisors of the Rogue River, Siskiyou, and Umpqua National Forests requested that Forest Service ecologists make a field search to locate "cells" needed for the Research Natural Area Program in the Pacific Northwest. The four areas listed as proposed RNA's in the Siskiyou Forest Plan were part of the analysis. In addition, the following areas were reviewed in the field, but were not selected.

KINNEY CREEK

The Kinney Creek area on the Rogue River National Forest was considered for its stand of canyon live oak (*Quercus chrysolepis*), indicative of shallow soils and hot sites. The stand was only several acres and without access. A river crossing was necessary to access the stand. Douglas-fir, incense-cedar and sugar pine were all represented and some of the stand was not climax to the oak.

TAYLOR CREEK

Taylor Creek, on the Galice Ranger District, was also considered for filling the canyon live oak cell need, but as with the Kinney Creek Site, both size and access were problems The stand is located just inside the Siskiyou National Forest boundary near the Taylor Creek road. The proposed Hoover Gulch RNA was a better option than either Kinney Creek or Taylor Creek.

ELKHORN PRAIRIE

Elkhorn Prairie is on the border of the Rogue River and Siskiyou National Forests (Applegate and Illinois Valley Ranger Districts). Grayback Mountain is the nearest well known landmark. Cells considered were herblands (grass balds), large, high elevation, cold springs, green fescue meadows and the red fir/white fir interface. It was considered as part of a larger area including cells on the Rogue River National Forest, but was not recommended because of the high degree of disturbance and domestic animal use.

WINDY VALLEY

Windy Valley, located on the northern quarter of the Chetco District, was considered for a representative of a typical marsh and coastal stream with riparian hardwoods The flat valley is somewhat atypical of

coastal streams and the area is too disturbed. Additionally the area does not meet the criteria for a typical coastal marsh

VALUES OF OTHER RESOURCES

TIMBER

Most sensitive plant concentration sites contain commercial timber land Some areas, such as Bear Camp, have high timber values; Eight Dollar Mountain and other areas have low or non-existent timber values. Potential timber volumes for sensitive plant concentration areas were calculated from empirical yield tables developed for the Forest Plan Average timber volumes represent a managed yield, i.e., the volume each acre would produce during a normal (managed) rotation. Potential timber volume (long-term sustained yield (LTSY)) for all proposed Botanical areas is 9.464 million board feet (MMBF) annually during a 100-year rotation; proposed RNA's represent .812 MMBF (Table F-3(a)) Potential timber volume (LTSY) in Alternative S (preferred) for all recommended Botanical areas is 2 526 million board feet (MMBF) annually during a 100-year rotation, recommended RNA's represent 812 MMBF (Table F-3(b)).

MINERALS

Many sensitive plant concentration sites contain locatable mineral deposits; inactive chromium and gold mines are located in or near a few of the areas (Table F-4). Ultramafic rock is common to 14 of the proposed sensitive plant Botanical areas and 2 of the Proposed RNA's (Figure F-2). Serpentine/peridotite soils derived from this rock type are abnormally high in magnesium and iron, and relatively low in silica, alumina, sodium, and calcium. Serpentine/peridotite soils contain nickel in concentrations varying from 0.1 to 2 0 percent. These soils are commonly referred to as nickel laterites (see Table F-4) Chromium, cobalt, and iron are associated with nickel laterites; except for iron, these metals are considered "strategic," especially chromium and cobalt. Len Ramp, former resident Geologist in Grants Pass for the Oregon Department of Geology and Mineral Industries, believes it may someday become economically feasible to mine nickel lateritic soils which contain nickel at concentrations of one-half of one percent or more (00.5+%)

Other than the Nickel Mountain deposit near Riddle, Oregon, Ramp (1978·63) states:

> Two other main areas of future nickel production potential lie in Oregon. One is in the Illinois Valley, in which a centrally located plant could draw from the larger, better grade, and more accessible deposits in the Josephine peridotite sheet; the other is in the Red Flat area southeast of Gold Beach. Several factors will affect this possible expansion of Oregon's nickel industry; future supply of and demand for nickel, chromium, and cobalt; national and local political policy regarding domestic production of these strategic minerals; the ability to develop efficient, inexpensive, and nonpolluting metallurgical processes, and the ability to develop satisfactory and inexpensive reclamation procedures.

MANAGEMENT OF PLANT RESOURCES

Forest managers have been directed by the Endangered Species Act of 1973 and the Regional Forester's Policy on Sensitive Plants (Forest Service Manual 2670), to take all necessary actions to assure that management activities do not jeopardize the continued existence of endangered, threatened, or sensitive species. Additionally, compliance with Public Law 93-452 (Sikes Act) requires the maintenance and enhancement of the habitats of endangered, threatened, and sensitive plant (and animal) species.

Publication of this appendix helps insure greater recognition and better management of the Siskiyou's rare plant resources, regardless of land assignments made in the various Forest Plan alternatives. This appendix serves as a "yellow flag" to our field-going personnel--that botanical values in these areas are especially important and need to be protected.

SENSITIVE SPECIES LISTS

Common and scientific names of all rare plants are listed in the current *Status List of Endangered, Threatened, Sensitive and Rare Plants on the Siskiyou National Forest* The various plant lists are categorized in Table F-5. The Siskiyou cooperates with two private organizations which maintain lists of sensitive and rare plants the Oregon Natural Heritage Data Base (ONHDB 1987) and the California Native Plant Society (Smith and York 1984) A field guide to the Siskiyou's sensitive plants is maintained for use by Forest Service volunteers and employees (Webb 1988).

INDICATOR SPECIES/MONITORING

Four indicator habitats for sensitive plants are designated in the Forest Plan: (a) bog and wet/moist places, serpentine subgroup; (b) bog and wet/moist places, non-serpentine sub-group; (c) rocky places (serpentine/non-serpentine), dry and moist, and, (d) open slopes, fields, meadows, and woods (serpentine/non-serpentine) (see Table F-6 for a complete list of species).

Selected locations will be monitored during the life of the plan to determine population trends of sensitive plant species. Where possible, sites selected for monitoring will be those with the most potential for resource conflicts· (a) timber harvesting; (b) road building, (c) mining; (d) recreation, and, (e) areas where unauthorized digging of sensitive plants may occur Concentration areas of sensitive plants will be sampled, and management activities will be reviewed as a gauge on the effectiveness of Standards and Guidelines If management reviews show that sensitive plants are being detrimentally (significantly) affected by ground-disturbing activities, this will trigger a review of Standards and Guidelines. As part of the Forest Plan, a detailed Monitoring Plan has been developed (Forest Plan, Appendix D).

Species Management Guides are prepared for sensitive species adversely affected by standard management practices. Such guides prescribe management direction, monitoring, and protection for a species based on the species needs over its entire range rather than on a local population or individual site.

FOREST PLANNING PROCEDURES

Treatment of botanical resources in the Forest Planning process is discussed in depth in the FEIS. For more information, see the VEGETATION and SENSITIVE PLANT sections of Chapter II (Alternatives Including the Proposed Action), Chapter III (Affected Environment), and Chapter IV (Environmental Consequences).

A subjective ranking system was used to analyze all potential RNA and Botanical areas (Table F-7). This scheme guided the land assignment decisions displayed in the Siskiyou National Forest FEIS (area allocations are listed by alternative in Table F-8 of this appendix). Important concentration areas of sensitive or rare plants are logical candidates for designation. Certain areas on the Forest, such as Eight Dollar Mountain, are more unique than others. The **Summaries** section of this appendix presents a short synopsis of each proposed area, ranked in order of priority. Rankings are a combination of data presented in Table F-7 and the expertise of the Forest Wildlife Biologist/Botanist. Allocation arrays by alternative for RNA and Botanical areas are discussed in detail in Chapter II of the FEIS (under Sensitive Plants).

STANDARDS AND GUIDELINES

There are two ways of employing standards and guidelines to manage plant resources: (1) Forest-wide; or, (2) by specific Management Area. Chapter IV of the Land and Resource Management Plan (Forest Plan) (not the FEIS) is summarized below. No Forest Plan alternative is expected to adversely affect habitats of sensitive plants. Most species are not found in areas subject to land-disturbing activities; but in any case, available data on sensitive plants locations are reviewed prior to development of planned activities.

Forest-wide. Forest-wide standards and guidelines will govern timber harvesting, road building, mining activities, and livestock grazing in candidate areas not selected in a given alternative This is also true for non-candidate (general forest) areas where sensitive/rare plants are more widely dispersed.

Biological evaluations are prepared for each project authorized, funded, or conducted on National Forest land to determine the possible effects the proposed activity will have on sensitive species (FSM 2672 4, including R-6 Supplement 41). It is often helpful to consult with professional Botanists or local knowledgeable and interested botanical authorities Habitat for sensitive plants is managed to ensure that species do not become threatened or endangered because of management activities

Sensitive plant concentration sites not converted to Botanical areas as part of the Forest Plan Preferred Alternative will be outlined on management overlays of the Total Resource Information (TRI) system and labeled as "Protect Rare Plants." Whenever ground-disturbing activities are planned at these sites, intensive field surveys for sensitive plant species will be done as part of the Environmental Analysis (EA) process.

Management Areas. Direct land assignments are made for plant resources under Management Area 3 (Research Natural Areas) and Management Area 4 (Botanical). Descriptions of these allocation areas (in Chapter IV of the Forest Plan) contain detailed management outlines. Many topics are covered, including recreation, visuals, wildlife, range, timber, water, minerals, lands, facilities, and fire management Natural physical and biological processes will prevail with minimal human intervention.

An Establishment Record must be written for each RNA recommended in the preferred alternative of the Forest Plan (procedures described in Forest Service Manual 4063). The Forest will continue to evaluate other areas for RNA status, under the guidance of Area Ecologists and the Interagency RNA Committee. Botanical areas are classified under 36 CFR 294.1 and managed to protect areas of the Forest with important botanical resources (Forest Service Manual 2370 Special Recreation Designations, Areas Designated Administratively). Management plans may be developed for individual Botanical areas; plans may supplement direction provided in the description of the Management Area.

MITIGATION

Standards and Guidelines (described in Chapter IV of the Forest Plan) have been developed to protect, maintain, and enhance sensitive plant habitat Standards and guidelines, along with direct land assignments, act as mitigation measures to insure the perpetuation of sensitive plant resources on the Siskiyou National Forest.

Special precautions are taken in layout of timber sales and location of roads to make sure that the needs of sensitive species are met. Care is taken to avoid spraying when herbicide use is allowed in areas where sensitive species are known to exist. Site plans for private mining operations on Forest Service administered land are analyzed and approved by the Forest Service before ground-disturbing activities can begin; sensitive plant needs are part of the analysis. In some cases, individual management plans will be devised for specific species, such as *Bensoniella oregana*, a plant which could be significantly impacted by timber management activities All of these methods act as mitigation measures to insure that the Siskiyou's diversity of existing plant species is not abridged.

Some of the management activities relating to minerals and mining on the Forest would cause significant environmental damage if done without means of mitigating potential adverse effects. The Forest Service has the opportunity to work with individual miners and companies to design, prescribe, and recommend ways to prevent resource damage. Coordination usually occurs during the development of a plan of operations (required by law) prior to the start of any mining project. If adverse environmental concerns cannot be adequately resolved within the plan of operations, the the Forest Service must, by law (National

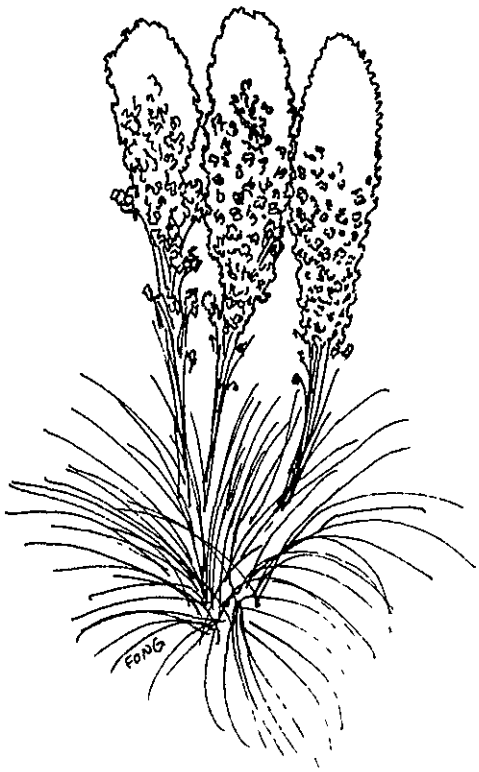
Environmental Policy Act of 1969 (NEPA)) be prepared to fully analyze environmental effects and their potential mitigation

Most mining mitigation measures available to the Forest Service relate to, (a) method, type, and scope of a mining operation, (b) location, design, type, and timing of access; and, (c) site specific requirements relating to reclamation, erosion, water and air quality, fish, wildlife, cultural resources, timber, fire, recreation, and human conflicts. Of course, the ultimate mitigation is to withdraw an area from mineral entry Recommendations for withdrawal from mineral entry will be limited to RNA proposals and to Botanical areas where mitigation will not adequately protect surface resource values Mitigation measures will be identified for those Botanical areas not withdrawn.

Given the abundant acreage of public land in southwestern Oregon and northwestern California, viable populations of sensitive plant species will be maintained on the Siskiyou and connecting National Forests/ Bureau of Land Management (BLM) Districts If in the future, new data on plant habitat requirements show a need for increased allocations of certain types of habitat, the Forest will have the ability to make those allocations for at least the next two decades, and possibly longer.

RESEARCH NEEDS

Detailed habitat requirements for many rare or sensitive plant species are unknown This makes it difficult to predict the effects of management activities on habitat The Species Management Guides mentioned above are helping fill in some of our knowledge gaps. Forest Botanists and Biologists also have long range plans to survey all of the Forest's potential sensitive plant habitat (including areas suggested by the public, in their comments on the Draft EIS and Plan). The capital investment tables in Appendix B of the Forest Plan provide information on future plant inventories, habitat improvements, management plans, seed banking, and other planned activities Specific research needs are listed in the beginning of Chapter II of the Forest Plan



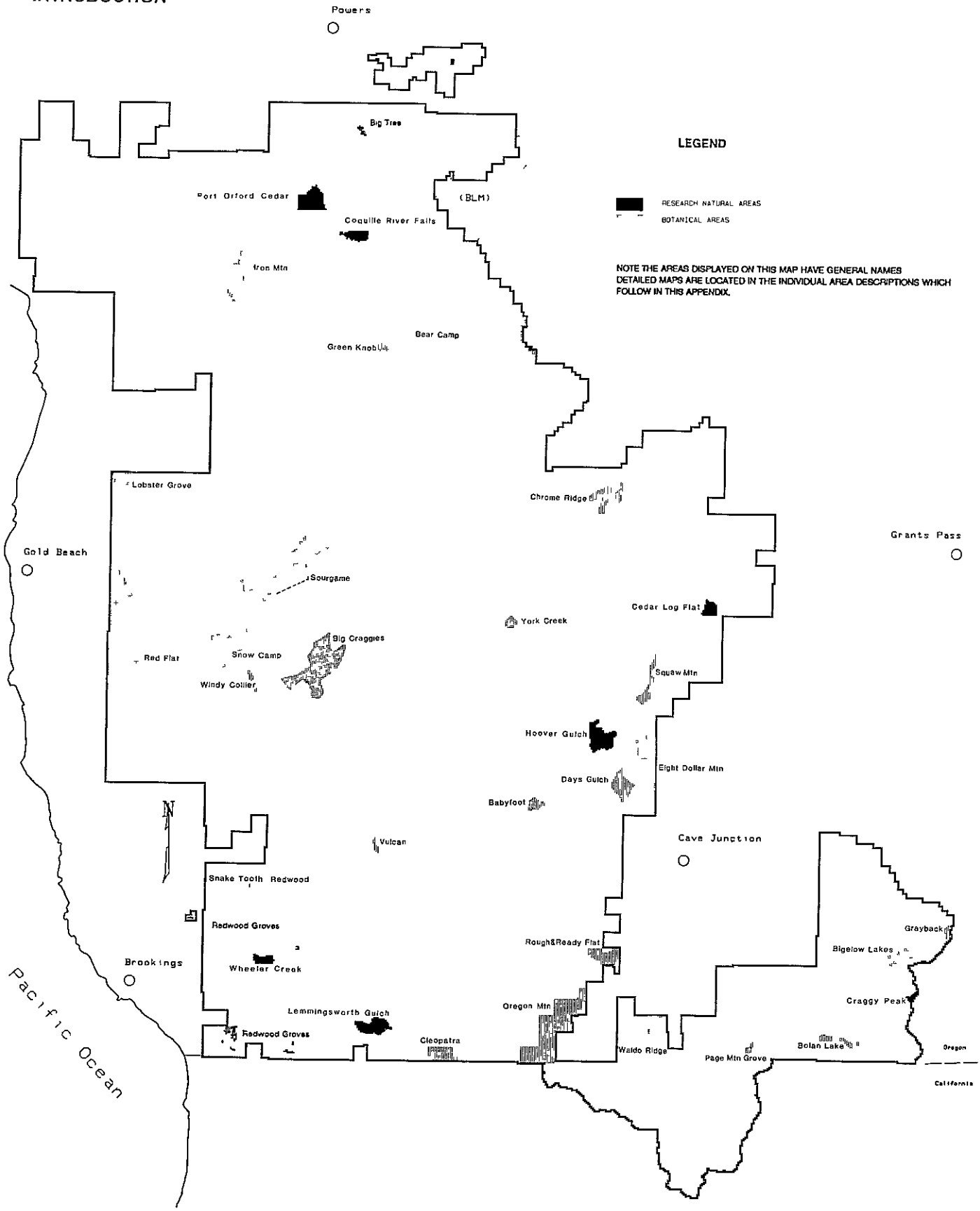


Figure F-1 Existing and Recommended Botanical and Research Natural Areas

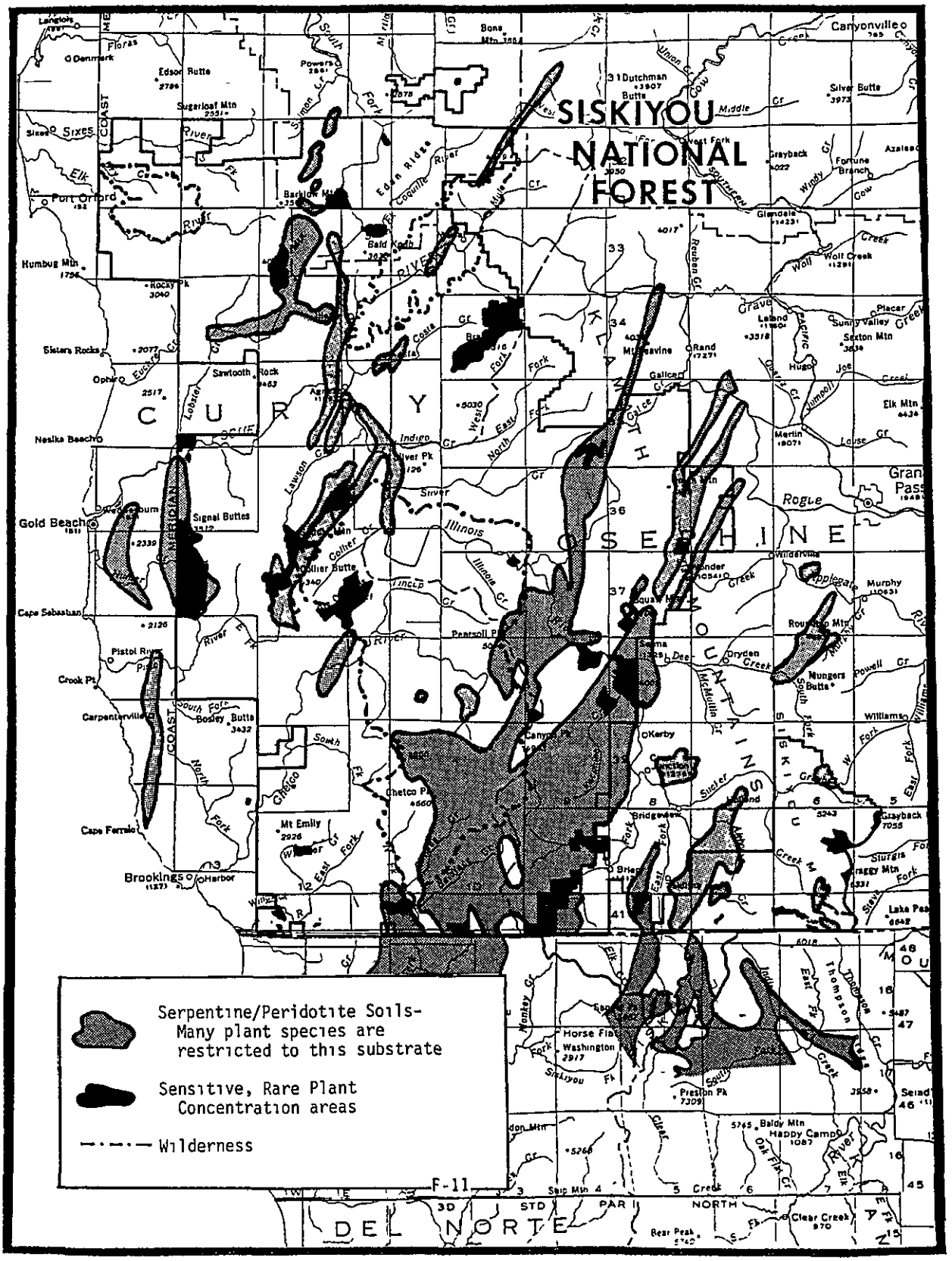


Figure F-2 Areas of Plant Endemism

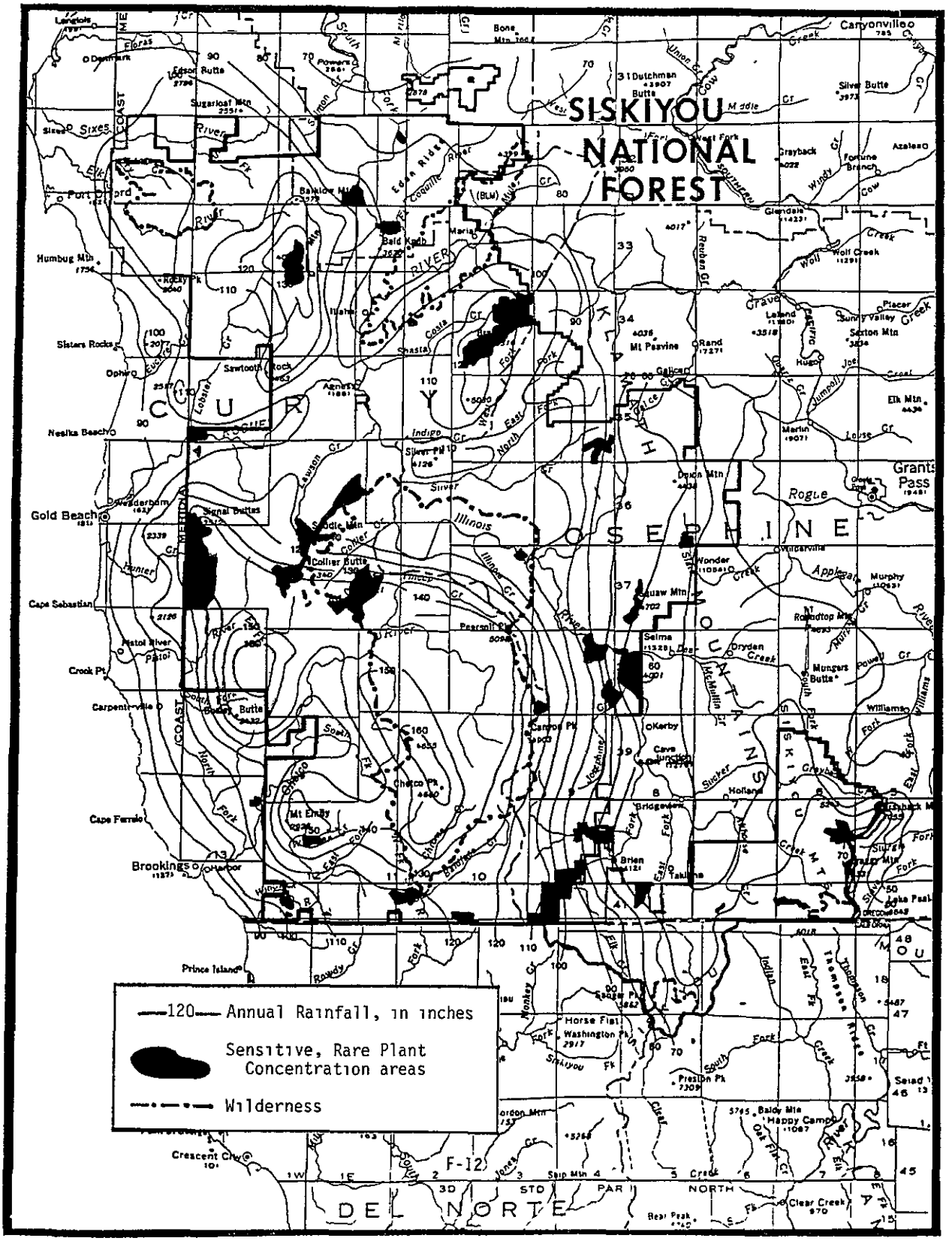


Figure F-3. Precipitation Map

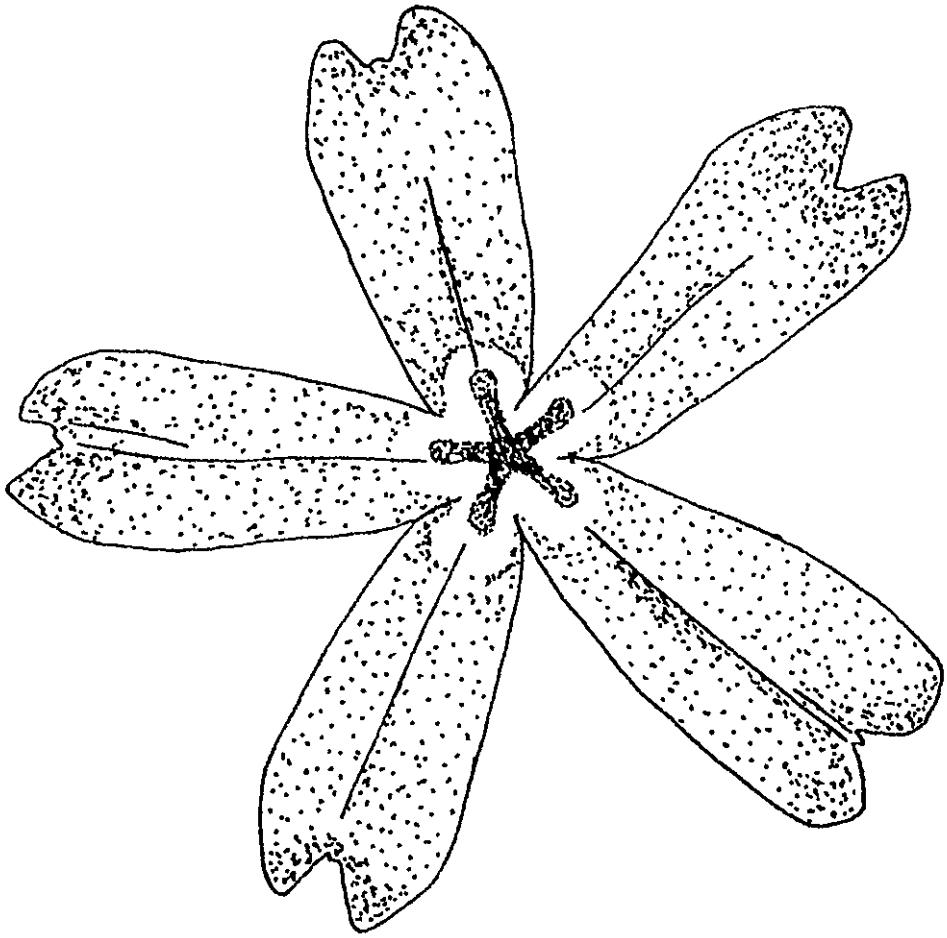


Table F-1 Existing and Proposed Botanical and Research Natural Areas (All Legal Locations are Willamette Meridian (W M) [T.--S.][R.--W.])

Name of Area and Ranger District 1/	Acres	General Legal Location			
		Township	Range	Section	
PROPOSED BOTANICAL AREAS (Sensitive Plants)					
Bear Camp - GA	5,927	34	10		
Bigelow Lake - IV	971	40	6	14	
Bolan Lake - IV	466	41	6	7	NW1/4
Chrome Ridge - GA	1,014	35	9	25,26,35	
Cleopatra - IV	800	41	10	17,18	
Days Gulch - IV	1,252	38	9	25	SE1/4
Eight Dollar Mountain - IV	2,938	38	8		
Grayback Mountain - IV	197	40	5	5,8	
Green Knob - GB	153	34	11	22,23	
Iron Mountain - PO	1,866	33	12	33	
Oregon Mountain - IV, CH	4,401	41	9,10		
Red Flat - CH 2/	7,172	37	13	30	
Rough and Ready Flat - IV	1,699	40	9	13	
Snow Camp - CH	1,475	37	12 1/2	25	
Sourgame - GB 3/	3,640	17	12	4,5,8	
		36	12	13,23,24,26,27,34	
Squaw Mountain - GA, IV	638	37	8	20	
Vulcan - CH	133	39	11	15	
Waldo Ridge - IV	707	41	8	4	
Windy Collier - CH	147	37	12	32	
Subtotal	33,932				
PROPOSED BOTANICAL AREAS (Old Growth)					
Big Tree - PO	127	32	11	9,8	
Lobster Grove - GB	534	36	13	31	
Page Mountain Grove - IV	128	41	7	17	NE
Redwood Groves - CH	511	41	12	3,7,8,11,14,17	
	40	12	14,15,16		
Snaketooth Redwood - CH	21	39	12	28	NW
Subtotal	1,321				
EXISTING BOTANICAL AREAS					
Babyfoot Lake - IV	352	39	9	31,32	
Big Craggies - CH, GB	3,803	37	12	25+	
York Creek - IV	320	37	10	1	NW
Subtotal	4,475				
Total (Botanical)	41,392				

Table F-1 Table F-1. Existing and Proposed Botanical and Research Natural Areas (All Legal Locations are Willamette Meridian (W M.) [T.--S.][R.--W.]) (Continued)

Name of Area and Ranger District 1/	Acres	General Legal Location		
		Township	Range	Section
PROPOSED RESEARCH NATURAL AREAS				
Cedar Log Flat - GA	441	36	8	36
Craggy Peak - IV	100	40	6	36
Hoover Gulch - IV	1,292	38	9	11,12
Lemmingsworth Gulch - CH	966	41	11	3,4
Subtotal	2,799			
EXISTING RESEARCH NATURAL AREAS				
Coquille River Falls - PO	501	33	11	17
Port Orford Cedar - PO	1,120	32	12	34,35
Wheeler Creek - CH	336	40	12	15,16
Subtotal	1,957			
Total (RNA)	4,756			

1/ Ranger Districts: CH = Chetco, GA = Galice, GB = Gold Beach, IV = Illinois Valley, PO = Powers
2/ Includes Hunter Creek Bog
3/ Includes Sourdough Camp and Game Lake

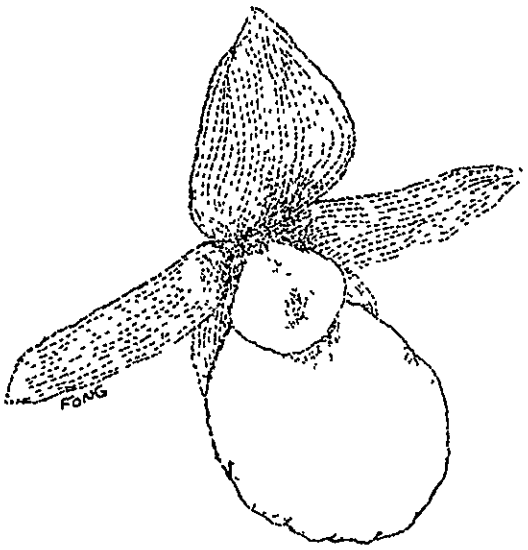


Table F-2. Occurrence List of Sensitive and Unusual Plants (Watch and Review Lists) on the Siskiyou National Forest

SENSITIVE PLANTS listed on first 3 pages; WATCH AND REVIEW LIST on last 3 pages.

Region 5 2/	Region 6 3/	Lists as of 1986 SENSITIVE PLANTS Scientific Name	Wilderness				Proposed RNA's				Exist Botan.	Proposed Botanical Areas																
			Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul	Babyfoot Lake	Big Craggies	York Creek	Bear Camp	Bigelow Lakes	Bolan Lake	Cleopatra	Chrome Ridge	Days Gulch	Eight Dollar Mtn.	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan	Waldo Ridge	Windy Collier	Other
-	S	Abronia umbellata ssp. breviflora 1/																														
-	S	Allium bolanderi		X	X														X	X		X		X								7
S	W	Arabis aculeolata		X				X		X			X				X	X		X	2				X	4	X		X		X		8
-	S	Arabis koehleri var. stipitata						X												X					6		X	X		X			8
S	S	Arabis modesta																															
S	-	Arabis serpentinicola				X																											
S	S	Arabis sp. nov./in ed. ("macdonaldiana")		?														2															
-	S	Arabis suffrutescens var. horizontalis																															1
S	S	Arctostaphylos hispidula								X													X	X		X							2
-	S	Asarum wagneri											X	X						X													2
-	S	Astragalus umbraticus																															1
4	S	Balsamorhiza sericea																	X	2				2									1
S	S	Bensoniella oregana																20									X	X				25	
-	S	Botrychium simplex												X																			
-	S	Brodiaea hendersonii var. leachiae					?																										2
-	S	Brodiaea ida-maia																															5
-	S	Brodiaea laxa		X																													1
-	S	Brodiaea terrestris																															
-	S	Calochortus howellii								X									X	X				X									4
-	S	Carex scabriuscula									X															X							2
S	-	Castilleja elata		X		X		X		8				X	X			X	X				X			X	X						4
-	S	Clintonia andrewsiana																															?
S	S	Cordylanthus maritimus ssp. palustris 1/																															
4	S	Cupressus bakeri (ssp. matthewsii, CA)																			X			X									1
4	S	Cypripedium californicum		4				X		8			X						X	3			X	2	X	X	X		X				10
4	S	Cypripedium fasciculatum		X																													3
1	S	Dentaria gemmata																					X			X							1
S	W	Dicentra formosa ssp. oregana		X				X		X				X					X	X			5		X								9
-	S	Dicentra pauciflora				X																											
S	-	Draba howellii ssp. carnosula																															
S	S	Draba howellii ssp. howellii																															1
-	S	Dudleya farinosa 1/																															
S	S	Epilobium oreganum																	X	X													1
-	S	Epilobium rigidum		X						X													X	2					X				3
S	S	Epilobium siskiyouense																															
-	S	Erigeron cascadensis																		X													
S	S	Erigeron cervinus		4							X									X				X									13
-	S	Erigeron petrophilus																															
4	S	Eriogonum diclinum												X																			1
S	R	Eriogonum hirtellum				X																											

Table F-2. (Con't)

Region 5 2/	Region 6 3/	SENSITIVE PLANTS Scientific Name	Wilderness						Proposed RNA's			Exist Botan	Proposed Botanical Areas																		
			Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul.	Babyfoot Lake	Big Craggies	York Creek	Bear Camp	Bigelow Lakes	Bolan Lake	Cleopatra	Chrome Ridge	Days Gulch	Eight Dollar Mtn.	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan	Waldo Ridge	Windy Collier	Other
-	S	Eriogonum incanum	*|	|	|	|	|*|	|	|	|*|	|	|*|	|X|	|	|	|#|	|	|	|	|#|	|	|	|	|	|#|	|	|	|*|	1|*
S	W	*Eriogonum pendulum*	*|	|	|	|	|*|X|	|	|X|*|	|	|	|*|	|	|	|	|#|	|X|	|	|	|#|X|X|	|X|X|#|	|	|	|	|*|	2|*
4	S	Eriogonum ternatum	*|	X|	|	|X|*|	|	|	|X|*|	|	|	|*|	|X|	|	|	|#|	|	|	|	|#|	|	|	|X|#|	|X|	|	|*|	3|*
4		Erythronium howellii	*|	|	|	|	|*|	|	|	|*|	|	|*|	|X|	|	|	|#|	|X|	|	|	|#|X|	|5|	|X|#|	|	|X|	|*|	1|*
-	S	Eschscholzia caespitosa	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|	|#|	|	|	|*|	1*
S	S	*Frasera umpquaensis*	*|	|	|	|	|*|	|	|	|	|*|	|*|2|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	3|*
-	S	Fritillaria gentneri	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|#|	|*
-	S	Fritillaria glauca	*|	X|	|	|X|*|X|	|	|	|*|X|X|	|*|X|	|	|X|	|#|X|X|	|	|	|#|	|	|X|	|	|#|	|X|	|	|#|	|	|X|	|*|	4|*
-	S	Gentiana bisetaea	*|	3|	|	|	|*|	|	|	|3|*|	|	|	|*|	|	|	|	|#|X|2|	|	|	|#|X|	|	|	|	|#|	|	|	|*|	3|*
-	S	Gentiana newberryi	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|	|#|	|	|	|*|	|*
3	S	Gentiana pleurisetosa (sp. nova)	*|	|	|	|	|*|	|	|	|	|*|	|	|*|	|X|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Haplopappus arborescens	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	1|*
-	S	Haplopappus whitneyi ssp. discoideus	*|	|	|	|	|*|	|	|	|	|*|	|*|	|X|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Hastingsia bracteosa	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|X|X|	|	|	|#|	|	|	|	|#|	|	|?|	|*|	2|*
-	S	Hieracium bolanderi	*|	2|	|	|	|*|X|	|	|X|*|	|	|	|*|	|	|	|	|#|	|	|	|	|X|#|	|	|	|	|#|	|X|	|	|*|	|*
-	S	Hydrocotyle verticillata	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
4	S	*Iliamna latibracteata*	*|	|	|	|	|*|	|	|	|	|*|	|*|	|X|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	1|*
-	S	Lasthenia macrantha ssp. prisca 1/	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
4	S	Lathyrus delnorticus	*|	X|	|	|X|*|	|	|	|*|	|	|*|	|	|	|	|#|	|X|	|	|	|#|	|X|	|	|X|#|	|	|	|*|	2|*
-	S	*Lewisia cotyledon ssp. purdyi*	*|	X|	|	|	|*|	|	|	|*|X|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	2|*
-	S	Lewisia leana	*|	|	|	|X|*|	|	|	|*|	|	|	|*|	|X|X|	|	|#|	|X|X|	|	|#|	|	|	|	|#|X|	|	|	|*|	4|*
S	S	Lewisia oppositifolia	*|	|	|	|	|*|	|	|	|*|X|	|	|*|	|	|	|#|X|X|	|	|#|X|	|X|	|	|#|	|	|X|	|*|	5|*
S	S	Lilium occidentale	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Lilium parvum	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|X|	|	|#|	|	|	|X|	|#|	|	|	|*|	1|*
4	S	Lilium rubescens	*|	X|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Limnanthes gracilis var. gracilis	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
4	S	Lomatium engelmannii	*|	X|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	1|*
-	S	*Lomatium nelsonianum*	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	?|*
4	S	Lomatium tracyi	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
4	S	Lupinus tracyi	*|	|	|	|	|*|	|	|	|*|X|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|X|#|	|	|	|*|	1|*
2	S	Lycopodium inundatum	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Meconella californica 1/	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Microseris bigelovii 1/	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	Microseris howellii	*|	X|	|	|X|*|X|	|	|	|*|	|	|*|	|	|	|	|#|X|X|	|	|	|#|X|2|X|	|	|#|	|	|X|	|*|	2|*
-	S	Mimulus douglasii	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	2|*
-	S	Mimulus tricolor	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
-	S	*Mirabilis greenei*	*|	|	|	|	|*|	|	|	|	|*|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
4	S	Monardella purpurea	*|	X|	|	|	|*|	|	|	|9|*|	|	|X|*|	|X|	|	|	|#|	|	|	|	|#|X|	|X|	|	|#|	|	|X|	|*|	3|*
S	-	*Oenothera wolfii 1/*	*|	|	|	|	|*|	|	|	|*|	|	|*|	|	|	|	|#|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	|*
S	S	Pedicularis howellii	*|	|	|X|	|*|	|	|	|	|*|	|	|*|	|	|X|	|	|#|	|	|	|	|	|#|	|	|	|	|#|	|	|	|*|	3|*

Table F-2. (Con't)

Region 5 2/	Region 6 3/	SENSITIVE PLANTS Scientific Name	Wilderness				Proposed RNA's					Exist. Botan	Proposed Botanical Areas																			Other
			Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul.	Babyfoot Lake	Big Craggies	York Creek	Bear Camp	Bigelow Lakes	Bolan Lake	Cleopatra	Chrome Ridge	Days Gulch	Eight Dollar Mtn.	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan Mountain	Waldo Ridge	Windy Collier	
-	S	Perideridia erythrorhiza																														
-	S	Perideridia howellii																														
S	-	Perideridia leptocarpa																														
-	S	Phacelia argentea 1/																														
3	S	Phacelia leonis																														
-	S	Phacelia malvaefolia																														
S	-	Phlox hirsuta																														
-	S	Poa laxiflora																														
4	S	Poa piperi																			X			X	X						3	
-	S	Polystichum californicum																													2	
-	S	Polystichum lemmoni			X																											
-	S	Potentilla glandulosa ssp. globosa																														
4	S	Ribes marshallii												X	X				X	X											3	
4	S	Salix delnortensis	X																													
4	S	Salix tracyi																													1	
S	-	Sanicula tracyi																														
S	-	Sedum laxum ssp. flavidum																														
4	S	Sedum laxum ssp. heckneri	X				X			X						X					X		X			X		X		10	
-	S	Sedum moranii																														
-	S	Sedum spathulifolium ssp. purdyi																														
-	S	Senecio hesperius	X				X												X	X			X		X						3	
-	S	Sidalcea cusickii																														
-	S	Sidalcea malachroides 1/																														
-	S	Sidalcea malvaeflora ssp. patula 1/																														
-	S	Sidalcea setosa ssp. querceta																													1	
4	S	Sidalcea setosa ssp. setosa																											X		1	
-	S	Silene hookeri ssp. bolanderi																													1	
S	-	Silene hookeri ssp. pulverulenta																					X									
-	S	Smilax californica																													1	
-	S	Sophora leachiana	X								?																				10	
S	S	Streptanthus howellii							X								X		X				X		X			X	X		2	
S	S	Tauschia howellii			X																										1	
-	S	Thlaspi montanum var. siskiyouense					2		8										2				X		X						1	
S	S	Viola occidentalis							X										X				X		2						1	

Table F-2. (Con't.)

CNPS 4/	ONHDB 5/	WATCH AND REVIEW LIST PLANTS Scientific Name	Wilderness: Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Proposed RNA's: Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul.	Babyfoot Lake	Big Craggies	York Creek	Exist. Botan: Bear Camp	Bigelow Lakes	Bolan Lake	Proposed Botanical Areas: Cleopatra	Chrome Ridge	Days Gulch	Eight Dollar Mtn.	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan Mountain	Waldo Ridge	Windy Collier	Other
-	R	Allium peninsulare																															
4	-	Allium siskiyouense		X					X		X				X	X	X					X											5
4	-	Amsinckia lunaris																															
4	-	Angelica arguta								X																							
4	-	Antennaria suffrutescens		X						8						X						X		X	X	4	X					4	
3	-	Arabis oregana																					X										
4	R	Arenaria howellii		X																X			X										5
-	W	Arenaria californica																															
4	-	Arnica cernua		X						X		X								X		X	X	X			X						3
4	-	Arnica spathulata ssp. spathulata								X																							
4	R	Aster brickellioides		X		X								2									X					2				8	
3	-	Aster paludicola																		X													
-	R	Astragalus accidens var. hendersonii																															
-	R	*Brodiaea crocea*																															
1	-	Calamagrostis foliosa																															
-	R	Callitriche marginata																															
3	-	Calochortus nudus																															
-	R	Camissia howellii																		X					X								1
-	R	Camissonia graciliflora																															
-	R	Camissonia ovata																															
1	-	Cardamine gemmata																															
3	-	Carex geyeri																															
4	R	Carex gigas																															
2	-	Carex halliana																															
1	R	Carex livida																															
4	-	Castilleja brevilobata					2			7										3				X		2				2			6
2	-	Chamaecyparis nootkatensis		2									X																				
4	-	Collomia tracyi																															
1	-	Cordylanthus maritimus ssp. maritimus 1/																															
-	R	Cryptantha milobakeri																															
4	W	Cypripedium montanum																												X			1
4	W	Darlingtonia californica		21			X		X	X	X	9			X			X	X	X		X	X		2	7	X	X	8		?	4	X		67
4	-	*Delphinium uliginosum*																															
4	-	*Dichelostemma venustum*																															
2	-	Epilobium luteum			X																												
2	-	Erigeron bloomeri var. nudatus														X			X					4						X			2
4	-	Eriogonum congdonii																															
-	R	Eriogonum lobbii																															
4	-	Eriogonum siskiyouense																															
-	R	Erysimum concinnum																															

Table F-2 (Con't)

CNPS 4/	ONHDB 5/	WATCH AND REVIEW LIST PLANTS Scientific Name	Wilderness: Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Proposed RNA's: Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul.	Babyfoot Lake	Big Craggies	York Creek	Exist Botan.: Bear Camp	Bigelow Lakes	Bolan Lake	Cleopatra	Proposed Botanical Areas: Chrome Ridge	Days Gulch	Eight Dollar Mtn	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan	Waldo Ridge	Windy Collier	Other
4	-	Erythronium citrinum														X			X					X								2	
4	-	Erythronium klamathense		?																													
-	W	Erythronium revolutum							X															X		X						5	
-	R	Fritillaria falcata																															
3	-	Gallum oreganum																															
2	-	Gentiana affinis var. affinis																														1	
-	R	Gilia capitata var. chamissonis																															
4	-	Haplopappus racemosus ssp. congestus																	X	X			X									3	
-	R	Hieracium greenei																															
-	R	Hieracium parryi							X																								
2	-	Horkelia sericata	X				X			X										X			X		2	X			X			1	
2	-	Iris bracteata								X										X			X		2							1	
4	-	Iris chrysophylla	X				X							X																			
2	-	Iris innominata	X					X															X			X	X					4	
3	-	Juncus regelii																															
4	R	Juncus supiniformis																															
3	-	Juncus tenius var. dudleyi																															
-	-	Kalmiopsis leachiana		6						X	X	X				X																3	
3	W	Lewisia cotyledon ssp. howellii		X											X																		
4	-	Lilium bolanderi	X			X			2					X		X							2			X	X	X	X	X		12	
-	R	Lilium kelloggii																					X	X									
3	-	Lilium vollmeri	X			X	X		7				X	X		X			X	3	X		?	3	2		X	X	X		X	4	
4	-	Lilium washingtonianum				X								X	X	X				X												2	
3	W	Lilium wigginsii			X									X	X																	2	
4	-	Listera cordata																															
-	R	Lithophragma campanulata																															
4	-	Lomatium howellii	X				X			X			X						X	2	X			X	X	X	X	X	X			10	
2	-	Lomatium martendalei									X																						
4	-	Lupinus croceus var. pilosellus																															
4	-	Lupinus lapidicola																															
4	-	Lycopus uniflorus																															
-	R	Meconella oregana																															
4	-	Melica spectabilis																															
-	W	Mimulus pulsiferae																															
4	-	Minuartia howellii																															
-	R	Montia diffusa																														1	
-	R	Navarretia leucocephala																															
-	R	Navarretia tagetina																															
4	W	Orthocarpus cuspidatus																															
2	-	Pedicularis contorta																															

Table F-2 (Con't.)

CNPS 4/	ONHDB 5/	WATCH AND REVIEW LIST PLANTS Scientific Name	Wilderness: Kalmiopsis	Wild Rogue	Red Buttes	Siskiyou	Proposed RNA's: Cedar Log Flat	Craggy Peak	Hoover Gulch	Lemmingsworth Gul.	Babyfoot Lake	Big Craggies	York Creek	Exist Botan: Bear Camp	Bigelow Lakes	Bolan Lake	Cleopatra	Chrome Ridge	Days Gulch	Eight Dollar Mtn.	Grayback Mountain	Green Knob	Iron Mountain	Oregon Mountain	Red Flat	Rough and Ready	Snow Camp	Sourgame	Squaw Mountain	Vulcan Mountain	Waldo Ridge	Windy Collier	Other
2	-	Pedicularis flavida												X																			
-	W	Phacelia capitata																															
-	W	Phacelia corymbosa				X				X						X			X			X	X	X								6	
2	-	Pinguicula macroceras																X	X														
4	-	Pityopus californicus											X								X	X											6	
4	-	Pleuropogon refractus																															
-	R	Poa pattersonii																															
4	-	Polemonium chartaceum																															
3	-	Polystichum lonchitis																															
2	-	Ribes laxiflorum																															
3	-	Rubus nivalis																		X													1
4	-	Sanicula peckiana							X														2		X								
-	R	Saxifraga fragarioides														X									X								1
2	-	Saxifraga howellii																															4
2	-	Scirpus subterminalis																															
-	W	Sedum oblanceolatum																															
2	-	Senecio macounii																															
-	R	Silene grayi																															
4	R	Sidalcea malvaeflora ssp. elegans			X														X			X		X	2				X				3
4	-	Smilax jamesii																															
4	-	Tauschia glauca														X							X		X								2
4	-	Trifolium howellii												X									X										
-	W	Trillium kurabayashii																															3
4	-	Trillium rivale				X		X	X										X				2	X									4
4	-	Triteleia crocea var. crocea																															
3	-	Vaccinium coccinium																															1
1	-	Vaccinium uliginosum						X																									
4	W	Vancouveria chrysantha							3														X										4
4	-	Veratrum insolitum																															
4	-	Veronica copelandii																															

1/ Plants found predominately in coastal environments. May not occur on the Siskiyou National Forest.

2/ Region Five. (Forest Service Pacific Sowthwest Region California).

S = SENSITIVE SPECIES. Listed as sensitive in California by Pacific Southwest Region.

1, 2, 3, 4 = see note 4/ CNPS for explanation.

3/ Region Six. (Forest Service Pacific Northwest Region, Oregon).

S = SENSITIVE SPECIES. Those plant and animal species identified by a Regional Forester for which population viability is a concern, as evidenced by: (a) significant current or predicted downward trends in population numbers or density, and (b) significant current or predicted downward trends in habitat capability that would reduce a species' existing distribution.

R = REVIEW LIST. Species still under review in Oregon. Coincides with R list under COLUMN ONHDB (5/)

W = WATCH/MONITOR list (Oregon). Basically coincides with W list under COLUMN ONHDB (5/). A few additional plants have been added to the Sisikiyou list at the discretion of the Forest Wildlife Biologist/Botanist. Species listed as W in this column should be monitored on the Siskiyou.

4/ CNPS. (California Native Plant Society--Inventory of Rare and Endangered Vascular Plants of California--September 1984--Special Publication No. 1, 3rd Edition--2380 Ellsworth, Suite D, Berkeley, California 94704).

1 = List 1: Plants of highest priority (1a: plants presumed extinct in California and 1b: plants rare and endangered in California and elsewhere).

2 = List 2: Plants rare or endangered in California, but more common elsewhere.

3 = List 3: Plants about which we need more information.

4 = List 4: Plants of limited distribution (a watch list).

5/ ONHDB. (Oregon Natural Heritage Data Base--Rare, Theatened and Endangered Plants and Animals of Oregon--March 1985--1234 NW 25th Avenue, Portland, Oregon 97210--$4.00).

R = The Review List contains species for which more information is needed before status can be determined, but which may be threatened or endangered in Oregon or throughout their range.

W = The Watch List species are those which are currently stable, but which may become threatened in Oregon in the forseeable future. These species currently do not need active management attention. However, they may need some type of continued monitoring.

The following represent occurrences in above table:

X = Species occurs within the area.

Number = Number of separate occurrences within the area.

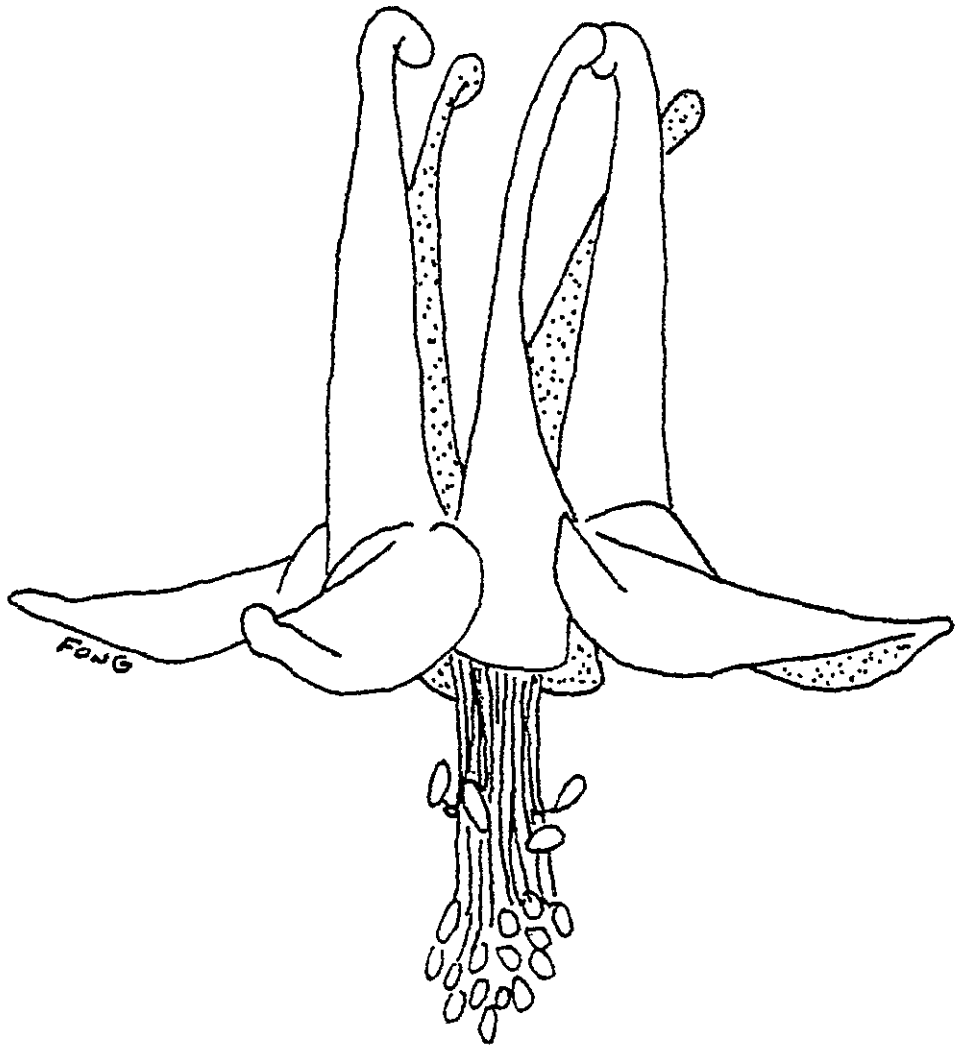

FONG

Table F-3(a) Timber Values in all PROPOSED Botanical and Research Natural Areas (Including Options and Additions)

Name of Area	National Forest (Acres)	National Forest Tent/Suit (Acres) 1/	Standing Volume (MMBF) 2/	ASQ Volume (MBF) 3/	LTSY Volume (MBF) 4/
PROPOSED BOTANICAL AREAS (Sensitive Plants)					
Bear Camp Option 1	244	177	2 9	53	96
Bear Camp Option 2	386	348	5 7	104	188
Bear Camp Option 3	2,983	2,611	49 5	783	1,410
Bear Camp Option 4	2,314	1,539	22 8	462	831
Bigelow Lakes	411	136	2 1	41	73
Bigelow Lakes Addition	560	160	2 9	48	86
Bolan Lake	466	124	2 0	37	67
Chrome Ridge	1,014	430	1 0	129	232
Cleopatra	800	249	0 5	75	134
Days Gulch	1,252	21	0 3	6	11
Eight Dollar Mountain	2,738	0	0 0	0	0
Eight Dollar Mountain Addition	200	50	0 4	14	25
Grayback Mountain	197	0	0 0	0	0
Green Knob	153	132	2 8	40	71
Iron Mountain	1,295	1,026	10 7	308	554
Iron Mountain Addition	571	420	3 6	126	227
Oregon Mountain	4,401	117	2 0	35	63
Red Flat	5,384	3,907	40.9	1,172	2,110
Red Flat Addition	1,788	866	8.9	260	468
Rough and Ready Flat	1,699	0	0 0	0	0
Snow Camp	748	561	5 0	168	303
Snow Camp Addition	727	702	13 0	211	379
Sourgame	1,094	533	6 0	160	288
Sourgame Addition	2,546	1,470	10 0	441	794
Squaw Mountain	638	252	3 9	76	136
Vulcan	133	0	0 0	0	0
Waldo Ridge	195	95	2 4	29	51
Waldo Ridge Addition	512	421	4 5	126	227
Windy Collier	147	115	0 0	35	62
Subtotal	35,596	16,462	203 8	4,939	8,886
PROPOSED BOTANICAL AREAS (Old Growth)					
Big Tree	127	116	3 6	35	63
Lobster Grove	85	64	1.7	19	35
Lobster Grove Addition	449	248	5 7	48	87
Page Mountain Grove	64	64	1 1	19	35
Page Mountain Grove Addition	64	59	1 3	18	32
Redwood Groves	185	181	3 7	54	98
Redwood Groves Option 1	326	315	8 6	95	170
Snaketooth Redwood	21	20	0 4	6	11
Subtotal	1,321	1,067	26 1	320	578
EXISTING BOTANICAL AREAS					
Babyfoot	352	0	0 0	0	0
Big Craggies	3,803	0	0 0	0	0
York Creek	320	0	0 0	0	0
Subtotal	4,475	0	0 0	0	0
Total (Botanical)	41,392	17,529	229 9	5,259	9,464

Table F-3(a). Timber Values in all PROPOSED Botanical and Research Natural Areas (Including Options and Additions)(Continued)

Name of Area	National Forest (Acres)	National Forest Tent/Suit (Acres) 1/	Standing Volume (MMBF) 2/	ASQ Volume (MBF) 3/	LTSY Volume (MBF) 4/
PROPOSED RESEARCH NATURAL AREAS					
Cedar Log Flat	441	145	1 0	44	78
Craggy Peak	100	0	0 0	0	0
Hoover Gulch	1,292	1,099	18 0	330	593
Lemmingsworth Gulch	966	261	1 0	78	141
Subtotal	2,799	1,505	20 0	452	812
EXISTING RESEARCH NATURAL AREAS					
Coquille River Falls	501	0	0 0	0	0
Port Orford Cedar	*1,120*	*0*	*0.0*	*0*	*0*
Wheeler Creek	336	0	0 0	0	0
Subtotal	1,957	0	0 0	0	0
Total (RNA)	4,756	1,505	20 0	452	812

1/ Tentatively suitable Forest land for timber production.

2/ Standing Volume is the amount of timber existing within the area, in millions of board feet

3/ ASQ (Allowable Sale Quantity) is the quantity of timber that could be sold from the area of suitable land within the RNA or Botanical area

4/ LTSY (Long-Term Sustained Yield) volume is the estimated timber harvest that could be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple use objectives

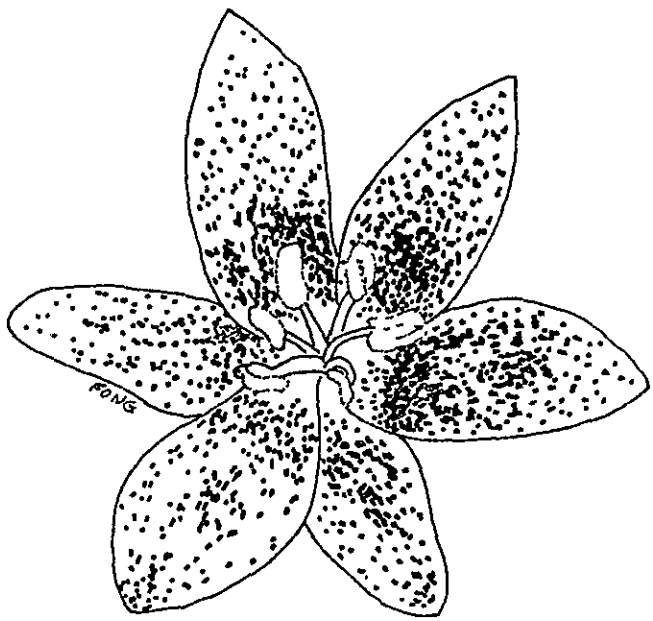


Table F-3(b) Timber Values in Botanical and Research Natural Areas RECOMMENDED in the Preferred Alternative (S) (Including Options and Additions)

Name of Area	National Forest (Acres)	National Forest Tent/Suit (Acres) 1/	Standing Volume (MMBF) 2/	ASQ Volume (MBF) 3/	LTSY Volume (MBF) 4/
PROPOSED BOTANICAL AREAS (Sensitive Plants)					
Bear Camp Option 1	244	177	2 9	53	96
Bear Camp Option 2	386	348	5 7	104	188
Bigelow Lakes	411	136	2.1	41	73
Bolan Lake	297	37	0 8	11	20
Chrome Ridge	589	256	0 5	77	138
Days Gulch	1,252	21	0 3	6	11
Eight Dollar Mountain	2,738	0	0 0	0	0
Grayback Mountain	197	0	0 0	0	0
Iron Mountain	1,295	1,026	10 7	308	554
Iron Mountain Addition	571	420	3 6	126	227
Oregon Mountain	2,623	102	1 5	31	55
Red Flat (Hunter Creek Bog)	53	37	0 0	11	20
Rough and Ready Flat	1,499	0	0 0	0	0
Snow Camp	1,041	840	9 0	252	454
Sourgame (Game Lake)	508	291	2 9	87	157
Sourgame (Sourdough Camp)	63	63	0 8	19	34
Vulcan	133	0	0 0	0	0
Subtotal	13,900	3,754	40 8	1,126	2,027
PROPOSED BOTANICAL AREAS (Old Growth)					
Big Tree	127	116	3 6	35	63
Lobster Grove	85	64	1 7	19	35
Lobster Grove Addition	449	248	5 7	48	87
Page Mountain Grove	64	64	1 1	19	35
Redwood Groves	185	181	3.7	54	98
Redwood Groves Option 1	326	315	8 6	95	170
Snaketooth Redwood	21	20	0 4	6	11
Subtotal	1,257	1,008	24 8	276	499
EXISTING BOTANICAL AREAS					
Babyfoot	352	0	0 0	0	0
Big Craggies	3,803	0	0 0	0	0
York Creek	320	0	0 0	0	0
Subtotal	4,475	0	0 0	0	0
Total (Botanical)	19,632	4,762	65 6	1,402	2,526

Table F-3(b). Timber Values in Botanical and Research Natural Areas RECOMMENDED in the Preferred Alternative (S) (Including Options and Additions)(Continued)

Name of Area	National National Forest (Acres)	Forest Tent/Suit (Acres) 1/	Standing Volume (MMBF) 2/	ASQ Volume (MBF) 3/	LTSY Volume (MBF) 4/
PROPOSED RESEARCH NATURAL AREAS					
Cedar Log Flat	441	145	1 0	44	78
Craggy Peak	100	0	0 0	0	0
Hoover Gulch	1,292	1,099	18 0	330	593
Lemmingsworth Gulch	818	261	1 0	78	141
Subtotal	2,651	1,505	20.0	452	812
EXISTING RESEARCH NATURAL AREAS					
Coquille River Falls	501	0	0 0	0	0
Port Orford Cedar	1,120	0	0.0	0	0
Wheeler Creek	336	0	0 0	0	0
Subtotal	1,957	0	0.0	0	0
Total (RNA)	4,608	1,505	20 0	452	812

1/ Tentatively suitable Forest land for timber production

2/ Standing Volume is the amount of timber existing within the area, in millions of board feet

3/ ASQ (Allowable Sale Quantity) is the quantity of timber that could be sold from the area of suitable land within the RNA or Botanical area.

4/ LTSY (Long-Term Sustained Yield) volume is the estimated timber harvest that could be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple use objectives

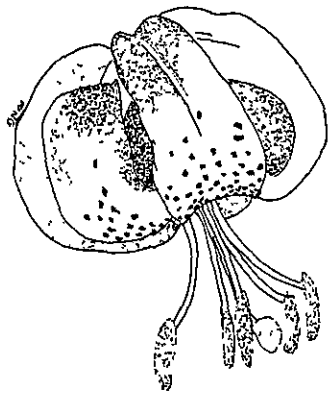


Table F-4. Mineral Values of Proposed Botanical Areas (Sensitive Plant Areas)

Botanical Area	Acres	Nickel Laterites (Main Deposits) Acres	(% of Area)	Nickel Laterites 1/ % of Composition of Nickel	Cobalt	Chrome	Iron	Notes on Mineral Values
Bear Camp	5,927	---No lateritic soils---						None known
Bigelow Lakes	971	---No lateritic soils---						None known
Bolan Lake	451	---No lateritic soils---						Inactive gold mine
Chrome Ridge	1,014	---Unknown---						Some chromite deposits mined
Cleopatra	800	---Nearby---						Mercury prospects
Days Gulch	987	---No lateritic soils---						Active gold mine
Eight Dollar Mountain	2,350	225	(10)	0 53	0 03	0 73	--	Nickel latrites, chromite
Grayback Mountain	166	---No lateritic soils---						None known
Green Knob	153	---No lateritic soils---						Possibly some coal
Iron Mountain	1,866	18	(1)	0 70	--	--	--	Chromite, copper, and coal prospects nearby
Oregon Mountain	4,401	85	(2)	0 50	0 04	1 36	--	Some nickel laterites, some chromite copper prospect
Red Flat	7,172	710	(10)	0 80	0 15	1.14	18 0	Nickel laterites, chromite
Rough and Ready Flat	934	320	(34)	0 45	0 03	1 00	16 0	Extensive thin rocky nickel laterites, gold, and platinum mined from area
Snow Camp	1,475	50	(3)	0 63	0 06	--	--	Some chromite
Sourgame	3,640	---No lateritic soils---						Ultramatic soil present
Squaw Mountain	638	---No lateritic soils---						Ultramafic soils present
Vulcan	133	---Unknown---						Chromite prospect
Waldo Ridge	707	---Unknown---						None known
Windy Collier	147	---Unknown---						Chromite deposits nearby

1/ Values listed are from samples, average percents listed are not values for entire proposed Botanical area Nickel mining may become economically feasible where nickel concentrations are 0 5 percent or greater (Len Ramp, former resident Geologist for Oregon Department of Geology and Mineral Industries, Grants Pass)

Table F-5. Endangered, Threatened, Sensitive, and Rare Plants of the Siskiyou National Forest, Categorized by Status. The Various Lists Encompass 223 Different Plant Species (Overlap Between Lists - Data as of May 19, 1988)

LIST CATEGORY	Known on Forest	Potentially on Forest	Total
FEDERAL ENDANGERED			
Listed	0	0	0
Proposed	0	0	0
FEDERAL THREATENED			
Listed	0	0	0
Proposed	0	0	0
FEDERAL CANDIDATES FOR ENDANGERED OR THREATENED STATUS			
Level 1 (Sufficient Information for listing as Endangered or Threatened)	1	0	1
Level 2 (Insufficient Information for listing as Endangered or Threatened)	20	18	38
CALIFORNIA-OFFICIAL STATE LIST			
Endangered	0	0	0
Rare	0	0	0
SENSITIVE (USDA-FS DESIGNATION)			
In Region Six (Oregon) Only	45	22	67
In Region Five (California) Only	9	5	14
In Both Regions Five and Six	10	3	13
Total Sensitive Plants	64	30	104
Candidates for Region Six Sensitive List	9	1	10
OREGON (OREGON NATURAL HERITAGE DATA BASE)			
Review List (Inventory)	11	19	30
Watch List (Monitor) 1/	13	7	20
CALIFORNIA NATIVE PLANT SOCIETY LISTS			
Plants Rare and Endangered in California and Elsewhere	9	10	19
Plants Rare or Endangered in California, but More Common Elsewhere	12	8	20
Plants About Which More Information is Needed	10	10	20
Plants of limited distribution (Watch/Monitor List)	47	22	69

1/ At Forest discretion, a few Watch List plants were added to the Region Six list (see current Status List of Endangered, Threatened, Sensitive, and Rare Plants on the Siskiyou National Forest, available at Forest offices)

Table F-6. Management Indicator Species - Sensitive Plant Species and Associates by Habitat Groups (Recommended for Monitoring) Most of the Plants Listed Below are Considered Sensitive; a Few are Monitor or Watch List Species. Numbers in Parentheses Indicate the Minimum Number of Populations Known on the Siskiyou

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BOG AND WET/MOIST PLACES, SERPENTINE SUBGROUP

Cypripedium californicum (30)
Darlingtonia californica (114) 1/
Gentiana bisetaea (19) 1/
Hastingsia bracteosum (2) 1/
Viola lanceolata ssp occidentalis (3)

BOG AND WET/MOIST PLACES, NON-SERPENTINE SUBGROUP

Bensoniella oregana (47) 1/
Gentiana setigera (1)
Erigeron cervinus (18)
Lilium vollmeri (19) 2/
Lilium wigginsii (2) 1/
Salix tracyi (2)
Smilax californica (1)

ROCKY PLACES (SERPENTINE/NON-SERPENTINE)

DRY

Arabis koehleri var. stipitata (12)
Arabis macdonaldiana (2) 1/
Arctostaphylos hispidula (4)
Calochortus howellii (7)
Dicentra formosa ssp. oregana (18) 1/
Eriogonum pendulum (7)
Fritillaria glauca (6)
Lewisia leana (3)
Lomatium engelmannii (2)
Microseris howellii (13)
Monardella purpurea (8)
Pedicularis howellii (8+) 1/
Poa piperi (6)
Sedum laxum ssp heckneri (10)
Streptanthus howellii (3) 1/
Thlaspi montanum var. siskiyouense (13) 1/

MOIST

Lewisia cotyledon var cotyledon (6)
Lewisia cotyledon var. howellii (?) 1/
Lewisia cotyledon var purdyi (?) 1/
Lewisia oppositifolia (7) 1/

OPEN SLOPES, FIELDS, MEADOWS, AND WOODS (SERPENTINE/NON-SERPENTINE)

Allium bolanderi (6)
Balsamorhiza sericia (B platylepis) (5)
Brodiaea ida-maia (5)
Epilobium rigidum (11)
Erythroniun howellii (8)
Frasera umquaensis (2) 1/
Lathyrus delnorticus (14)
Kalmiopsis leachiana (3 outside of wilderness)
Mimulus douglasii (2)
Ribes marshallii (6)
Senecio hesperius (3)
Sophora leachiana (10) 1/
Sidalcea setosa ssp querceta (1) 1/
Vancouveria chrysantha (8)

1/ Plants should be represented by at least two sites (unless only one is known)
2/ A large population of Lilium vollmeri on the Gold Beach Ranger District should be monitored, it is the largest known population of this species (see TRI Sensitive Subsystem for details)

Table F-7. Priority Ranking Methods for Proposed Botanical and Research Natural Areas

I. Ranking criteria for Botanical Areas - Sensitive Plant Areas

A How many different sensitive species are present (as of 1985)?

Score	No. Species
1	17+
2	13-16
3	9-12
4	5-8
5	1-4

B. How botanically unique is this area? How important is this area to professional/amateur botanists?

Score	Value
1	Very Important
2	Quite Important
3	Important
4	Somewhat Important
5	Low Importance

C. Competing resources. Would designation as a Botanical area (no timber harvest plus other restrictions) be positive, negative, or neutral in relation to sensitive plants vs. other resource values, significantly timber. If timber harvesting would enhance plant resources in a specific area, this would actually result in a more negative criteria value (larger number).

Score	Ranking
1	Positive for sensitive plant resources
2	Somewhat positive benefits for sensitive plant resources
3	Neutral - Plant resources vs other resources
4	Somewhat negative for other resources
5	Negative for other resources

Table F-7. Priority Ranking Methods for Proposed Botanical and Research Natural Areas (Continued)

Name of Area	Criteria - Scores A	+	B	+	C	=	Total Score	Priority Ranking
Bear Camp Option 1	4	+	1	+	2	=	7	4
Bear Camp Option 2	4	+	2	+	3	=	9	6
Bear Camp Option 3	5	+	3	+	4	=	12	7
Bear Camp Option 4	5	+	3	+	5	=	13	10
Bigelow Lakes	3	+	1	+	1	=	5	2
Bigelow Lakes Addition	4	+	1	+	2	=	7	4
Bolan Lake	5	+	2	+	3	=	10	7
Chrome Ridge	5	+	2	+	3	=	10	7
Cleopatra	5	+	4	+	2	=	11	7
Days Gulch	2	+	1	+	1	=	5	2
Eight Dollar Mountain	1	+	1	+	2	=	4	1
Eight Dollar Mountain Addition	4	+	3	+	4	=	11	8
Grayback Mountain	4	+	4	+	1	=	9	6
Green Knob	5	+	3	+	3	=	11	8
Iron Mountain	4	+	1	+	2	=	7	4
Iron Mountain Addition	4	+	1	+	2	=	7	4
Oregon Mountain	1	+	2	+	3	=	6	3
Red Flat (Hunter Crk Bog)	4	+	3	+	3	=	10	7
Red Flat Addition	4	+	3	+	4	=	11	8
Rough and Ready Flat	2	+	3	+	2	=	7	4
Snow Camp	3	+	2	+	3	=	8	5
Snow Camp Addition	4	+	2	+	3	=	9	5
Sourgame	3	+	3	+	3	=	9	6
Sourgame Addition	4	+	3	+	3	=	10	7
Squaw Mountain	5	+	4	+	3	=	12	9
Vulcan	4	+	3	+	1	=	8	5
Waldo Ridge	3	+	4	+	3	=	10	7
Waldo Ridge Addition	5	+	4	+	4	=	13	10
Windy Collier	5	+	4	+	3	=	12	9

Lowest Total Score indicates Highest Value as a Botanical area.

Highest Total Score indicates Lowest Value as a Botanical area

II. Ranking Criteria for Botanical Areas - Old Growth Sites

The five areas listed have basically similar values. Ranking criteria (recreation value, timber values, etc) were so similar that the five sites had essentially the same total value. All sites are priority ranked as number 1.

Table F-7. Priority Ranking Methods for Proposed Botanical and Research Natural Areas (Continued)

III. Ranking Criteria for Research Natural Areas

A How many cells would be filled (how many plant communities would be represented that are not included in existing RNA's)?

Score	Cells Filled
1	5+
2	4
3	3
4	2
5	1

B. Importance of the area to the Pacific Northwest Research Station

Score	Importance
1	Primary
2	Secondary

C. Does the area contain significant sensitive plant resources?

Score	Significance
3	High
4	Medium
5	Low

	Criteria - Scores							
Name of Area	A	+	B	+	C	=	Total Score	Priority Ranking
Cedar Log Flat	5	+	2	+	3	=	10	3
Craggy Peak	4	+	2	+	4	=	10	4
Hoover Gulch	3	+	1	+	5	=	9	2
Lemmingsworth Gulch	1	+	1	+	3	=	5	1

Most of the proposed Craggy Peak RNA is within the Rogue River National Forest (the Rogue River portion is called Oliver Matthews RNA)

Lowest Total Score indicates Highest Value as a Research Natural Area.

Highest Total Score indicates Lowest Value as a Research Natural Area.

Table F-8 Allocation of Proposed Botanical and Research Natural Areas, by Alternative

Name of Area	Priority Ranking	Alternative (Acres)					
		NC, A and A-Dep	B, C, D and D1	E	G and M	K	S
PROPOSED BOTANICAL AREAS (Sensitive Plants)							
Bear Camp Option 1	4	--	--	244	244	244	244
Bear Camp Option 2	6	--	--	386	386	386	386
Bear Camp Option 3	7	--	--	2,983	2,983	--	--
Bear Camp Option 4	10	--	--	--	2,314	--	--
Bigelow Lakes	2	--	--	411	411	411	411
Bigelow Lakes Addition	4	--	--	560	560	--	--
Bolan Lake	7	--	--	541	451	--	297
Chrome Ridge	7	--	--	1,014	1,014	--	589
Cleopatra	7	--	--	--	800	--	--
Days Gulch	2	--	987	987	987	987	1,252
Eight Dollar Mountain	1	--	2,150	2,150	2,150	2,150	2,738
Eight Dollar Mountain Addition	8	--	--	--	200	--	--
Grayback Mountain	6	--	166	166	166	--	197
Green Knob	8	--	--	153	153	--	--
Iron Mountain	4	--	--	1,295	1,295	1,295	1,295
Iron Mtn Addition	4	--	--	571	571	571	571
Oregon Mountain	3	--	--	4,401	4,401	--	2,623
Red Flat 1/	7	--	--	5,384	5,384	--	53
Red Flat Addition	8	--	--	--	1,788	--	--
Rough and Ready Flat	4	--	934	--	934	--	1,499
Snow Camp	5	--	--	748	748	--	1,041
Snow Camp Addition	5	--	--	727	727	--	--
Sourgame 2/	6	--	--	--	1,094	--	571
Sourgame Addition	7	--	--	--	2,546	--	--
Squaw Mountain	9	--	--	--	638	--	--
Vulcan	5	--	133	--	133	--	133
Waldo Ridge	7	--	--	--	195	--	--
Waldo Ridge Addition	10	--	--	--	512	--	--
Windy Collier	9	--	147	--	147	--	--
Subtotal	-	--	4,517	22,721	33,932	6,044	13,900
PROPOSED BOTANICAL AREAS (Old Growth)							
Big Tree	-	--	--	--	--	--	127
Lobster Grove	-	--	--	85	85	85	85
Lobster Grove Addition	-	--	--	360	360	--	449
Page Mountain Grove	-	--	64	64	64	64	64
Page Mountain Grove Addition	-	--	--	--	64	--	--
Redwood Groves	-	--	--	--	--	--	185
Redwood Groves Option 1	-	--	--	--	--	--	326
Snaketooth Redwood	-	--	--	21	21	21	21
Subtotal	-	--	64	530	594	170	1,257
EXISTING BOTANICAL AREAS 3/							
Babyfoot Lake	-	352	352	352	352	352	352
Big Craggies	-	3,803	3,803	3,803	3,803	3,803	3,803
York Creek	-	320	320	320	320	320	320
Subtotal	-	4,475	4,475	4,475	4,475	4,475	4,475
Total (Botanical)	-	4,475	9,056	27,726	39,001	10,689	19,632

Table F-8 Allocation of Proposed Botanical and Research Natural Areas, by Alternative (Continued)

Name of Area	Priority Ranking	Alternative (Acres)					
		NC, A and A-Dep	B, C, D and D1	E	G and M	K	S
PROPOSED RESEARCH NATURAL AREAS							
Cedar Log Flat	3	--	--	441	441	441	441
Craggy Peak	4	--	100	100	100	100	100
Hoover Gulch	2	1,292	1,292	1,292	1,292	1,292	1,292
Lemmingsworth Gulch	1	--	--	966	966	966	818
Subtotal	-	1,292	1,392	2,799	2,799	2,799	2,651
EXISTING RESEARCH NATURAL AREAS							
Coquille River Falls	-	501	501	501	501	501	501
Port Orford Cedar	-	1,120	1,120	1,120	1,120	1,120	1,120
Wheeler Creek	-	336	336	336	336	336	336
Subtotal	-	1,957	1,957	1,957	1,957	1,957	1,957
Total (RNA)	-	3,249	3,349	4,756	4,756	4,756	4,608

1/ Alternative S includes Hunter Creek Bog
2/ Alternative S includes Game Lake and Sourdough Camp
3/ Seventy-Six percent of the existing acreage for Botanical areas is within the Kalmiopsis Wilderness (3,408 Acres).

SUMMARIES

This section presents a short synopsis of each proposed area, ranked in order of importance. Rankings are based on a combination of the data presented in Table F-7 and the expertise of the Forest Wildlife Biologist/Botanist. Future inventories would likely influence the rankings. The boundaries of some areas were modified in the Preferred Alternative (S); refer to the narratives of individual areas for maps and explanations of changes.

SENSITIVE PLANT BOTANICAL AREAS

All three areas were established by authority of the Chief of the Forest Service and represent permanent land assignments not subject to review in this Forest Plan Most of the Big Craggies, some of Babyfoot, and all of York Creek are within the Kalmiopsis Wilderness (3,408 or 76 percent of the 4,475 total acres is within the Wilderness).

EXISTING

1 *Babyfoot Lake.* The Babyfoot Unusual Interest Area (Botanical) (350 acres) was established in 1966 to protect Brewer spruce and other rare plant species; sensitive plant species are present Parent material is diorite/gabbro; mining potential is low.

2 *Big Craggies* The Big Craggies Botanical Area (3,800 acres) was established in 1964, primarily to protect Brewer spruce and *Kalmiopsis leachiana.*

3 *York Creek.* The York Creek Unusual Interest Area (Botanical) (320 acres) was established in 1966 primarily to protect an extensive patch of *K. leachiana*

PROPOSED PRIORITY CLASS A

These are the most important Botanical Sites on the Siskiyou National Forest.

1. *Eight Dollar Mountain.* Sixteen (16) sensitive species are present, over one-fourth of those known to be on the Siskiyou, this same assemblage is not known to be present elsewhere (as a group). Sensitive species are located on both bog and dry sites at a variety of locations; the largest *Darlingtonia* Bogs on the Forest are within this area Some species are known from Eight Dollar Mountain and only a few other sites; some species reach their greatest development here. This site has been continually botanized since the 1880's and is of much historical interest in regard to early-day botanists. A number of species were first collected in this area. Additional plant inventory of the area is desirable. This is an ideal site for studies of plant distribution and development. extensive elevation range of 1200-4000 feet; full range of aspects; one type of parent material, uniform climate (rainfall). Livestock grazing has occurred in portions of the area and may have a detrimental impact on some sensitive plant species. There are moderate to high conflicts with mineral values; most of Eight Dollar Mountain is covered by mining claims. The most important nickel laterite deposits on the mountain are not on National Forest land. Nickel laterites would only be important if a processing plant was already in operation at a nearby mining site. At the present time, nickel laterite resources at this site alone are probably not sufficient to warrant development. Land on the east side of the mountain under the jurisdiction of the Bureau of Land Management has been designated as an Area of Critical Environmetal Concern (ACEC).

Eight Dollar Mountain - First Priority

Eight Dollar Mountain Addition - Second Priority

2 *Bigelow Lakes.* A large variety of sensitive species are present at this alpine, non-serpentine site. Some plant species are at their most northerly or westerly limits. Substantial plant inventory data is available. This concentration of plants is not known elsewhere on the Siskiyou or adjacent National Forests. Boundaries are easily locatable on-the-ground. This area is within a grazing allotment (Applegate Ranger District). The impact of grazing on botanical values needs to be assessed. There are no mineral conflicts.

Bigelow Lakes - First Priority

Bigelow Lakes Addition - Second priority, but both options together make a more logical unit.

3. *Days Gulch.* This area is part of the Eight Dollar Mountain complex. It is just southwest of Eight Dollar and contains a much visited *Darlingtonia* bog inhabited by a number of sensitive plants. The Days Gulch site is separated from the Eight Dollar site by the Illinois Wild and Scenic River corridor. At least 11 sensitive species are present.

4. *Iron Mountain* Many species at this site are at the periphery of their ranges. A large variety of plant species are present, including a number of sensitive species. Extensive inventory data is available. Boundaries are easily locatable on-the-ground. Timber values are minor; most of the area is low site land and marginal at best. Mineral conflicts are not major; a small portion of the area contains a nickel laterite deposit

Iron Mountain - First Priority

Iron Mountain Addition - Second Priority, but both options together make a very logical unit.

5 *Bear Camp.* A variety of non-serpentine plants are present, including an interesting variety of nonsensitive plants. This is a concentration area for *Bensoniella oregana*, a sensitive species with a severely restricted range. Several other plants found here are not otherwise known from southwest Oregon A large amount of commercial timber land is present. Sensitive species and unique botanical values can be preserved by selecting out specific habitat types, rather than designating the entire area More plant inventory is needed to determine full extent and range of sensitive/rare plant values over the entire area

Option 1 First Priority

Option 2 Second Priority

Option 3 Third Priority (Lower Priority)

Option 4 Fourth Priority (Lower Priority)

PROPOSED PRIORITY CLASS B

These areas are important sensitive plant sites, and the priority is nearly as high as in A.

6 *Snow Camp.* A number of sensitive plants are present on both dry and moist sites. The site has considerable habitat variety. More plant inventories are needed to determine the full extent of rare plant resources. Part of this sensitive plant site contains nickel laterite deposits. An interesting stand of Brewer spruce is present.

Snow Camp - First Priority

Snow Camp Addition - Second Priority, but plant values high here also.

7 *Chrome Ridge.* A number of sensitive plants are present. Parts of the area have been intensively inventoried, but extensive plant surveys are needed to determine total extent of rare plant resources No nickel laterite deposits are known, although some chromite has been mined in the area.

8 *Oregon Mountain.* A large variety of sensitive species (16) are present There is some overlap with sensitive species known from Eight Dollar Mountain The area has been botanized since the 1880's and is of historical interest, in regards to early-day botanists. Additional plant inventory is needed Nickel laterite deposits are present, along with copper and chromium prospects. There is opportunity to locate a joint Botanical area at this site with the Bureau of Land Management.

9. *Rough and Ready Flat.* This is a concentration area for sensitive/rare plants More plant inventory is needed. There is some overlap with botanical values of Oregon Mountain and Eight Dollar Mountain. A state park (Rough and Ready Botanical Wayside) is nearby. Important deposits of nickel lateritic soil are present. There is opportunity to locate a joint Botanical area at this site with the Bureau of Land Management and Oregon State Parks.

10 *Sourgame.* This area is near the Snow Camp site, but has its own unique characteristics. A variety of soil types are present, which provide a number of contact zones harboring a rich mix of plant species. This is a fairly large area, which has been divided into two parts. The Sourgame area needs to be intensively inventoried Game Lake and Sourdough Camp are located within the area; both sites contain very interesting botanical resources

Sourgame - High Priority

Sourgame Addition - Moderate Priority

11 *Vulcan.* A number of sensitive plant species are present. This area is on the edge of the Kalmiopsis Wilderness A chromite prospect is located within the area. There are no known deposits of nickel laterites. The area is almost a de facto Botanical area because of its location. More plant inventory work is necessary

12 *Grayback Mountain.* This area is located on the Forest's highest mountain (7,055 feet). The eastern half of the mountain is located on the Rogue River National Forest. Soils are derived from gabbro and quartz diorite There are no timber values The area is very interesting botanically, an intensive plant inventory of the area is needed. The Bigelow Lakes site is a few miles to the south.

13. *Bolan Lake.* This is an interesting site for *Lewisia* species and *Pedicularis howellii*, but other botanical values are not well-known. The Bolan area contains a significant population of *P. howellii*, a plant with a very limited range. The Klamath and Siskiyou are working on a joint management plan for the species. More plant inventories are needed Other than construction of recreation facilities or roads, no man-made habitat change is likely. Gold has been mined within the area, but no other mineral values are known.

14 *Red Flat.* A number of sensitive plants are present, primarily serpentine endemics. The area needs extensive plant inventories. There are fairly high timber values, and the boundary probably needs refinement. Major conflicts are possible in the western portion of the area where important nickel laterite deposits are located. The eastern edge of the drainage basin for Hunter Creek Bog (BLM) is located in the Red Flat area.

Red Flat - No clear distinction between Red Flat and Red Flat Addition. This portion of the area is on Chetco Ranger District.

Red Flat Addition - This portion of the area is on Gold Beach Ranger District

15. *Waldo Ridge.* A number of sensitive plant species are present. The nearby town of Waldo was a major collecting location for early-day botanists Fairly high timber values are present in the part of the area described as the Addition; the area needs extensive plant surveys and the boundary of the addition may need to be refined There are no known mineral deposits. There is opportunity to locate a joint Botanical area at this site with the Bureau of Land Management.

Waldo Ridge - High Priority

Waldo Ridge Addition - Low Priority

PROPOSED PRIORITY CLASS C

Areas with lower priority.

16 *Cleopatra.* This area contains the only known site in Oregon for a undescribed *Arabis* formerly thought to be *Arabis macdonaldiana.* A population of *A. macdonaldiana* located on Red Mountain in Mendocino County, California is listed as endangered by the Federal Government (USDI Fish and Wildlife Service). The Siskiyou population of *Arabis* nov./in ed. ("macdonaldiana") is considered sensitive. Intensive plant survey work is needed to establish a range for our "*macdonaldiana*" and to ascertain the extent of other rare plant values. Boundaries will need to be better defined. There are no known deposits of nickel laterites; mercury prospects are present.

17. *Green Knob.* Plant species of this area have been extensively inventoried; some sensitive species are present. The area is also a cultural site. This site is presently designated as Protect Rare Plants and Protect Cultural Sites in the TRI system. This is probably adequate for protection of the site's rare plant values.

18. *Windy Collier.* This site contains a very interesting assemblage of intermixed bog and dry sites in serpentine habitat. Extensive plant inventory is needed. Chromite prospects have occurred, but no other mineral values are known.

19 *Squaw Mountain.* This area in the vicinity of Serpentine Lookout on the Galice and Illinois Valley Ranger Districts has not been intensively surveyed. A few sensitive plants are known; undoubtedly others will be added to the list. The area contains both metavolcanic and ultramafic rock types

OLD-GROWTH BOTANICAL AREAS

These five areas are deemed relatively equal in value and are not ranked by priority.

PROPOSED

1. *Big Tree.* This old-growth site contains the world's largest Port-Orford-cedar. The area is located along the South Fork of the Coquille River, south of Elk Creek. A trail winds through the grove and a nearby picnic area Recreation and educational potential is good. This area was listed as a Supplemental Resource area in the DEIS.

2 *Lobster Grove.* This is an old growth grove, mostly large Douglas-fir, near the mouth of Lobster Creek. The site is close to the Rogue River; access could be easily provided to the public Visitor use of nearby areas is very high. This site has high potential for recreation and environmental education. The site has some visual restrictions. An 89 acre site to the south was added to the area between the draft and final plans, in response to public comment; this area contains a recreation trail which winds through a grove of very large Douglas-fir, tanoak, and other species.

3. *Page Mountain Grove.* This is an old growth grove of large Douglas-fir and Port-Orford-cedar in the southeastern portion of the Illinois Valley Ranger District. The grove is along the Happy Camp Road near the divide between the Siskiyou and Klamath National Forests. The area is quite accessible to the public and has high potential for recreation and environmental education use. Part of the site (not the Addition) is within a 300 acre MMR site for pileated woodpeckers, (Management Area 8, Designated Wildlife Habitat, see the Forest Plan).

4 *Redwood Groves.* This proposed Botanical area was created between the draft and final plans, in response to public comments. The area contains a number of separate stands, which represent some of the best remaining old-growth redwood forest on the Siskiyou (and in Oregon). Several stands are near the existing Wheeler Creek RNA.

5. *Snaketooth Redwood* This 21 acre site is the northern-most coastal redwood grove. Half of the original 40 acre site was harvested in the early 1960's. It is located on the Chetco Ranger District, in the Little Redwood Creek drainage.

RESEARCH NATURAL AREAS

EXISTING

1. *Coquille River Falls.* The Coquille River Falls RNA contains two plant communities (cells) not represented in other RNA's: (a) mixed forest of Douglas-fir, tanoak, and Port-Orford-cedar; and (b) red alder/swordfern

2. *Port Orford Cedar.* The Port Orford Cedar RNA contains six plant communities (cells) not represented in other RNA's: (a) mixed stand of grand fir, bigleaf maple, and western hemlock, with understory dominated by swordfern; (b) open vegetational mosaic on serpentine ridge with stunted Douglas-fir, canyon live oak, and coffeeberry; (c) swale dominated by red alder and slough sedge (*Carex obnuta*); (d) swale dominated by Oregon ash and slough sedge (*Carex obnuta*); (e) mixed-forest stand located on serpentine and dominated by Douglas-fir, with minor amounts of Port-Orford-cedar and Pacific madrone in the overstory, and tanoak and beargrass in the understory; and (f) mixed upland forest dominated by Douglas-fir, Port-Orford-cedar, and western hemlock, with understory of tanoak and swordfern.

3 *Wheeler Creek.* The Wheeler Creek Research Natural Area was established to preserve (a) a redwood stand near the northern limit of its range. Two additional cells in this RNA are: (b) forested riparian zone with a major hardwood component of bigleaf and vine maple, and abundant herbaceous cover; and (c) mesic forest with understory of tanoak, Evergreen huckleberry, and Pacific rhododendron.

PROPOSED

Forest ecologists have identified four sites on the Forest suitable for establishment of new RNA's They are listed by priority order.

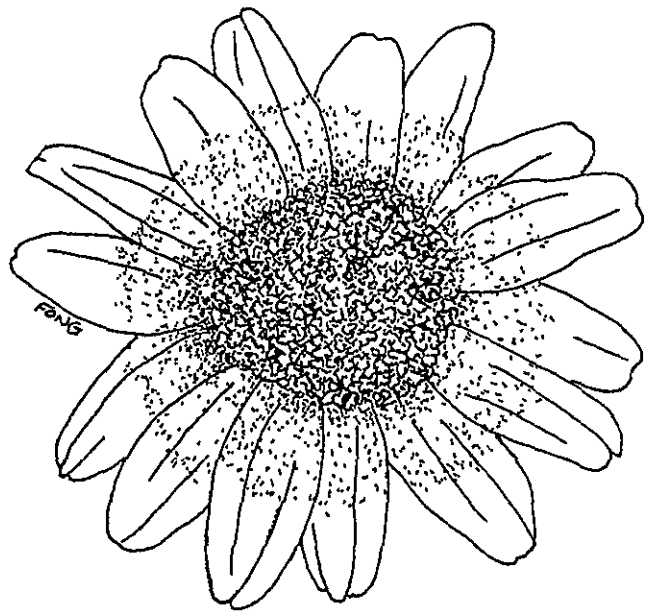
1 *Lemmingsworth Gulch.* Lemmingsworth Gulch (Chetco Ranger District) contains eight cells: (a) mixed-evergreen forest (Douglas-fir and evergreen hardwoods--minor component), (b) tanoak/madrone forest, (c) knobcone pine, (d) Jeffrey pine/grass on serpentine at high elevation, (e) serpentine vegetation matrix and normal soil island with good representation of contacts, (f) stream drainage in serpentine at mid- to high-elevation, and (g) mountain bog in serpentine area with *Darlingtonia* This site also contains a variety of sensitive and rare plant species

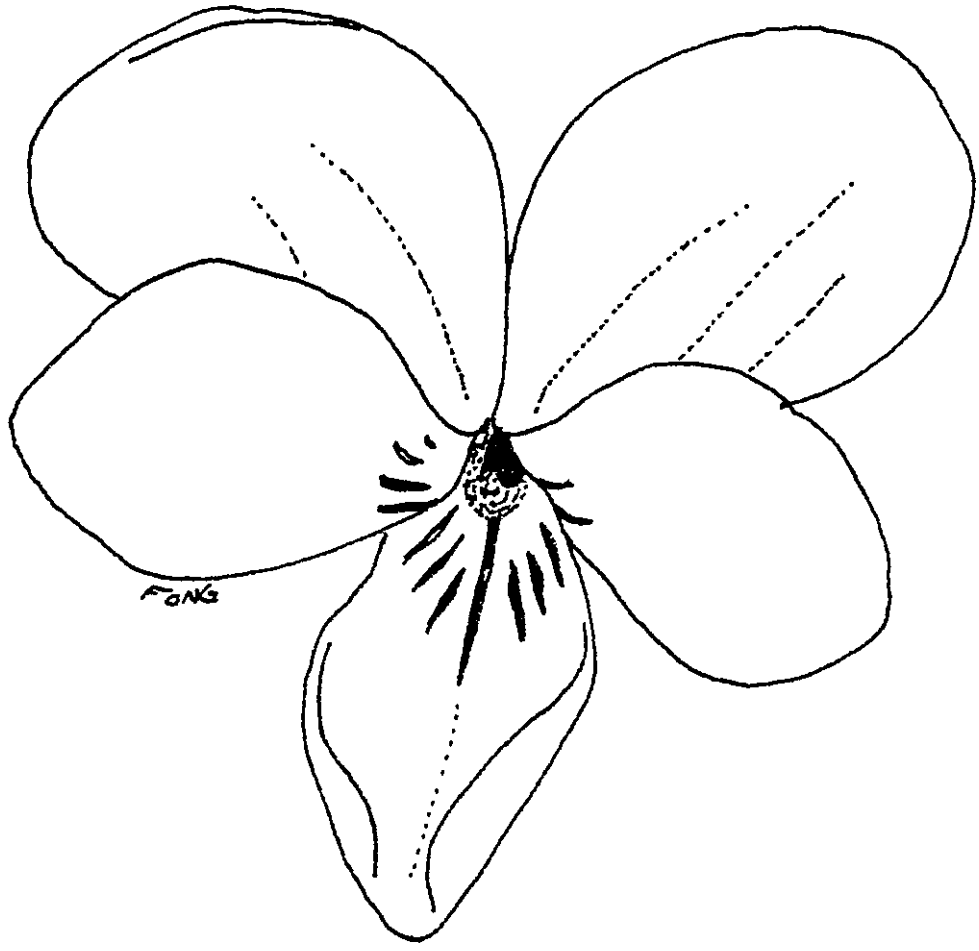
2. *Hoover Gulch.* Hoover Gulch (Illinois Valley Ranger District) contains three plant communities (cells) not represented in other existing or proposed Research Natural Areas. (a) canyon live oak, (b) mixed evergreen forest (Douglas-fir and evergreen hardwoods), and (c) a major drainage in mixed-evergreen forest These plant communities are common in southwest Oregon and northwest California, but suitable

locations for RNA's are not. The lower portion of the area is within the Wild and Scenic Illinois River corridor This site is also part of a spotted owl habitat area (SOHA) (see Management Area 8, Forest Plan). There are no existing mining claims in the area.

3. *Cedar Log Flat.* Cedar Log Flat (Galice Ranger District) contains an important plant community not represented in other existing or proposed Research Natural Areas: Jeffrey pine-grass at low elevation This is an uncommon plant community. There are no other sites available to represent this plant community in the RNA system. This site has not been grazed. In 1984 Dennis Vroman (Galice Ranger District) discovered six sensitive plant species at the site, most of which are otherwise confined to the Illinois Valley area.

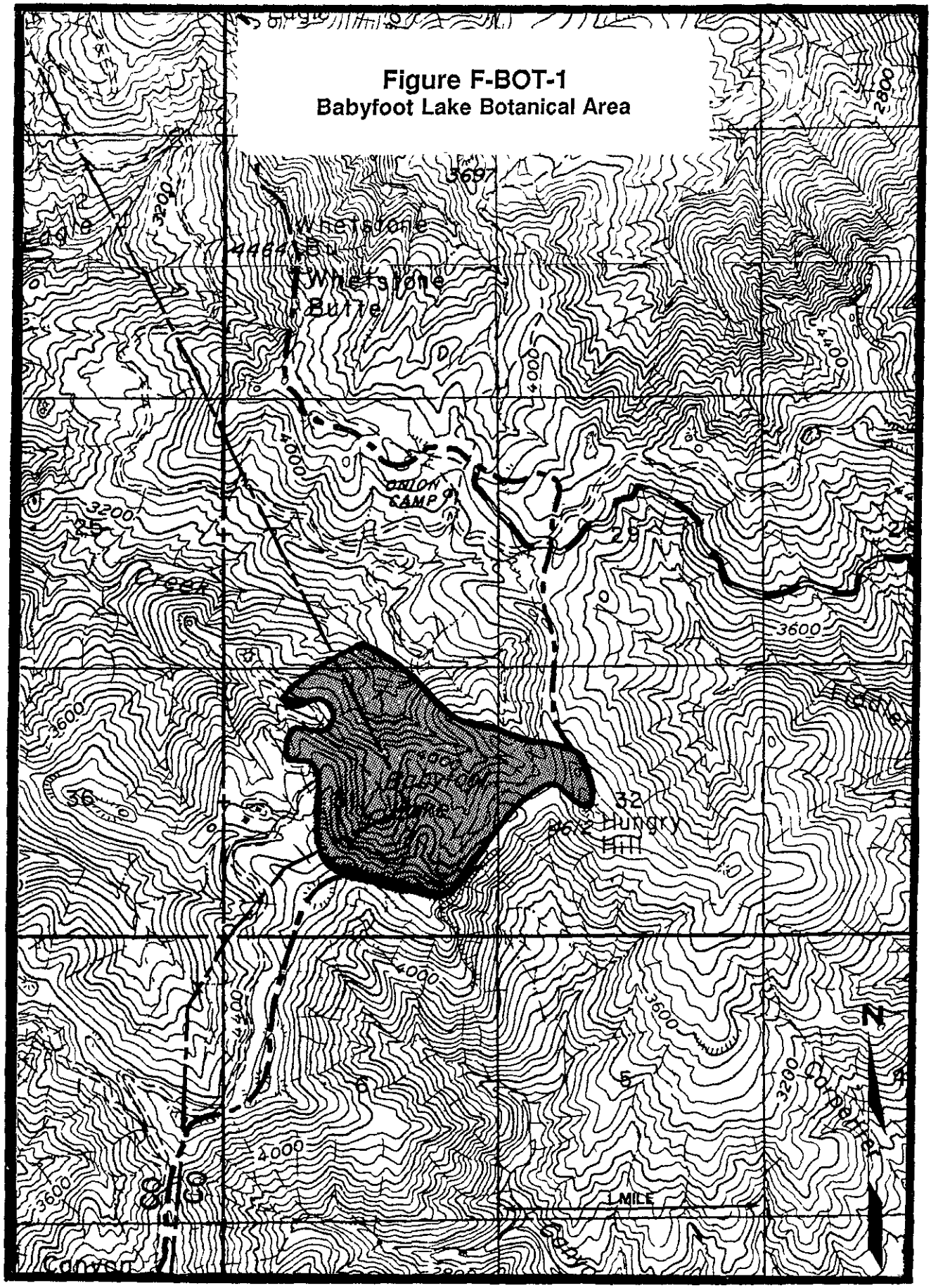
4. *Craggy Peak.* The Craggy Peak site (Illinois Valley Ranger District) contains six cells: (a) vernal pond at mid- to high-elevation, (b) cold springs, (c) Shasta red fir - white fir forest, (d) Brewer spruce showing maximum development, (e) Baker cypress in the eastern Siskiyou Mountains, and (f) mountain herblands at high elevation. The largest portion of the proposed Craggy Peak RNA is located on the Rogue River National Forest (the portion on the Rogue River is called Oliver Matthews RNA). Cells b and f are on the Siskiyou portion of area; the cold springs cell is especially important.




FONG

NARRATIVES
SENSITIVE PLANT BOTANICAL AREAS




Figure F-BOT-1
Babyfoot Lake Botanical Area
Whetstone Butte
3697
4464
UNION CAMP
Hungry Hill
3612
Babyfoot Lake
Eagle
Canyon
Cottonwood
1 MILE
N

SENSITIVE PLANT BOTANICAL AREAS - EXISTING

BABYFOOT LAKE - F-BOT-1

The Babyfoot Unusual Interest Area (Botanical) (352 total acres, of which 144 are in the Kalmiopsis Wilderness) was established in 1963 to protect Brewer spruce and other rare plant species (Figure F-BOT-1) Sensitive plant species are listed in Table F-BOT-1. An application for mineral withdrawal has been submitted to the Bureau of Land Management (BLM) (for lands outside the wilderness). The area was established by authority of the Chief of the Forest Service and represents a permanent land allocation not subject to review in this Forest Plan.

The following information is excerpted from the Establishment Report for Babyfoot Lake Botanical area (on file at the Supervisor's Office):

Topographic features quite effectively isolate this area. Babyfoot Lake lies in a spectacular glacial cirque at the head of Babyfoot Creek, a tributary of the Chetco River. Slopes throughout the area are precipitous except for the floor of the cirque surrounding the lake. The rock structure is very complex, mostly of a metavolcanic type formed by metamorphosis of tuffs and lava flows.

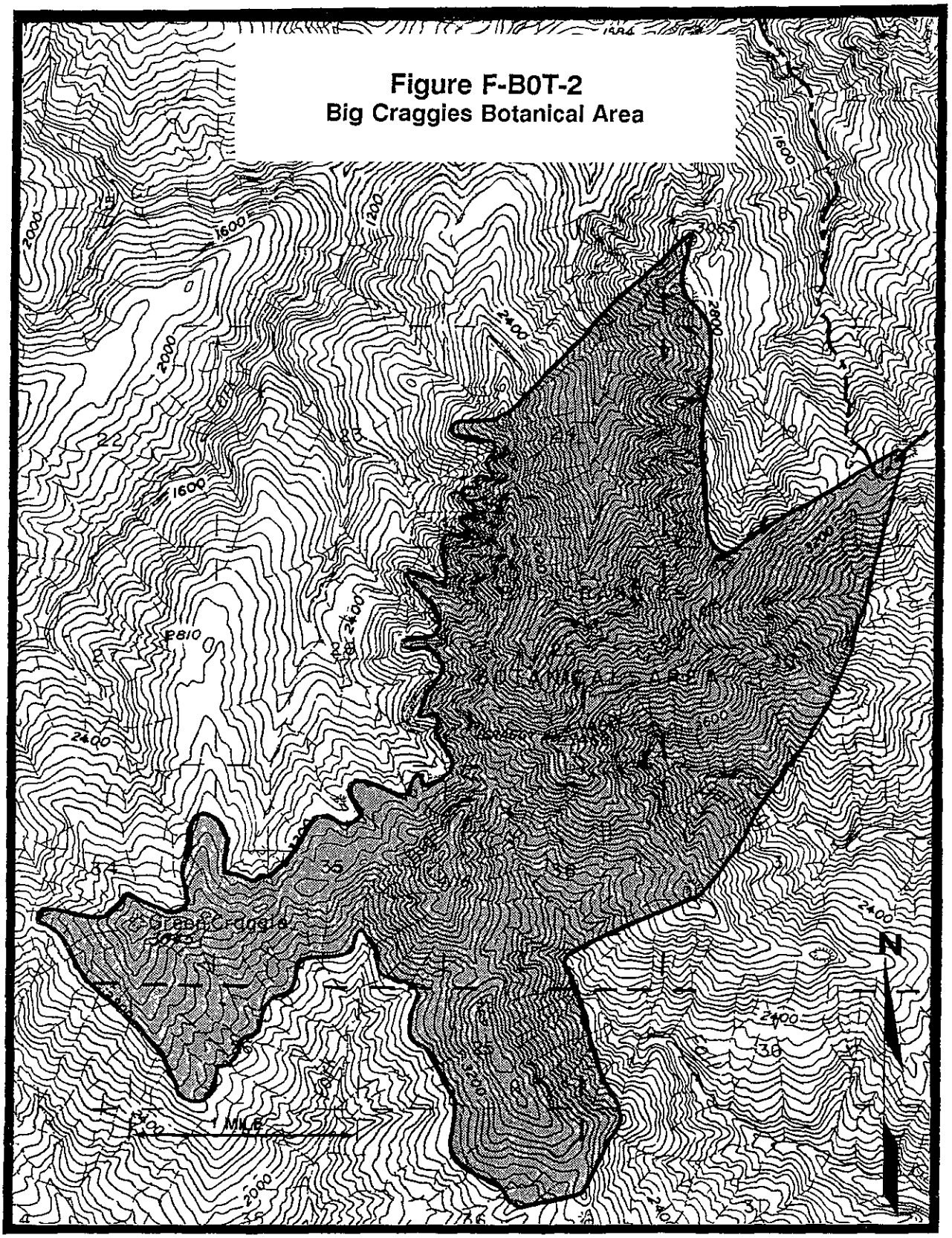
Diorite, greenstone, and layered tuffs predominate. Some serpentine is present. The vegetative cover is typical of the semi-alpine portions of the Siskiyou mountains except that the area being established contains the largest stand of Brewer spruce known on the Siskiyou Forest. On the cirque floor near the lake the Brewer spruce specimens are large, tall, and well formed. From the vicinity of the lake they grade down to alpine forms near the ridgetop. The spruce grows in association with Douglas-fir, Shasta red fir, sugar pine, Port-Orford-cedar, and incense-cedar.

Shrub species include Sadler oak, squaw-carpet, creeping juniper, prostrate ceanothus, and tanoak.

Table F-BOT-1. Unusual Plants in the Babyfoot Lake Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Calochortus howellii	Howell's mariposa Lily
Fritillaria glauca	Siskiyou fritillaria
Lewisia cotyledon ssp. *purdyi*	Purdy's lewisia
Lewisia oppositifolia	opposite-leaved lewisia
Lupinus tracyi	Tracy's desert parsley
Watch/Review Species	
Erigeron cervinus 1/	deer erigeron
Sedum laxum ssp. *heckneri* 1/	lax stonecrop

1/ Potential candidate for Regional Forester's sensitive list.


Figure F-B0T-2
Big Craggies Botanical Area
1600
2000
2400
2800
PBIO
Green Craggie
MILE
N

BIG CRAGGIES - F-BOT-2

The Big Craggies Botanical Area (3,803 total acres, of which 2,944 are in the Kalmiopsis Wilderness) was established in 1964 primarily to protect Brewer spruce and *Kalmiopsis leachiana* (Figure F-BOT-2). Sensitive plant species are present (Table F-BOT-2). An application for mineral withdrawal has been submitted to the Bureau of Land Management (for lands outside the wilderness). The area was established by authority of the Chief of the Forest Service and represents a permanent land allocation not subject to review in this Forest Plan.

The following information is excerpted from the Establishment Report for the Big Craggies Botanical Area (on file at the Supervisor's Office):

Big Craggies Mountain includes perhaps the roughest terrain on the Siskiyou National Forest. The highest elevation on the mountain is 4,621 feet. Slopes on the south side of the mountain are extremely steep. Slopes on the north side are precipitous and composed mostly of series of cliffs with slides and talus intervening. The primary formation is peridotite (a basic magma rock) with areas modified or metamorphosed to serpentine. Very little soil has accumulated on the mountain.

Ground cover on the ridge tops and south slopes is composed mostly of shrubby species.

There is little or no ground cover on the north slopes above the bottom of the cliff and slide area. Some pockets of old-growth Douglas-fir are found below the cliffs and slides. Brewer spruce was found growing abundantly in the heads of the glacial basins to the very summit. Some western white pine and an occasional western yew were also growing near the summit.

The entire Big Craggies Botanical Area is extremely interesting botanically. The following list is from the Establishment Report.

Scientific Name	Common Name
Tree species found in the area include:	
Picea breweriana	Brewer or weeping spruce
Pinus monticola	western white pine
Pinus jeffreyi	Jeffrey pine
Taxus brevifolia	western yew
Pseudotsuga menziesii (stunted growth forms)	Douglas-fir
Pinus attenuata	knobcone pine

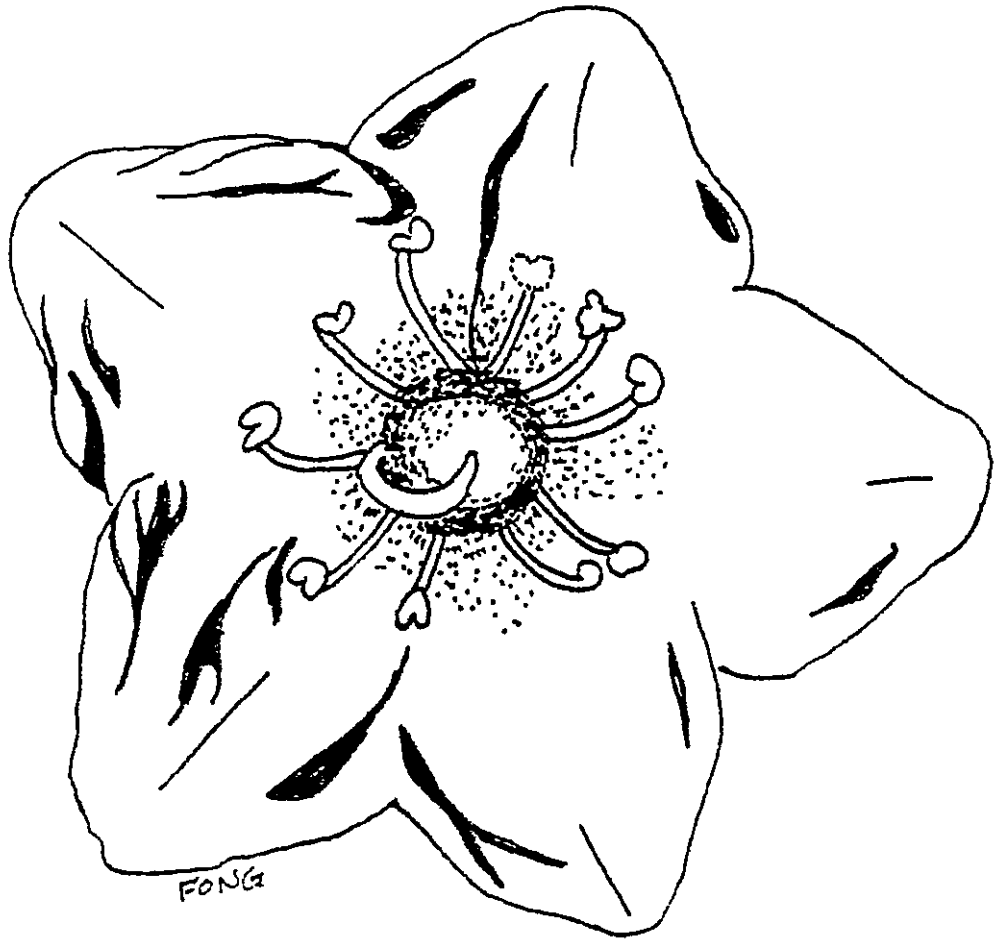
Species list (Cont'd)

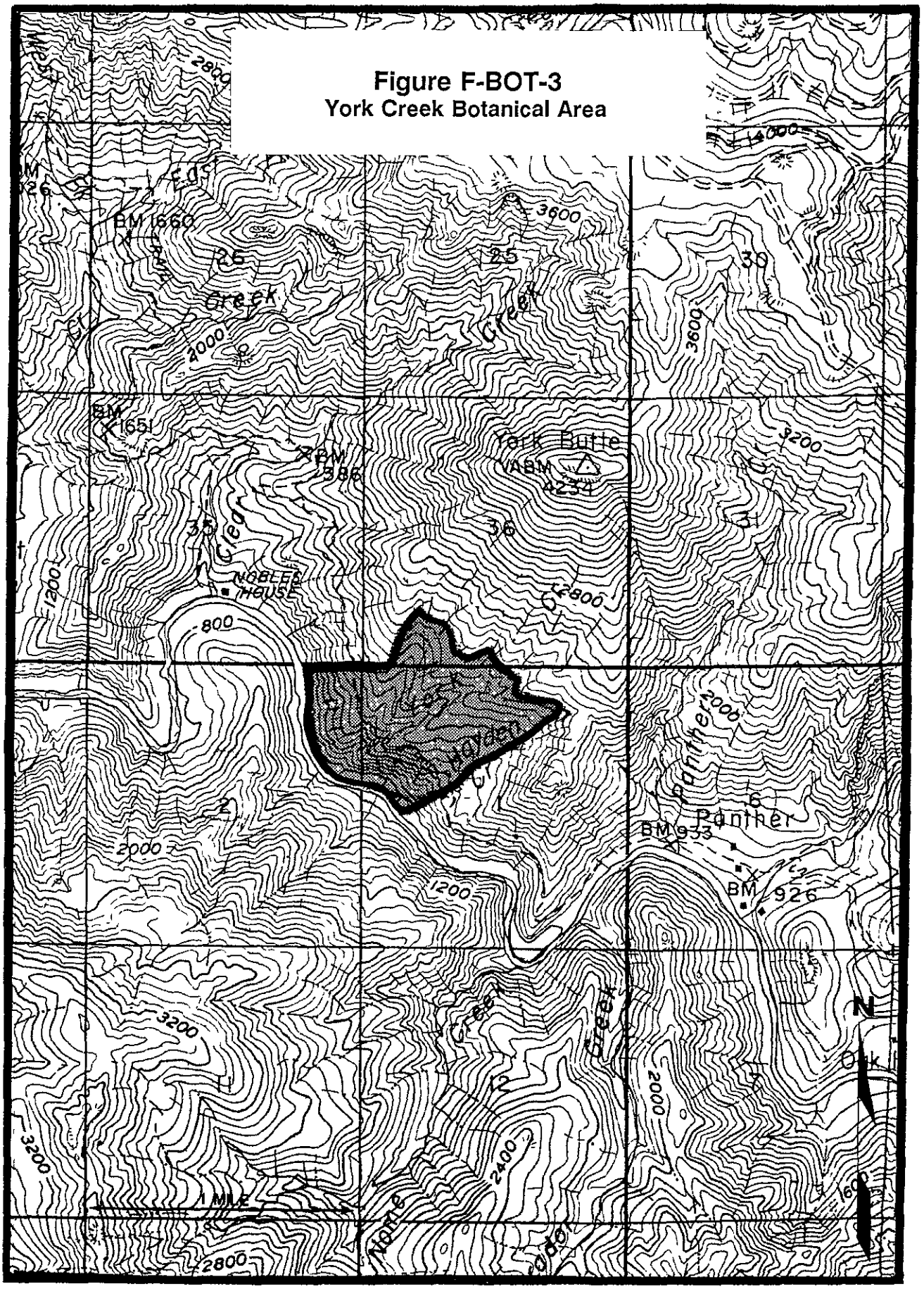
Scientific Name	Common Name
Shrub species include:	
Rhododendron californicum	rhododendron
Rhododendron occidentale	western azalea
Quercus sadleriana	Sadler oak
Quercus vaccinifolia	huckleberry oak
Garrya fremontii	silktassel bush
Kalmiopsis leachiana	kalmiopsis
Quercus chrysolepis	canyon live oak
Manzanita spp.	
Juniperus sibirica	creeping juniper
Ceanothus prostratus	prostrate ceanothus
Holidiscus spp.	oceanspray
Vaccinium ovatum	evergreen huckleberry
Ceanothus velutinus	varnish-leaf ceanothus
Herbaceous species of special interest include:	
Penstemon rupicola	rock penstemon
Lewisia cotyledon	imperial lewisia
Arnica spp.	
Senecio spp.	
Iris spp.	
Xerophyllum tenax	beargrass
Lotus spp.	

Table F-BOT-2. Unusual Plants in the Big Craggies Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Carex scabriuscula	cascade sedge
Fritillaria glauca	Siskiyou fritillaria
Watch/Review Species	
Arctostaphylos hispidula 1/	Howell's manzanita
Kalmiopsis leachiana	kalmiopsis

1/ Potential candidate for Regional Forester's sensitive list.


FONG


Figure F-BOT-3
York Creek Botanical Area
BM 1660
25
Creek
3000
BM 1651
York Butte
ABM 4234
RPM 386
35
36
31
NOBLES HOUSE
800
1200
2800
3600
3200
2000
Panther
BM 933
BM 926
Boundary
2400
1 MILE
N

YORK CREEK - F-BOT-3

The York Creek Botanical Area (320 acres, all in the Kalmiopsis Wilderness) was established in 1963 primarily to protect an extensive patch of *Kalmiopsis leachiana* (Figure F-BOT-3) Sensitive plant species are present (Table F-BOT-3). Because the area is within a wilderness, mineral entry is not permitted. The area was established by authority of the Chief of the Forest Service and represents a permanent land allocation not subject to review in this Forest Plan.

The following information is excerpted from the Establishment Report for York Creek Botanical Area (on file at the Supervisor's Office):

This small patch of *Kalmiopsis* is the most accessible patch of the shrub to be found on the Siskiyou Forest It is located astride the Illinois River Trail. The actual area covered by the plant is approximately .18 acres on a very dry northwest slope above the East Fork of York Creek.

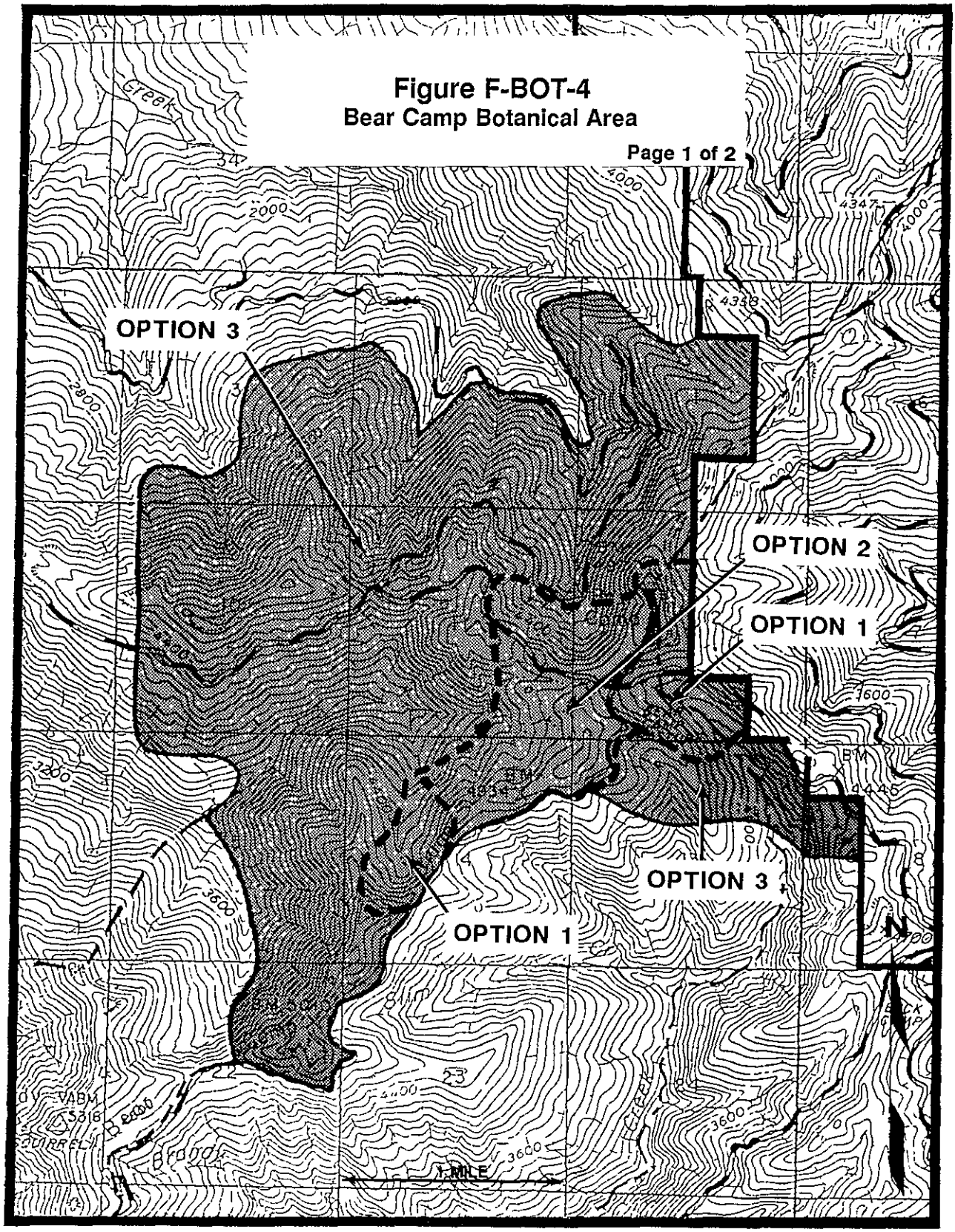
The basic rock formation in this area is peridotite. Large masses of this peridotite have been altered to serpentine throughout the York Creek-York Butte locality The site actually occupied by the plant is in broken but unaltered peridotite.

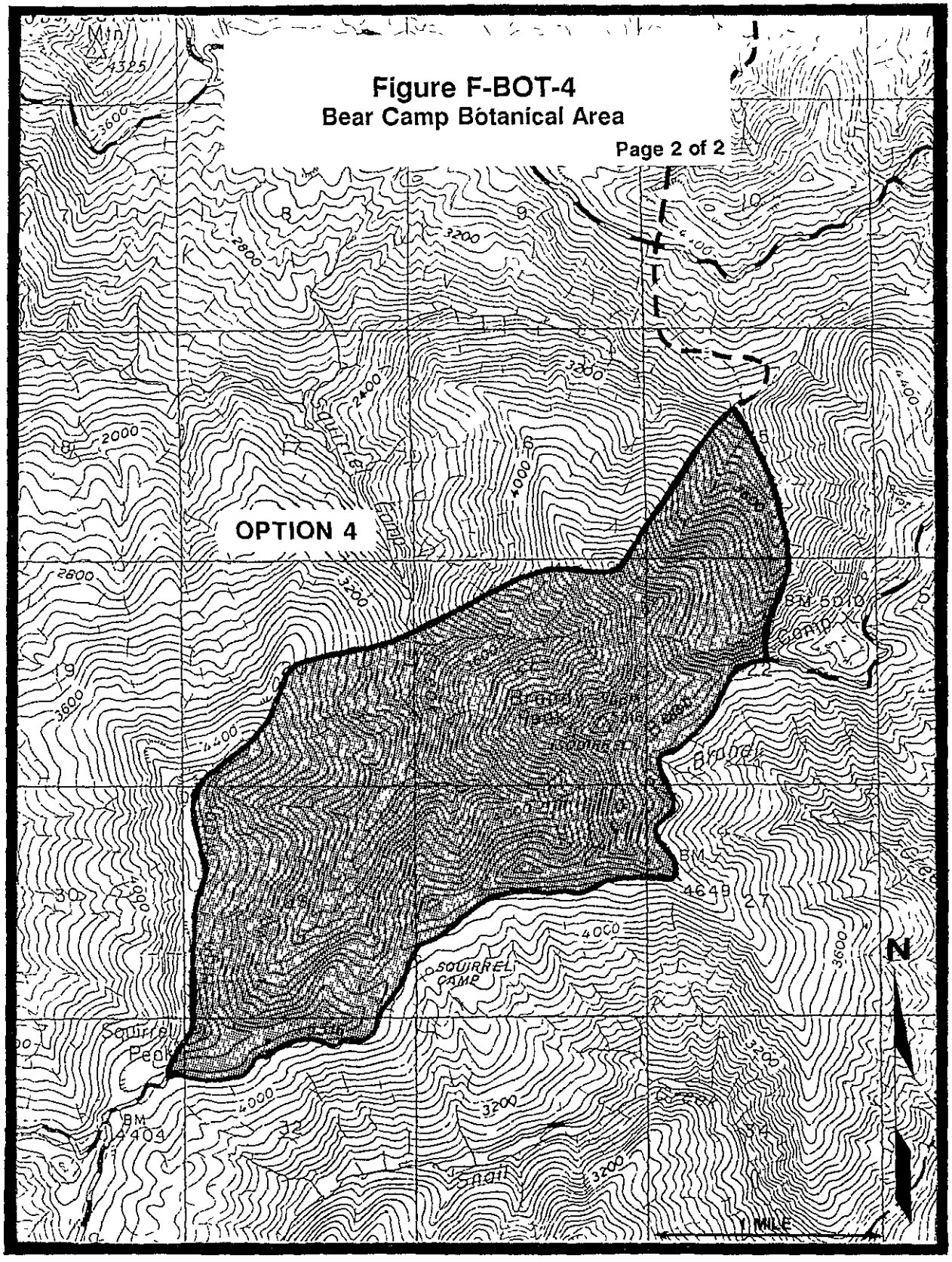
Shrub growth associated with the *Kalmiopsis* in this location includes tanoak (*Lithocarpus densiflorus*), canyon live oak (*Quercus chrysolepis*), and evergreen huckleberry (*Vaccinium ovatum*). There is a sparse overstory of rather stunted Douglas-fir and Jeffrey pine. Some sugar pine occurs in the vicinity.

Table F-BOT-3. Unusual Plants in the York Creek Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Monardella purpurea	Siskiyou monardella
Sophora leachiana ?	western sophora
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Cypripedium californicum 1/	California lady's-slipper
Darlingtonia californica	California pitcher plant
Kalmiopsis leachiana	kalmiopsis

1/ Potential candidate for Regional Forester's sensitive list.


Figure F-BOT-4
Bear Camp Botanical Area
Page 1 of 2
OPTION 3
OPTION 2
OPTION 1
OPTION 3
OPTION 1
N
1 MILE


Figure F-BOT-4
Bear Camp Botanical Area
Page 2 of 2
OPTION 4
Squirrel Camp
BM 5010
Camp X
Barrel
BM 4649
SQUIRREL CAMP
Squirrel Peak
BM 4404
Snail
N
1 MILE

SENSITIVE PLANT BOTANICAL AREAS - PROPOSED

BEAR CAMP - F-BOT-4

The proposed Bear Camp Botanical Area is located on the Galice Ranger District at T 34S , R 10W (approximately 5,927 acres) Elevation range is from approximately 3,500 to 5,000 feet, slopes vary from gentle to steep (Figure F-BOT-4, 2 parts).

The proposed area is mainly a true fir and Doulgas-fir mix with scattered areas of rimrock and other open places, including meadows such as Bear Camp Pasture (T.34S , R.10W., Section 12 SW 1/4) and Elk Wallow (Section 14 NW 1/4). Soils are derived from the Dothan formation and are non-mineral in character (Ramp and Peterson 1979) Many timbered acres contain openings with scattered conifers and moist soils; this is typical habitat for *Bensoniella oregana*, a small, inconspicuous member of the Saxifrage family. *Bensoniella*, a sensitive species, is found only in a few locations, basically above 3,500 feet elevation in the Bear Camp area and west to the Fishhook Peak area, and in the Fairview Meadow area (the type locality). *Bensoniella* populations seem to be associated with cloud/fog banks that blanket the mountain tops at certain times of year (Joan Seevers, Botanist, Bureau of Land Management - personal communication). A few small sites are also known in the vicinity of Snow Camp Peak near Arcata, California. Most of the *Bensoniella* plants in existence occur on the Siskiyou National Forest

Local botanists describe the Bear Camp flora as interesting, diverse, and locally unique (Table F-BOT-4). For example, the Bear Camp area contains a variety of *Ribes* spp. (*bracteosum*, *binominatum*, *cruentum*, *lacustre*, *sanguineum*) and at least 5 species of *Penstemon* (*anguineus*, *cardwellii*, *deustus*, *parvulus*, *rupicola*) in close proximity to one another. The Bear Camp area also contains a few plant species uncommon or otherwise absent in southwest Oregon. Plants in this category are *Stenanthium occidentale*, *Frasera umpquaensis*, *Chamaecyparis nootkatensis* (Alaska yellow-cedar), *Isopyrum hallii*, and *Saxifragia caespitosa*

In a letter to the Forest Service on 14 September 1984, local botanist Veva Stansell described the Bear Camp area.

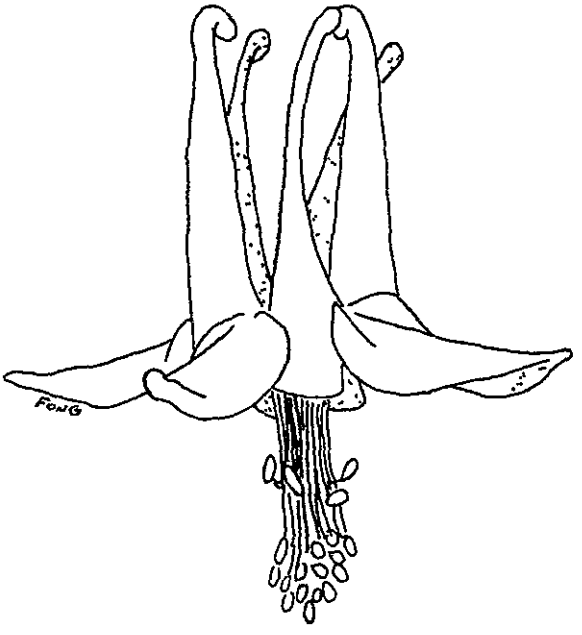
> These ridges and their flanks are locations for an assortment of plant species that includes plants of the Siskiyous, the Coast Range, and the Cascades. For instance, the range of *Isopyrum hallii* (found at Elk Wallow) is supposed to be from Marion County and the Columbia Gorge northward. *Penstemon deustus*, *Frasera umpquaensis* and *Saxifraga caespitosa* are from the Cascades. Five or six species of *Penstemon*, five of *Ribes*, and four species of *Sedum* are found along these ridges. These are unusual concentrations.

About 4,675 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 2,525 thousand board feet (MBF) of harvestable timber on a long-term sustained yield (LTSY) basis (see Table F-3). The Bear Camp area has been divided into four options (Table F-7). This provides flexibility to land managers who must make decisions on land allocations. For further information on the options see Table F-3, Figures F-1 and F-BOT-4 (2 parts).

Options 1 and 2 have been recommended in the Preferred Alternative (S). These options contain the most important botanical elements. The land in Options 3 and 4 will be managed for a variety of resources, including timber production, with populations of sensitive species individually protected.

Table F-BOT-4. Unusual Plants in the Proposed Bear Camp Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Bensoniella oregana	Oregon bensonia
Frasera umpquaensis	Umpqua frasera
Fritillaria glauca	Siskiyou fritillaria
Watch/Review Species	
Lilium vollmeri	Vollmer's lily



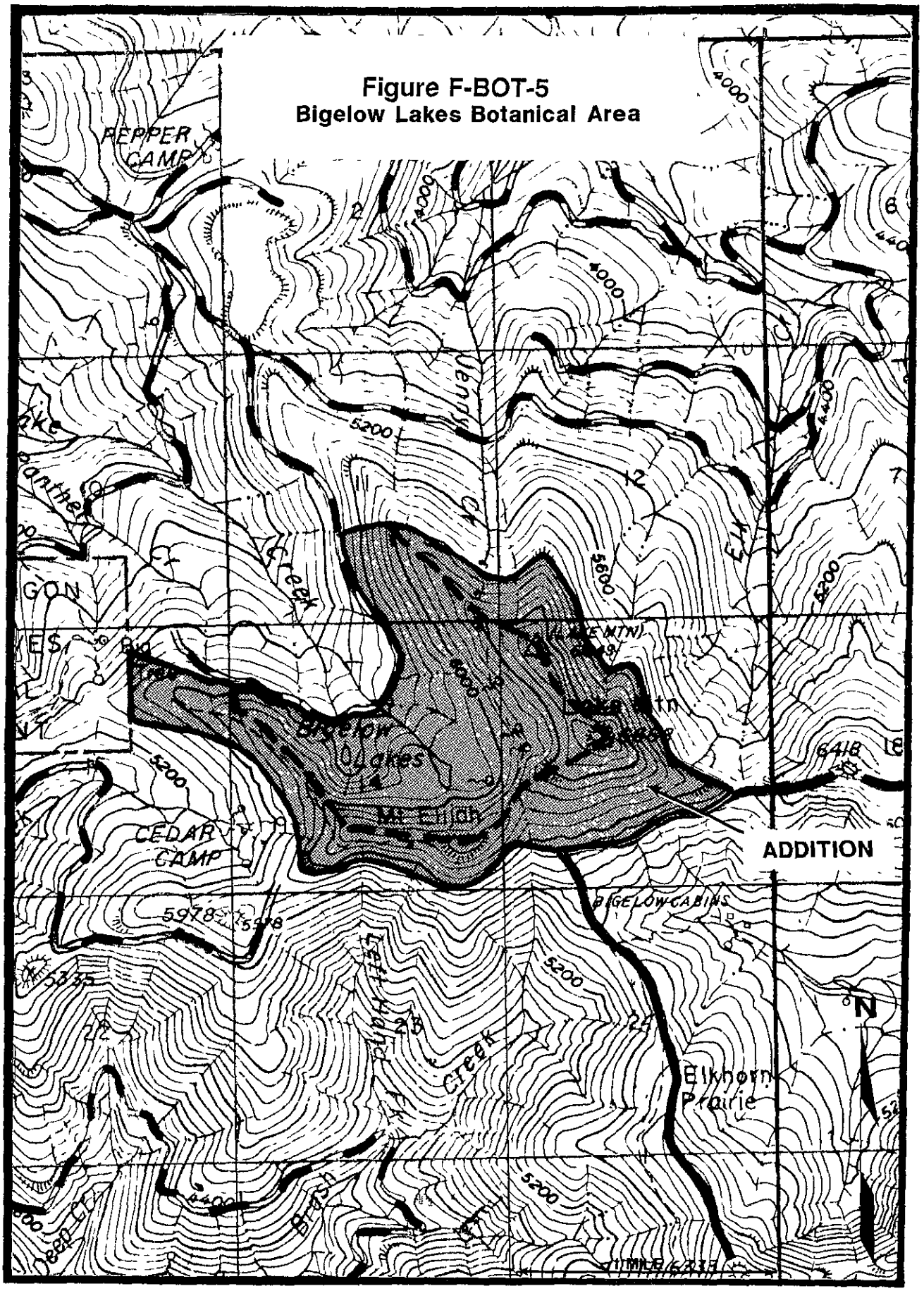


Figure F-BOT-5
Bigelow Lakes Botanical Area

BIGELOW LAKES - F-BOT-5

The proposed Bigelow Lakes Botanical Area is located in a glacial cirque on the Illinois Valley Ranger District, approximately one mile east of Oregon Caves National Monument (T.40S., R.6W., Sections 13, 14) The boundary follows topographic and legal lines (Figure F-BOT-5). The proposed area is approximately 971 acres Elevation range is approximately 5,200 to 6,668 feet Soils are derived from diorites, gabbros, and scattered inclusions of other rock types; no mineral deposits are known (Ramp and Peterson 1979). Mt. Elijah and Lake Mountain are both on the boundary of the proposed area

Local and nonlocal botanists alike extol the unique and diverse plant resources of the Bigelow Lakes vicinity Habitats are so varied and interspersed that a large variety of plant species with different habitat requirements are found growing in close proximity to one another. Habitats vary from dry meadow, wet meadow, moist shrub, dry shrub, and forested areas to rocky areas and cliffs. Local botanist Mary Paetzel cataloged over 100 species of plants in the vicinity of the larger lake. In 1986 Veva Stansell, a botanist from Pistol River, reported large numbers of *Erigonum declinum* in the upper lake area. Genera such as *Penstemon*, *Haplopapus*, and *Epilobium* are well represented; a large variety of trees and shrubs are also present, including a number of manzanita species, mountain and western hemlock, true fir species, incense-cedar, rocky mountain maple, willow species, Sitka alder, and the only known quaking aspen stand (shrub form) on the Forest. The area is one of the few glaciated places in the Siskiyou mountains where cirque lakes are still present. The shallower of the two lakes sometimes dries up during the summer, which makes it botanically interesting.

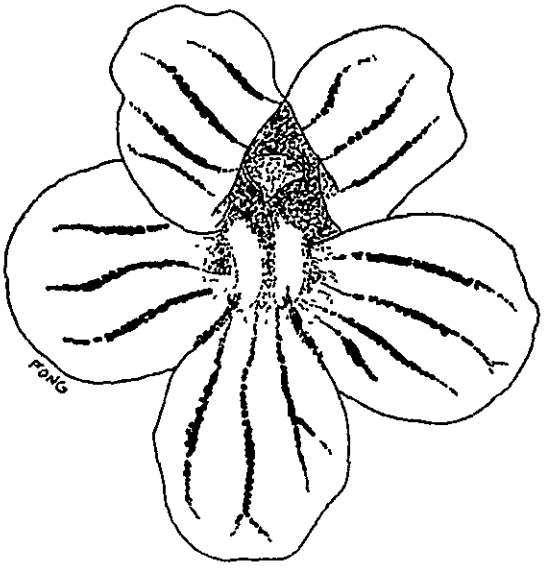
A number of unusual plants are residents of the proposed area (Table F-BOT-5) The concentration and variety of unusual plants is greater here than in any other non-serpentine area on the Forest. Some of the plants, such as *Lilium wigginsii* and *Gentiana setigera* (*pleurisetosa* [sp nova]), are at the northern limit of their range. Other species, such as mountain hemlock and quaking aspen, are at the western edge of their range.

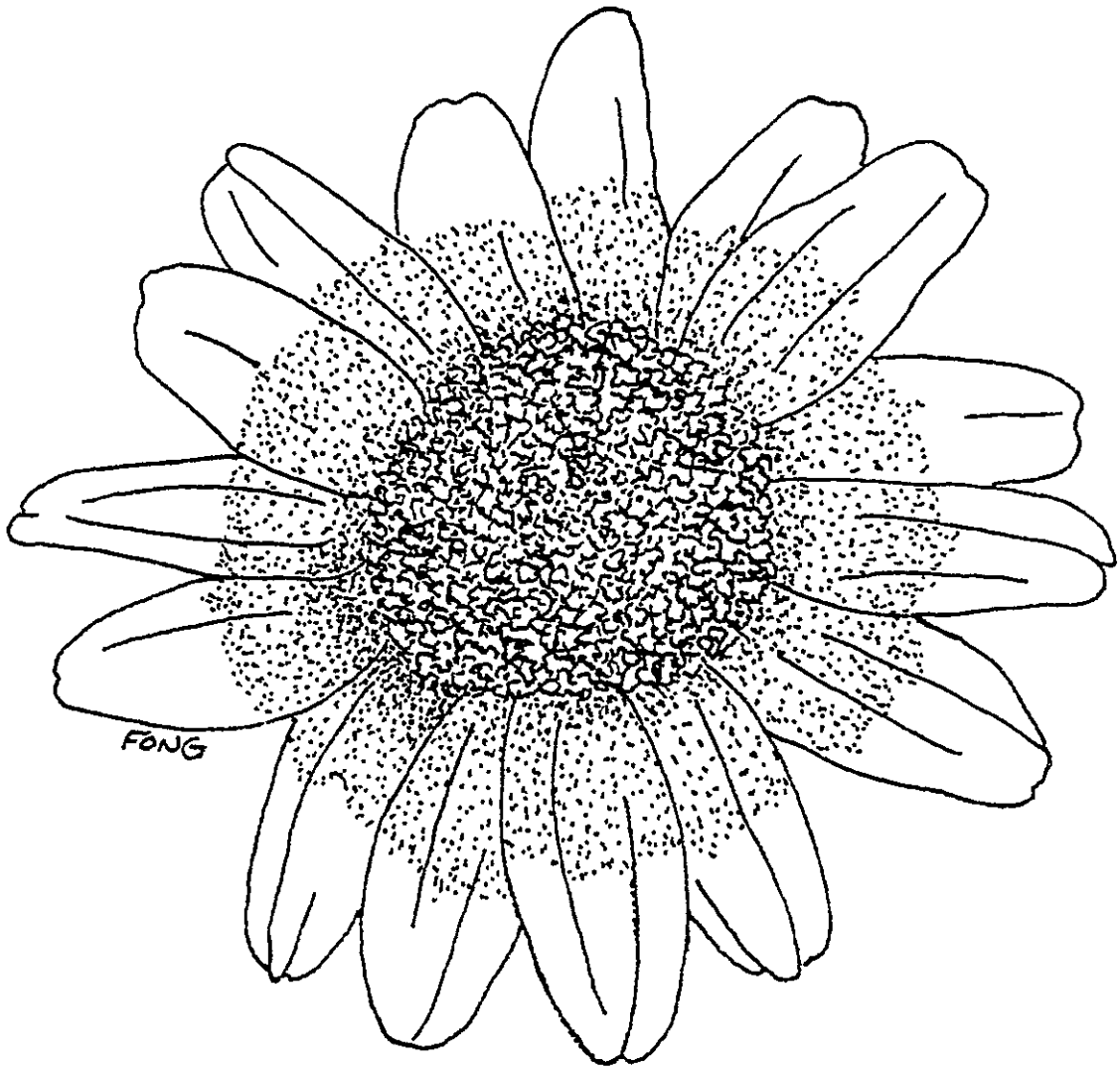
About 296 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of annually producing about 159 thousand board feet (MBF) of harvestable timber on a long-term sustained yield (LTSY) basis (Table F-3). The Bigelow Lakes site has been divided into two sections; this provides flexibility to land managers who must make decisions on land allocations. The main area contains the lakes and their drainage basin. The addition contains surrounding land outside of the primary drainage basin. The main area is recommended in the Preferred Alternative (S); the addition is not. For further information on these options see Figures F-1 and F-BOT-5.

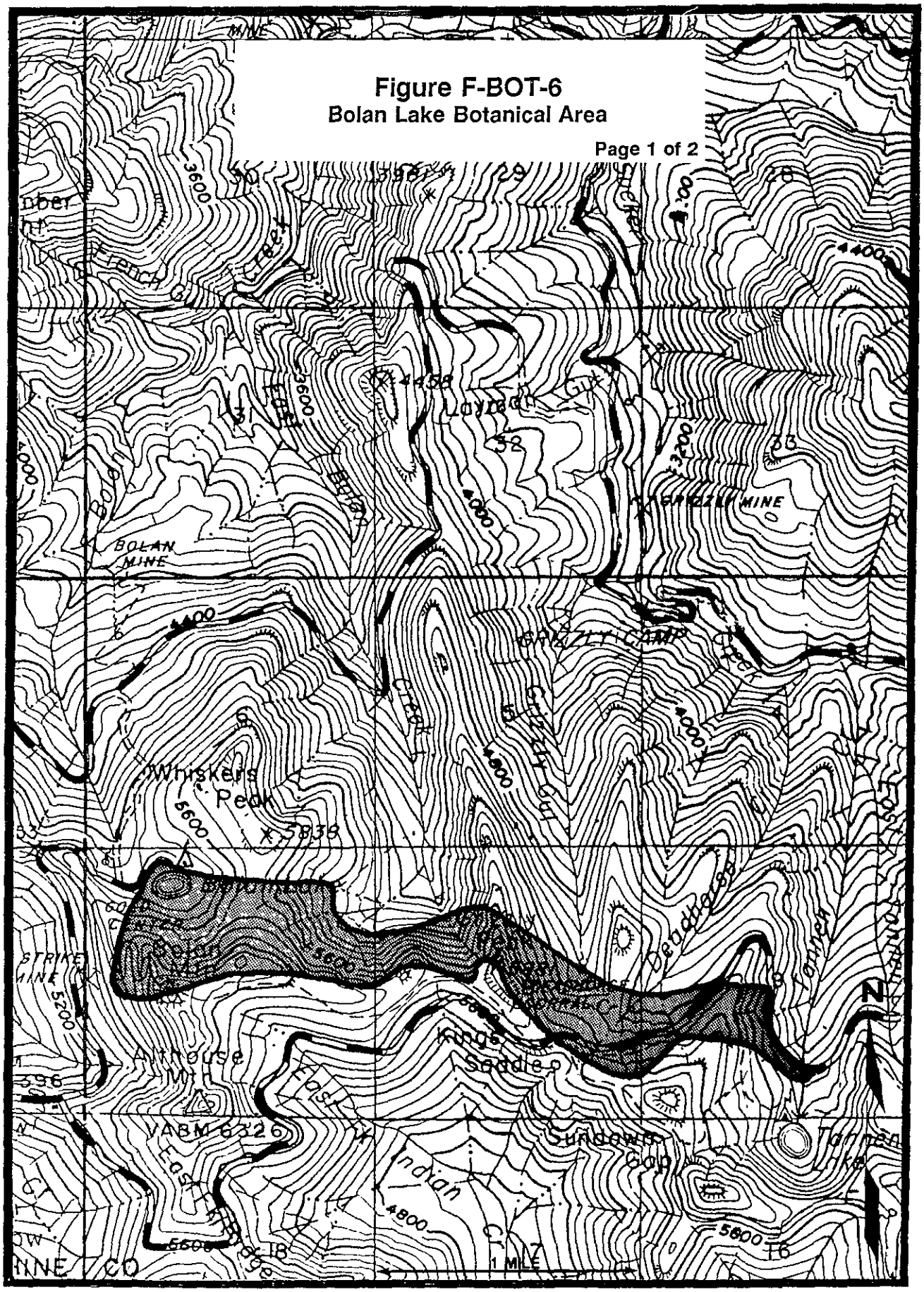
Table F-BOT-5. Unusual Plants in the Proposed Bigelow Lakes Botanical Area

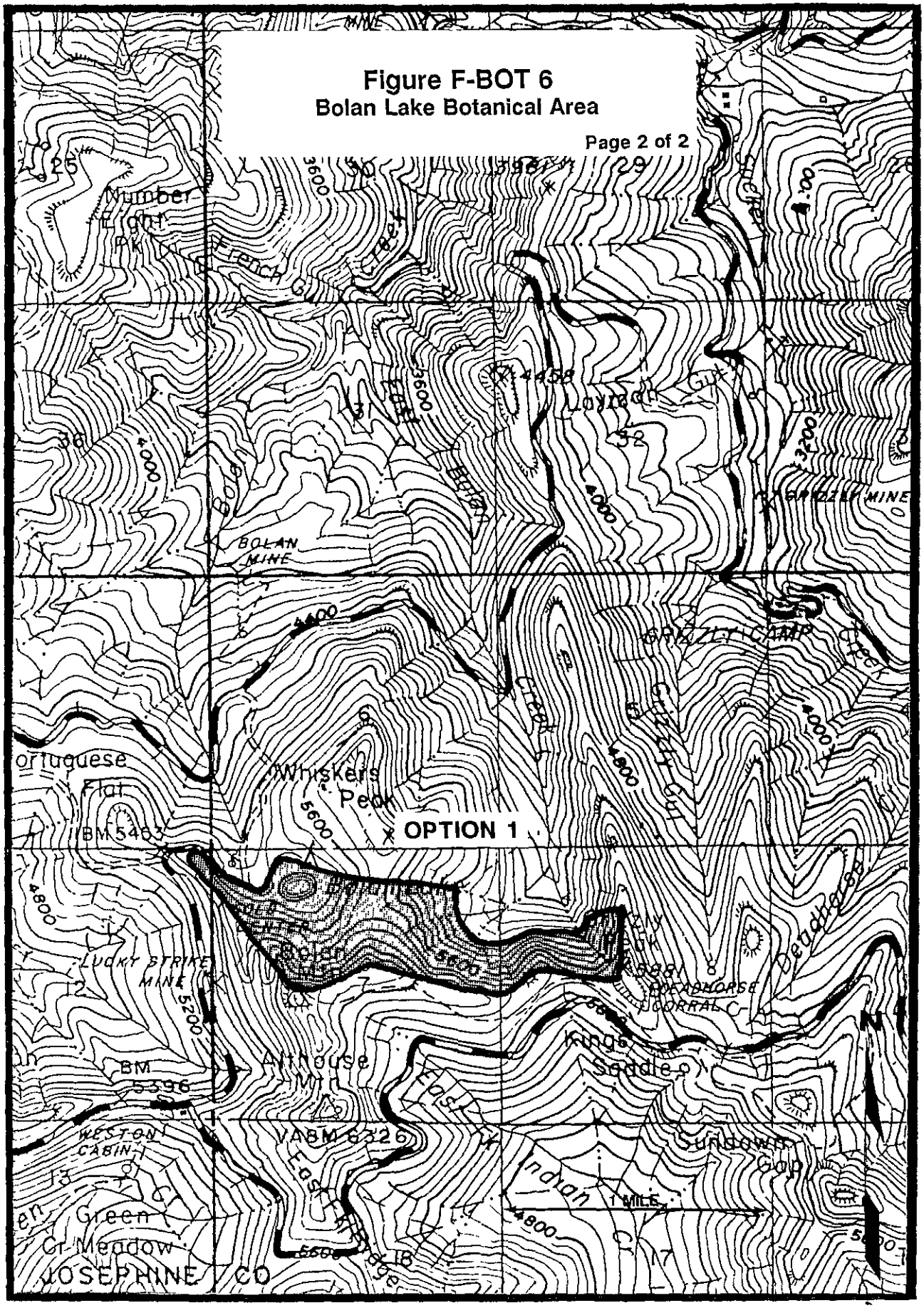
Scientific Name	Common Name
Sensitive Species	
Eriogonum declinum	buckwheat-knotweed
Erythronium howellii	Howell's fawn lily
Gentiana setigera (pleurisetosa [sp nova])	side-bristly gentian
Haplopappus whitneyi ssp. *discoideus*	Whitney's haplopappus
Iliamna latibracteata	broad-bracted globe mallow
Lewisia leana	Lee's lewisia
Monardella purpurea	Siskiyou monardella
Ribes marshallii	Applegate's gooseberry
Watch/Review Species	
Aster brickelliodes	rayless leafy aster
Botrychium simplex	grape fern
Dicentra formosa ssp. *oregana*	Oregon bleeding heart
Eriogonum ternatum 1/	Waldo eriogonum
Lilium vollmeri	Vollmer's lilly
Lilium wigginsii	Wiggin's lily

1/ Potential candidate for Regional Forester's sensitive list




FONG


Figure F-BOT-6
Bolan Lake Botanical Area
Page 1 of 2
Whiskers Peak
X 5838
Althouse Mtn
VABM 6326
Bolan Lake
Kings Saddle
Sundown Mtn
Indian Cr
Deadman Cr
Bolan Mine
Grizzly Camp
Grizzly Mine
Layout Gulch
French Gulch
East Fork
Bolan Cr
Strike Mine
1 MILE
N


Figure F-BOT 6
Bolan Lake Botanical Area
Page 2 of 2
OPTION 1
Number Eight Pk
French Gulch
BOLAN MINE
GRIZZLY CAMP
Whiskers Peak
Portuguese Flat
BM 5463
Lucky Strike Mine
BM 5396
Antelope Mtn
VABM 6326
Kings Saddle
Sundown Gap
Indian
Green Meadow
JOSEPHINE CO
1 MILE

BOLAN LAKE - F-BOT-6

The proposed Bolan Lake Botanical Area is located in the corner of Illinois Valley Ranger District, near the California Border (T.41S., R 6W, Sections 7-9) (Figure F-BOT-6). The proposed area contains approximately 451 acres and is centered on the relatively steep north and west-facing slopes above Bolan Lake and extends east to the Tannen Lakes area. Elevation ranges from 5,000 feet in Grizzly Gulch to 6,269 feet at Bolan Peak Metavolcanic rocks underlay the area At least one abandoned gold mine is located within the area, and recoverable quantities of gold may still be present in the area and nearby vicinity (Ramp and Peterson 1979)

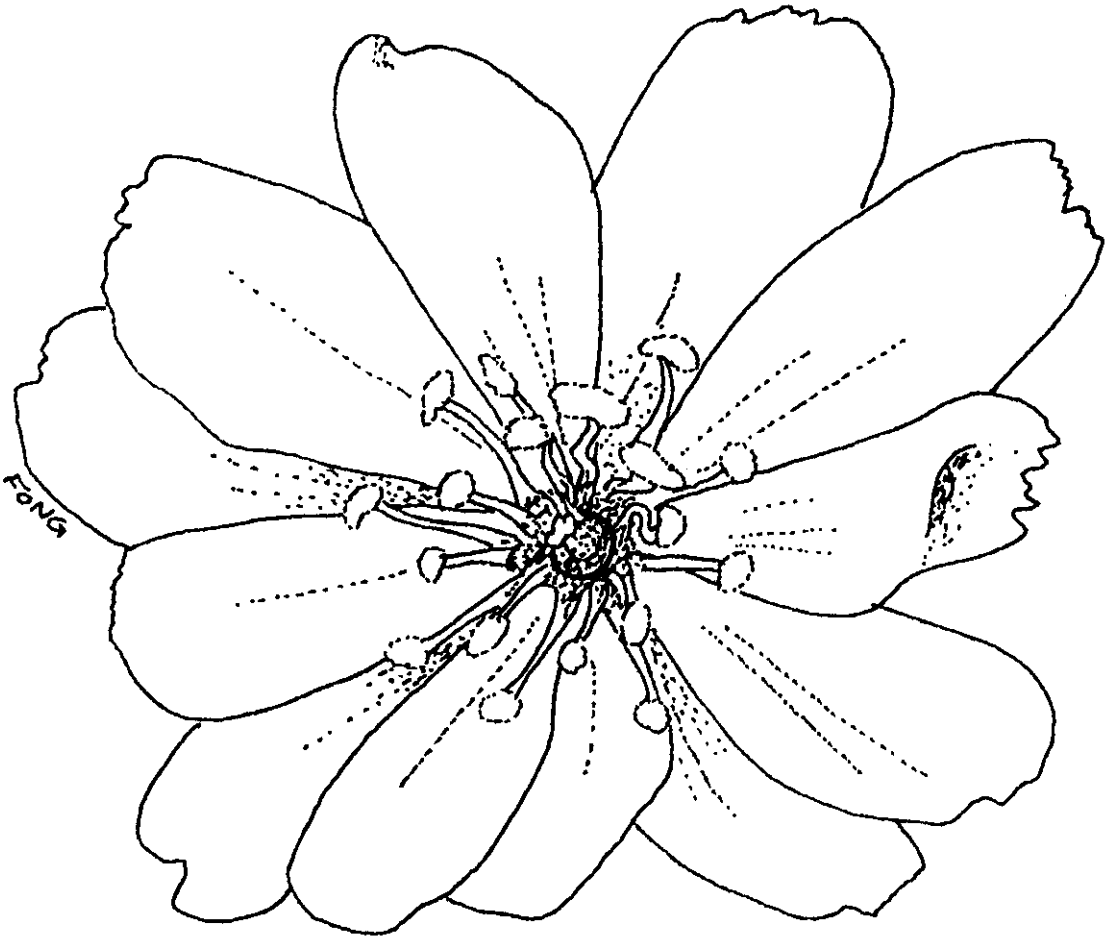
Although intensive general plant inventories of the proposed Bolan Lake Botanical Area are lacking, cliff areas on the north slope are known to contain two species of *Lewisia* (*cotyledon* and *leana*) (Table F-BOT-6). *Lilium wigginsii*, a yellow "tiger lily," occurs in the proposed area near the shore of Bolan Lake In the summer of 1983, Dave Maercklein of the Klamath National Forest conducted an extensive search of the Bolan/Tannen Lakes area for *Pedicularis howellii* (a sensitive species); he found thousands of individual plants in and around the proposed Botanical area (report on file at the Supervisor's office) The Klamath and Siskiyou National Forests are developing a management plan for this species.

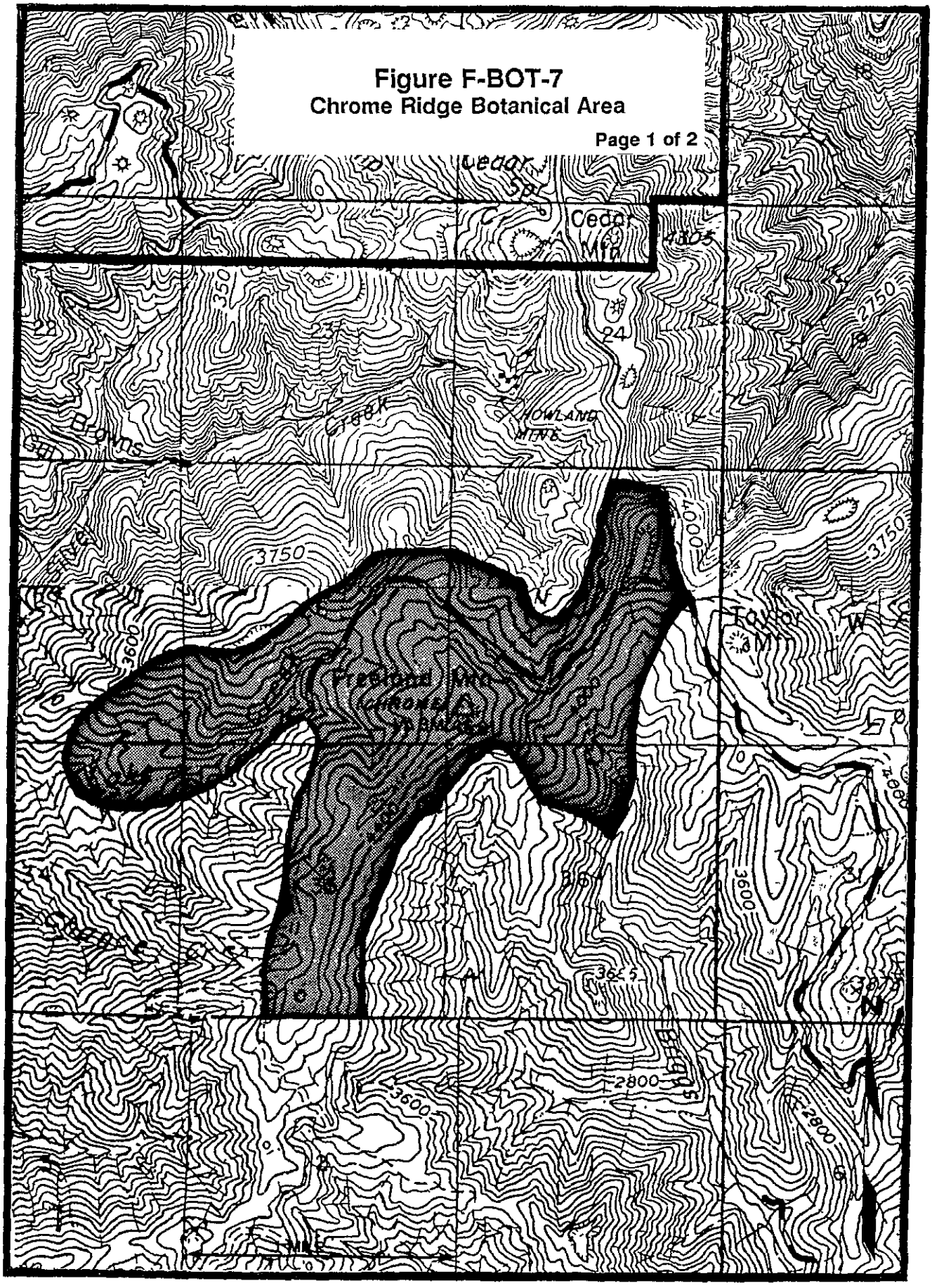
About 124 acres in this proposed Botanical area are tentatively available and suitable for timber production, capable of producing about 67 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3)

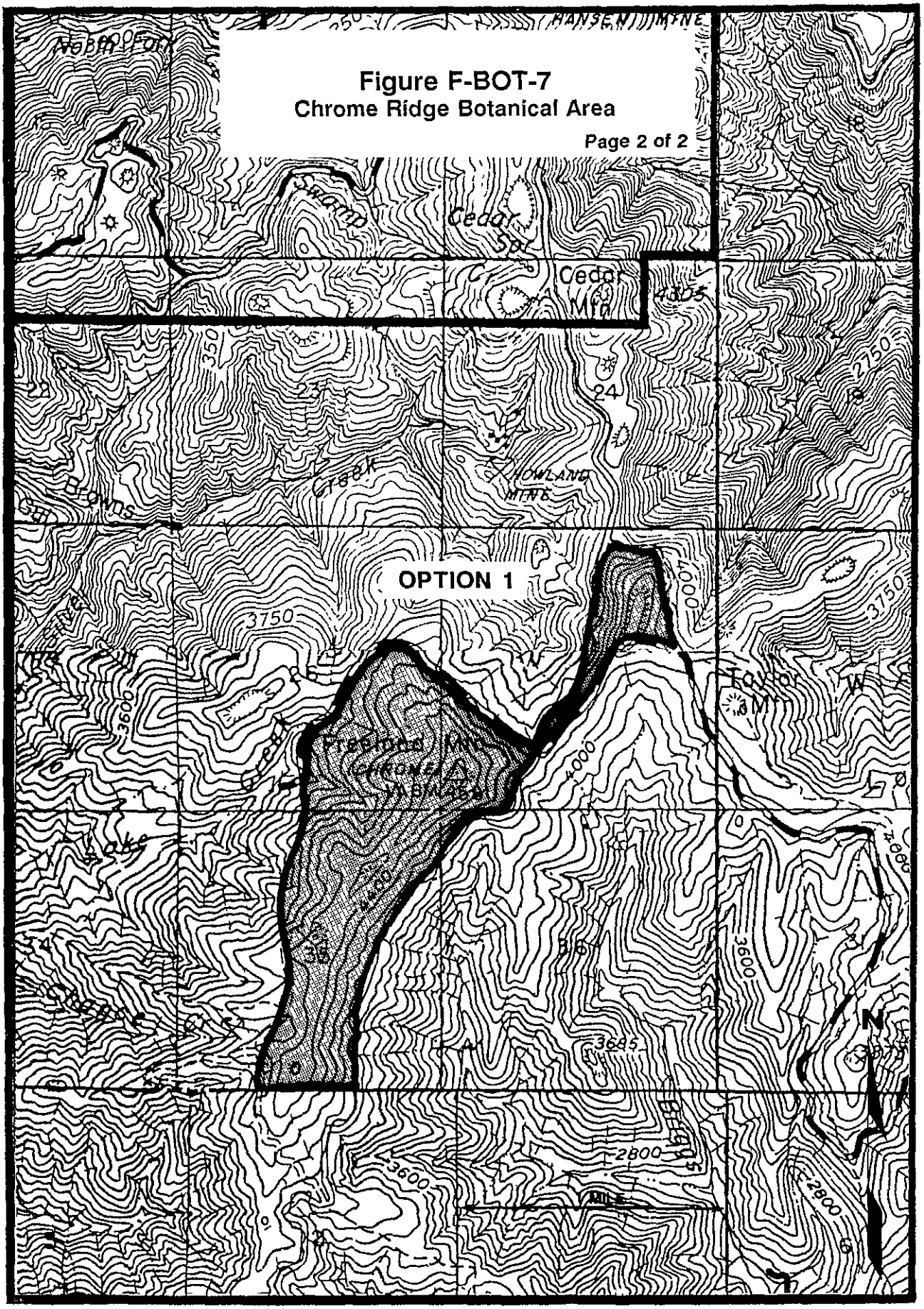
In the Preferred Alternative (S) slightly more than half of the area proposed in the DEIS is recommended, plus a small additional piece west of Bolan Lake (Figure F-BOT-6, Page 2 of 2). The boundary adjustments better reflect the distribution of important botanical resources, primarily *Pedicularis howellii*. This species is endemic to the Siskiyou Mountains in a narrow range along the Oregon and California border Some populations are in areas where timber harvesting and road building may take place. An important component of the pending management plan for *Pedicularis howellii* will be the protection of some major Oregon populations including those in the vicinity of Bolan Lake.

Table F-BOT-6. Unusual Plants in the Proposed Bolan Lake Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Lewisia leana	Lee's lewisia
Pedicularis howellii	Howell's lousewort
Ribes marshallii	Applegate's gooseberry
Watch/Review Species	
Lewisia cotyledon ssp. *howellii*	Howell's lewisia
Lilium wigginsii	Wiggin's lily
Saxifraga fragarioides	strawberry saxifrage


FONG


Figure F-BOT-7
Chrome Ridge Botanical Area
Page 1 of 2
Cedar Mtn
4305
Howland Hills
Taylor Mtn
Freshwater Mtn
3750
3600
2800
24
36


Figure F-BOT-7
Chrome Ridge Botanical Area
Page 2 of 2
OPTION 1
Cedar Mtn
Cedar Spr
Taylor Mt
Freedom Mtn
Chrome Ridge Botanical Area
Bluff Creek
Lowland Mine
Hansen Mine
North Fork
Swamp
Lake
Creek
4805
3750
4000
3600
2800
2750

CHROME RIDGE - F-BOT-7

The proposed Chrome Ridge Botanical Area is located on a ridgetop in the Galice Ranger District (T.35S., R 9W , Sections 25, 26, 35) (Figure F-BOT-7). The proposed area contains some 1,014 acres, 60 percent of which is serpentine habitat Brushfields comprise another 20 percent. Elevation range is about 4,000 to 4,580 feet. Freeland Mountain is in the center of the area Much of the area is open serpentine with scattered shrubs and Jeffrey pine, although some forested areas are also included.

Forest Service personnel for years have been aware of the high botanical values of the Chrome Ridge Area and several times have informally proposed the site as a Botanical area Although the proposed Chrome Ridge Botanical Area has not been thoroughly inventoried, a variety of rare plants have been found there by local botanists (Table F-BOT-7) The only patch of *Kalmiopsis leachiana* presently accessible by road is located in the northwest corner of the proposed area A local botanist, Mary Paetzel, has located several sites that contain relatively large numbers of *Lilium bolanderi*. Mary has conducted numerous plant surveys of the area and catalogued well over a 100 plant species (reports are on file at the Supervisor's Office). After a trip to the area in July 1981, she had this to say about the headwaters of Lake Creek

> In the upper levels, at this time of year, the water runs a few hundred feet then goes underground, suddenly reappearing farther down. Through the middle part, where the tree and brush cover is most dense, the water runs continuously, forming pools and small waterfalls where the maidenhair ferns grow among rocks wet with spray. Islands of *Darlingtonia* are dotted all along the streamside, even on the drier upper reaches. They become thicker and taller deeper into the canyon. Snow-plant and Bolander's lily are seen occasionally on the dry banks above the stream, and young Brewer spruce are scattered all along the middle and lower levels.

She also noted the presence of California lady's slipper and other interesting plants, and further wrote·

> Here is an unique, untouched little piece of wilderness with a most interesting ecosystem. Rugged, to the point of being almost impassable on foot, yet a very fragile, finely balanced community of associated plants, trees and water.

Most of the soils in the proposed area are derived from ultramafic rock. No deposits of nickel-bearing laterites have been mapped within the area, but some chromite deposits have been mined and may be of commercial interest in the future (Ramp and others 1977).

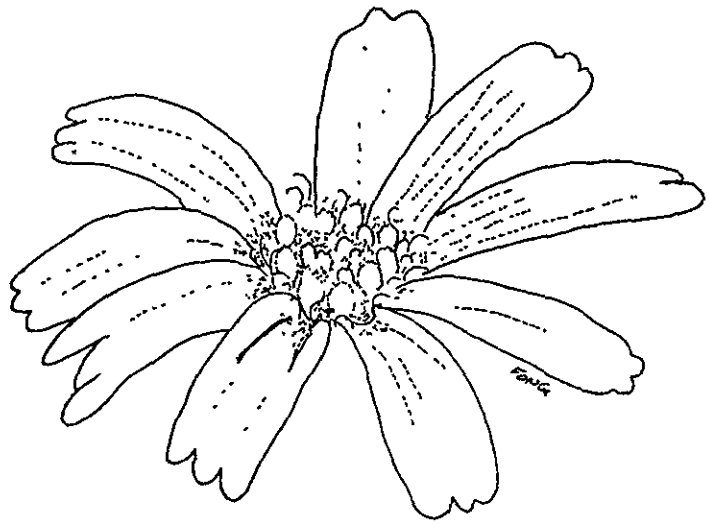
About 430 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 232 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

In the Preferred Alternative (S) a portion of the area is recommended; this area contains the best rare plant resources (Figure F-BOT-7, Page 2 of 2).

Table F-BOT-7. Unusual Plants in the Proposed Chrome Ridge Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Fritillaria glauca	Siskiyou fritillaria
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Darlingtonia californica	California pitcher plant
Kalmiopsis leachiana	kalmiopsis
Lilium vollmeri	Vollmer's lily
Sedum laxum ssp *heckneri* 1/	lax stonecrop

1/ Potential candidate for Regional Forester's sensitive list.



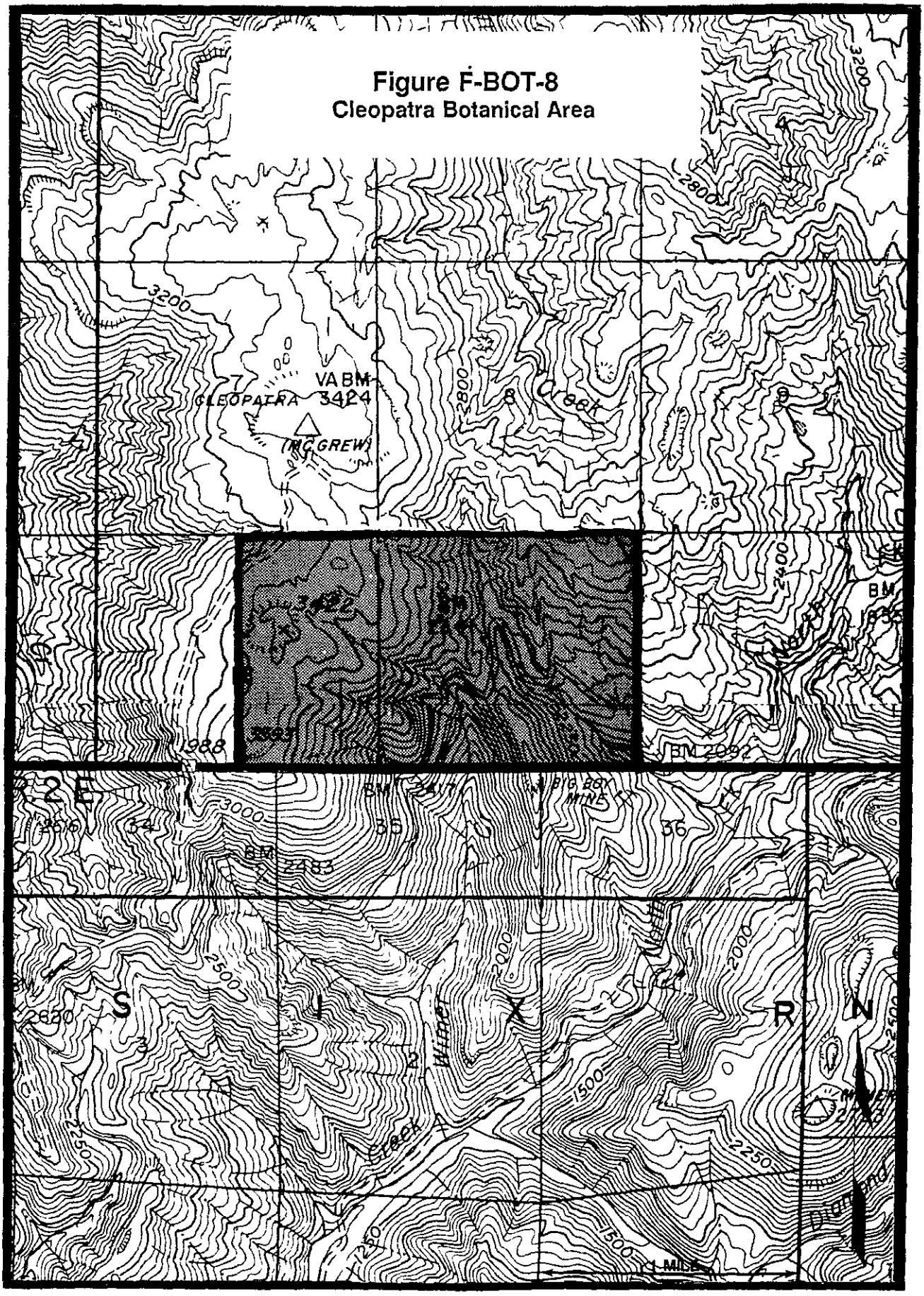


Figure F-BOT-8
Cleopatra Botanical Area

CLEOPATRA - F-BOT-8

The proposed Cleopatra Botanical Area is located in the southwest corner of the Illinois Valley Ranger District, just southeast of Cleopatra Mountain and adjacent to the California border (T.41S., R 10 W., Sections 17 and 18) (Figure F-BOT-8). The proposed area contains 800 acres; 97 percent is serpentine habitat Elevation range is approximately 2,000 to 3,422 feet.

The Cleopatra area is the only known occurrence site in Oregon for McDonald's Rock Cress (*Arabis "macdonaldiana"*), except for a small population in the Packsaddle Mountain area a few miles west. Most of *Arabis "macdonaldiana's"* range is within California, in Del Norte County near the Oregon border, and on a small site in Mendocino County. Less than 100 plants are known to occur at two locations in the proposed Cleopatra Botanical Area (Figure F-BOT-8).

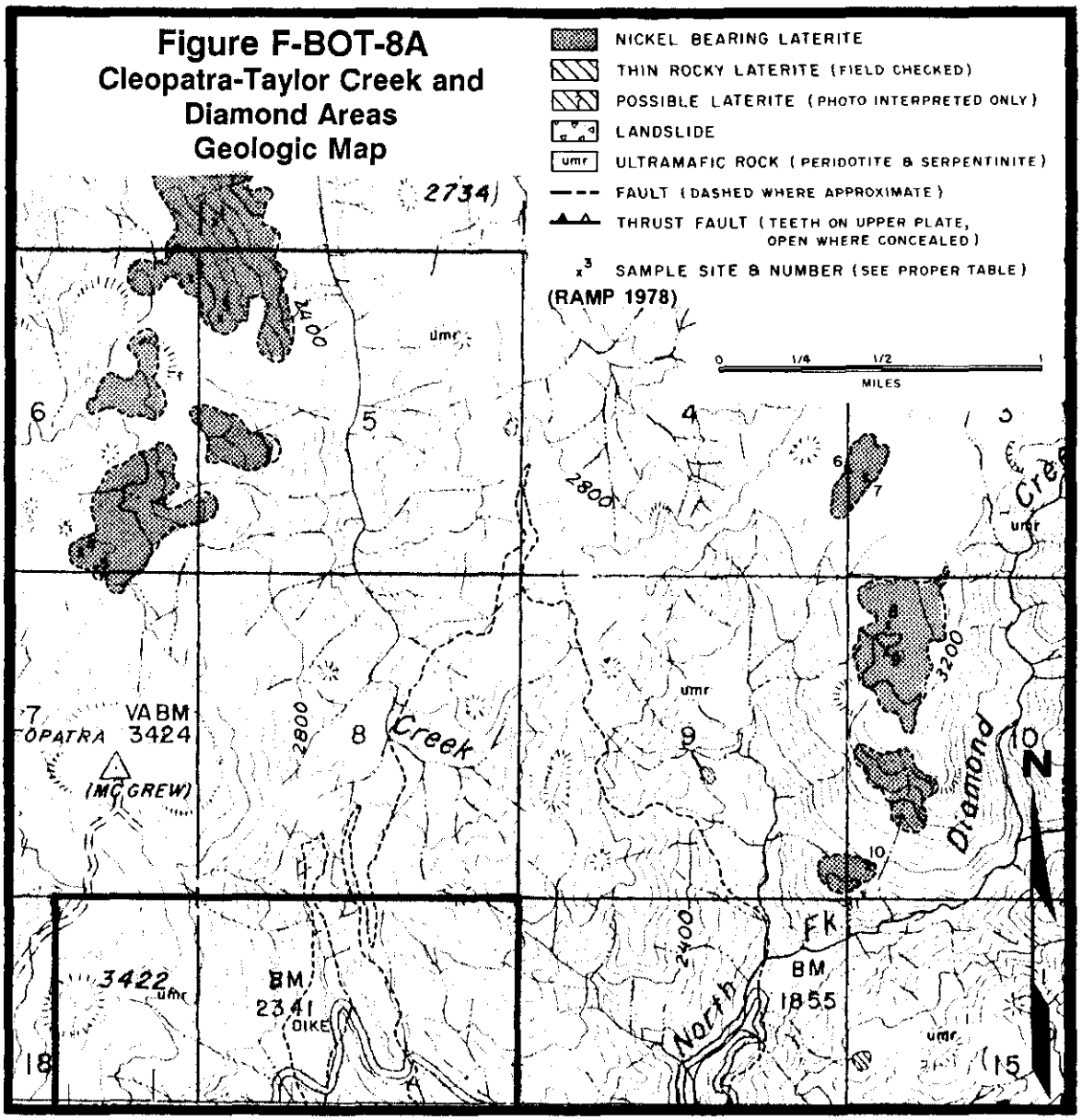
The Siskiyou population of *Arabis "macdonaldiana"* was at one time classified as endangered, because it was thought to be identical to a species of rock cress growing on Red Mountain, Mendocino County, California It has since been determined by the Fish and Wildlife Service (USDI), that the Siskiyou's version of the plant is an as-yet undescribed member of the purple *Arabis* complex. The NW California/SW Oregon populations of *Arabis* sp. nov./in ed (*"macdonaldiana"*) are now classified sensitive by the Forest Service (Region 6) A few other unusual plants also occur in the proposed Cleopatra Botanical Area (Table F-BOT-8). Future field surveys will probably turn up additional populations of *Arabis "macdonaldiana"* and other uncommon species. Cleopatra is not recommended in the Preferred Alternative (S)

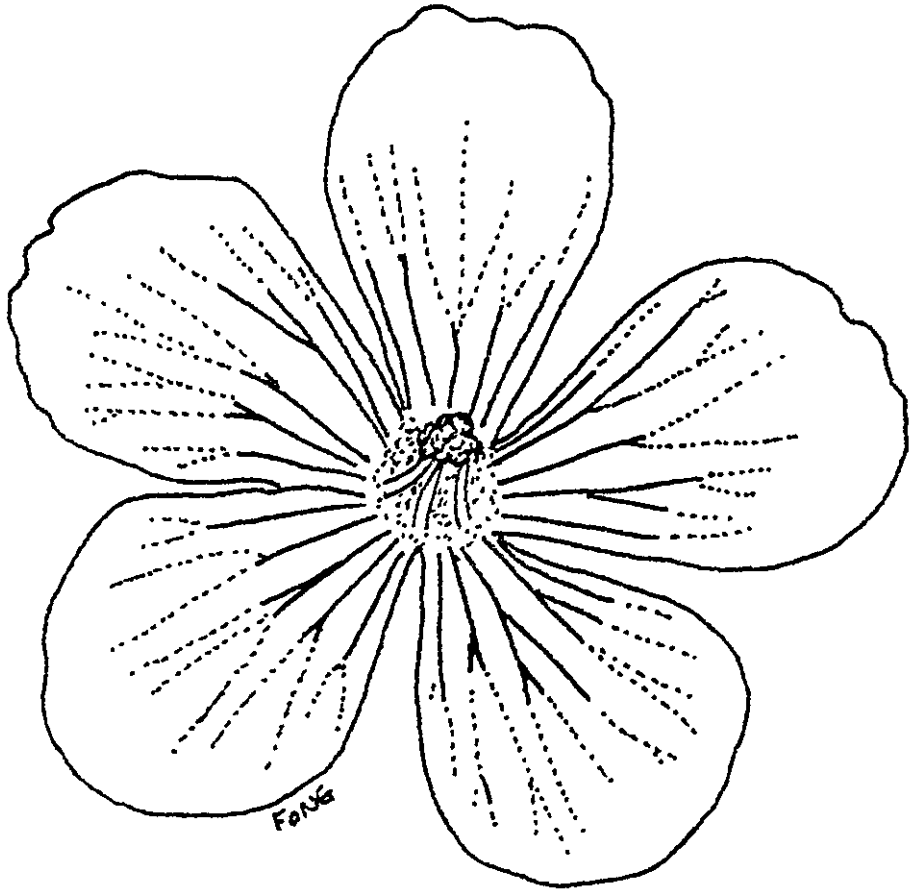
About 249 acres in this proposed Botanical area are tentatively available and suitable for timber production, this land is capable of producing about 134 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

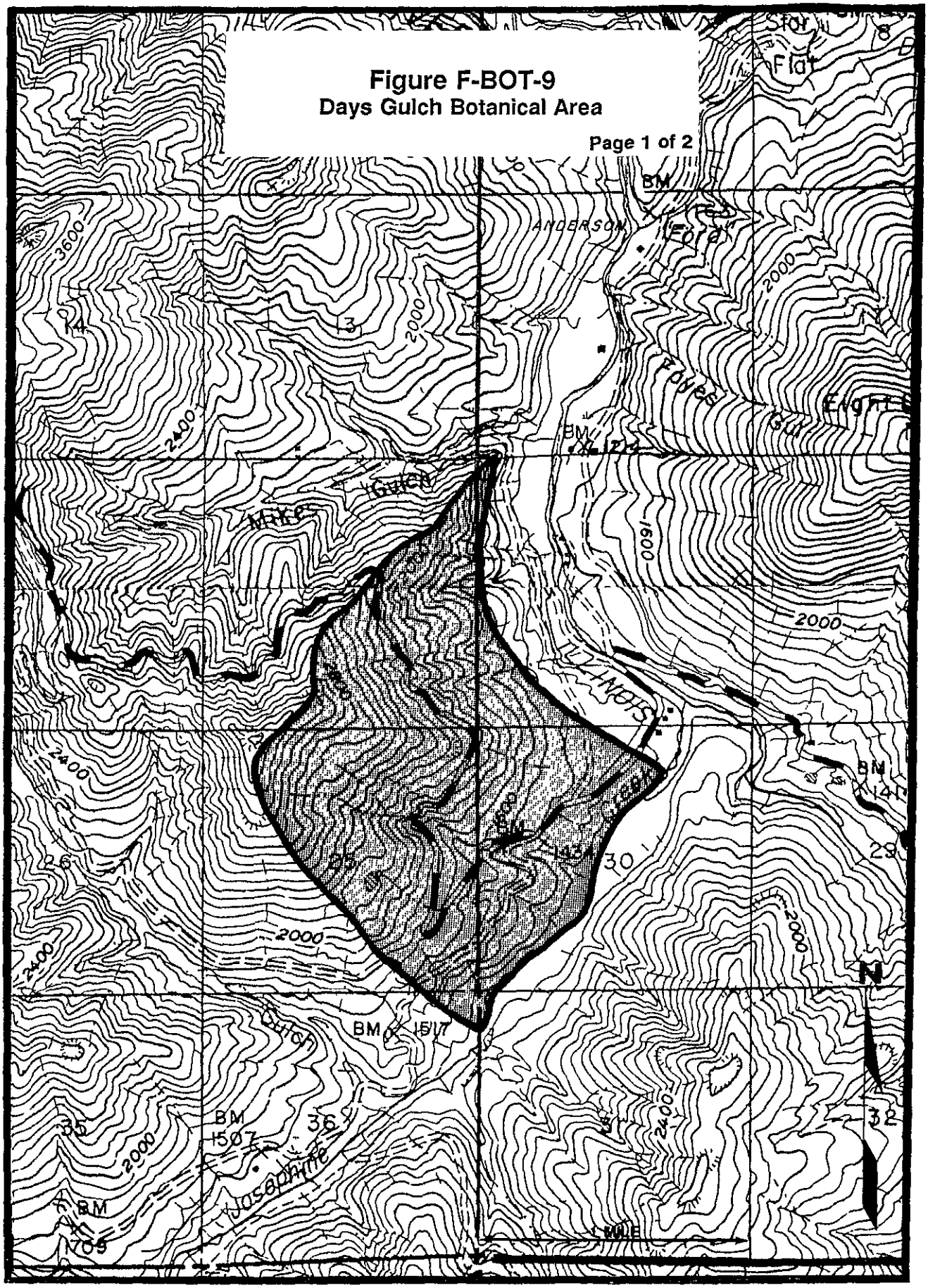
Most of the soils in the area of this proposal are derived from ultramafic rock. No deposits of nickel-bearing laterites have been mapped within the area, but prospects for mercury are present (Ramp and Peterson 1979) (Figure F-BOT-8A).

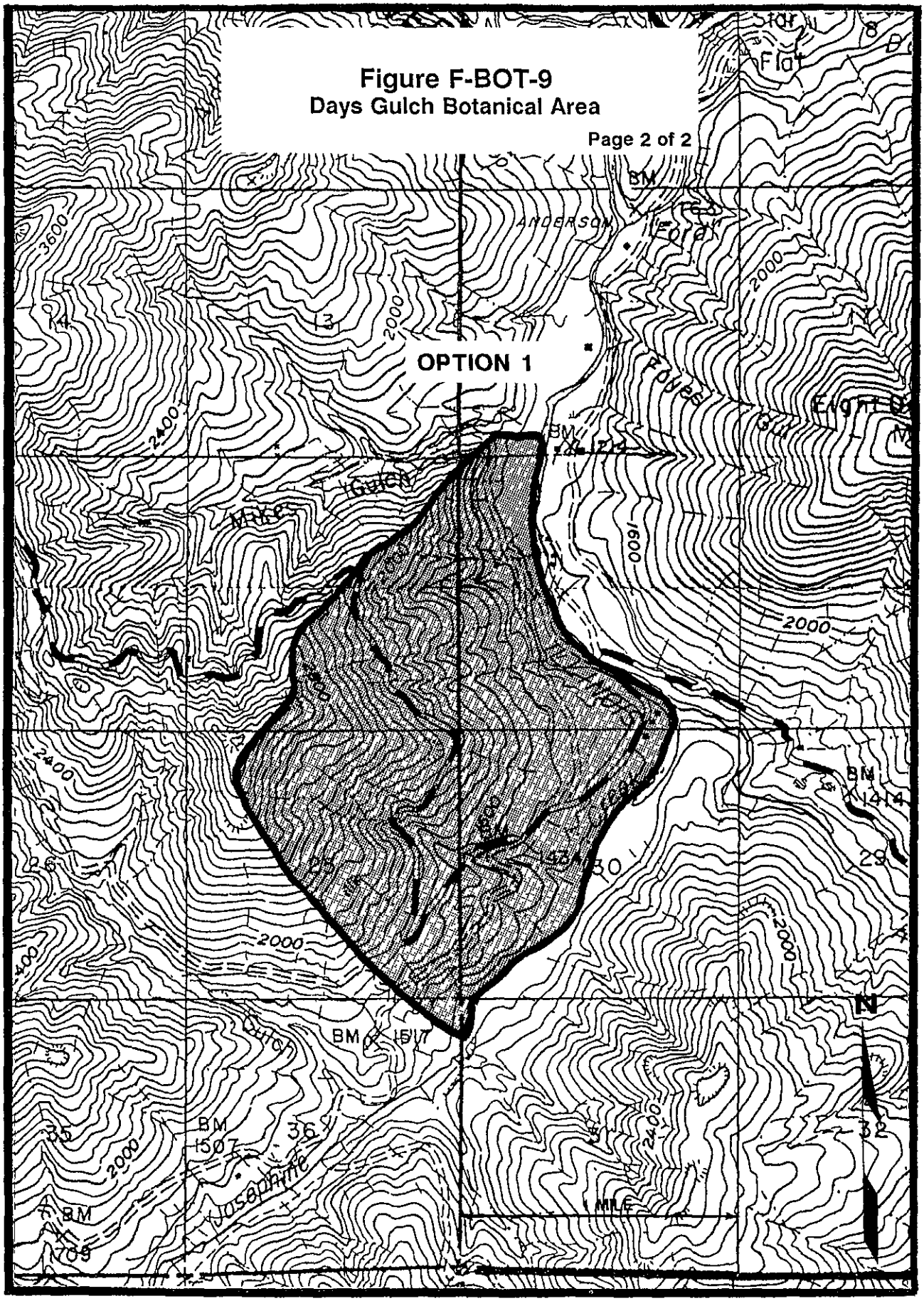
Table F-BOT-8. Unusual Plants in the Proposed Cleopatra Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Arabis sp. nov./in ed (*"macdonaldiana"*)	MacDonald's rock cress
Streptanthus howellii	Howell's streptanthus
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Darlingtonia californica	California pitcher plant


Figure F-BOT-8A
Cleopatra-Taylor Creek and
Diamond Areas
Geologic Map
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
umr ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
x3 SAMPLE SITE & NUMBER (SEE PROPER TABLE)
(RAMP 1978)
0 1/4 1/2 1
MILES
2734
2400
umr
6
5
4
2800
7
Creek
3200
VA BM
3424
(MC GREW)
8
9
10
N
Diamond
FK
BM
1855
3422
BM
2341
DIKE
18
15


FONG


Figure F-BOT-9
Days Gulch Botanical Area
Page 1 of 2
BM
ANDERSON
Ford
2000
3600
14
13
2400
Mike
Gulch
1600
2000
BM
1507
35
36
Jasoahine
BM
1705
2400
2000
30
29
32
N


Figure F-BOT-9
Days Gulch Botanical Area
Page 2 of 2
OPTION 1
ANDERSON
Ford
Flat
BM
2000
2400
1600
GULCH
MILE
Josephine
N

DAYS GULCH - F-BOT-9

The proposed Days Gulch Botanical Area is located two miles southeast of Eight Dollar Mountain, on the Illinois Valley Ranger District (T 38S., R 8W., Secs. 19 and 30, and T.38S., R 9W , Secs. 24 and 25) (Figure F-BOT-9) The proposed area contains some 1,252 acres, all serpentine habitat. Elevation range is approximately 1,500 to 3,200 feet; slopes face east. The proposed Botanical area is bordered by Josephine Creek on the southeast and is bisected by Forest Service road 4201. This general area is well known to botanists and popularly referred to as "Days Gulch", although Days Gulch itself is located just southeast of the proposed Botanical area This proposed site is home to a large number of sensitive and unusual plants (Table F-BOT-9).

The centerpiece of the Days Gulch area is a large *Darlingtonia* bog in the southeastern corner of section 25, near the switchback on road 4201; the site is a frequent destination for people who want to view the botanical wonders of the Eight Dollar Mountain area. This delicate bog harbors a number of interesting species; among them are Waldo gentian, California lady's-slipper, California pitcher-plant, western azalea, butterwort, and California coneflower. Surrounding the bog one can find shooting stars, lewisia, Siskiyou butterweed, pennycress and many other species.

Other *Darlingtonia* bogs are present in the area, and a small shallow pond is located near the center of section 25 In 1983 a permanent transect (for plant inventory) was laid out SW to NE from above the pond, down hill to the Illinois River. The pond border harbors an extensive display of shooting stars. Intensive plant inventories have not been conducted in much of the area; future field surveys will undoubtedly turn up fascinating botanical details about this important site.

In the FEIS The Illinois Wild and Scenic River corridor adjacent to the Days Gulch site is included in the proposed area The river corridor is just as interesting botanically, but in the DEIS had not been included in the proposed Days Gulch Botanical Area. Designation of the Illinois River as Wild and Scenic results in protection of plant resources in the corridor. For more information on this botanically unique corner of the Forest, refer to the following narrative about Eight Dollar Mountain.

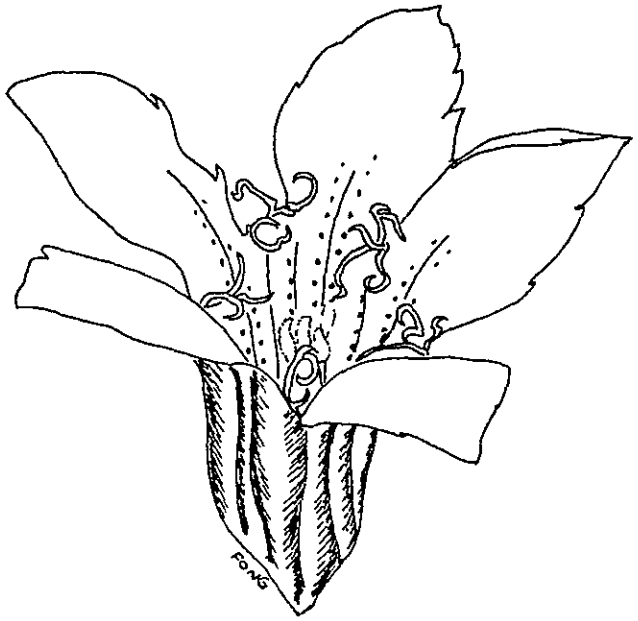
Only 21 acres of the land in this proposed Botanical area is tentatively available and suitable for timber production; this land is capable of annually producing about 11 thousand board feet (MBF) of harvestable timber on a long-term sustained yield (LTSY) basis (see Table F-3). The soils in the area are derived from ultramafic rock. No deposits of nickel-bearing laterites have been mapped within the area, but an active gold mine is located in the southern tip of the area A small amount of chromite was mined in the northern portion of the area in the 1950's (Ramp and Peterson 1979).

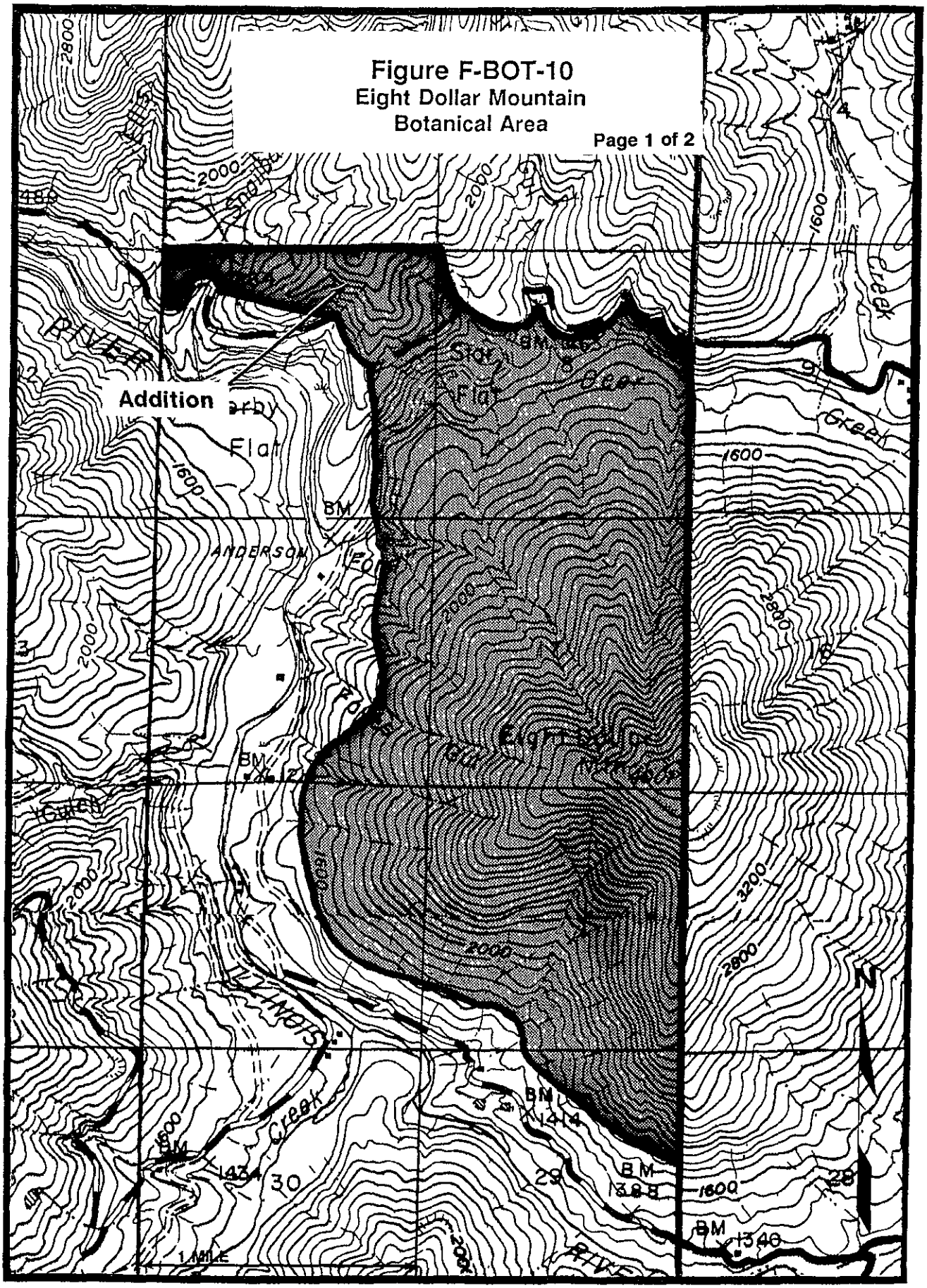
The Days Gulch Botanical area is recommended in the Preferred Alternative (S), and includes the adjacent Scenic River corridor along the east bank of the Illinois River (Figure F-Bot-9, Page 2 of 2).

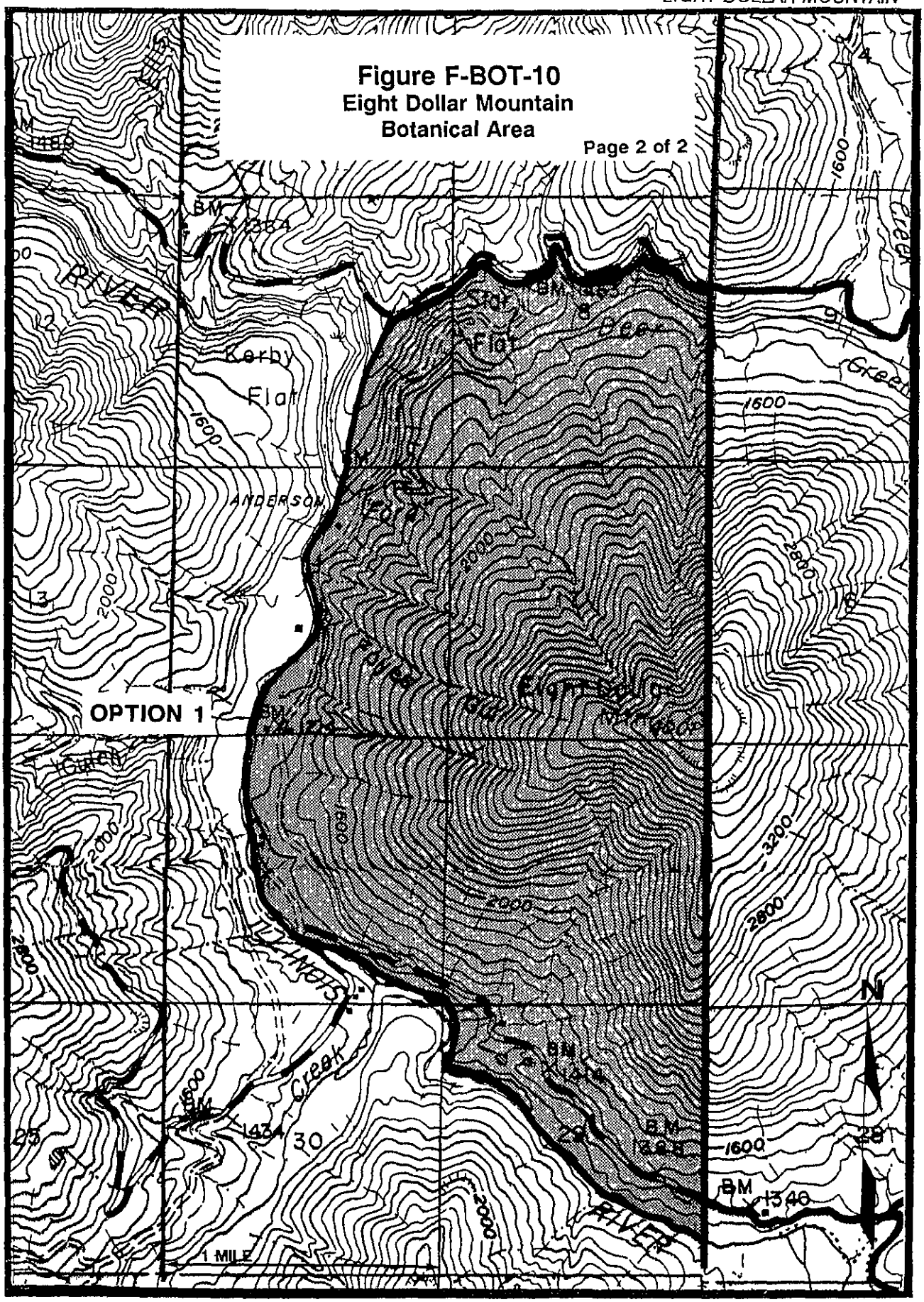
Table F-BOT-9. Unusual Plants in the Proposed Days Gulch Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Allium bolanderi	Bolander's onion
Balsmorhiza sericea	silky balsamroot
Calochortus howellii	Howell's mariposa lily
Epilobium oreganum	Oregon willow-herb
Fritillaria glauca	Siskiyou fritillaria
Gentiana bisetaea	Waldo gentian
Hastingia bracteosa	large-flowered rush lily
Lewisia oppositifolia	opposite-leaved lewisia
Microseris howellii	Howell's microseris
Senecio hesperius	Siskiyou butterweed
Viola lanceolata ssp. *occidentalis*	western violet
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Castilleja elata	slender paintbrush
Cypripedium californicum 1/	California lady's-slipper
Darlingtonia californica	California pitcher-plant
Dicentra formosa ssp. *oregana*	Oregon bleeding heart
Lilium vollmeri	Vollmer's lily

1/ Potential candidate for Regional Forester's sensitive list.




Figure F-BOT-10
Eight Dollar Mountain
Botanical Area
Page 1 of 2
Addition
Flat
Creek
RIVER
ANDERSON
Gulch
Creek
BM
1414
BM
1388
BM
1340
BM
1434
1600
2000
2800
3200
30
29
28
1 MILE


Figure F-BOT-10
Eight Dollar Mountain
Botanical Area
Page 2 of 2
OPTION 1
Kerby Flat
ANDERSON
Flat
Creek
RIVER
Hicks
Creek
1 MILE
N

EIGHT DOLLAR MOUNTAIN - F-BOT-10

The proposed Eight Dollar Mountain Botanical Area is located on the Illinois Valley Ranger District (T.38S , R 8W., Secs. 7, 8, 17, 18, 19, 20, and 29) (Figure F-BOT-10) The proposed area contains some 2,738 acres; almost all is serpentine habitat. Elevation range is approximately 1,200 to 4,000 feet. The proposed Botanical area encompasses the west half of Eight Dollar Mountain, including Star Flat and the mouth of Deer Creek In the FEIS The Illinois Wild and Scenic River corridor adjacent to Eight Dollar Mountain is included in the proposed area. The river corridor is just as interesting botanically, but in the DEIS had not been included in the proposed Days Gulch Botanical Area. Designation of the Illinois River as Wild and Scenic results in protection of plant resources in the corridor. In the Preferred Alternative (S), the entire National Forest portion of Eight Dollar Mountain is recommended, including the adjacent Scenic River corridor; the Addition is not included (see Figure F-Bot-10, Page 2 of 2).

The proposed Eight Dollar Mountain Botanical Area has been divided into two parts (the "Addition" contains land not part of the Mountain); this provides flexibility to land managers who must make decisions on land allocations. For further information on these options see Figures F-1 and F-BOT-10. The "Addition" area is part of the Squaw Mountain Roadless Area (see Appendix C, FEIS). The plant list for the Squaw Mountain Roadless Area primarily represents plants found in the "Addition" area

The entire Eight Dollar Mountain ecosystem encompasses about 4,400 acres of private and public lands in southwest Oregon. Ownership or administration of the lands on the east half consists of private (including The Nature Conservancy), Josephine County, State of Oregon, and the BLM (Bureau of Land Management). Except for a small amount of private land, the west half of the mountain is managed by the Forest Service (this is the proposed Botanical area).

Eight Dollar Mountain is one of the most significant botanical sites in Oregon, representing the major area of species endemism in the state. The mountain provides diversified habitats for eleven candidate species (9 percent of those listed for Oregon) which are under review by the USDI Fish and Wildlife Service for listing as threatened or endangered.

Since the 1880's, botanists from Oregon and many other parts of the world have known Eight Dollar Mountain (and Oregon Mountain) as an important focal point for uncommon plants Many of the serpentine endemics found in southwest Oregon and northwest California are most abundant here. Many large *Darlingtonia* bogs are present on Eight Dollar Mountain; an especially large hillside bog is located in the southwest quadrant of the Mountain (National Forest land). A number of other rare plants are associated with these bogs, such as *Cypripedium californicum*, *Lilium vollmeri*, *Senecio hesperius*, *Viola lanceolata* ssp. *occidentalis*, *Gentiana bisetaea*, and *Hastingsia bracteosa* (the last two are known from Eight Dollar Mountain and only a few other sites). Unusual plants on dry serpentine sites are also well represented, with species such as *Arabis aculeolata*, *Dicentra formosa* ssp. *oregana*, *Microseris howellii*, and a number of others. Sixteen sensitive plant species are known to occur on the National Forest portion of Eight Dollar Mountain; this is 25 percent of the total for the Forest (Table F-BOT-10).

Eight Dollar Mountain is an ideal site for the study of plant distribution and development. Where plants are and how they develop (or change over time) is very much related to elevation and aspect The proposed Eight Dollar Mountain Botanical Area has an extensive elevation range and all aspects are represented. In addition, the soils are derived from one type of parent material and rainfall is uniform in the entire proposed area (approximately 75 inches).

Aerial photographs (1:24,000 color) of the serpentine/peridotite areas of the Forest and adjacent lands were examined for the presence of large bogs (approximately two acres or larger). In terms of size and concentration, bog habitat reaches maximum development on Eight Dollar Mountain. The largest bogs are outside of the Forest boundary, on the east half of the mountain. However, bogs within the proposed area are larger and more numerous than elsewhere within the Forest.

Timber Resources. About 50 acres in this proposed Botanical area are tentatively available and suitable for timber production (all in the Eight Dollar Mountain Addition); this land is capable of annually producing about 27 thousand board feet (MBF) of harvestable timber on a long-term sustained yield (LTSY) basis (see Table F-3).

Mineral Resources. There is moderate to high potential for user conflicts between plant and mineral resources Much of the proposed Eight Dollar Mountain Botanical Area is covered by mining claims.

Soils in the proposed area are derived from ultramafic rock. A number of nickel-bearing laterite deposits have been mapped in the general area; some are within the proposed area (Figure F-BOT-10A, Table F-4) Nickel assay samples from ore deposits within the Eight Dollar Mountain area, range from 0.32 to 1.00 percent. Chromite ore has been mined at several locations within the area.

Len Ramp (1978:28) has mapped mineral deposits in the Eight Dollar Mountain Area. He described the mountain as:

> .. a roughly cone-shaped erosional landform of periodotite (hazburgite) and serpentinite intruded by a few small basic to intermediate dikes, e.g., diabase. The ultramafic rocks have a relatively high-angle, west-dipping fault contact; with steeply dipping slatey siltstone and sandstone of the Galice Formation near the east base of the mountain; and a high-angle, northeast-trending fault contact with Jurassic metavolcanic rocks of the Rogue Formation, a short distance down the Illinois River from the mouth of Deer Creek.
>
> The main ore deposits are on the southeast flank of the mountain in Section 21 and NW1/4 Section 28 [not on National Forest land]. They appear to be remnants of old landslide or slump deposits. A fair abundance of silica boxwork float, at various places on Eight Dollar Mountain, indicates the probability of some garnierite at fairly shallow depths.

In a informal discussion between State Geologist Len Ramp and Forest Wildlife Biologist Lee Webb, Ramp indicated he felt the most important nickel laterite deposits on Eight Dollar Mountain are not on the Siskiyou National Forest Laterite deposits on the proposed Botanical area (National Forest land) would only be commercially important if smelting grade deposits, such as those in the proposed area, were used to amortize investments made in a smelter initially built to utilize ore from higher grade deposits.

A cursory estimate of the nickel resources of the proposed area indicates that potential gross value could be as high as 200 million dollars. This gross value is based on a set of problematical assumptions: (a) five million tons of nickel laterite ore are available within the Botanical area (less than this amount may actually exist), (b) average nickel content of the ore is 0.7 percent; (c) the value of nickel is $3.00 per pound, or $42 00 per ton of ore; (d) the cost of transporting ore to the smelting site is not prohibitive. It is important to realize that nickel laterite deposits in the botanical interest area have **potential** value, rather than **actual**; at present, these deposits could not possibly be mined at a profit.

Impacts of Grazing and Water Withdrawal. Parts of Eight Dollar Mountain have been grazed in the past by cattle Potential impacts of grazing on the mountain's plant resources need to be assessed In a 2 July 1979 letter from Gilbert Muth (Pacific Union College) to Tom Jimerson (Botanist, Six Rivers National Forest), Muth described a site on Eight Dollar Mountain that was visited in conjunction with a Six Rivers National Forest contract to determine the range of certain sensitive plant species. Muth noted that in May 1979 Clifton and Overton surveyed a seepage where *Hastingsia bracteosum* occurred and "found the population was considerably trampled, grazed, and polluted by cattle." The site described is in the southwest quadrant of the mountain, on National Forest land. In 1978, Bill Copeland, Plant Ecologist for The Nature Conservancy, noted that the south and west portions of National Forest Land on Eight Dollar Mountain were fairly heavily grazed

On the southeast quadrant of the mountain (non-National Forest land), water sources for some of the bogs are being tapped for domestic use. This could affect the viability of plant communities in bogs located down-slope from the withdrawal point. Water withdrawal on the National Forest portion of Eight Dollar Mountain is not believed to be a problem at present.

Land on Eight Dollar Mountain Managed by Other Agencies. Because of important plant resources, The Nature Conservancy and Josephine's Environment Matters (JEM) proposed to the BLM that land on Eight Dollar Mountain under the Bureau's jurisdiction be designated an Area of Critical Environmental Concern (ACEC-Bureau of Land Management Designation). This same area was also evaluated for National Natural Landmark designation by the Heritage Conservation and Recreation Service (Federal).

The Federal Land Policy and Management Act requires the Bureau of Land Management to identify sites which may be candidates for ACEC status. Because of the botanical values present, on 23 October 1986 the Bureau found that Eight Dollar Mountain met the identification criteria for nomination as an ACEC. Bureau administered lands were formally designated as an ACEC on 27 February 1987.

Section 16, on Eight Dollar Mountain, is under the jurisdiction of the Oregon Division of State Lands. On August 10, 1978, the Natural Area Preserves Advisory Committee recommended that the Division of State Lands decline to issue mineral exploration permits for Section 16. The Committee "determined that the unique and important biological values at Eight Dollar Mountain, especially those within Section 16, would be severely jeopardized or destroyed by mineral exploration or by mining activity." The committee based this recommendation on part of the information in a report entitled *Botanical Survey of Eight Dollar Mountain - May 6-9, 1978.* In the report, Bill Copeland, Plant Ecologist for The Nature Conservancy's Oregon Natural Heritage Program, described the plant communities of the mountain. His field activities were concentrated in Section 16, but a few bog communities were surveyed on other parts of the mountain as well. Much of the data in his report has application to plant communities on that portion of the mountain managed by the Forest Service

Eight Dollar Mountain as an RNA. Scientists in the Pacific Northwest are aware that Eight Dollar Mountain contains cells (plant communities) that are not yet included within existing Research Natural Areas. Cell needs are described in the "Yellow Book" (Dyrness and others 1975).

Unfilled cells present on Eight Dollar Mountain are:

from Table 53

15. Jeffrey pine/grass on serpentine at low elevation
16. Jeffrey pine/grass on serpentine at high elevation

from Table 54

14. Mountain bog in serpentine

Lemmingsworth Gulch, a proposed Research Natural Area on the Chetco Ranger District (Figure F-RNA-7), contains cells which partially overlap with those at Eight Dollar Mountain. This includes numbers 14 and 16 above However, Copeland compared the plant communities and species of Eight Dollar Mountain with the proposed Lemmingsworth Gulch Research Natural Area; significant differences were evident. Basically, Eight Dollar Mountain is an inland version of serpentine habitat and receives one-half the rainfall of Lemmingsworth Gulch, which is influenced by a maritime climate that includes frequent summer fogs. Cell 15 would be filled by the proposed Cedar Log Flat RNA (see RNA narrative section).

Research in progress on the plant communities of southwest Oregon may show the need for representation by more plant communities (cells) than are presently shown in Dyrness and others (1975)

Research Natural Area status for Eight Dollar Mountain has not been actively sought in the past because of perceived conflicts with mineral resources There is a possibility that Research Natural Area status might be pursued at a later date

Eight Dollar Mountain Consensus Group. An Eight Dollar Mountain Consensus Group, composed of private citizens, The Nature Conservancy, and public agencies with land management responsibilities on the mountain, was formed in 1984 Potential conflicts between mineral and botanical resources prompted formation of the group. They held a series of meetings between May 1984 and May 1985 to review the resources and resource management issues on Eight Dollar Mountain.

In April 1986, this group published a final report. *Eight Dollar Mountain Coordinated Management Framework*. The participants (Forest Service, Bureau of Land Management, Josephine County, Division of State Lands, The Nature Conservancy, and Eight Dollar Mountain Landowners Association) also have developed a Memorandum of Understanding (MOU) agreement to manage the mountain in compliance with the Framework. The MOU is still (as of **1 November 88**) in the process of being signed by the participants. Copies of the "Framework" report and MOU agreement are on file at the Supervisor's Office

Management guidelines recommended as a part of this process are outlined in an Executive Summary dated May 1985: *Eight Dollar Mountain Recommended Management Guidelines* (on file at the Supervisor's Office). The consensus group considered five alternative approaches for management of the Mountain These approaches have all been considered during the Forest planning process and are represented in our range of alternatives for the Forest Plan.

Coordinated Management Framework. The Coordinated Management Framework provides for a MOU to establish a cooperative relationship between the public agencies, The Nature Conservancy, and Eight Dollar Mountain Landowner Association. There will be a provision in the MOU for a biannual meeting of the involved agencies and publics to review and renew the Plan.

A Coordinated Management Plan will be prepared for Eight Dollar Mountain that integrates the management of all public agencies and The Nature Conservancy, and encourages the participation of private landowners owning property within the boundaries of the management area The Plan will be general in nature, with flexibility that will allow resource use with protection of all the resources (resource use includes botanical, wildlife, timber, mineral, and communication sites, for example). It is expected that each agency and private landowner will provide some type of special designation that recognizes and protects the botanical and other resource values

The Coordinated Management Framework highlights the following subjects: minerals, transportation system, timber management, grazing, communications, scenic, wildlife, fire management, recreation/tourism, community involvement, and establishment of baselines for monitoring. An included action plan features the following items: Coordinated Management Plan, Memorandum of Understanding, research/monitoring, minerals, transportation, timber management, grazing/wildlife/ communications, fire management, community involvement, and land exchange.

Memorandum of Understanding. The intent of the Memorandum is to establish a cooperative management relationship between, Josephine County (County), the State of Oregon (State), the USDI Bureau of Land Management (BLM), the USDA Forest Service (USFS), The Nature Conservancy (TNC), and participating private landowners in the Eight Dollar Mountain Landowners Association for management of lands in the Eight Dollar Mountain Special Management Area

The objective of the Memorandum is to facilitate the preparation and execution of a Coordinated Research and Management Plan for Eight Dollar Mountain that integrates the actions of the public agencies, The Nature Conservancy and other private landowners on the Mountain and encourages public participation. The plan will provide for maintaining the integrity of the plant communities while allowing other resource

activity on the mountain. All resource use would be subject to monitoring and mitigation based on protecting the botanical values of the area

Alternatives developed by the Consensus Group The five alternatives all have a management focus that preserves the botanical integrity of the mountain. Activities described will protect the basic resource values of clean air, quality water, and soils for present and future generations

Alternative 1 National Natural Landmark

Designation. National Natural Landmark (exception private lands).

Management Direction. Basically unchanged to preserve the natural botanical systems and other noncommodity resource values.

Corresponding Alternative(s) in Forest Plan. Although no specific alternative in the Forest Plan recommends Eight Dollar Mountain as a National Natural Landmark, alternatives which allocate the National Forest portion of the land to Botanical area status accomplish essentially the same objectives (B, C, D, D1, E, G, K, M, S)

Alternative 2. Coordinated Management Plan.

Designation. Eight Dollar Mountain Coordinated Management Area. USFS· Special Management Area.

Management Direction. Active management to restore the area, research and monitor to provide future direction. Existing activities are integrated and coordinated.

Corresponding Alternative(s) in Forest Plan. Alternatives which allocate the National Forest portion of the land to Botanical area status meld with this Consensus Group Alternative (B, C, D, D1, E, G, K, M, S)

Alternative 3. Botanical Area.

Designation. Eight Dollar Mountain Botanical Area (each agency uses a Special Use area designation).

Management Direction. Manage the mountain more conscientiously than in the past while allowing existing uses to continue. Maintain the integrity of existing plant communities

Corresponding *Alternative(s) in Forest Plan.* Alternatives which allocate the National Forest portion of the land to Botanical area status meld with this Consensus Group Alternative (B, C, D, D1, E, G, K, M, S).

Alternative 4. Modified Current.

Designation. Eight Dollar Mountain Resource Management Area (each agency uses a Special Area designation).

Management Direction. Limited commercial activity is allowed while preserving and protecting the botanical and other resources.

Corresponding Alternative(s) in Forest Plan Alternatives which allocate the National Forest portion of the land to Botanical area status meld with this Consensus Group Alternative (B,

C, D, D1, E, G, K, M, S). There are no timber values in the National Forest portion of the area; regulated mining activities are allowed under the prescription for Botanical areas (see Chapter IV of the LRMP, Standards and Guidelines.

Alternative 5. Current.

Designation. No formal designations. USFS has special botanical designation (informal designation - Botanical Interest Area).

Management Direction. Commercial and other activities occur based on past patterns.

Corresponding Alternative(s) in Forest Plan. Alternatives which extend the current management regime for the National Forest portion of the mountain are NC, A and A-Departure.

Supporting Document - Ken Chambers. On December 15, 1981, in a letter to the manager of the Medford District Office of the BLM, Kenton Chambers, Herbarium Curator at Oregon State University, described the significance of Eight Dollar Mountain's plant resources. Portions of Chambers' letter have important application to National Forest Land on Eight Dollar Mountain:

> Information and testimony you have already received from botanists will attest to the richness of species in the localized and endemic flora of the Illinois River Valley and its tributaries, centered in the region running approximately from Takilma on the south to Selma on the north A significant number of plant species are known to occur *only* in that region, and being thus highly localized, they qualify as rare plants The extent to which they may also be classified as threatened or endangered depends on the size and stability of their populations, and perceived or potential threats to their habitat These plants' status is well known to, and acknowledged by, the professional plant taxonomists at Oregon's major universities and herbaria. I have personally been active in studying the biological relationships of certain of these species, in connection with a determination of their taxonomic status and classification.
>
> The earliest botanical exploration for plants of the upper Illinois River date from the 1880's, when Thomas Howell in particular was active in bringing this flora to the attention of leading taxonomists such as Asa Gray and Sereno Watson, at Harvard University. These two scientists received numerous collections from Howell which represented newly discovered and undescribed species; in publishing descriptions of these, Gray and Watson often applied the specific epithet "*howellii*" to them, in honor of the discoverer. The exact sites where Howell and others made these new species discoveries are usually known through published accounts, or the sites may be deduced today from information on the travel itineraries of the collectors The original discovery site of each species is called its "type locality " We known for sure that the "type locality" of three rare plants-- *Aster paludicola, Schoenolirion* [*Hastingsia*] *bracteosum,* and *Thlaspi montanum* ssp *siskiyouense*--is Eight Dollar Mountain; and for another species, *Senecio hesperius*, it is a good assumption that the type locality is on or near this mountain Still others of Howell's rare species discoveries were published as being from "Waldo," a defunct mining town south of present-day Cave Junction, and as they are known also from Eight Dollar Mountain (a site known to have been visited by Thomas Howell), this mountain stands as an important locality in the botanical history of the rare flora of the Illinois Valley The importance to science of the "type locality" is that it is the one most authentic place where representatives of the named species can today be seen and studied. Populations of the same species from other sites may vary in one respect or another from the description as originally published by the botanical authority.
>
> The Bureau of Land Management ownership on Eight Dollar Mountain complements and supplements the Forest Service Land on the same mountain, in terms of its representation of the

ecologically to be expected that the different slopes of a symmetrical mountain, for example southwest versus northeast, will differ in vegetation and species composition, and these factors, along with others such as soils and water seepage for marsh development, are quite evident on Eight Dollar Mountain In biological terms, it would not be correct to assume that a botanical preserve on Forest Service Land would obviate the need for similar preservation of flora on Bureau of Land Management land

The Kalmiopsis Wilderness likewise does not represent a botanical substitute for an Area of Critical Environmental Concern on Eight Dollar Mountain Many of the rare and possibly endangered plant species which I made reference to above, do not occur in the Kalmiopsis, as far as is known They would not be expected to occur there, due to the distinct climatic, altitudinal, and vegetational difference existing between the two areas The reverse is also true; many significant rare plants known from the Kalmiopsis Wilderness have not been found on Eight Dollar Mountain The soils, topography, and climate of the mountainous southwestern corner of Oregon (comprising the general Siskiyou Mountains area) are remarkably diverse and change dramatically over short distances, as can be observed in comparing Eight Dollar Mountain with established wilderness to the west and south

Eight Dollar Mountain has many notable qualities as a site for special management aimed at preserving botanical and wildlife values. It has a greater range of elevation, and hence habitat diversity, than most other possible sites for preservation on public lands in the upper Illinois River region.



Table F-BOT-10 Unusual Plants in the Proposed Eight Dollar Mountain Botanical Area.

Scientific Name	Common Name
Sensitive Species	
Allium bolanderi	Bolander's onion
Balsamorhiza sericea	silky balsamroot
Calochortus howellii	Howell's mariposa lily
Epilobium oreganum	Oregon willow-herb
Erythronium howellii	Howell's fawn lily
Fritillaria glauca	Siskiyou fritillaria
Gentiana bisetaea	Waldo gentian
Hastingsia bracteosa	large-flowered rush lily
Lewisia leana	Lee's lewisia
Lewisia oppositifolia	opposite-leaved lewisia
Microseris howellii	Howell's microseris
Ribes marshallii	Applegate's gooseberry
Senecio hesperius	Siskiyou butterweed
Streptanthus howellii	Howell's streptanthus
Thlaspi montanum var *siskiyouense*	wild candytuft
Viola lanceolata ssp. *occidentalis*	western violet
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arabis koehleri var. *stipitata* 1/	Koehler's rock cress
Arenaria howellii	Howell's sandwort
Camassia howellii	Howell's camas
Castilleja elata	slender paintbrush
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher plant
Dicentra formosa ssp. *oregana*	Oregon bleeding heart
Eriogonum pendulum	long-stalked eriogonum
Lathyrus delnorticus	Del Norte pea
Lilium vollmeri	Vollmer's lily
Sidalcea malvaeflora ssp. *elegans*	mallow sidalcea

1/ Potential candidate for Regional Forester's sensitive list.

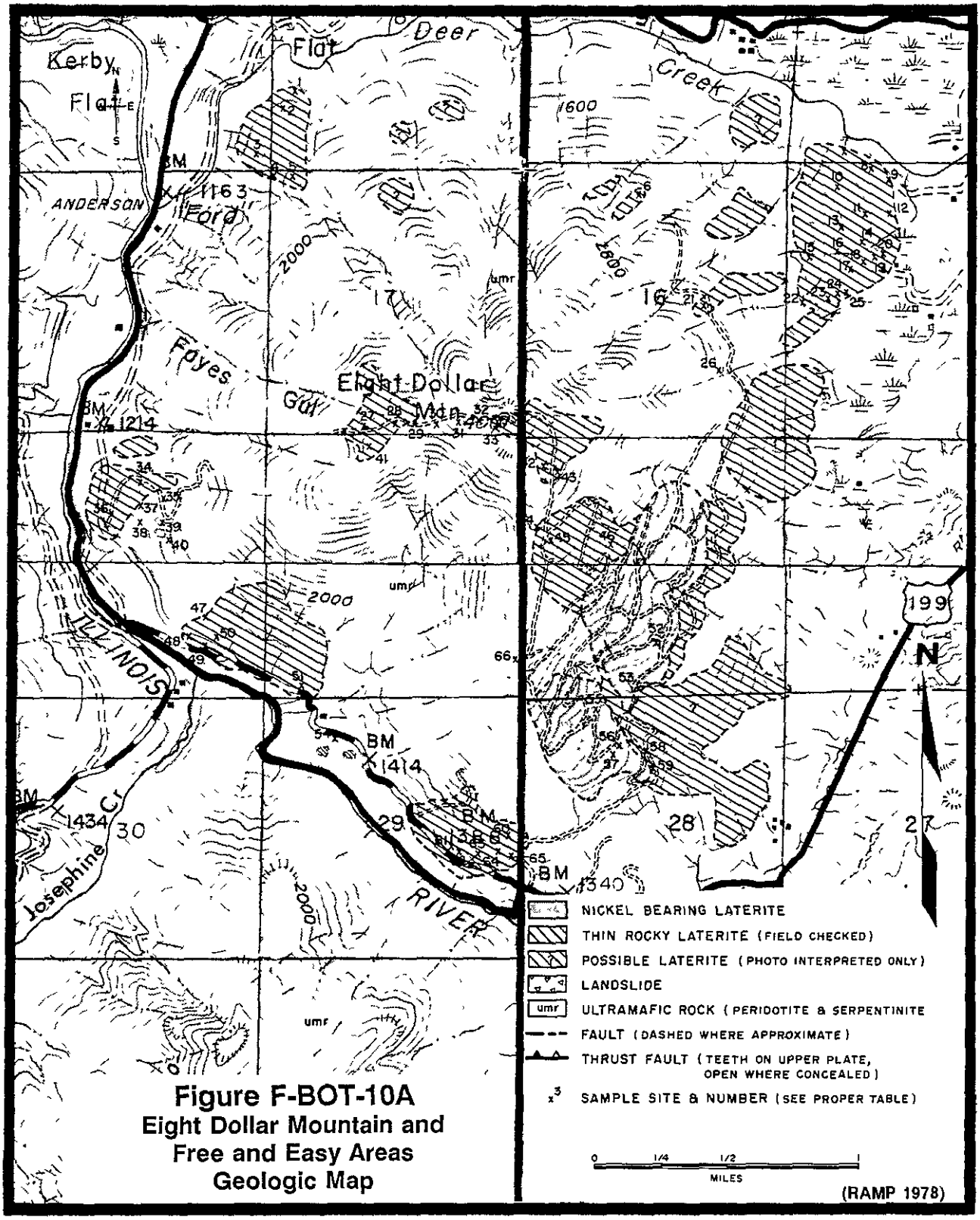
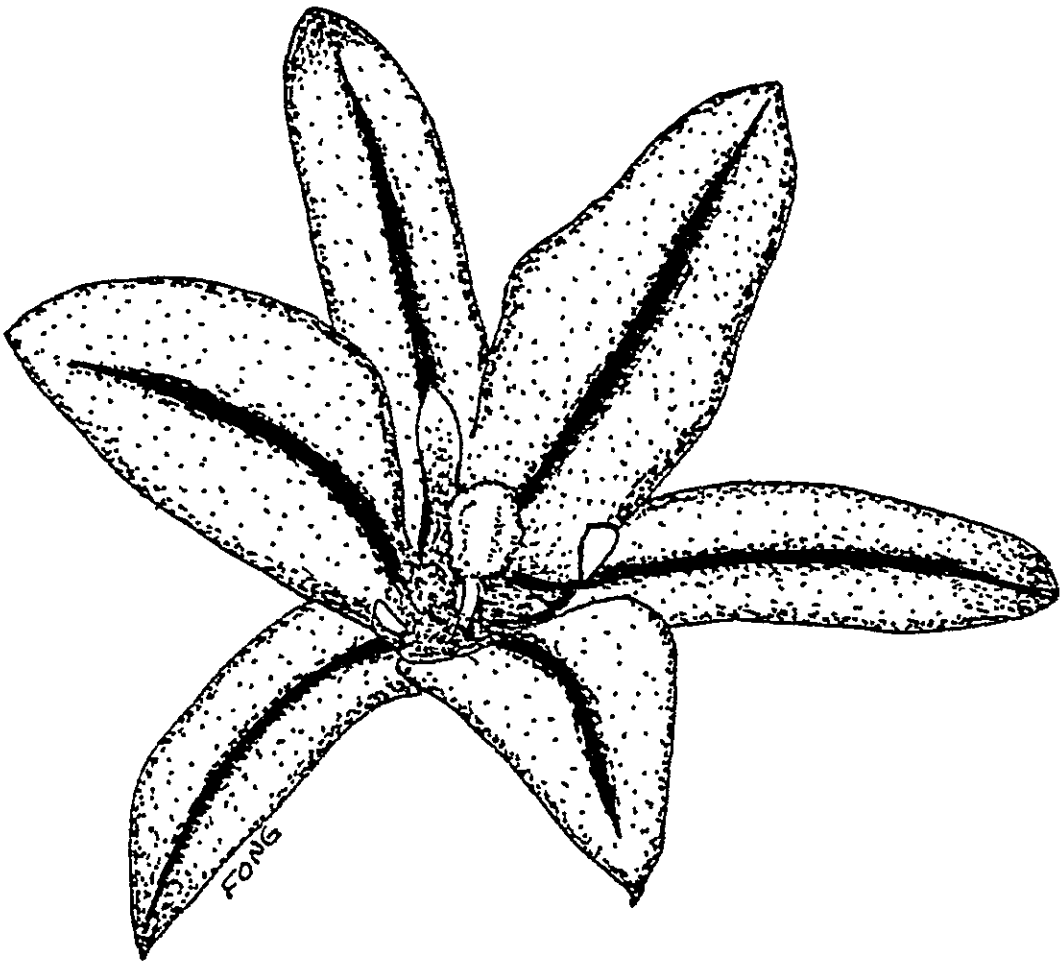
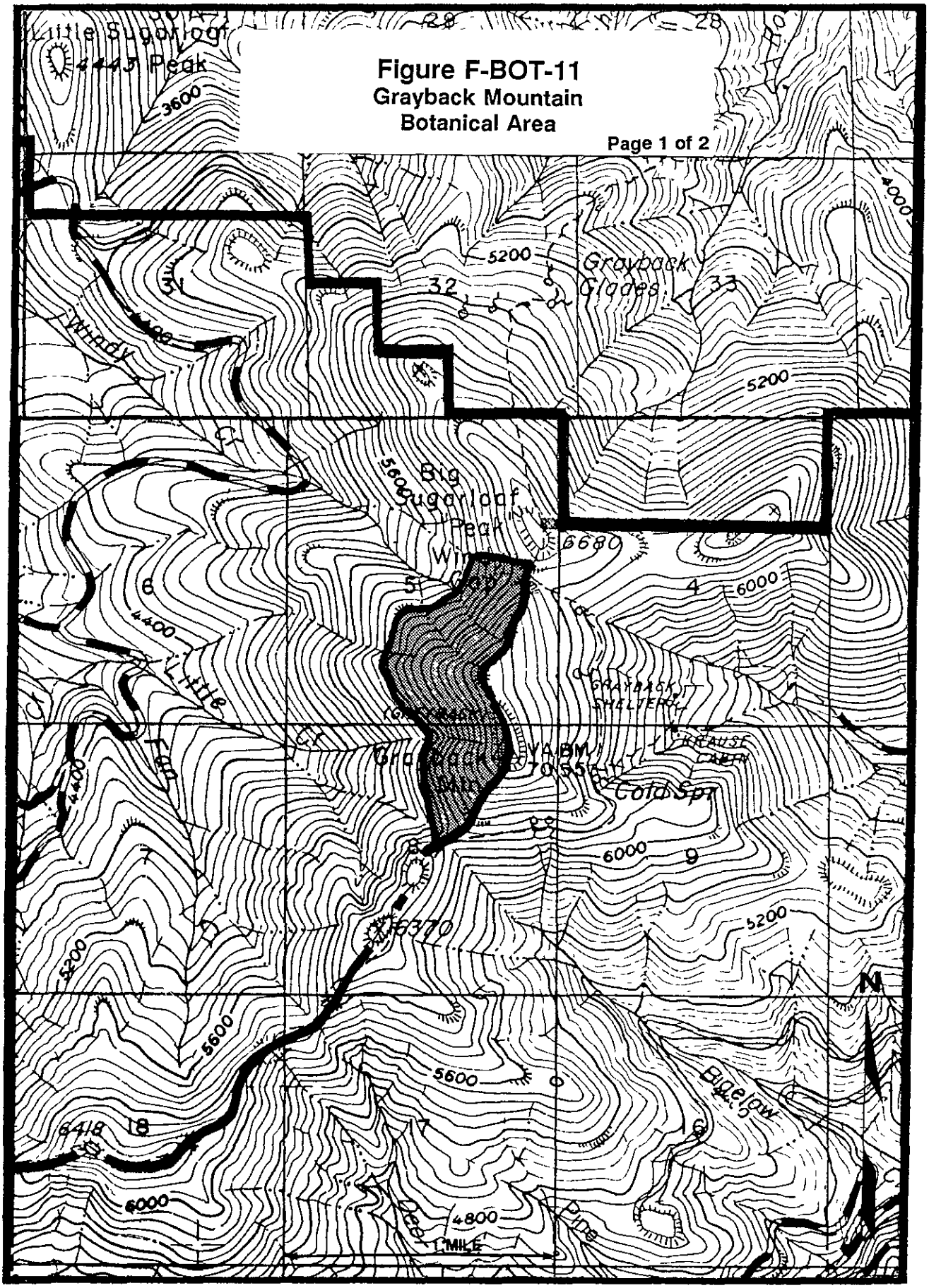
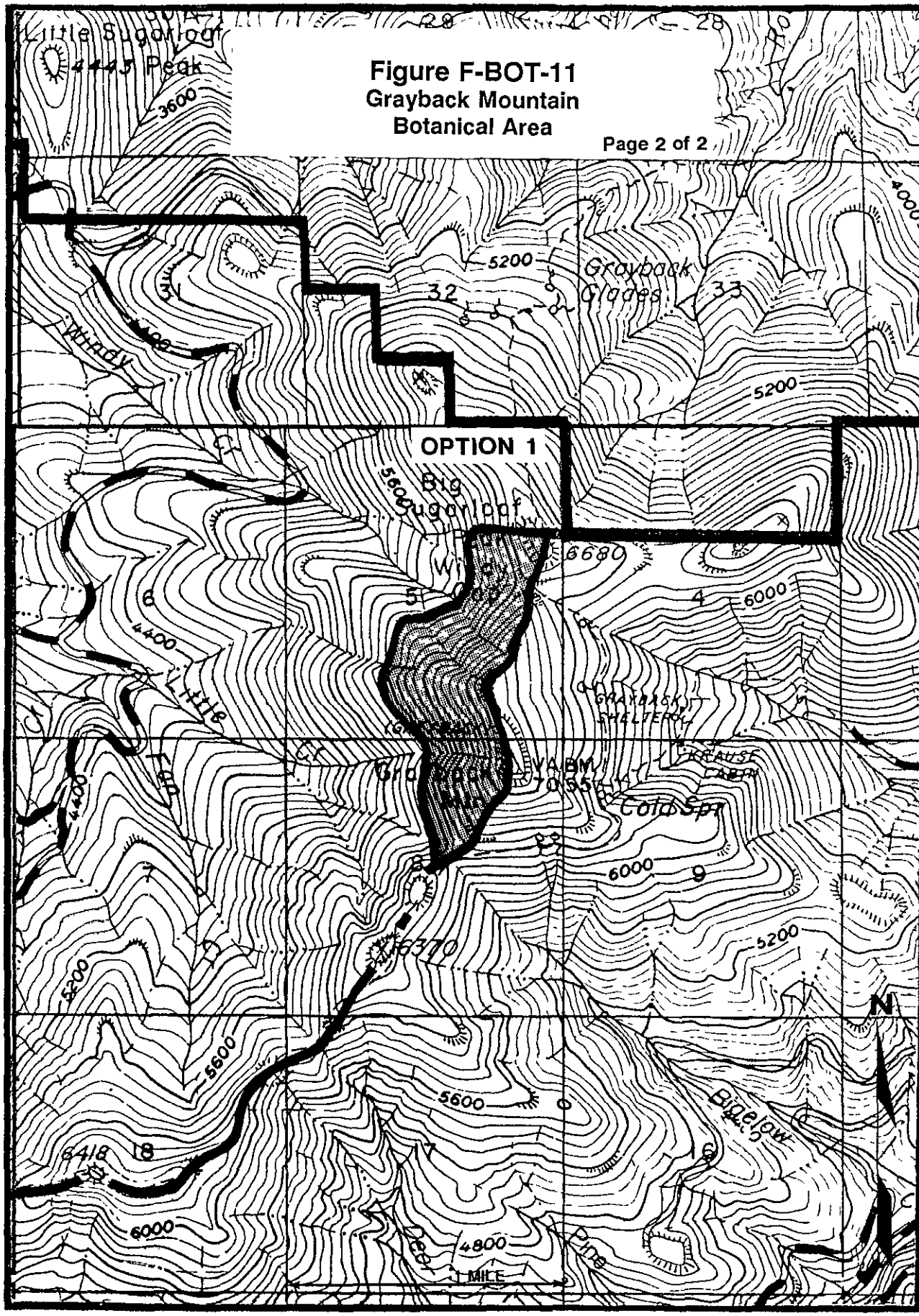


Figure F-BOT-10A
Eight Dollar Mountain and Free and Easy Areas Geologic Map


FONG


Figure F-BOT-11
Grayback Mountain
Botanical Area
Page 1 of 2
Little Sugarloaf
4443 Peak
3600
5200
Grayback
Glades
32
33
Windy
4400
5200
Big
Sugarloaf
Peak
6680
6000
4600
Little
Fen
Cr.
Grayback
Cr.
Grayback
Shelter
Cold Spr
6000
9
6370
5200
5200
5600
5600
6418
18
6000
4800
1 MILE
Bigelow
Pine
N


Figure F-BOT-11
Grayback Mountain
Botanical Area
Page 2 of 2
OPTION 1
Little Sugarloaf
4445 Peak
Big Sugarloaf
Grayback Glades
Windy
Little Trap
Cold Spr
Bigelow
Pine
6680
6370
6418
5200
5600
6000
4800
4400
4000
1 MILE
N

GRAYBACK MOUNTAIN - F-BOT-11

The proposed Grayback Mountain Botanical Area is located about six miles northeast of Oregon Caves in the northeast corner of the Illinois Valley Ranger District, and borders the Rogue River National Forest (T 40S , R 5W , Sections 5 and 8) (Figure F-BOT-11) At 7,055 feet, it is the highest mountain on the Forest (the lowest elevation in the proposed area is about 6,000 feet) The entire area is botanically interesting, however, only the western half of the Mountain is within the Siskiyou National Forest and described here The proposed area contains some 197 acres. Grayback Mountain is within the Kangaroo Roadless area (see Appendix C, Roadless Areas). Planners on the Rogue River National Forest are considering Botanical Area status for the east side of Grayback Mountain The west half of the Mountain is recommended as a Botanical area in the Siskiyou's Preferred Alternative (S), with a boundary reconformed to better match the Botanical area proposed by the Rogue River NF (Figure F-Bot-11, Page 2 of 2).

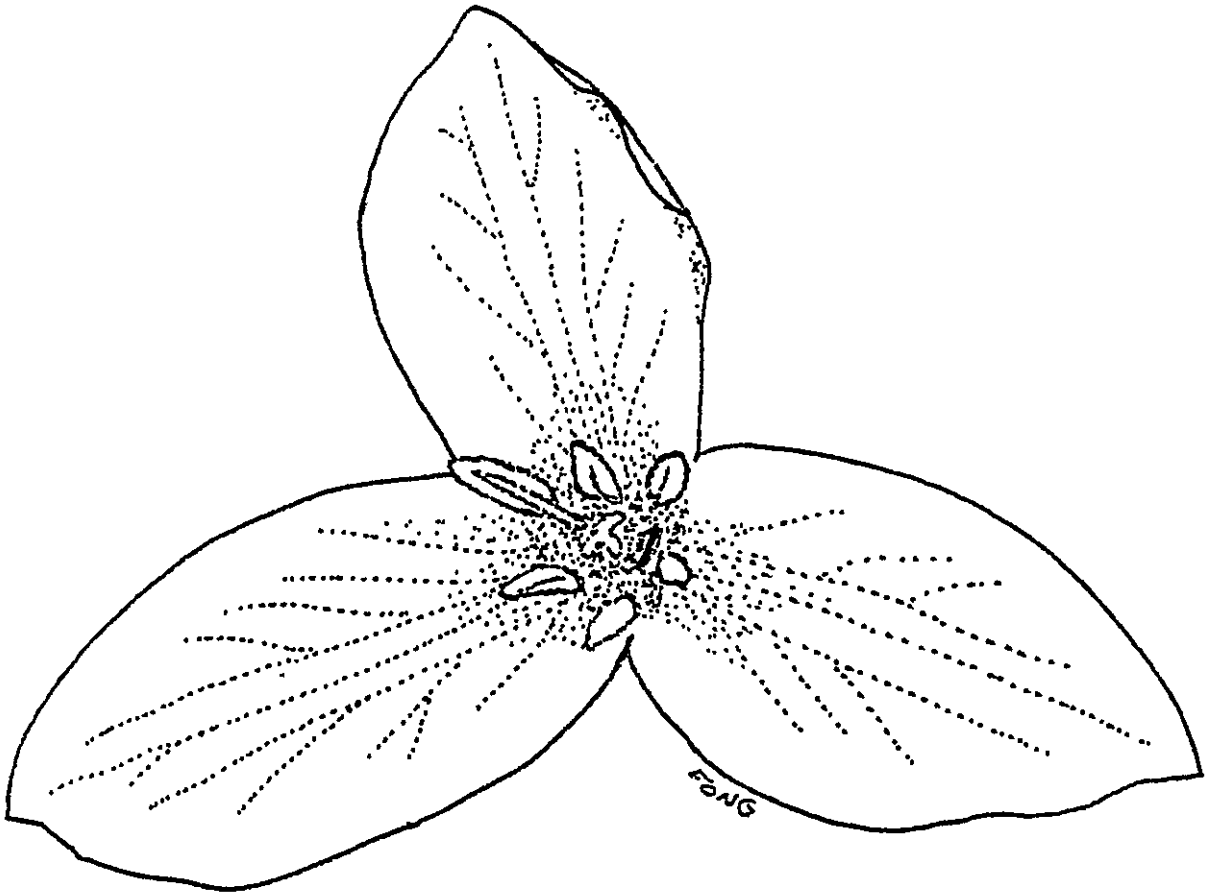
The Boundary Trail traverses through part of the proposed Botanical area Lower slopes on the Siskiyou portion of Grayback Mountain contain Douglas-fir, white fir, and some Shasta red fir. The upper slopes are generally open, with shrub-fields, talus, and outcrops predominating The Siskiyou side of the mountain site contains a variety of interesting plants, many of them sensitive (Table F-BOT-11). Matthew's cypress, Cascade daisy, Lee's lewisia, Applegate's gooseberry, and Washington lily, are a few of the known species. The Rogue River (National Forest) side of the mountain shows past glaciation and has some plant communities not represented on the Siskiyou side, in particular an extensive hillside bog on compacted glacial till Interesting plants on the Rogue River side include *Gentiana setigera* (*pleurisetosa* sp.nov./in ed.), *Spiranthes porrifolia*, *Lewisia nevadensis*, *Botrychium multifidum*, and the largest population of *Anemone occidentalis* (Pasque flower) in the Siskiyou Mountains. Grayback mountain has not been heavily botanized and the Forest Service species list for the area is sketchy. Future inventories will no doubt turn up interesting additions to the list.

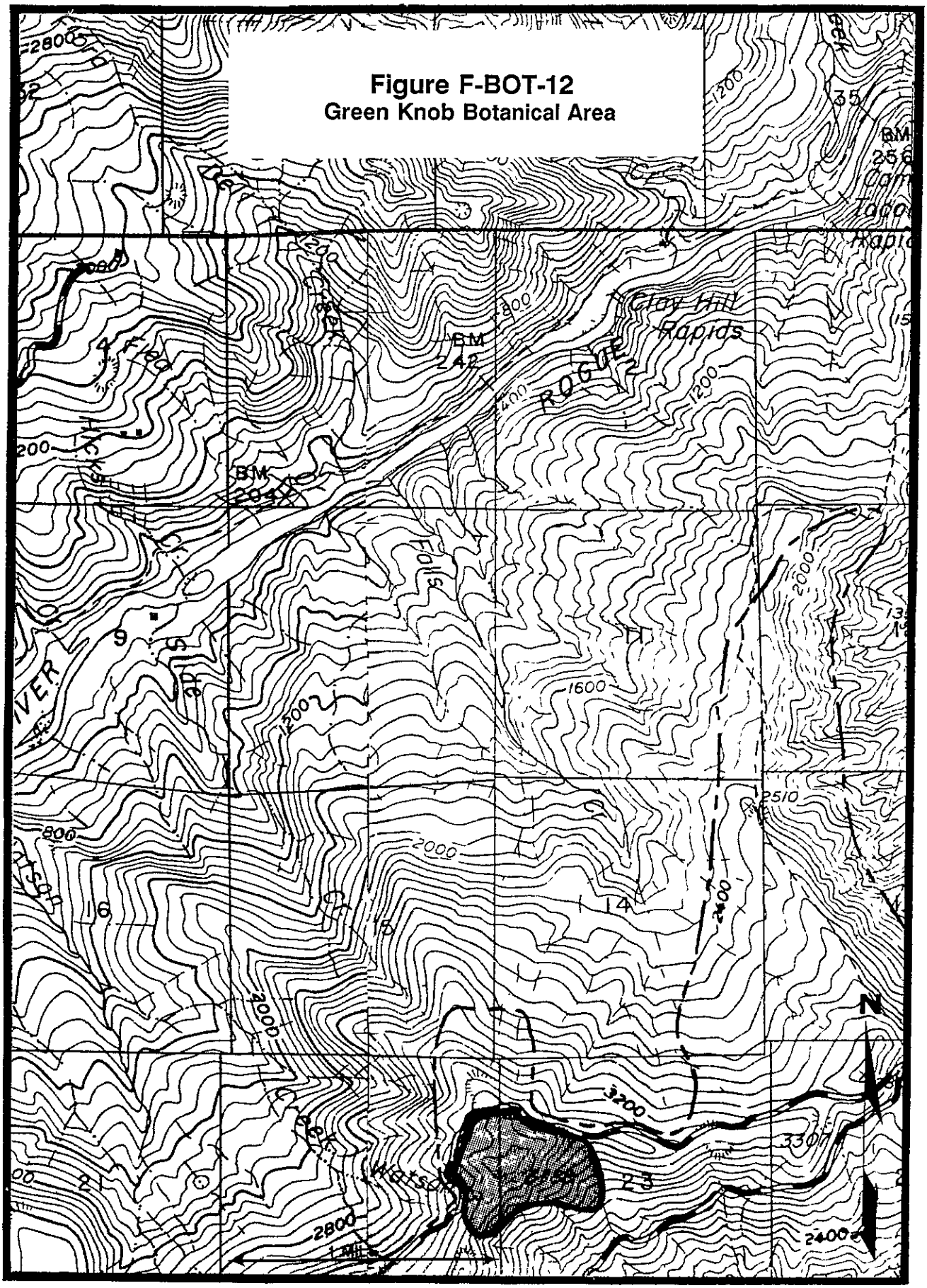
None of the land in this proposed Botanical area is tentatively available and suitable for timber production (see Table F-3). The soils in the area are derived mainly from gabbro, with some quartz diorite There are no known locatable minerals in the proposed Botanical area (Ramp and Peterson 1979)

Table F-BOT-11. Unusual Plants in the Proposed Grayback Mountain Botanical Area

Scientific Name	Common Name
Sensitive Species	
Cupressus bakeri ssp matthewsii	Matthew's cypress
Lewisia leana	Lee's lewisia
Lilium parvum	small tiger lily
Ribes marshallii	Applegate's gooseberry
Watch/Review Species	
Erigeron cascadensis	Cascade daisy
Erigeron cervinus 1/	deer erigeron
Lilium vollmeri	Vollmer's lily

1/ Potential candidate for Regional Forester's sensitive list.


FONG


Figure F-BOT-12
Green Knob Botanical Area
Clay Hill
Rapids
ROGUE
BM
242
BM
2042
Falls
1600
2000
2510
2400
3200
3300
2800
N

GREEN KNOB - F-BOT-12

The 153 acre proposed Green Knob Botanical Area is located on the Gold Beach Ranger District approximately 1.5 miles northeast of Green Knob at the headwaters of Watson and Slide Creeks (T.34S., R.11W., Sections 22 and 23) (Figure F-BOT-12).

Elevation range is 3,650 to 3,780 feet Soils are derived from sedimentary rock (marine) No mineral resources are known to be present; there is a possibility that coal deposits may be interbedded with the rock layers (Ramp and others 1977). The area is also an archaeological site (Indian ceremonial rocks).

The diverse plant resources of the Green Knob area were extensively inventoried in 1977 and 1978 by Rosamond Hess and Helen Planeto, residents of the Gold Beach area (report on file at the Supervisor's Office). They catalogued 122 plant species from 37 different plant families. One of the plants they found is listed as sensitive by the Forest Service (Table F-BOT-12).

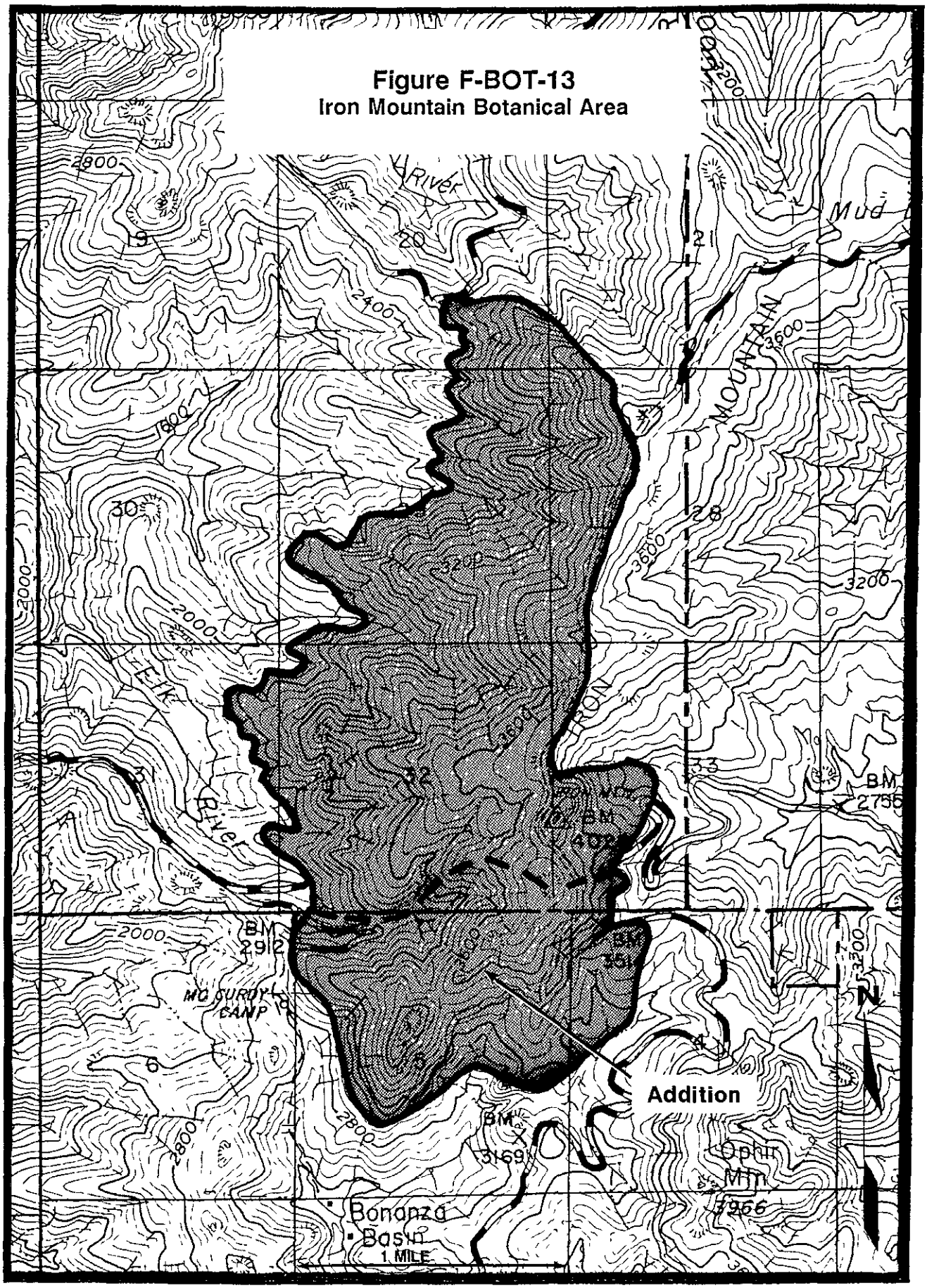
About 132 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 71 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3)

The Green Knob site is presently designated as "Protect Rare Plants and Protect Artifacts or Sites" in the Total Resource Information (TRI) system. This area is not recommended as a Botanical area in the Preferred Alternative (S).

Table F-BOT-12 Unusual Plants in the Proposed Green Knob Botanical Area

Scientific Name	Common Name
Sensitive Species	
Allium bolanderi	bolander's onion
Watch/Review Species	
Arctostaphylos hispidula 1/	Howell's manzanita

1/ Potential candidate for Regional Forester's sensitive list


Figure F-BOT-13
Iron Mountain Botanical Area
Addition
Bonanza Basin
1 MILE
Ophir Mtn
Mud
MOUNTAIN
SOUTH FORK
River
BM 2912
BM 3169
BM 2756
MO SURVEY CAMP
2800
2400
2000
1600
3600
3200
3000

IRON MOUNTAIN - F-BOT-13

The proposed Iron Mountain Botanical Area sits astride the boundary between the Powers and Gold Beach Ranger Districts (T 33S., R 12W., Sections 20, 21, 28, 29, 31, 32, 33 and T 34S., R.12W , Sections 4 and 5) The Iron Mountain site has been divided into two parts (based on District boundaries); this provides flexibility to land managers who must make decisions on land allocations. For further information on this division see Figures F-1 and F-BOT-13.

The proposed Iron Mountain Botanical Area encompasses approximately 1,866 acres About 1,466 acres are considered tentatively available and suitable for timber production and are capable of producing 781 thousand board feet (MBF) per year of harvestable timber on a long-term sustained yield (LTSY) basis (Table F-3).

The area is drained almost entirely on the west side by tributaries of the Elk River, and on the east side by Rock Creek. The topography is broken and rugged, due to much erosion and to the nature of the old and metamorphosed geologic formations Intrusive masses of granitic rocks form much of the Mountain, along with greenstones, marble, serpentine, and peridotite. The headwaters of Iron Mountain Creek (Section 29) contain interesting travertine deposits and formations. Elevation range is 2,400 to 4,050 feet.

Len Ramp (1978:48) has mapped mineral deposits in the Iron Mountain Area, which includes the proposed Botanical area (Figure F-BOT-13A). He described Iron Mountain as:

> ...underlain by a body of partly serpentinized harzburgite a little more than a mile wide and 5 miles long, which trends about N.20oE. These ultramafic rocks appear to have a fault-contact relationship with the surrounding Upper Jurassic Galice Formation, which is composed of dark slaty siltstone, sandstone, and lesser metavolcanic rocks (greenstone).
>
> The high point of Iron Mountain on the line of Sections 32 and 33 is underlain by a small gabbro body which intrudes the ultramafic rocks. A slightly larger quartz diorite body is exposed on the south end of Iron Mountain in Section 5. Other minor dikes of similar composition occur in the area. Small erosional remnants of fossil-bearing Tertiary marine sediments are exposed along the eastern fault zone near the road junction and township line between Sections 4 and 33 A small deposit of coal was once prospected in these Tertiary rocks. Among other prospects in the area are the Miss Dolly Copper Prospect in the NE1/4 Section 5 and the Rock Creek chromite occurrence in SW1/4 of the NE1/4 of Section 33.

The main deposit of nickel lateritic soil is on the southeast slope of Iron Mountain in Sections 4, 5, and 33 in an area about 800 feet wide and a mile long. The two patches forming this main area cover about 74 acres (12 acres within the Botanical area); the soil is relatively thin and rocky. Percent of nickel is 0.70.

The proposed area contains uncommon plants (Table F-BOT-13). However, the area's most significant botanical values center on the Mountain's unique location; the ranges of many plant species do not extend beyond Iron Mountain.

In 1956, W. H. Baker published the results of a comprehensive study of the plants of Iron Mountain (Am. Midland Nat., 56:(1) pp. 1-53). His report shows that at least 300 species of plants are found on Iron Mountain. Approximately 60 species either reach their known northern limits here, (such as Brewer spruce, *Picea breweriana*) or do not extend any great distance beyond the Mountain; approximately nine species reach their southern limits here. These plants comprise about 23 percent of the total flora of Iron Mountain. A total of at least 59 plant families are represented at Iron Mountain (50 percent of the total for the State of Oregon). This represents a very diverse flora, including several unusual species such as *P. breweriana*, *Iris innominata*, *Sedum laxum*, *Arnica cernua*, *Cirsium acanthodontum*, *Phacelia corymbosa*, and many others at the limits of their ranges.

Common tree species in the Botanical area include lodgepole (*Pinus contorta*) and western white pine (*Pinus monticola*), Douglas-fir (*Pseudotsuga menziesii*), Port-Orford-cedar (*Chamaecyparis lawsoniana*), golden chinquapin (*Castanopsis chrysophilla*), huckleberry oak (*Quercus vaccinifolia*), Sadler oak (*Quercus sadleriana*), and Brewer spruce. A large stand of Brewer spruce is located in the SW1/4 of Section 33.

Common shrubs include green (*Arcotostaphylos patula*) and hairy manzanita (*A columbiana*), Pacific rhododendron (*Rhododendron macrophyllum*), western azalea (*R occidentale*), coffeeberry (*Rhamnus californica*), silktassel (*Garrya* sp.), and salal (*Gaultheria shallon*). The California pitcher-plant (*Darlingtonia california*), grows in large numbers on the west side of the mountain in wet serpentine-peridotite areas.

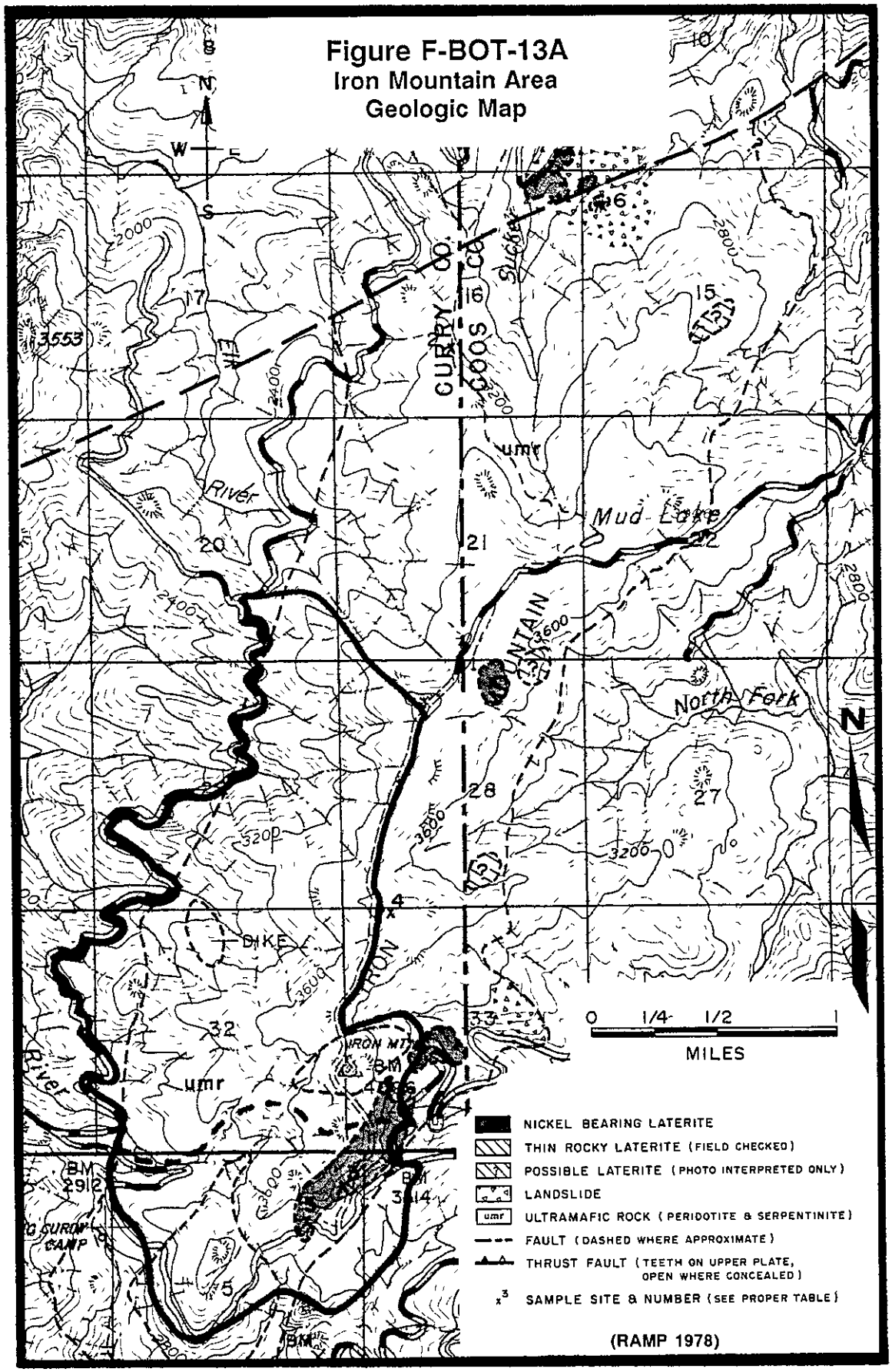
A small communications site in the northeast corner of the Botanical area has been deleted from the proposal, otherwise the entire area is recommended as a Botanical area in the Preferred Alternative.

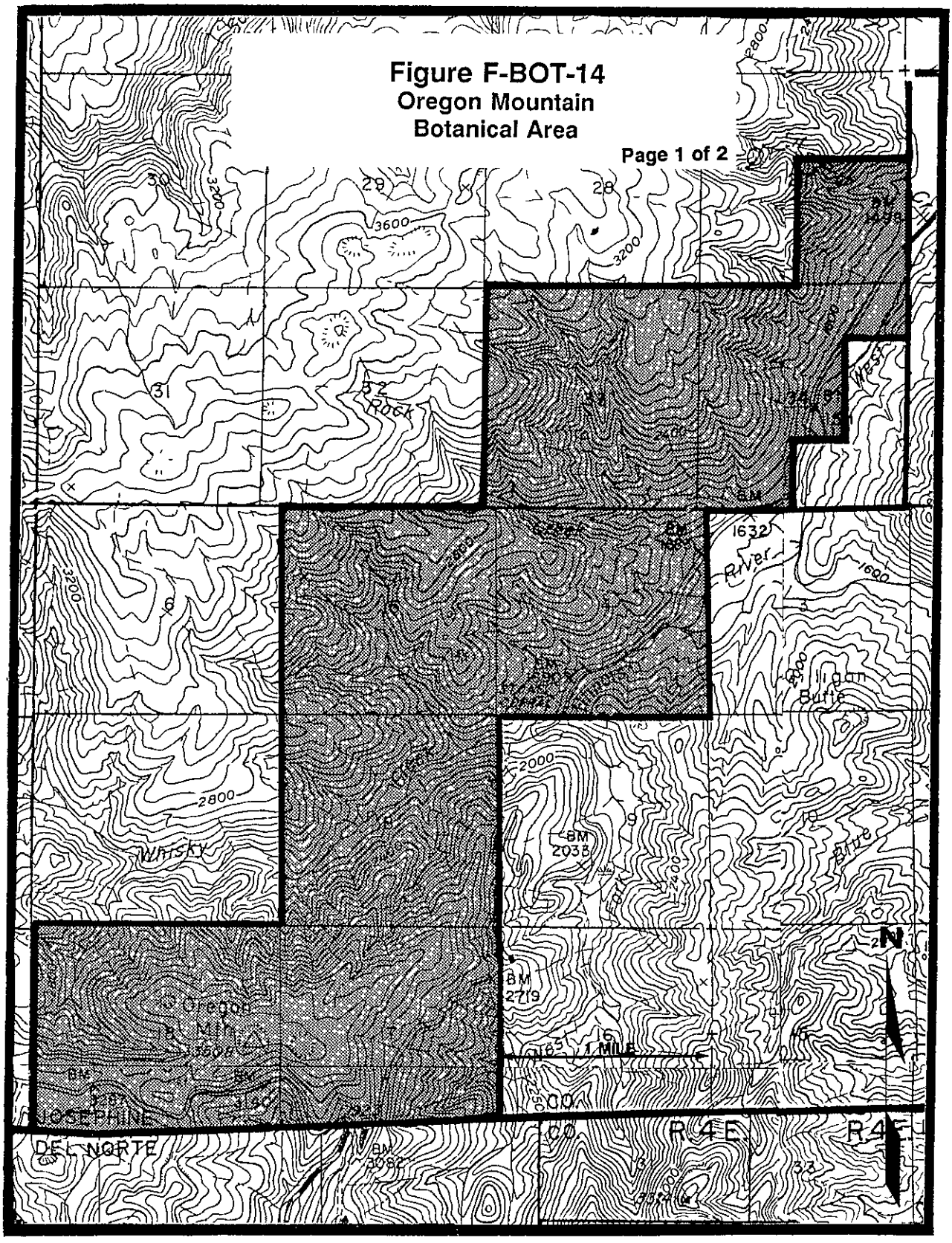
This Iron Mountain narrative was written by Dave Shea, former Wildlife Biologist on the Powers Ranger District.

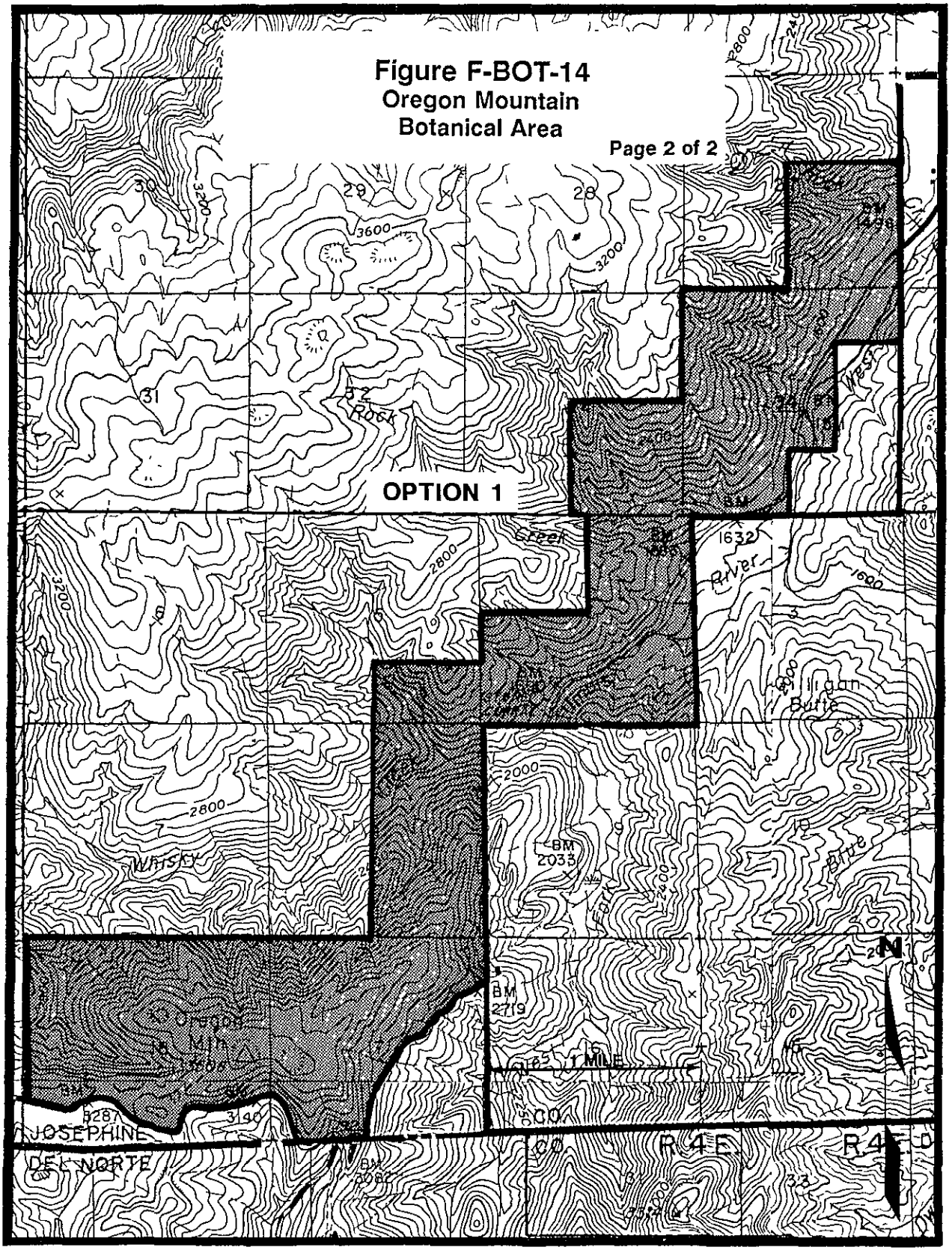
Table F-BOT-13. Unusual Plants in the Proposed Iron Mountain Botanical Area

Scientific Name	Common Name
Sensitive Species	
Epilobium rigidum	rigid willow-herb
Hieracium bolanderi	Bolander's hawkweed
Poa piperi	Piper's bluegrass
Watch/Review Species	
Arctostaphylos hispidula 1/	Howell's manzanita
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Lilium vollmeri	Vollmer's lily
Sedum laxum ssp. *heckneri* 1/	lax stonecrop
Sidalcea malvaeflora ssp. *elegans*	mallow sidalcea

1/ Potential candidate for Regional Forester's sensitive list.


Figure F-BOT-13A
Iron Mountain Area
Geologic Map
CURRY CO.
COOS CO.
Sucker
Mud Lake
North Fork
River
IRON MOUNTAIN
DIKE
IRON MT.
BM
umr
0 1/4 1/2 1
MILES
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
SAMPLE SITE & NUMBER (SEE PROPER TABLE)
(RAMP 1978)


Figure F-BOT-14
Oregon Mountain
Botanical Area
Page 1 of 2
3600
3200
2800
2000
1600
1632
BM 1499
BM 1388
BM 2038
BM 2719
BM 3082
BM 1387
BM 1150
Oregon
BM
1150
Whisky
Creek
Rock
River
Illinois
Butte
Blue
Bear
Creek
West
Fork
1 MILE
JOSEPHINE
CO.
DEL NORTE
CO.
R4E
R4E
N


Figure F-BOT-14
Oregon Mountain
Botanical Area
Page 2 of 2
OPTION 1
Rock
Creek
River
Burnt
Fork
Whisky
Oregon
Mtn.
JOSEPHINE
DEL NORTE
R4E
R4
1 MILE
N

OREGON MOUNTAIN - F-BOT-14

The proposed Oregon Mountain Botanical Area is located on the Illinois Valley Ranger District, a few miles southwest of the town of O'Brien (T.40S., R.9W., parts of Sections 27, 33, 34, and T.41S., R 9W., parts of Sections 4, 5, 8, 17, 18) (Figure F-BOT-14). The Botanical area contains some 4,401 acres, most of which is serpentine habitat. Elevation range is approximately 1,500 to 3,500 feet. Oregon Mountain, the Stone Corral, and parts of Rock and Whiskey Creeks are within the proposed Botanical area. Basically, the proposed area encompasses a band of serpentine land on the west side of the West Fork Illinois River and stretches from just southwest of O'Brien to the California border.

Botanists from Oregon and many other parts of the world know Oregon Mountain (and Eight Dollar Mountain) as important focal points for unusual plants. Many of the serpentine endemics found in southwest Oregon and northwest California are most abundant here Many *Darlingtonia* bogs are present, along with associated species such as *Cypripedium californicum*, *Gentiana bisetaea*, and *Viola lanceolata* ssp. *occidentalis*. Dry serpentine sites support such plants as *Lilium bolanderi*, *Lomatium howellii*, *Streptanthus howellii*, and *Vancouveria planipetala*. Seventeen sensitive plant species are known to occur in the Oregon Mountain area, this is 25 percent of the total for the Siskiyou National Forest (Table F-BOT-14)

The old mining settlement of Waldo, just a few miles east of the proposed Botanical area, was an important center of interest for early botanists; "Waldo" is the type locality for a number of unusual plants endemic to southwest Oregon and northwest California.

About 117 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 63 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

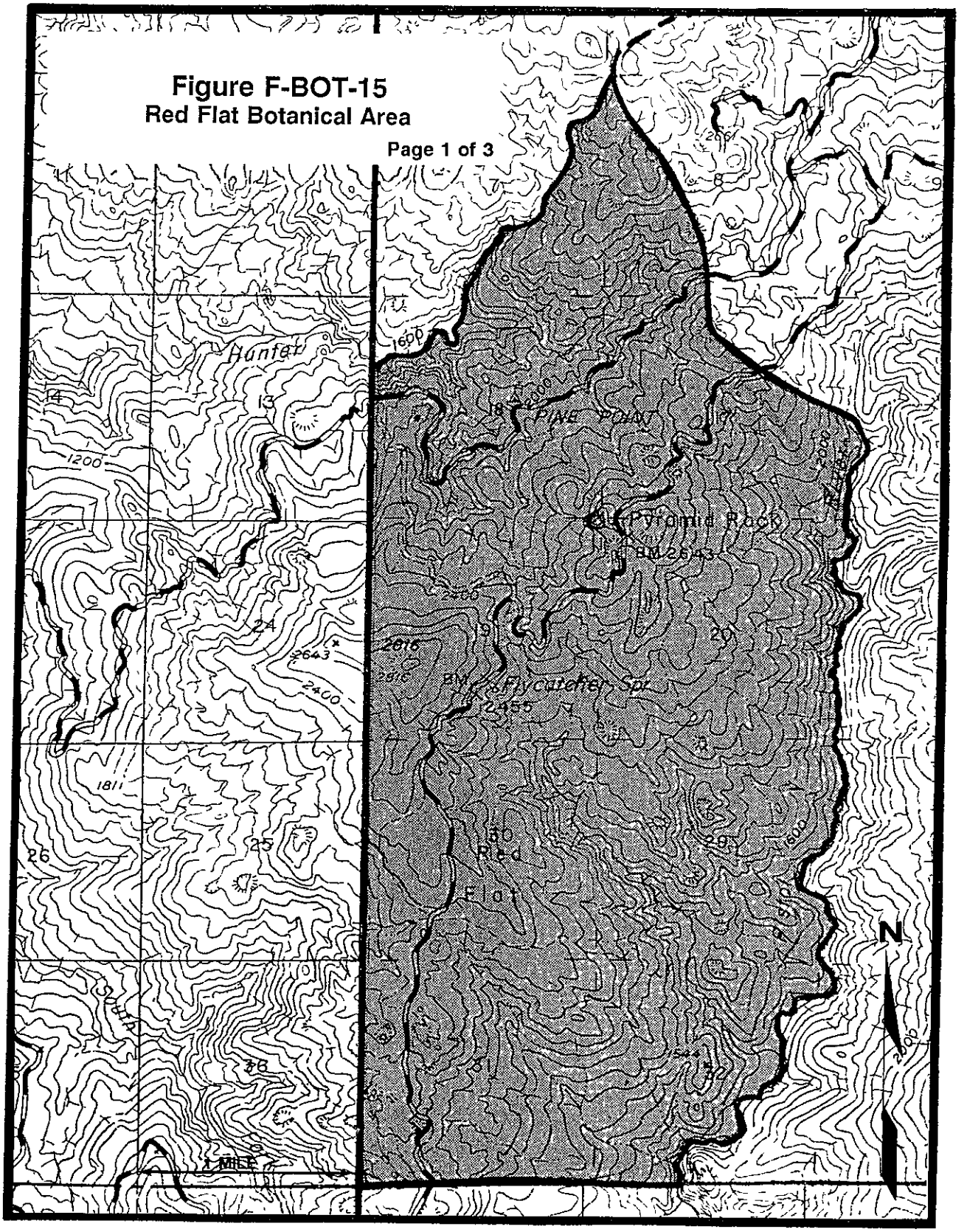
Soils in most of the proposed area are derived from ultramafic rock. A deposit of nickel lateritic soils is located in the southeast corner of Section 27; nickel content ranges from 0.36 to 0.65 percent (see Figure F-BOT-16A) The area also contains several chromite deposits, plus a copper prospect on Rock Creek (Ramp and Peterson 1979)

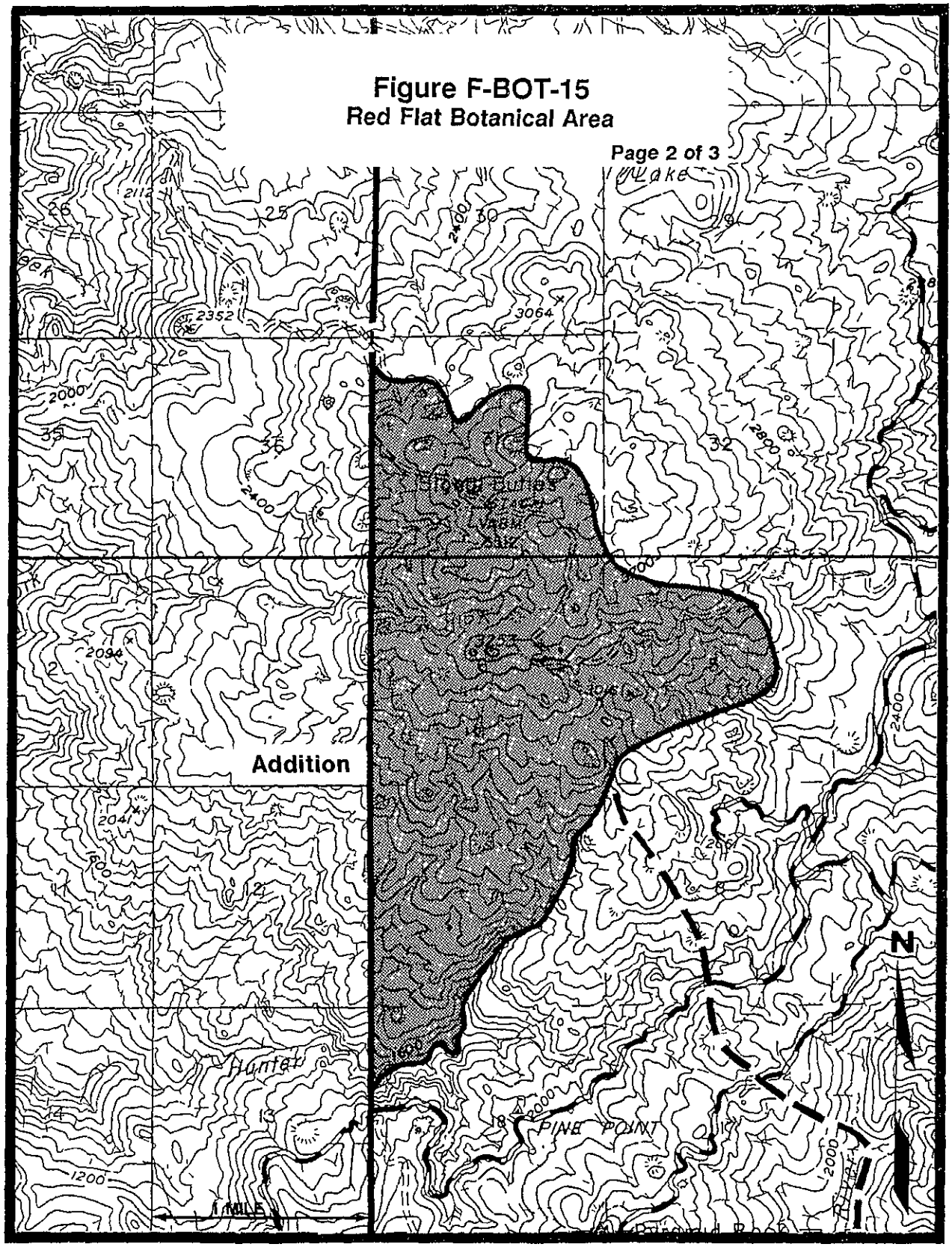
The best concentrations of rare plants occur along the western and southern portions of the proposed Botanical area This 2,623 acre section is recommended as the Oregon Mountain Botanical area in the Preferred Alternative (S) (Figure F-Bot-14, Page 2 of 2). Much of the land adjacent to the recommended area is managed by the Bureau of Land Management; similar botanical values are present, and the Bureau may eventually designate a Botanical area here to complement the Forest Service classification.

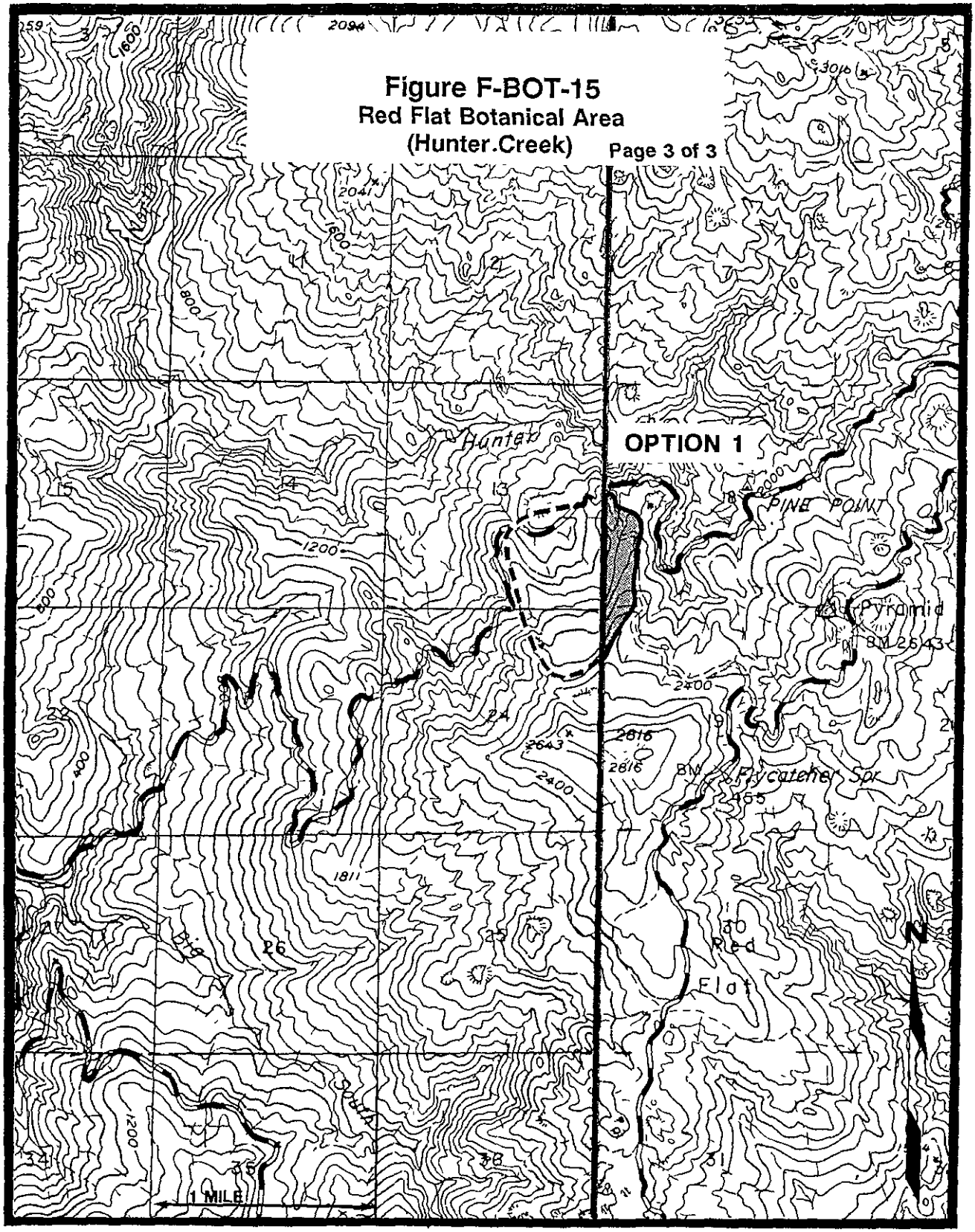
Table F-BOT-14. Unusual Plants in the Proposed Oregon Mountain Botanical Area

Scientific Name	Common Name
Sensitive Species	
Allium bolanderi	Bolander's onion
Balsamorhiza sericea	silky balsamroot
Calochortus howellii	Howell's mariposa lily
Cupressus bakeri ssp. matthewsii	Matthew's cypress
Dentaria gemmata	purple toothwort
Epilobium rigidum	rigid willow-herb
Erythronium howellii	Howell's fawn lily
Gentiana bisetaea	Waldo gentian
Lewisia oppositifolia	opposite-leaved lewisia
Microseris howellii	Howell's scorzonella
Monardella purpurea	Siskiyou monardella
Senecio hesperius	Siskiyou butterweed
Streptanthus howellii	Howell's streptanthus
Thlaspi montanum var. siskiyouense	wild candytuft
Viola lanceolata ssp occidentalis	western violet
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arabis koehleri var. *stipitata* 1/	shrubby rock cress
Arenaria howellii	Howell's sandwort
Aster brickellioides	rayless leafy aster
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Dicentra formosa ssp. *oregana*	Oregon bleeding heart
Eriogonum pendulum	long-stalked eriogonum
Fritillaria glauca	Siskiyou fritillaria
Lilium kelloggii	lilac lily
Lilium vollmeri	Vollmer's lily
Sidalcea malvaeflora ssp *elegans*	mallow sidalcea
Vancouveria chrysantha	yellow vancouveria

1/ Potential candidate for Regional Forester's sensitive list.


Figure F-BOT-15
Red Flat Botanical Area
Page 1 of 3
Hunter
PINE POINT
Pyramid Rock
BM 2643
Flycatcher Spr
Red Flat
N


Figure F-BOT-15
Red Flat Botanical Area
Page 2 of 3
Addition
PINE POINT
N
1 MILE


Figure F-BOT-15
Red Flat Botanical Area
(Hunter.Creek)
Page 3 of 3
OPTION 1
Hunter
PINE POINT
Pyramid
BM 2643
Flycatcher Spr
Red
Flat
1 MILE

RED FLAT - F-BOT-15

The 7,172 acre proposed Red Flat Botanical Area straddles the boundary between the Gold Beach and Chetco Ranger Districts. The area is bounded on the east by the North Fork Pistol River, on the south by a township line, on the west by the Forest Proclamation Boundary, and on the north by Signal Buttes (T 37S., R.13W , Sections 5, 6, 7, 8, 17, 18, 19, 20, 29, 30, 31, 32; T.36S., R 13W., Section 31 (Figure F-BOT-15, 2 parts) Elevation range is 1,200 to 2,643 feet Pyramid Rock, Flycatcher Spring, Signal Buttes, Pine Point Campground and part of Hunter Creek are within the proposed area. The Red Flat site has been divided into two sections; this provides flexibility to land managers who must make decisions on land allocations. For further information on these options see Figures F-1 and F-BOT-15 (3 parts).

The plant resources of the Red Flat area have not been extensively inventoried One sensitive species, *Microseris howellii*, occurs in the area (Table F-BOT-15). A number of *Darlingtonia* bogs are present, along with such associated species as *Cypripedium californicum* and *Lilium vollmeri*. Hunter Creek Bog lies just to the west of the Forest boundary, along Road 3680 on land administered by the Bureau of Land Management Part of the drainage basin for the bog lies on National Forest land The bog had been proposed as a Research Natural Area as early as 1973 This effort was abandoned in August 1978, after it became apparent that the bog area was blanketed with mining claims. Up to that point, it had been the Forest Service's intention to further protect the bog's drainage basin by a set-aside of land within the National Forest in the W1/2 of the SE1/4 of Section 18 and the W1/2 of the NW1/4 of Section 19, T.37S , R.13W. (on file at the Supervisor's Office under FSM 4060/Proposed Hunter Creek Bog Research Natural Area).

The mineral values of the proposed Red Flat Botanical Area are considerable. Much of the area is under claim. The western section of the area contains extensive areas of nickel lateritic soil. Nickel content of the soil averages 0.8 percent. The soil also contains relatively high concentrations of cobalt, chrome, and iron. The total known area of lateritic soil cover on land administered by the Forest Service is approximately 710 acres. Len Ramp (1978:15) has mapped mineral deposits in the Red Flat Area (F-BOT-15A). He describes this area as·

> ...a relatively thin erosional remnant of an ultramafic thrust sheet together with a thin sheet of Colebrooke Schist overlying the Dothan-Otter Point Formation. Patches of partly serpentinized harzburgite overlie sheared serpentinite, which in turn overlies and is intermixed with thin lenses and sheets of Colebrooke Schist. This assemblage overlies relatively unaltered Dothan-Otter Point marine sediments and minor volcanic rocks. Nickel-bearing lateritic soils and saprolite have developed on the partly serpentinized harzburgite.
>
> The maximum depth of soil and saprolite development with or without nickel-enriched serpentinite is about 50 feet, but the average thickness of the nickel-rich serpentinite deposit is 12.5 feet. A few surface patches of iron-shot accumulation occur on the untransported residual soil on the ridge top in the W1/2 of Section 30. Garnierite occurs in the nickel-enriched serpentinites a few hundred feet north of the spring near the south end of the ridge in SW1/2 of Section 30. The presence of garnierite in the serpentinite probably best explains its anomalous nickel content.

About 4,773 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 2,578 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Most of the proposed Red Flat site is not recommended as a Botanical area in the Preferred Alternative (S). More Botanical inventory is needed to pinpoint any important concentrations of rare species. If future inventories turn up new information about the area, it will be reviewed at the next revision of the Forest Plan. The Bureau of Land Management is presently involved in a land management planning process, Hunter Creek Bog will be considered for Botanical area status Among other proposals, the BLM will consider

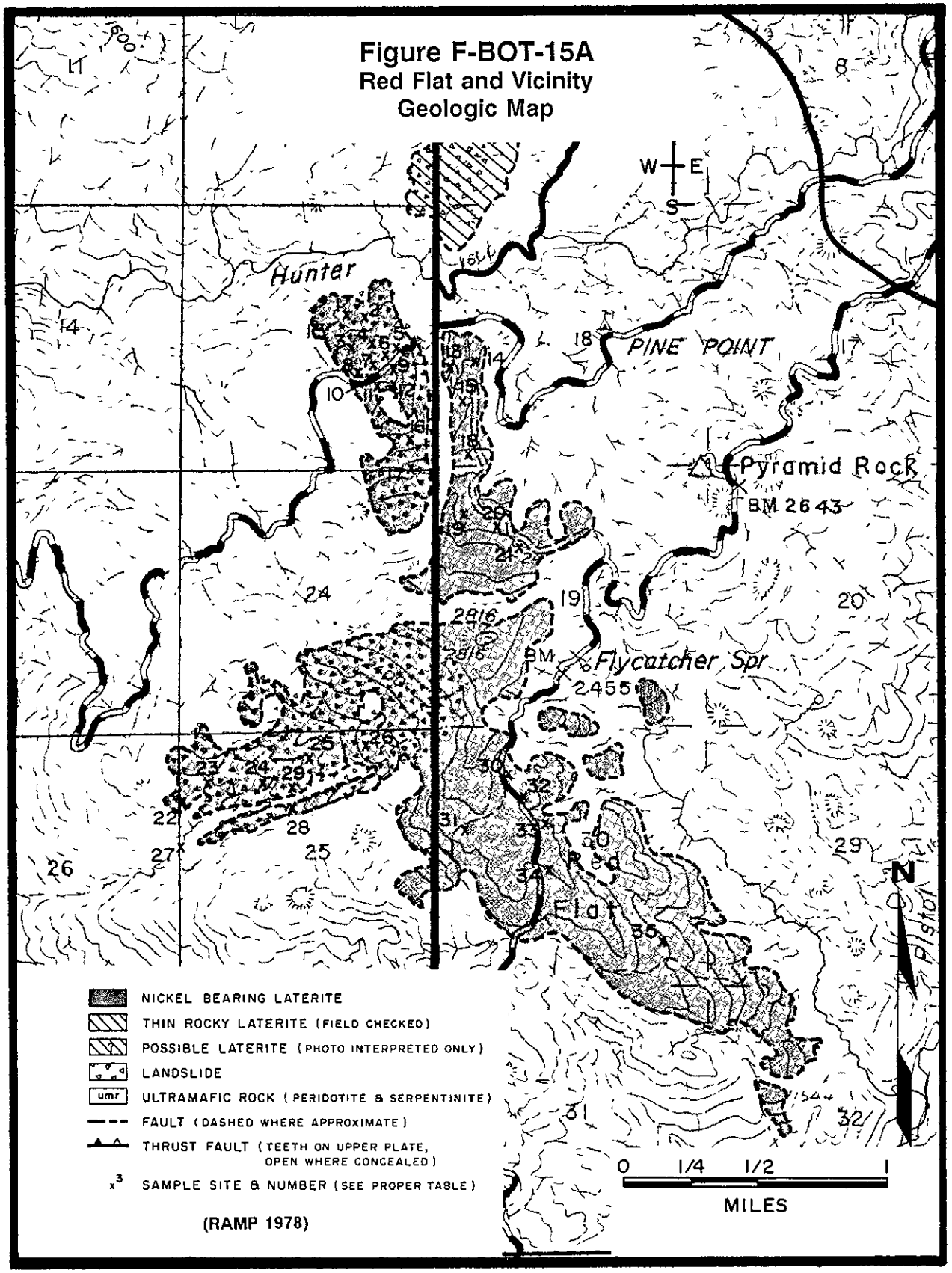
designation of the Bog's entire watershed The portion of the Bog's watershed within the boundary of the Siskiyou National Forest has been recommended as a Botanical area by the Forest Service (53 acres; see Figure F-Bot-15, Page 3 of 3)

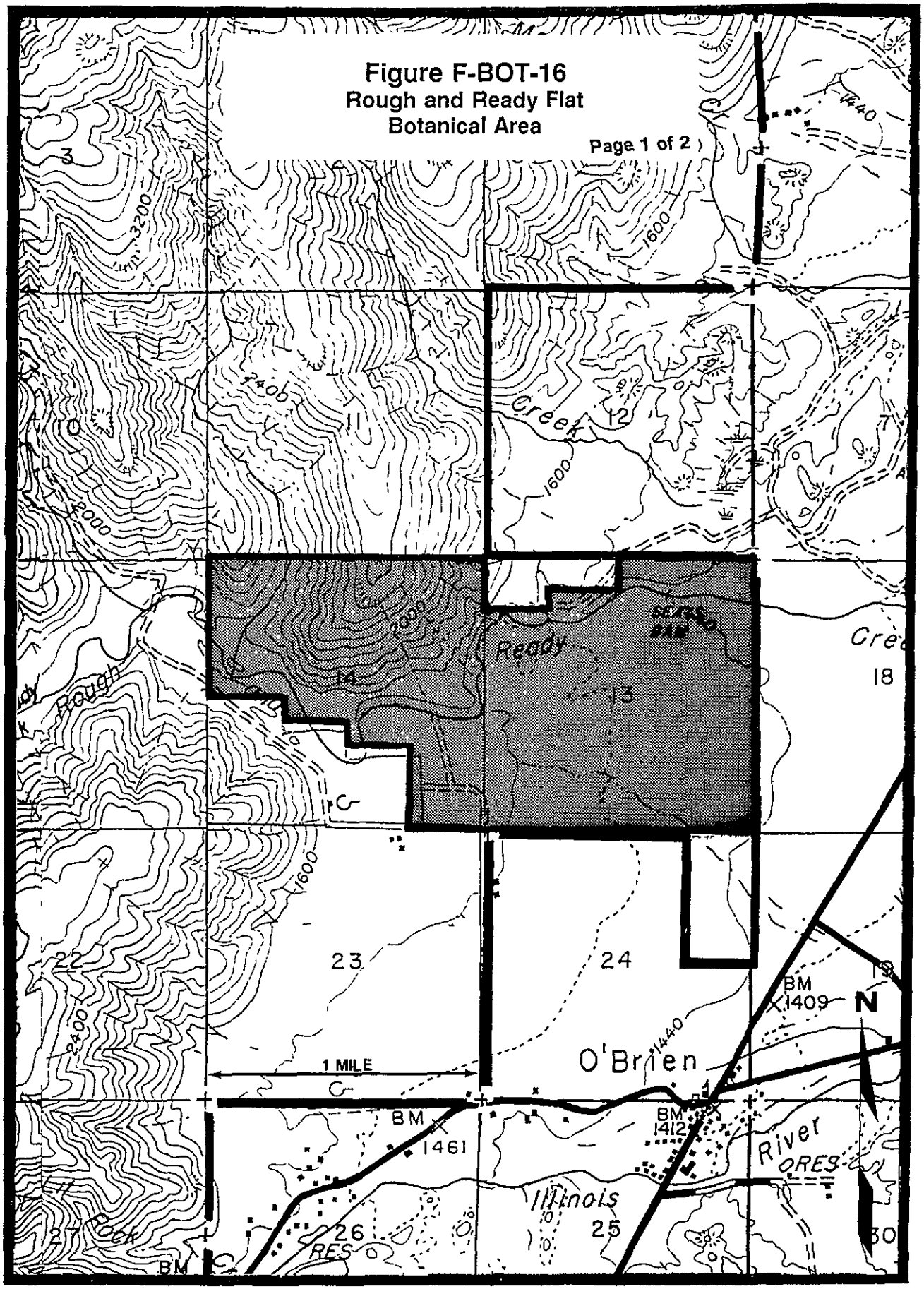
Table F-BOT-15 Unusual Plants in the Proposed Red Flat Botanical Area

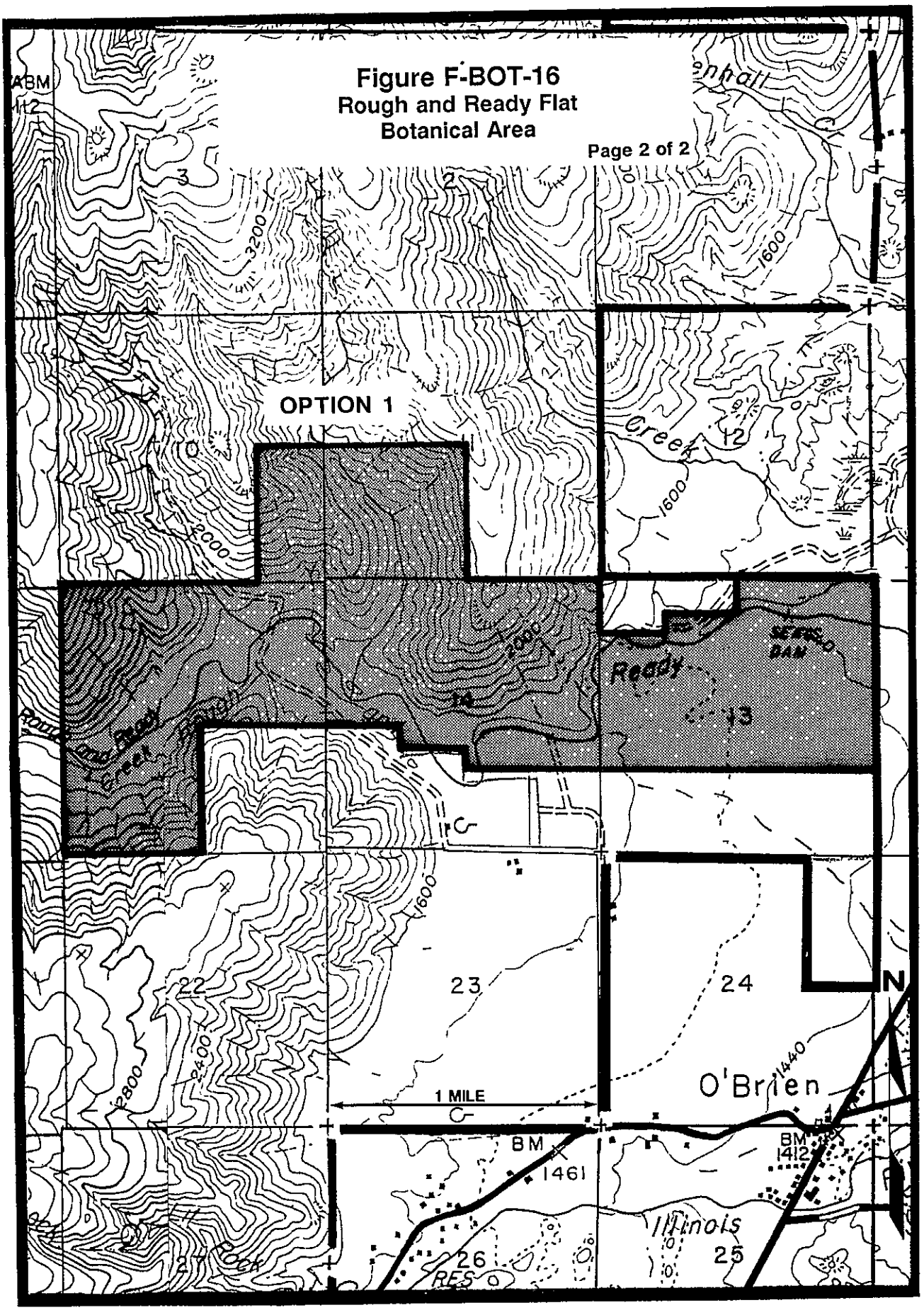
Scientific Name	Common Name
Sensitive Species	
Microseris howellii	Howell's microseris
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arctostaphylos hispidula 1/	Howell's manzanita
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Erigeron cervinus 1/	Siskiyou daisy
Eriogonum pendulum	Waldo eriogonum
Erythronium revolutum	coast fawn lily
Lathyrus delnorticus 1/	Del Norte pea
Lilium vollmeri	Vollmer's lily
Sedum laxum ssp. *heckneri* 1/	lax stonecrop

1/ Potential candidate for Regional Forester's sensitive list.




Figure F-BOT-15A
Red Flat and Vicinity
Geologic Map
W
E
S
Hunter
PINE POINT
Pyramid Rock
BM 2643
Flycatcher Spr
2455
Red
Flat
Pistol
N
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
umr
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
x3
SAMPLE SITE & NUMBER (SEE PROPER TABLE)
(RAMP 1978)
0
1/4
1/2
1
MILES


Figure F-BOT-16
Rough and Ready Flat
Botanical Area
Page 1 of 2
3
3200
1600
1440
Creek
12
2400
11
10
2000
1600
Ready
13
14
18
Rough
1600
22
23
24
2400
1 MILE
BM
1409
N
1440
O'Brien
BM
1461
BM
1412
River
ORES
Illinois
25
26
RES
27
Cook
BM
30


Figure F-BOT-16
Rough and Ready Flat
Botanical Area
Page 2 of 2
OPTION 1
Rough and Ready Creek
Ready
SERIS DAM
O'Brien
Illinois
1 MILE
BM 1461
BM 1412
RES
3200
2000
1600
2800
2400
1440
22
23
24
25
26
N

ROUGH AND READY FLAT - F-BOT-16

Approximately 1,700 acres are considered for recommendation in the proposed Rough and Ready Botanical Area. One proposal covers 934 acres, the other includes 1499 acres (Figure F-BOT-16, 2 parts) This site is located on the Illinois Valley Ranger District, one mile northwest of the town of O'Brien (T 40S., R 9W., Sections 13, 14) (Figure F-BOT-16, 2 parts). The eastern one-third of the proposed Botanical area is relatively flat (approximately 1,550 feet elevation) The western two-thirds is relatively steep; elevation range is 1,600 to near 3,000 feet Rough and Ready Creek bisects the proposed area, and Rough and Ready Creek Forest Wayside State Park is a mile to the east.

The 1,499 acre area is recommended as a Botanical area in the Preferred Alternative (S) (Figure F-Bot-16, Page 2 of 2) This area differs from the 934 acre proposal by containing more steep hillsides, rock outcrops, and creek bottom, some of the flat alluvial ground to the east is not included. These changes increase the breadth of plant communities and habitats within the Botanical area. A three-agency Botanical area could be designated in the area. The Bureau of Land Management could designate land in section 18, which would connect the Forest Service and State Park holdings.

Although the plant resources of the area have not been thoroughly inventoried, ten sensitive species are known to be present Included are two species of rock cress (*Arabis*) and four members of the lily family (*Liliaceae*) (Table F-BOT-16).

The area contains no land tentatively available and suitable for timber production.

Soils in the proposed Rough and Ready Creek Botanical Area are derived from ultramafic rock (Figure F-BOT-16A). Approximately 500 acres of thin rocky laterites (Rough and Ready outwash) have been mapped within the proposed Botanical area. The Oregon Department of Geology and Mineral Industries calculated nickel content of the soil at 0 45 percent. A small area of approximately 20 acres of nickel-bearing laterite is located on Parker Ridge in the NW1/4 of the NE1/4 of Section 14 Oregon Department of Geology and Mineral Industries calculated the nickel content here at 1.0 percent, chrome and cobalt content was 2 0 and 0.1 percent respectively Early-day gold placer miners recovered small amounts of gold and platinum metals along part of the bench gravel area along Rough and Ready Creek (Ramp 1978).

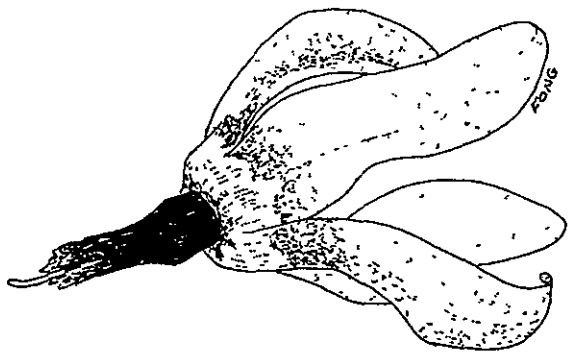
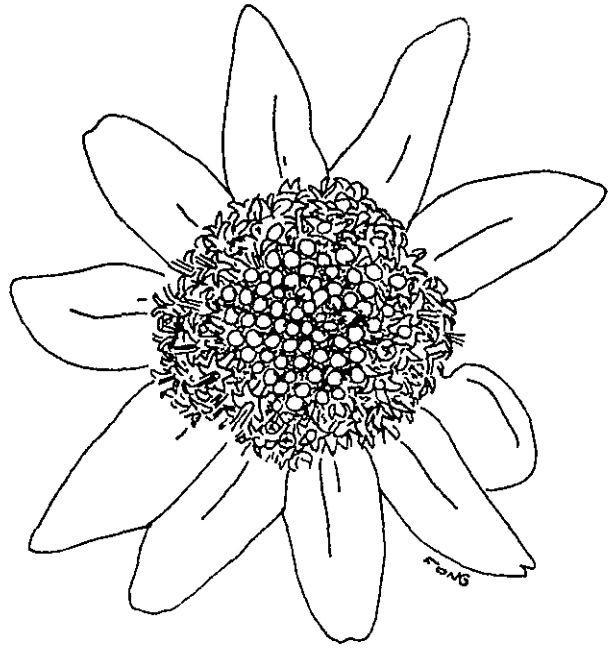
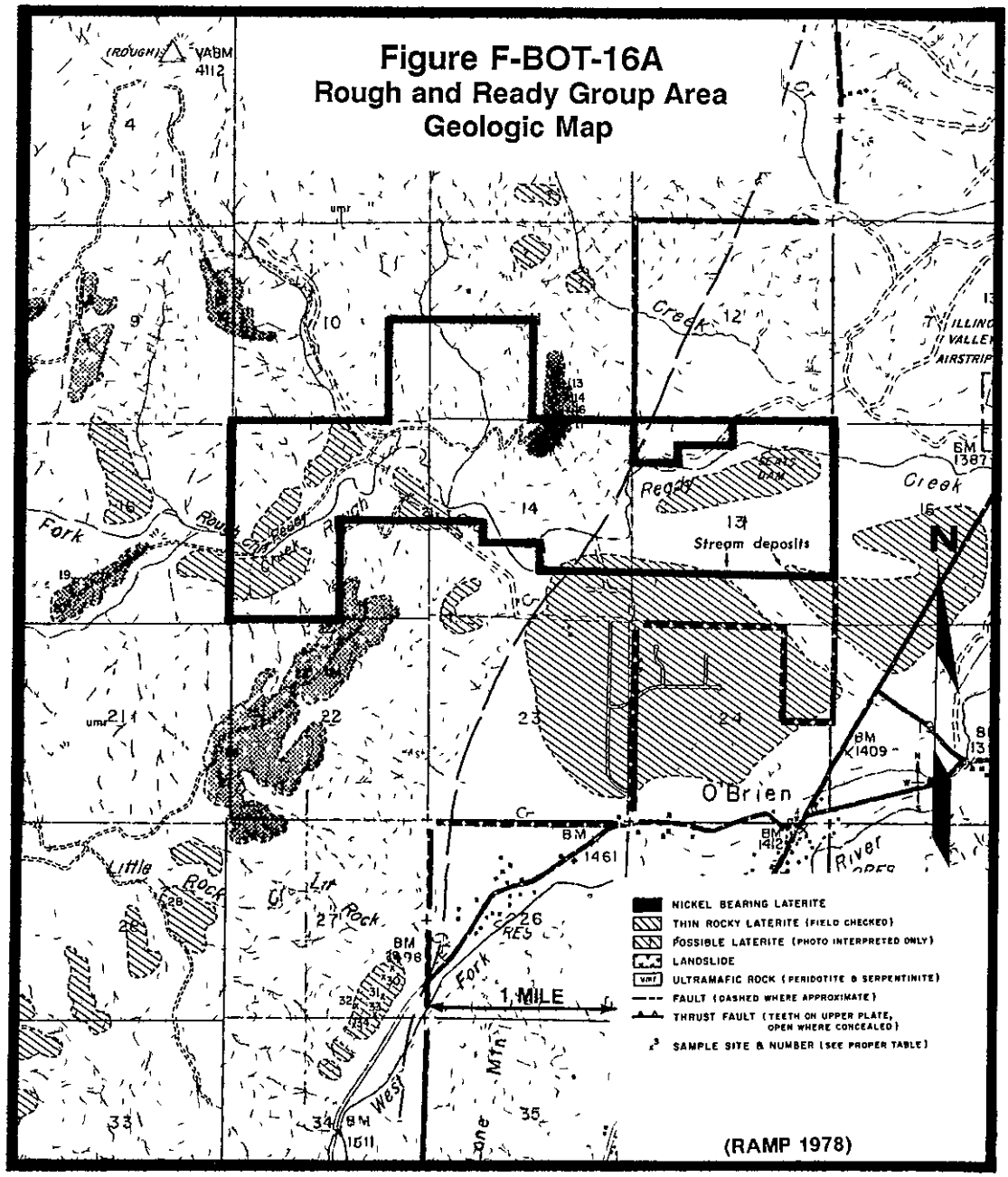


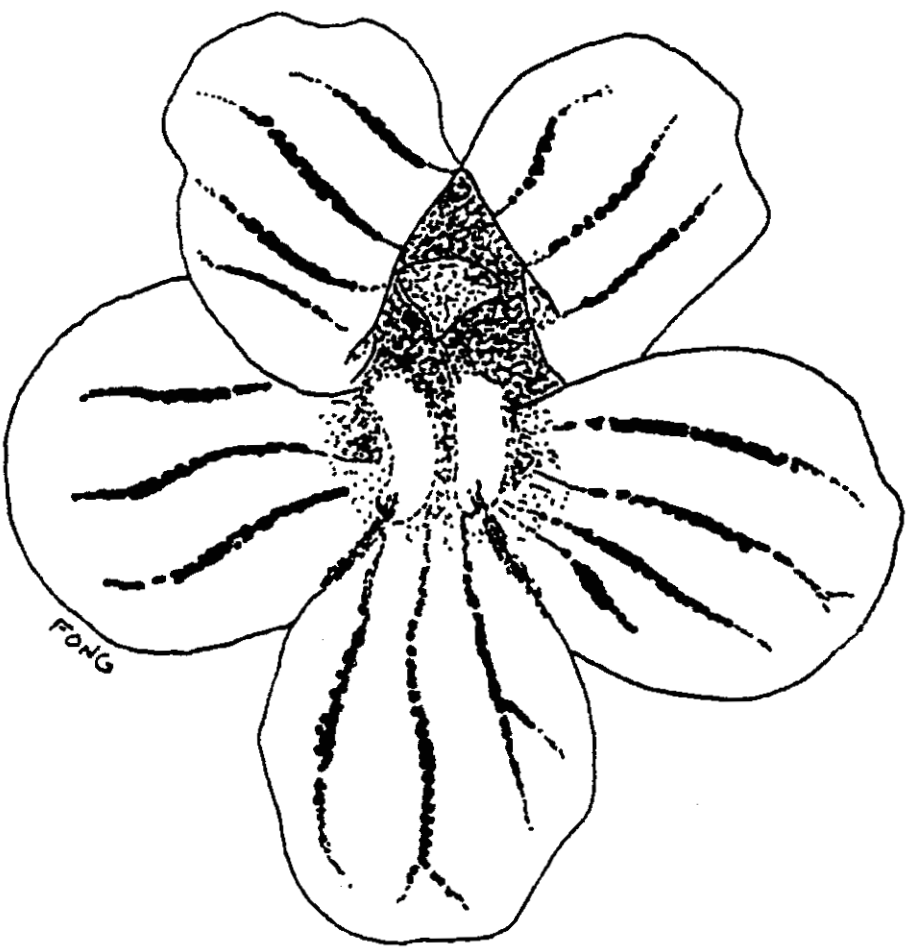
Table F-BOT-16 Unusual Plants in the Proposed Rough and Ready Flat Botanical Area

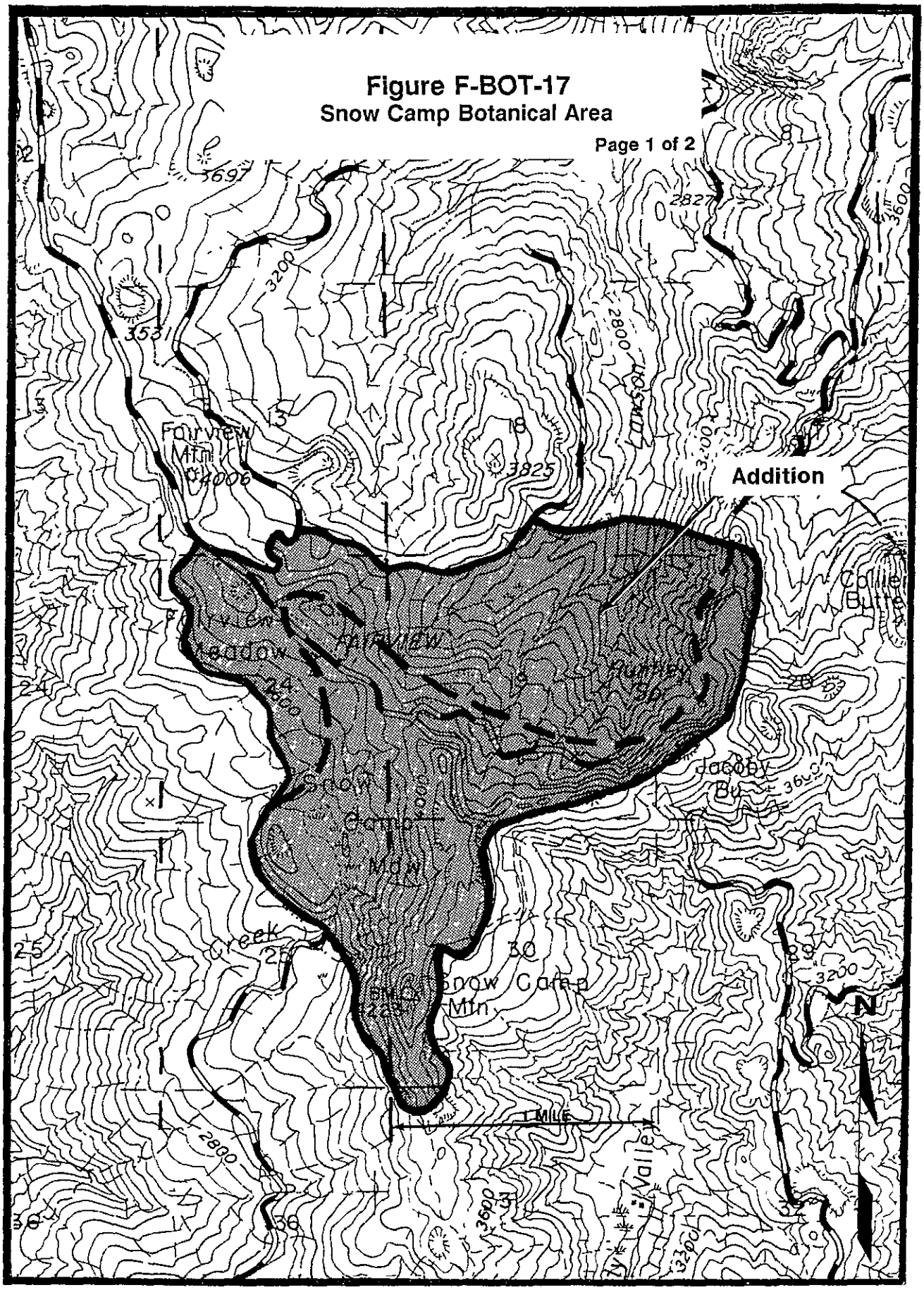
Scientific Name	Common Name
Sensitive Species	
Calochortus howellii	Howell's mariposa lily
Erythronium howellii	Howell's fawn lily
Fritillaria glauca	Siskiyou fritillaria
Lewisia oppositifolia	opposite-leaved lewisia
Microseris howellii	Howell's scorzonella
Monardella purpurea	Siskiyou monardella
Poa piperi	Piper's bluegrass
Senecio hesperius	Siskiyou butterwort
Thlaspi montanum var. *siskiyouense*	wild candytuft
Viola lanceolata ssp. *occidentalis*	western violet
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arabis koehleri var. *stipitata* 1/	Koehler's rock cress
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Dicentra formosa ssp *oregana*	Oregon bleeding heart
Sidalcea malvaeflora ssp. *elegans*	mallow sidalcea

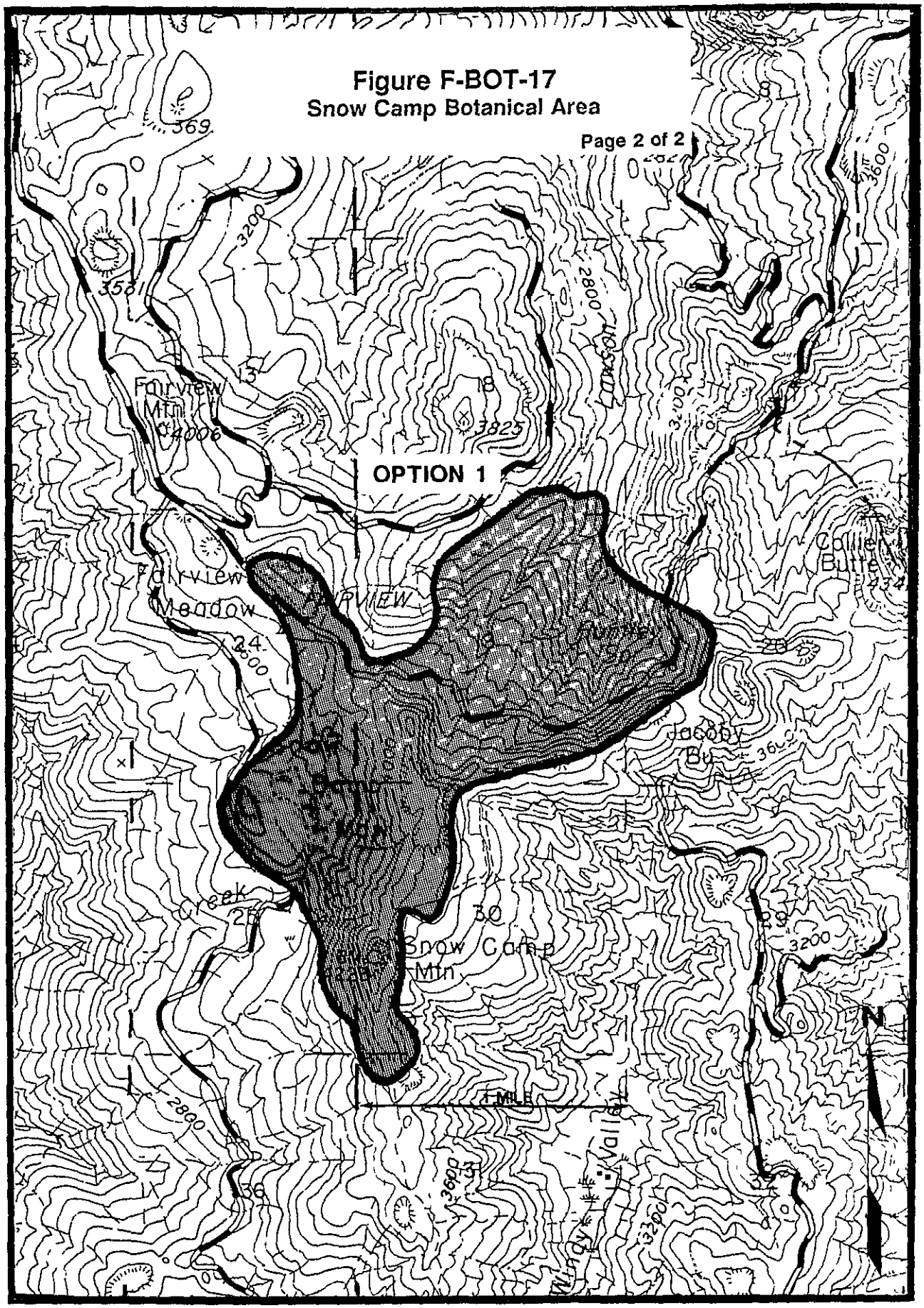
1/ Potential candidate for Regional Forester's sensitive list.




Figure F-BOT-16A
Rough and Ready Group Area
Geologic Map
Stream deposits
O'Brien
Creek
Fork
Little Rock
1 MILE
(RAMP 1978)
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
SAMPLE SITE & NUMBER (SEE PROPER TABLE)


FONG


Figure F-BOT-17
Snow Camp Botanical Area
Page 1 of 2
Addition
Fairview Mtn
Fairview Meadow
Snow Camp Mtn
Snow Camp Mtn
Jacoby Bu
Collier Butte
Fairview
Further Spr
Valley
1 Mile
N


Figure F-BOT-17
Snow Camp Botanical Area
Page 2 of 2
OPTION 1
Fairview Mtn
Fairview Meadow
Snow Camp Mtn
Jacoby Butte
Jacoby Bu
Collier Butte
Creek
1 MILE
N

SNOW CAMP - F-BOT-17

The 1,475 acre proposed Snow Camp Botanical Area is located in the northwest corner of the Chetco Ranger District, both Snow Camp Meadow and Snow Camp Mountain are within the area (T 37S , R 12 1/2 W , Sections 13, 24, 25; T.37S., R.12W., Sections 19, 20, 30, 31) (Figure F-BOT-17). Elevation range is approximately 3,350 to 4,223 feet The Snow Camp site was initially divided into two sections, this provided flexibility to land managers who must make decisions on land allocations. A 1,041 composite area is recommended as a Botanical area in the Preferred Alternative (S) (F-Bot-17, Page 2 of 2), most of the core area is included, plus that part of the addition with more important botanical elements (Huntly springs, an area of Brewer spruce, and Meg's meadow, which contains a large population of *Bensoniella oregana*). For further information on the options see Figures F-1 and F-BOT-17 (2 parts)

The flora of the Snow Camp area is quite varied. The area is home to at least six sensitive species (Table F-BOT-17) Wet sites contain such sensitive plants as *Carex scabriuscula* and *Lilium vollmeri*; dry sites are inhabited by plants such as *Lilium bolanderi* and *Streptanthus howellii*. Snow Camp Meadow contains native grasses including species of *Danthonia* and *Deschampsia*.

Huntly Springs is located in the Snow Camp Addition (Figure F-BOT-17). This is one of those exciting spots treasured by botanists. The spring area contains *Darlingtonia* and a good representation of bog species such as *Lilium vollmeri* and *Cypripedium californicum*. Nearby dry sites harbor such noteworthy plants as *Picea breweriana*, *Lilium bolanderi* and a good-sized population of *Arabis koehleri* var. *stipitata*.

The Snow Camp area has long held the fascination of serious botanists Veva Stansell, an expert botanist from Pistol River, described the area as follows:

> Snow Camp Botanical Area with its varied geology provides botanists and wildflower enthusiasts with a generous spring display. The meadows along the road near the Lookout Junction harbor an assortment of belly-flowers in addition to the sensitive species *Bensoniella oregona* and *Erythronium revolutum*. There is also botanical history here as this is thought to be the area where *B. oregona* was first collected as a genus new to science. The type locality is given as simply Snow Camp, and this is the logical site, being along the old trail.
>
> Snow Camp meadow supports a good assortment of native grasses. At Huntley Springs metavolcanics and ultramafic rocks meet for more botanical diversity. *Picea breweriana* and *Acer glabrum* are next-door to *Darlingtonia californica*, *Lilium vollmeri* and the Pines. The old-growth Douglas-fir association which includes several non-chlorophyll species near Fairview rounds out an outstanding package of diverse habitats.

About 1,263 acres in this proposed Botanical area are tentatively available and suitable for timber production, this land is capable of producing about 682 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3)

Two types of surface rock are present in the Snow Camp Botanical area: ultramafic (partly serpentinized harzburgite) and metavolcanic (Colebrooke Schist) In some places the harzburgite appears to be thrust over Colebrooke Schist. Both of these rock types overlay rocks of the Dothan-Otter Point Formation (sedimentary/volcanic). The proposed area contains approximately 50 acres of mapped nickel laterite deposits (Figure F-BOT-17A). Len Ramp (1978.54) describes most of the deposits as shallow and rocky. He further states that

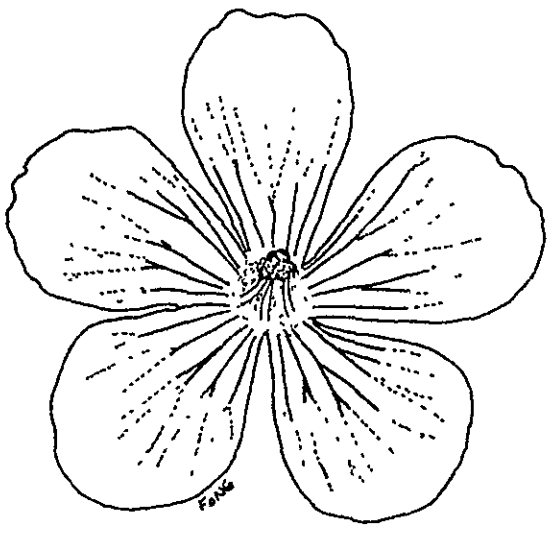
> .the Snow Camp Meadow deposit is a large landslide area that at one time contained a small, 15-acre slide lake in the central part of the meadow This area has a fairly thick deposit of pale, greenish-gray, fine-grained lake sediments exposed in the creek banks near the south end of the meadow The outer ridge of the slide appears to be the principal area of lateritic soil, but it also

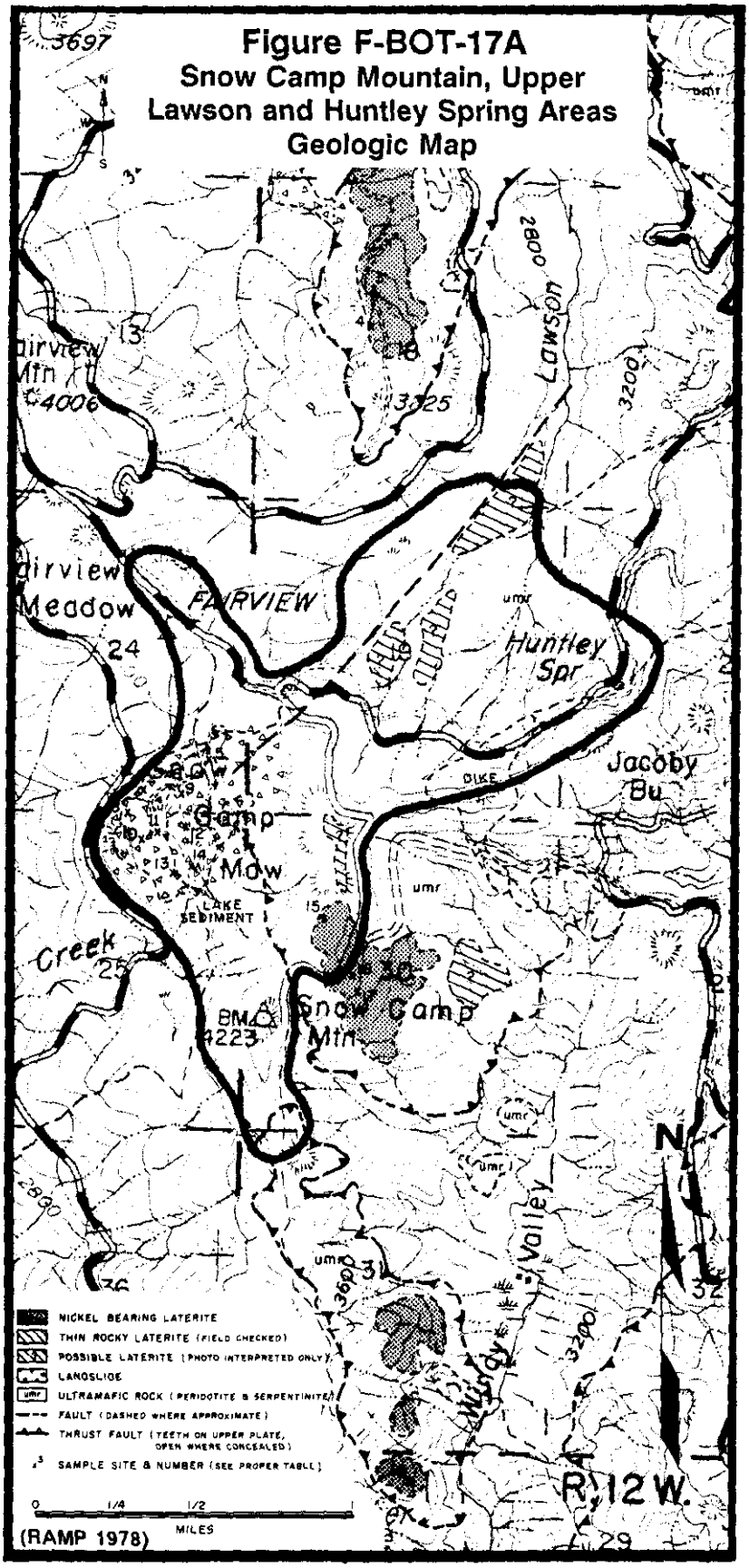
occurs under the lake sediments The laterites and saprolite development in the meadow slide deposit may be as deep as 50 feet or more in places; average depth is estimated to be 20 feet Estimated average depth of nickel enrichment in the Snow Camp Mountain patch is about 8 feet The calculated average grade of soil sampled in lake sediments is 0 63 percent nickel

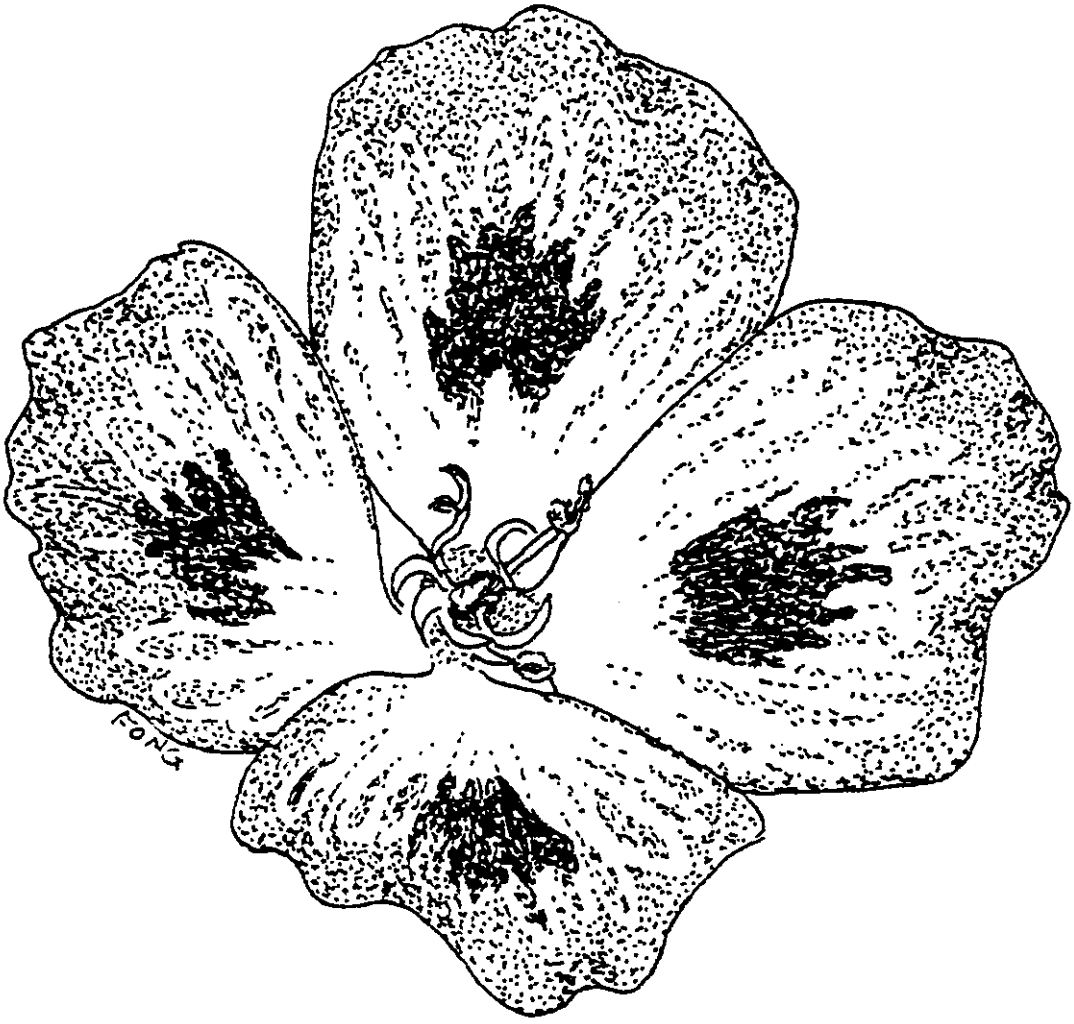
Table F-BOT-17 Unusual Plants in the Proposed Snow Camp Botanical Area

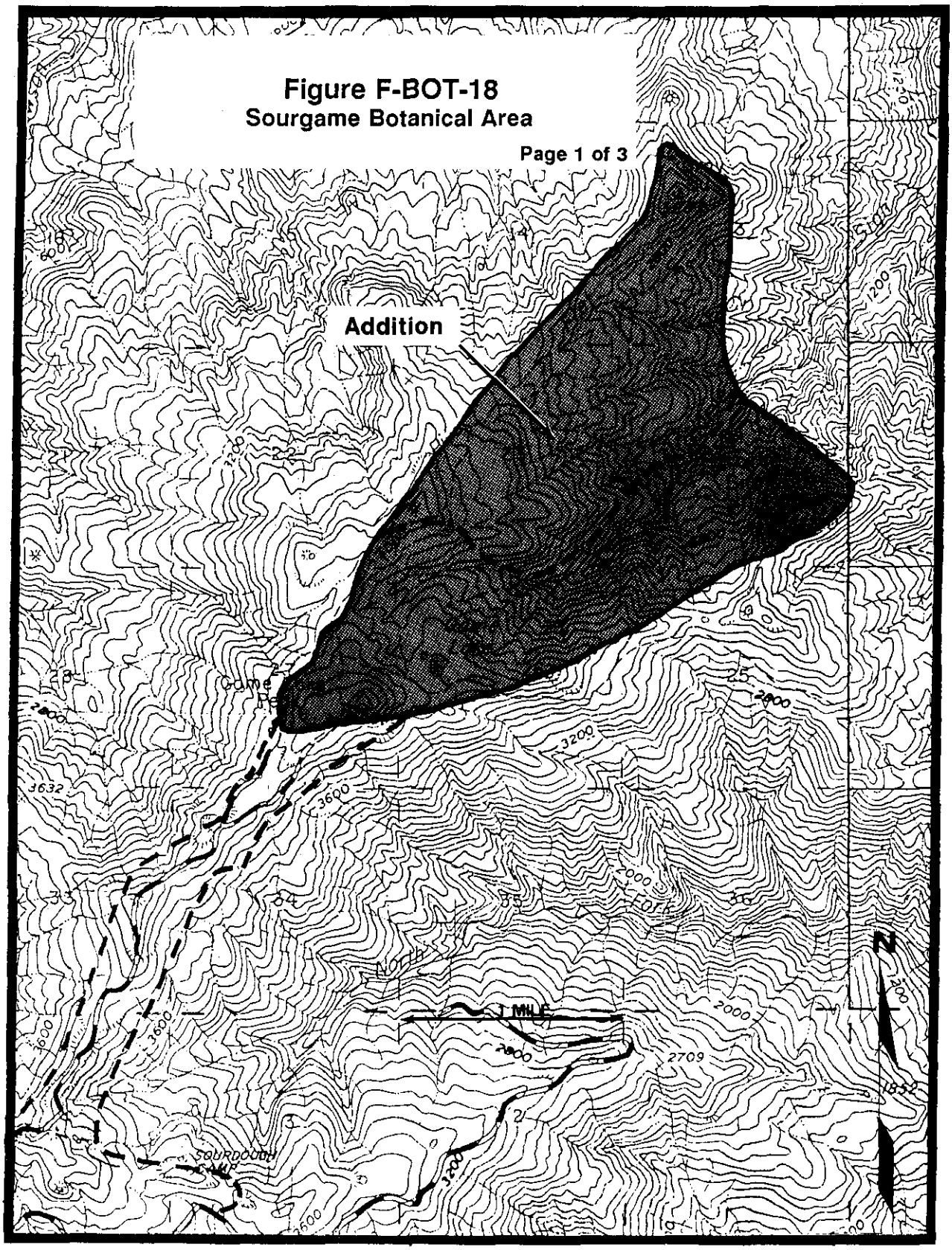
Scientific Name	Common Name
Sensitive Species	
Bensoniella oregana	bensonia
Carex scabriuscula	Cascade sedge
Dentaria gemmata	purple toothwort
Poa piperi	Piper's bluegrass
Streptanthus howellii	Howell's streptanthus
Watch/Review Species	
Arabis koehleri var *stipitata* 1/	Koehler's rock cress
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Eriogonum pendulum	long-stalked eriogonum
Erythronium revolutum	coast fawn lily
Lilium vollmeri	Vollmer's lily
Saxifraga fragarioides	strawberry saxifrage

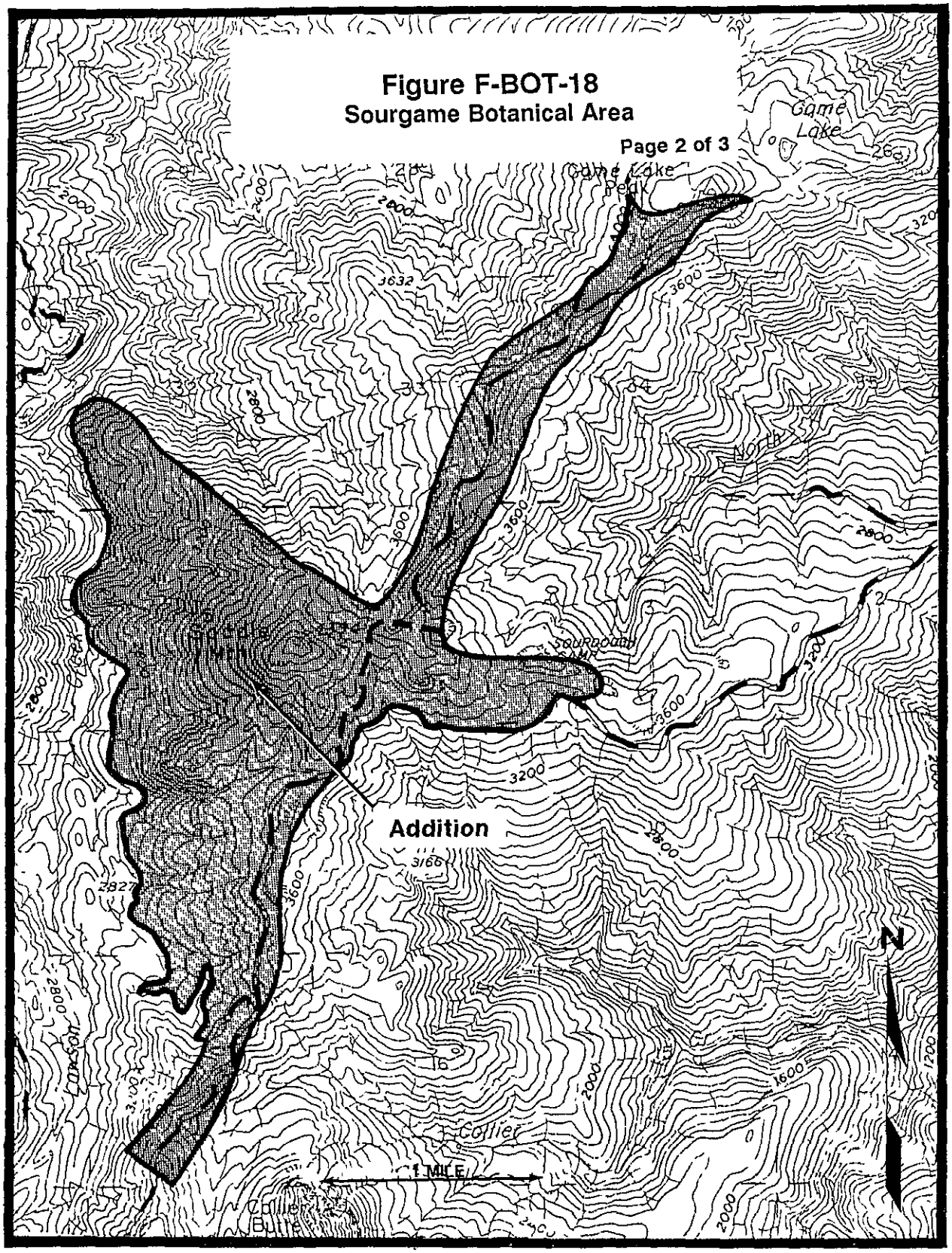
1/ Potential candidate for Regional Forester's sensitive list

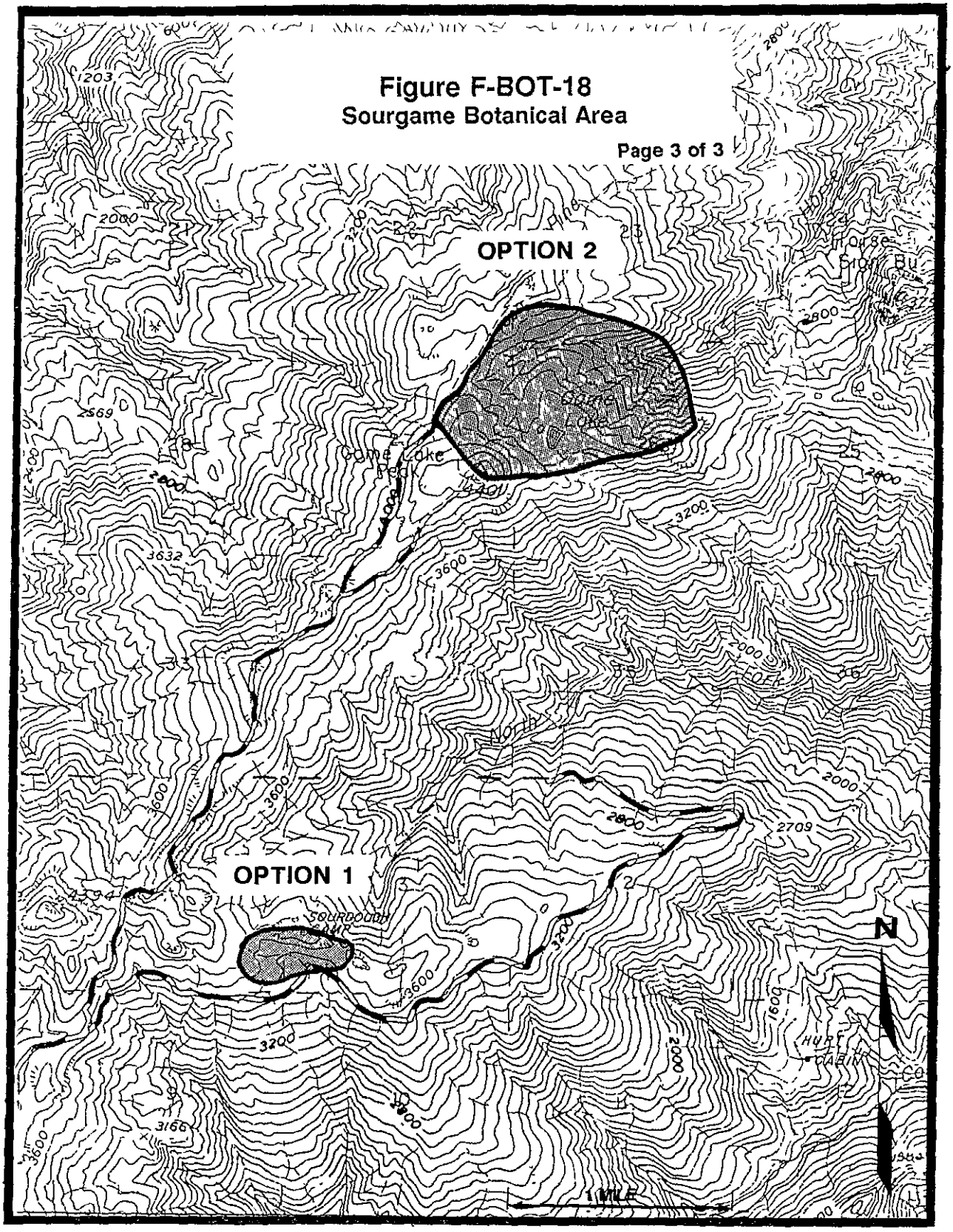



Figure F-BOT-17A
Snow Camp Mountain, Upper Lawson and Huntley Spring Areas Geologic Map
3697
Fairview Mtn
4006
3325
2800
LAWSON
3200
Fairview Meadow
FAIRVIEW
Huntley Spr
Jacoby Bu
DIKE
Snow Camp Mow
LAKE SEDIMENT
Creek
BM 4223
Snow Camp Mtn
umr
Valley
Mudsy
2890
3600
3200
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
SAMPLE SITE & NUMBER (SEE PROPER TABLE)
0 1/4 1/2
MILES
(RAMP 1978)
R.12W.
N


FONG


Figure F-BOT-18
Sourgame Botanical Area
Page 1 of 3
Addition
Game
Pe
North
Fork
1 MILE
N
3632
3600
3200
2000
2709
1852


Figure F-BOT-18
Sourgame Botanical Area
Page 2 of 3
Game Lake
Addition
Collier
1 MILE
N


Figure F-BOT-18
Sourgame Botanical Area
Page 3 of 3
OPTION 2
OPTION 1
Game Lake
Peak
SOURDOUGH PEAK
HUFF CABIN
1 MILE
N
2000
2800
3200
3600
2709
3166
3632
2569

SOURGAME - F-BOT-18

The 3,640 acre proposed Sourgame Botanical Area is located in the southwest corner of the Gold Beach Ranger District, it takes its name from Sourdough Camp and Game Lake. Other geographic points within the area are Saddle Mountain, Gray Butte, Horse Sign Butte, and Game Lake Peak (T 36S , R 12W and T 37S., R.12W) (Figure F-BOT-18, 3 parts). Elevation range is approximately 1,600 to 4,394 feet The Sourgame site has been divided into two sections; this provides flexibility to land managers who must make decisions on land allocations. For further information on these options see Figures F-1 and F-BOT-18 (3 parts)

The flora of the Sourgame area is unique The wide variety of soil types present have produced a number of contact zones which harbor a botanically rich species mix. At least three sensitive species are present (Table F-BOT-18). *Darlingtonia* bogs dot the area The Game Lake area harbors *Eriogonum pendulum*, *Allium bolanderi*, *Allium falcifolium*, *Lilium vollmeri*, *Frazera speciosa*, *Lewisia nevadensis*, unusual sedges, and four species of violets, including *Viola macloskeyi*. Sourdough Camp's complement of species includes *Darlingtonia*, *Bensoniella oregana*, *Castilleja elata*, and a large population of *Lilium vollmeri*. The population of Vollmer's lily here is one of the finest populations of this species existing, according to Orrel Ballantyne, a botanist from the Arcata, California area who has studied our native *Lilium* species extensively.

A few of the other interesting species in the Sourgame area are *Lathyrus delnorticus*, *Arabis koehleri* var. *stipitata*, *Mimulus cardinalus*, *Lilium bolanderi*, *Sanicula tuberosa*, and *Picea breweriana*.

About 3,640 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 1,082 thousand board feet (MBF) of harvestable timber annually on long-term sustained yield (LTSY) basis (see Table F-3). Some laterite soils are present (Figure F-BOT-18A).

In the Preferred Alternative (S), two separate portions of the area are recommended as Botanical areas: Sourdough Camp (63 acres), Game Lake (508 Acres). Both areas are outlined in Figure F-BOT-18 (Page 3 of 3). These two sites have important botanical values, as attested to by Veva Stansell, a local Botanist from Pistol River:

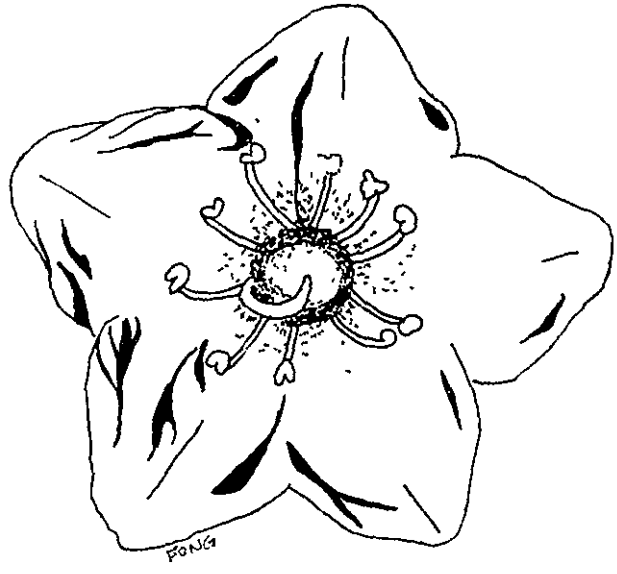
> **Sourdough Camp**, rarely shown on current Forest maps, is named on USGS topographical maps. It consists of a small damp meadow with a thicket of *Rhododendron occidentale* below, and a *Darlingtonia californica* population above. The meadow is spangled in June and July with an abundance of *Lilium vollmeri*, a healthy and vigorous stand. Above the *Darlintonia* is a shaded grassy area where *Bensoniella oregana* is found. It is unusual for these two species to be found in the same drainage. The main road along the east side of Saddle Mountain supports another rare plant, *Lathyrus delnorticus*. This dainty legume is endemic to the Siskiyou Mountains *Castilleja elata*, a pink to lavender-flowered paintbrush, is another uncommon species found near the damp areas.
>
> The meadow area around **Game Lake** is surprisingly undegraded in number of species, in spite of heavy use as a camping site. The serpentine-peridotite hillside east of the lake provides a view of the mysterious Big Craggies, and a carpet of wildflowers in season. *Allium bolanderi*, *A. falcifolium*, *Eriogonum pendulum,* and *Frasera speciosa* are among those of interest. The trail to the old lookout site above the lake begins at Skinners Camp, a small cold shaded spring in a patch of *Darlingtonia californica*. Four members of the Orchid Family grow in or near this damp area (two *Habenaria*'s, and a *Listera* and *Coralorhiza*). *Lilium vollmeri*, *Castilleja elata*, and *Allium validum* are among a long list of species at this site. On up the trail large blocks of granodiorite provide a habitat contrasting with the wet area at Skinners Camp. A small grove of *Picea breweriana* sits on a slope near the top. The unusual spikes of the tall Green Gentian (*Frasera speciosa*) tower to 4 feet or so. Iris, columbine,

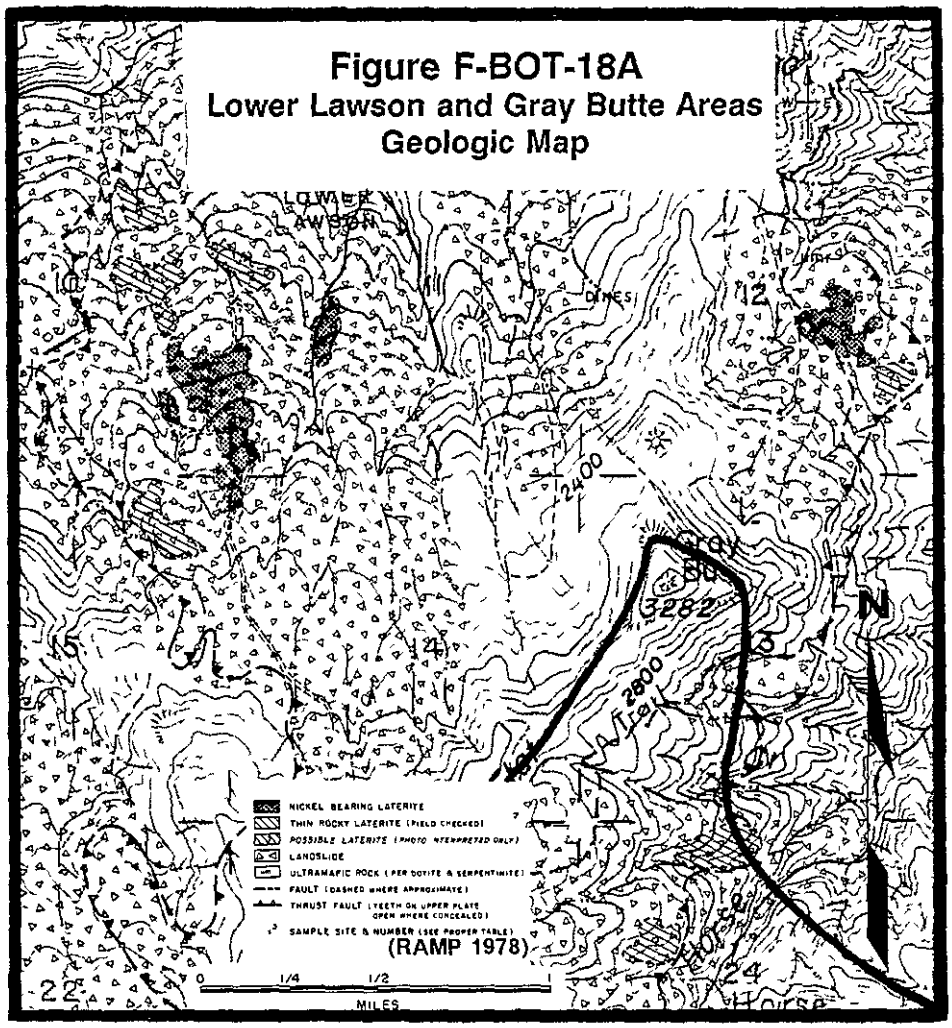
violet, and dwarf ceanothus are but a few of the colorful species lining the trail to the remains of the old lookout

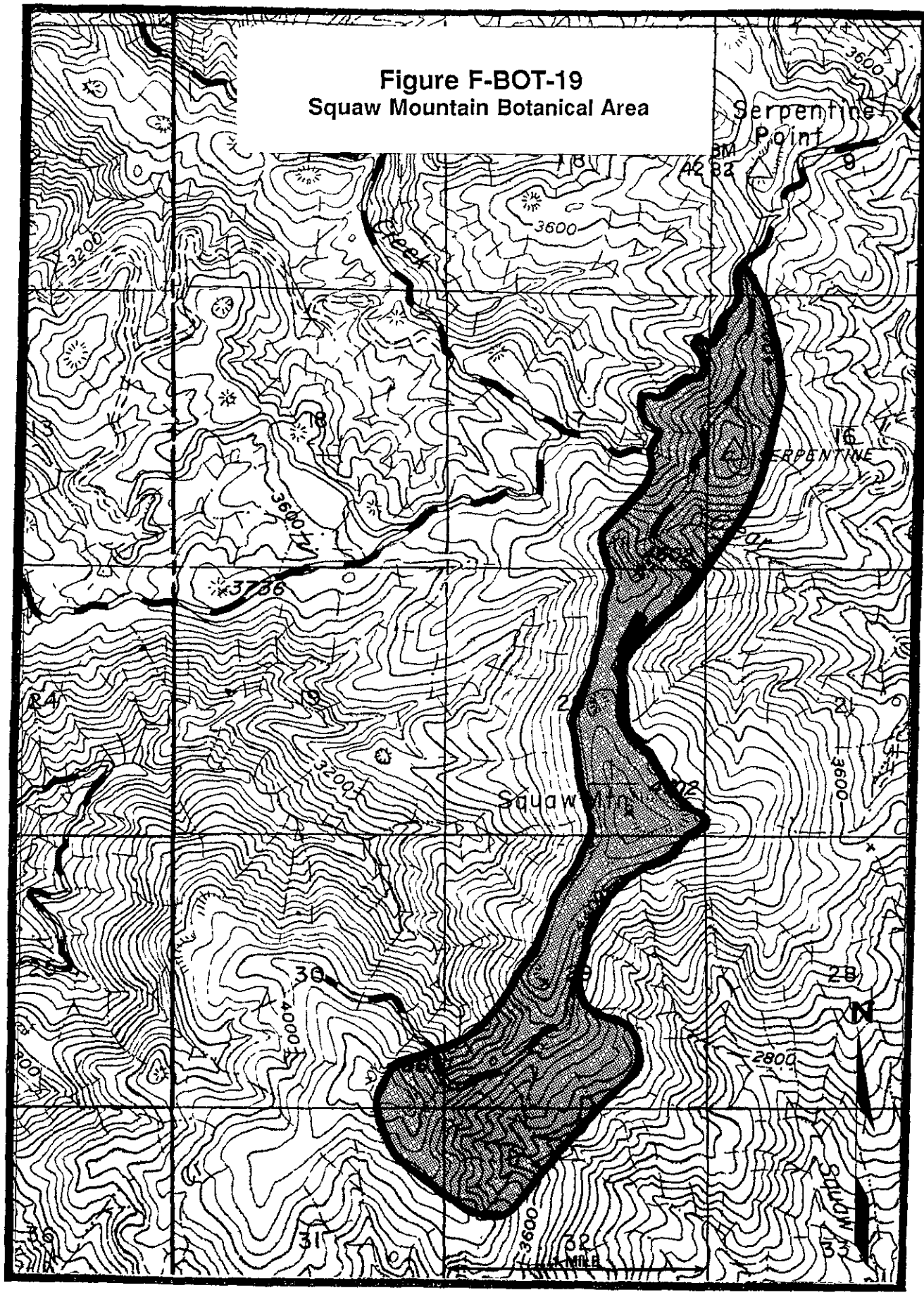
Table F-BOT-18 Unusual Plants in the Proposed Sourgame Botanical Area

Scientific Name	Common Name
Sensitive Species	
Allium bolanderi	Bolander's onion
Bensoniella oregana	bensonia
Erythronium howellii	Howell's fawn lily
Lupinus tracyi	Tracy's lupine
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arabis koehleri ssp *stipitata* 1/	Koehler's rock cress
Castilleja elata	slender paintbrush
Darlingtonia californica	California pitcher-plant
Eriogonum pendelum	long-stalked eriogonum
Eriogonum ternatum 1/	Waldo eriogonum
Lathyrus delnorticus 1/	Del Norte pea
Lilium vollmeri	Vollmer's lily
Sedum laxum ssp. *heckneri* 1/	lax stonecrop

1/ Potential candidate for Regional Forester's sensitive list.




Figure F-BOT-18A
Lower Lawson and Gray Butte Areas
Geologic Map
LOWER LAWSON
DIKES
2400
Gray Butte
3282
2800
N
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE, OPEN WHERE CONCEALED)
SAMPLE SITE & NUMBER (SEE PROPER TABLE)
(RAMP 1978)
0
1/4
1/2
MILES


Figure F-BOT-19
Squaw Mountain Botanical Area
Serpentine Point
3600
3200
3766
4000
2800
R4
T46N

SQUAW MOUNTAIN - F-BOT-19

The 638 acre proposed Squaw Mountain Botanical Area is located on the Galice and Illinois Valley Ranger Districts, a few miles north of Eight Dollar Mountain (T 37S , R 8W., Sections 16, 17, 20, 29, 30, 31, 32) (Figure F-BOT-19). This proposed area occupies metavolcanic and ultramafic rock ridges and includes the Serpentine Lookout Site and Squaw Mountain. Elevation ranges from 3,500 to 4,702 feet.

The plant resources of the area have not been well inventoried, two sensitive species are known to be present (Table F-BOT-19).

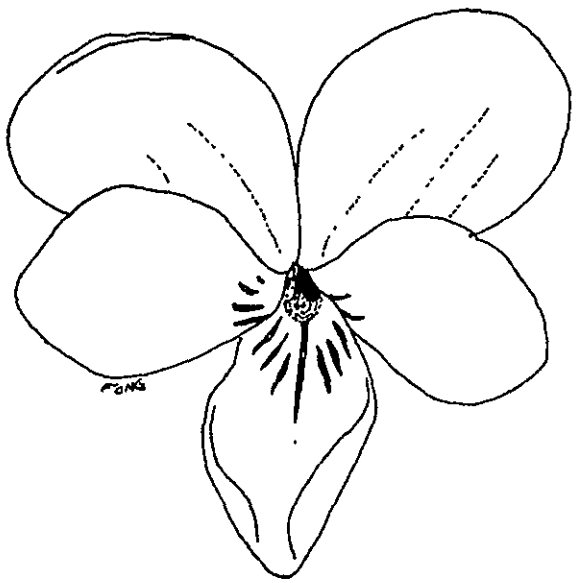
About 252 acres in this proposed Botanical area are tentatively available and suitable for timber production, this land is capable of producing about 136 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3). Two chromium prospects are located in the vicinity (Ramp and Peterson 1979).

This area is not recommended as a Botanical area in the Preferred Alternative (S).

Table F-BOT-19 Unusual Plants in the Proposed Squaw Mountain Botanical Area

Scientific Name	Common Name
Sensitive Species	
Lewisia leana	Lee's lewisia
Senecio hesperius	Siskiyou butterweed
Watch/Review Species	
Arabis koehleri var. *stipitata* 1/	Koehler's rock cress

1/ Potential candidate for Regional Forester's sensitive list.



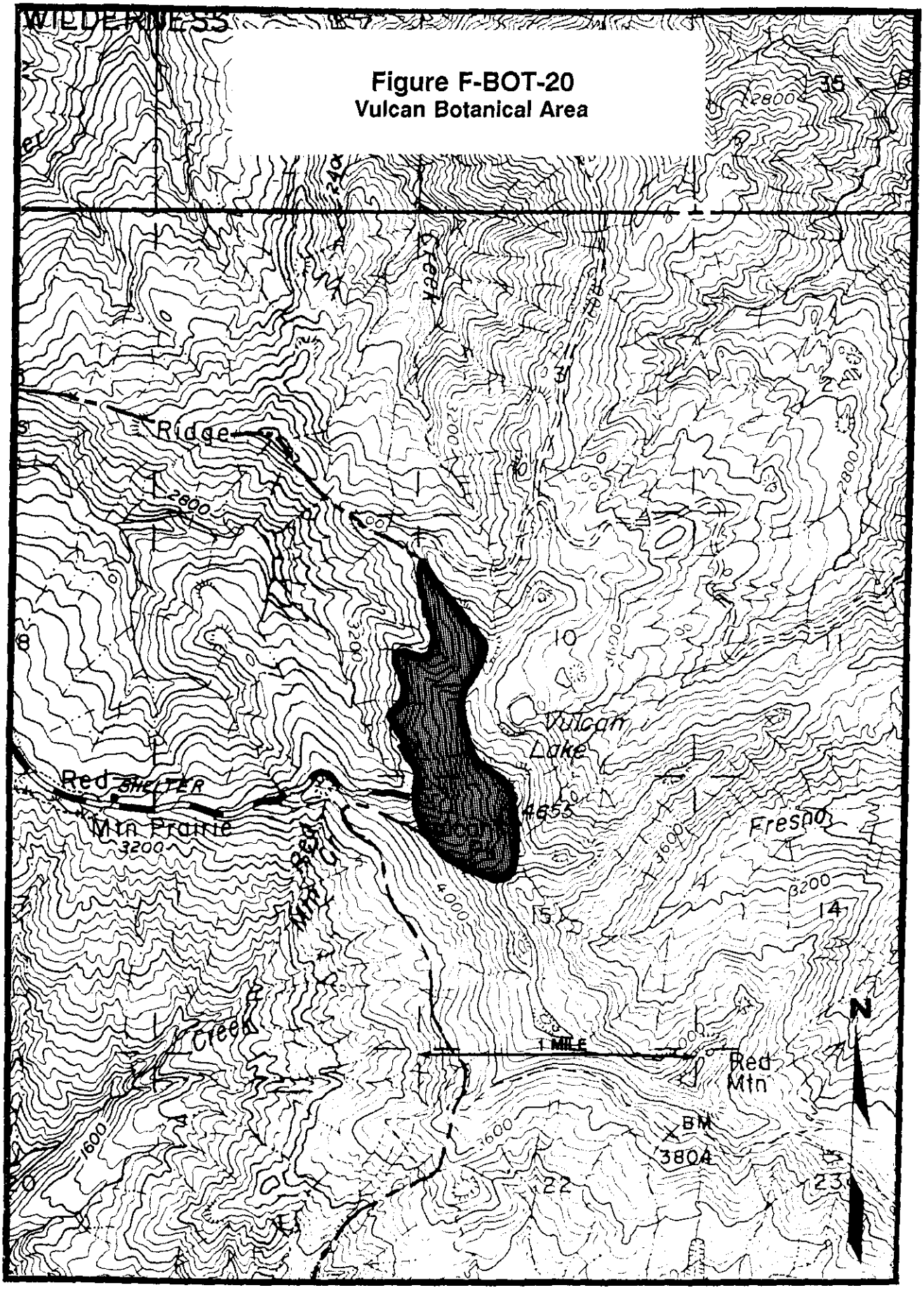


Figure F-BOT-20
Vulcan Botanical Area

VULCAN - F-BOT-20

The 133 acre proposed Vulcan Botanical Area is located on the western boundary of the Kalmiopsis Wilderness, on the Chetco Ranger District (T.39S , R.11W., Sections 9, 10, 15) (Figure F-BOT-20) Elevation range is 3,600 to 4,655 feet (at Vulcan Peak). This area is recommended as a Botanical area in the Preferred Alternative (S)

Although not thoroughly inventoried, the known flora of the proposed Botanical area includes four sensitive species. *Epilobium rigidum* is present, along with other interesting species such as *Dentaria gemmata*, *Hieracium bolanderi* and *Horkelia sericata* (Table F-BOT-20).

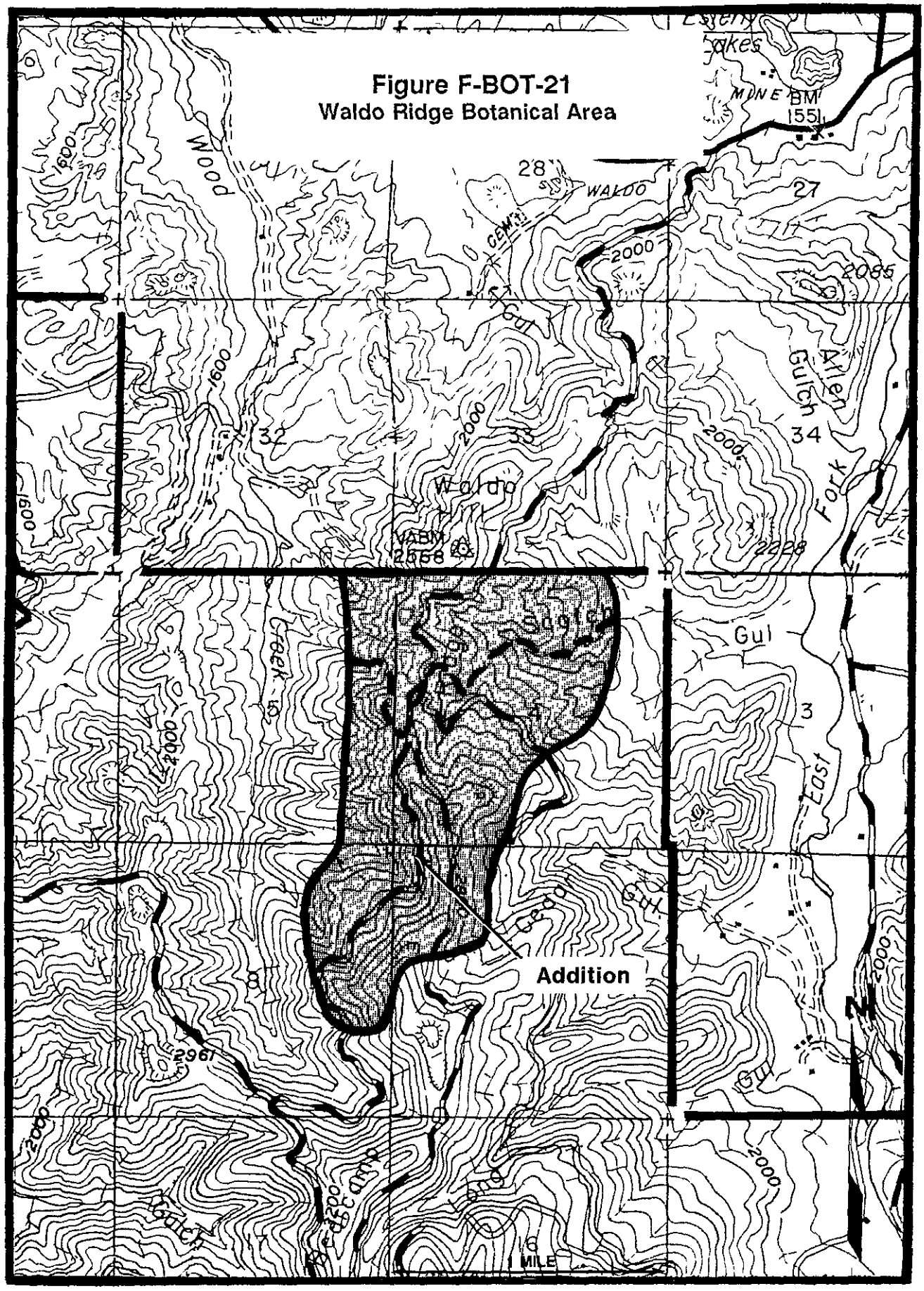
The area has no lands tentatively available and suitable for timber production

Soils in the area are derived from ultramafic rock. No mineral deposits have been mapped within the area. The nearest significant nickel laterite deposits are located at the Cottonwood Camp Area, just south of Vulcan Peak. A chromite prospect is located in the northeast corner of the proposed Botanical area (Section 10 SE1/4 of the NW1/4 of the SW1/4) (Ramp and others 1977).

Table F-BOT-20. Unusual Plants in the Proposed Vulcan Botanical Area

Scientific Name	Common Name
Sensitive Species	
Dentaria gemmata	purple toothwort
Epilobium rigidum	rigid willow-herb
Hieracium bolanderi	Bolander's hawkweed
Streptanthus howellii	Howell's streptanthus
Watch/Review Species	
Cypripedium californicum 1/	California lady's slipper
Darlingtonia californica	California pitcher-plant
Eriogonum ternatum 1/	Waldo eriogonum
Lilium vollmeri	Vollmer's lily
Sedum laxum ssp *heckneri* 1/	lax stonecrop

1/ Potential candidate for Regional Forester's sensitive list


Figure F-BOT-21
Waldo Ridge Botanical Area
Addition
1 MILE
Wood
Waldo
Gul
Allen Gulch
Fork
East
Creek
Gulch
MINE BM 1551
VABM 2558
WALDO
GEM
28
27
32
33
34
3
2000
2085
2228
2961
1600

WALDO RIDGE - F-BOT-21

The proposed 707 acre Waldo Ridge Botanical Area is located on the Illinois Valley Ranger District, two miles south of the old mining town of Waldo (T 40S , R.8W., Sections 4, 5, 8, 9) (Figure F-BOT-21) Waldo Hill (2,568 feet) is just north of the proposed area; the headwaters of Scotch and Cedar Gulches drain the eastern half of the area Elevation range is 1,750 to 3,200 feet.

The Waldo Ridge site has been divided into two sections; this provides flexibility to land managers who must make decisions on land allocations. The primary area contains more sensitive plant resources than the addition. For further information on these options see Figures F-1 and F-BOT-21

Although the plant resources of the proposed area have not been completely inventoried, ten sensitive species are known to be present. Included are *Monardella purpurea*, *Senecio hesperius*, and lilies such as *Calochortus howellii* and *Fritillaria glauca* (this may be the type locality for the last species). *Limnanthes gracilis* ssp. *gracilis* has been reported from the area, along with *Arabis suffrutescens* var. *horizontalis* These two sightings would be firsts for the Siskiyou National Forest (they need to be verified). Sensitive plants are concentrated in the northern portion of the area (see Figure F-BOT-21).

The old mining settlement of Waldo, just north of the proposed Botanical area, was an important center of interest for early-day botanists. Waldo is listed as the type locality for a number of rare plants endemic to southwestern Oregon and northwestern California Until recent years, labels on herbarium specimen-sheets rarely contained site-specific data. Although labels on older herbarium specimen-sheets may indicate that a plant was picked at a specific site, such as "Waldo", collecting may actually have taken place anywhere within a few miles. For example, on May 18, 1930, Tracy's sanicula (*Sanicula tracyi*) was collected at "Waldo" by Kildale. Conceivably, this specimen may actually have been collected within the Waldo Ridge proposed Botanical area, two miles south of the settlement of Waldo Recent botanical surveys of the Waldo townsite area have failed to turn up any specimens of *S. tracyi*; perhaps this species will yet be rediscovered on the Waldo Ridge area. Intensive plant inventories of the proposed area are needed before the full extent of the area's unusual plant resources can be established

The Waldo Ridge proposed area, as presently delineated, contains 516 acres of land tentatively suitable for timber production, mostly in the "Addition". These acres are capable of a long-term sustained yield (LTSY) of about 278 thousand board feet (MBF) annually of timber harvest (see Table F-3 for more detail).

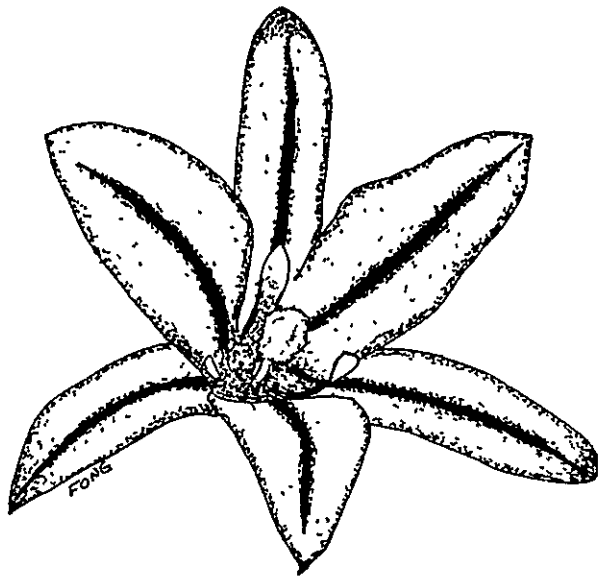
Soils in the area are derived from two rock types: ultramafic (serpentine/peridotite) and metavolcanic (Applegate Group). Ultramafic rock is found mainly in the upper and lower third of the Botanical area; the middle third is metavolcanic. No known mineral deposits are within the Botanical area, but ultramafic rock does contain minor deposits of gold, and placer deposits of platinum originate in this rock type Gold-bearing quartz veins are characteristic of the metavolcanic rock within this proposed area (Ramp and Peterson 1979).

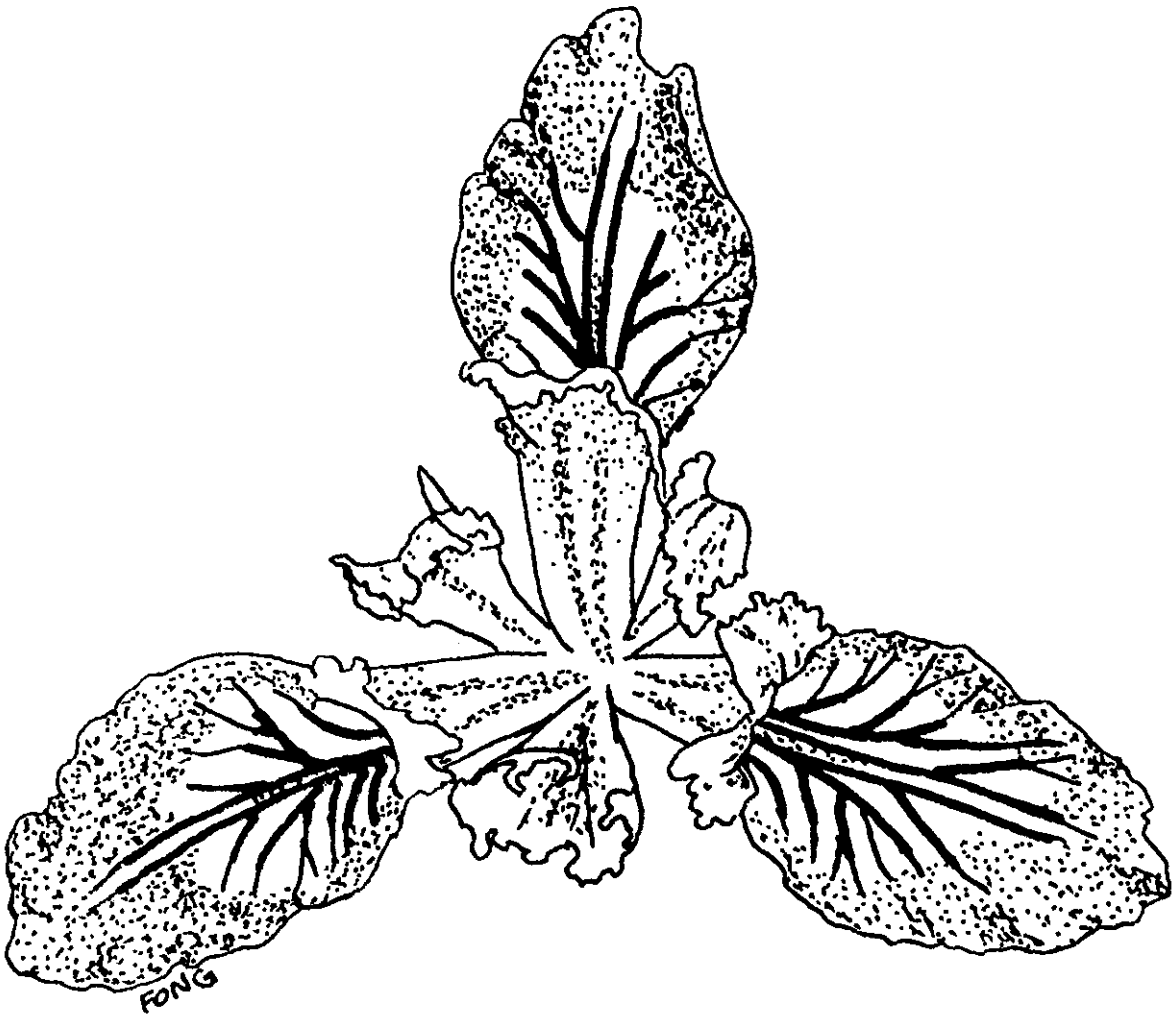
The Waldo Ridge area is not recommended as a Botanical area in the Preferred Alternative (S). More botanical inventory is needed to pinpoint important concentration sites for rare species; it is also thought by botanists that rare plant values are higher on adjacent land (to the north) managed by the Bureau of Land Management. The Bureau is presently involved in a comprehensive land management planning process; they will consider the land north of Waldo Hill for Botanical area status. If the BLM does classify the Waldo site as a Botanical area, at a future date the Forest Service could follow suit and designate the Siskiyou portion. The site could become a "joint" Botanical Area. In any event, the Forest Service portion of the area will be reconsidered at the next revision of the Forest Plan.

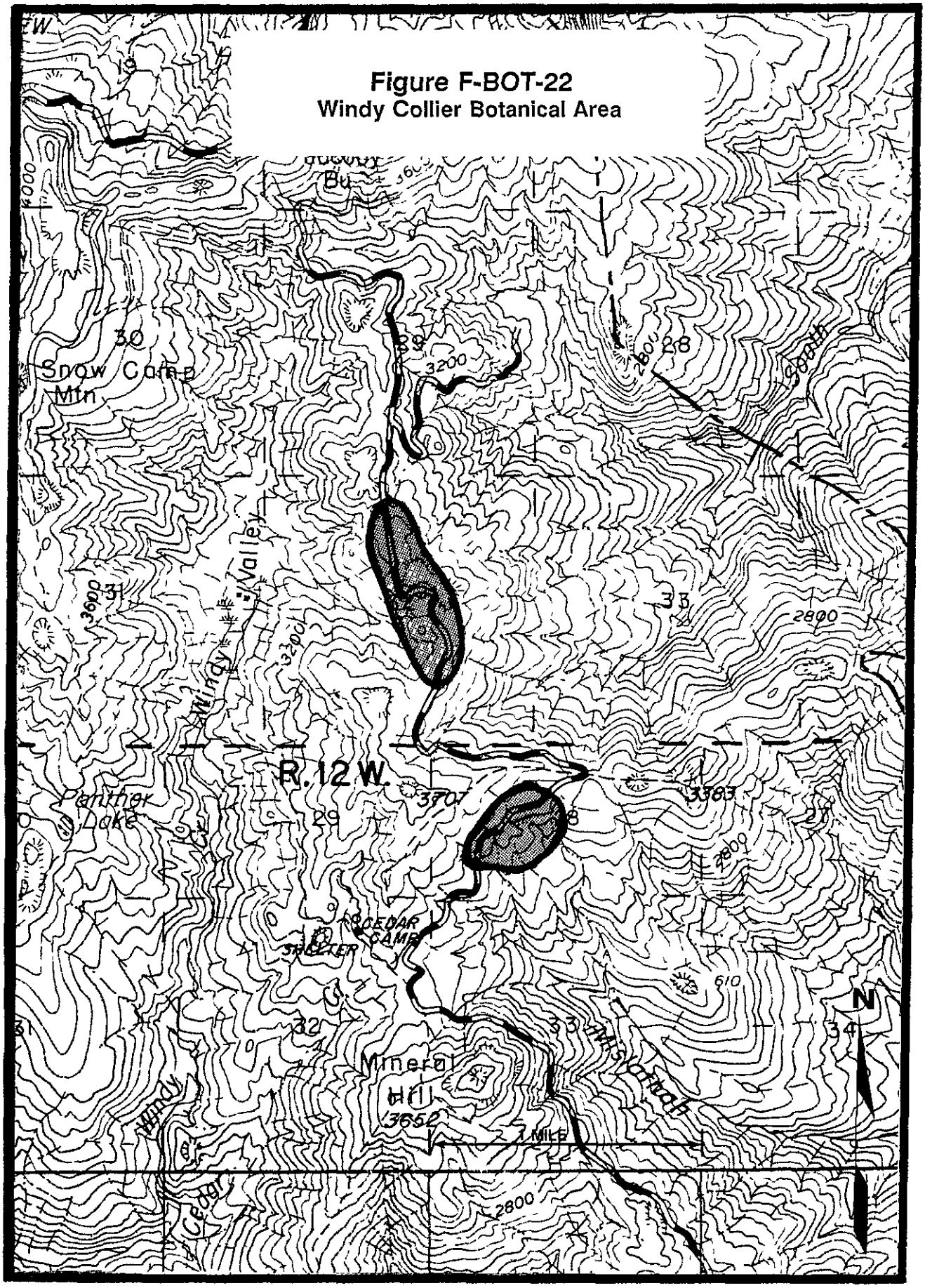
Table F-BOT-21 Unusual Plants in the Proposed Waldo Ridge Botanical Area

Scientific Name	Common Name
Sensitive Species	
Calochortus howellii	Howell's mariposa lily
Epilobium oreganum	Oregon willow-herb
Erythronium howellii	Howell's fawn lily
Fritillaria glauca	Siskiyou fritillaria
Lewisia oppositifolia	opposite-leaved lewisia
Microseris howellii	Howell's scorzonella
Monardella purpurea	Siskiyou monardella
Sanicula tracyi ?	Tracy's sanicula
Senecio hesperius	Siskiyou butterweed
Streptanthus howellii	Howell's streptanthus
Watch/Review Species	
Arabis aculeolata	Waldo rock cress
Arabis koehleri var. *stipitata* 1/	Koehler's rock cress
Aster brickellioides	brickellbush aster
Cypripedium montanum	mountain lady's slipper
Sidalcea malvaeflora ssp *elegans*	mallow sidalcea
Sidalcea setosa ssp. *setosa* 1/	edgewood checkermallow

1/ Potential candidate for Regional Forester's sensitive list.




FONG


Figure F-BOT-22
Windy Collier Botanical Area
Snow Camp Mtn
Windy Valley
R.12W.
Panther Lake
CEDAR CAMP
SHELTER
Mineral Hill
3650
Mt. Shorrah
1 MILE
N

WINDY COLLIER - F-BOT-22

The 147 acre proposed Windy Collier Botanical Area is located on serpentine ridgetops in the northwestern corner of the Chetco Ranger District. The area is divided into two separate portions a mile apart, one in Section 32, T.37S , R.12W., and the other in Section 28, T.37 1/2 S., R.12W (Figure F-BOT-22) Elevation range is 3,050 to 3,450 feet. Windy Valley is approximately one mile to the west.

This area is an unusual assemblage of intermixed dry and wet sites. Scattered *Darlingtonia* bogs are juxtaposed with dry chaparral sites. Plants such as *Lilium vollmeri* (bog site) grow within 10 feet of *Lilium bolanderi* (dry site). *L.* bolanderi is especially common. Intensive plant inventories of this area will undoubtedly reveal the presence of sensitive species (Table F-BOT-22).

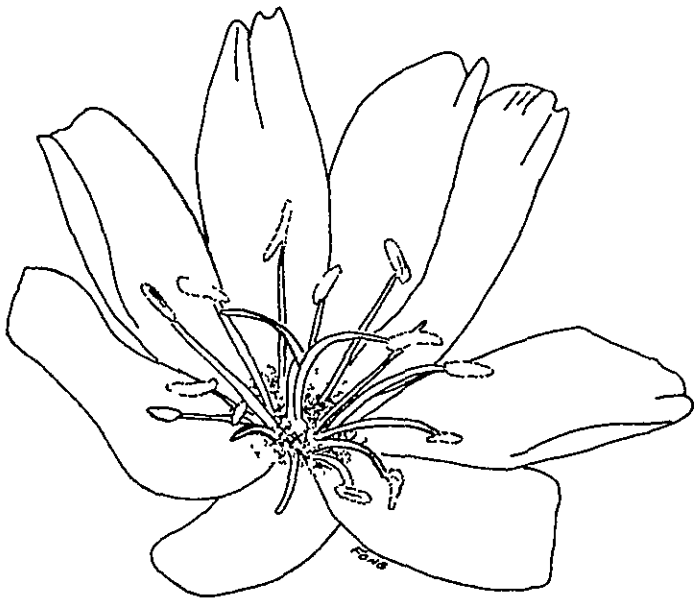
The Windy and Collier proposed area contains 115 acres of land tentatively suitable for timber harvest and could produce approximately 62 thousand board feet (MBF) per year of harvestable timber on a long-term sustained yield (LTSY) basis (see Table F-3).

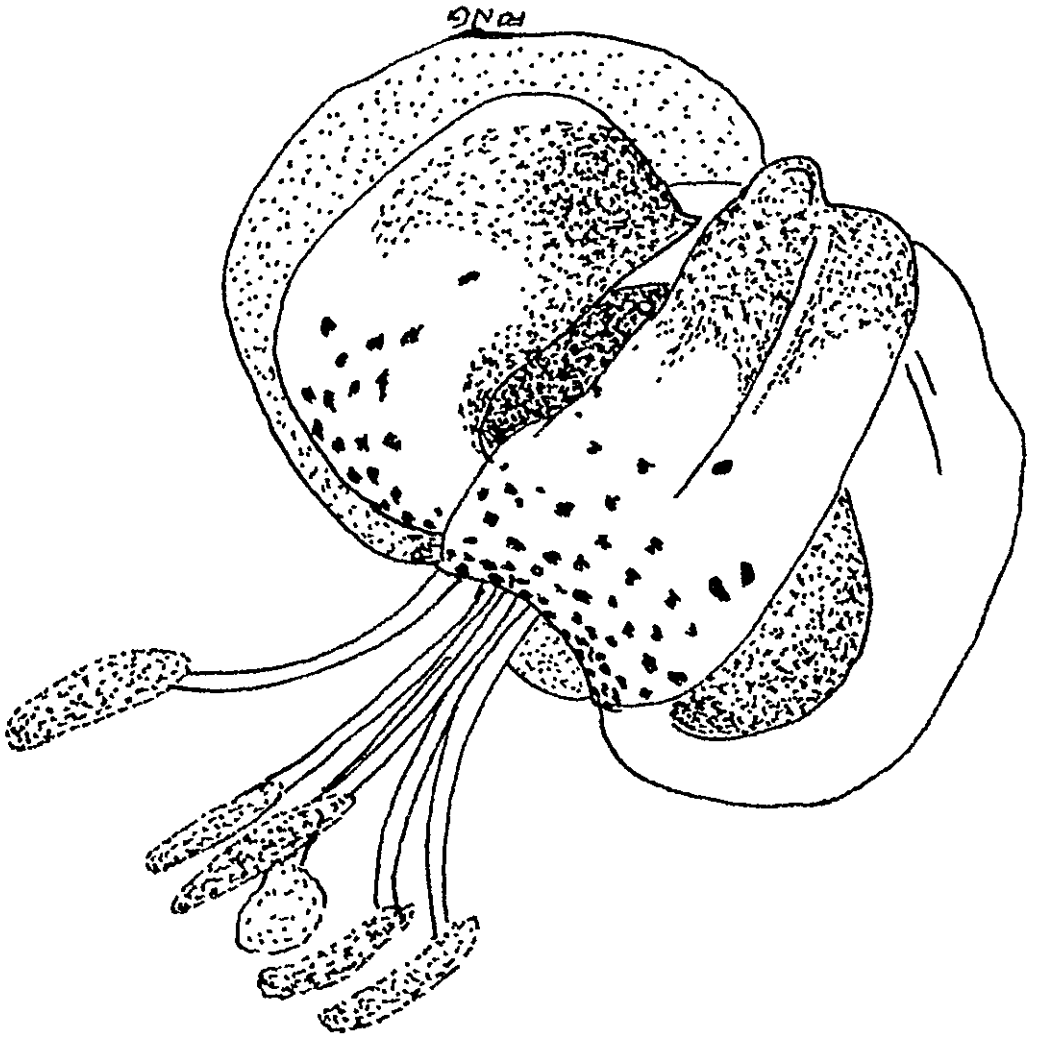
Soils in this area are derived from ultramafic rock (serpentinite). Chromite prospects have occurred in both portions of the Botanical area; no other mineral deposits are known (Ramp and others 1977)

This area is not recommended as a Botanical area in the Preferred Alternative of the Forest Plan (S).

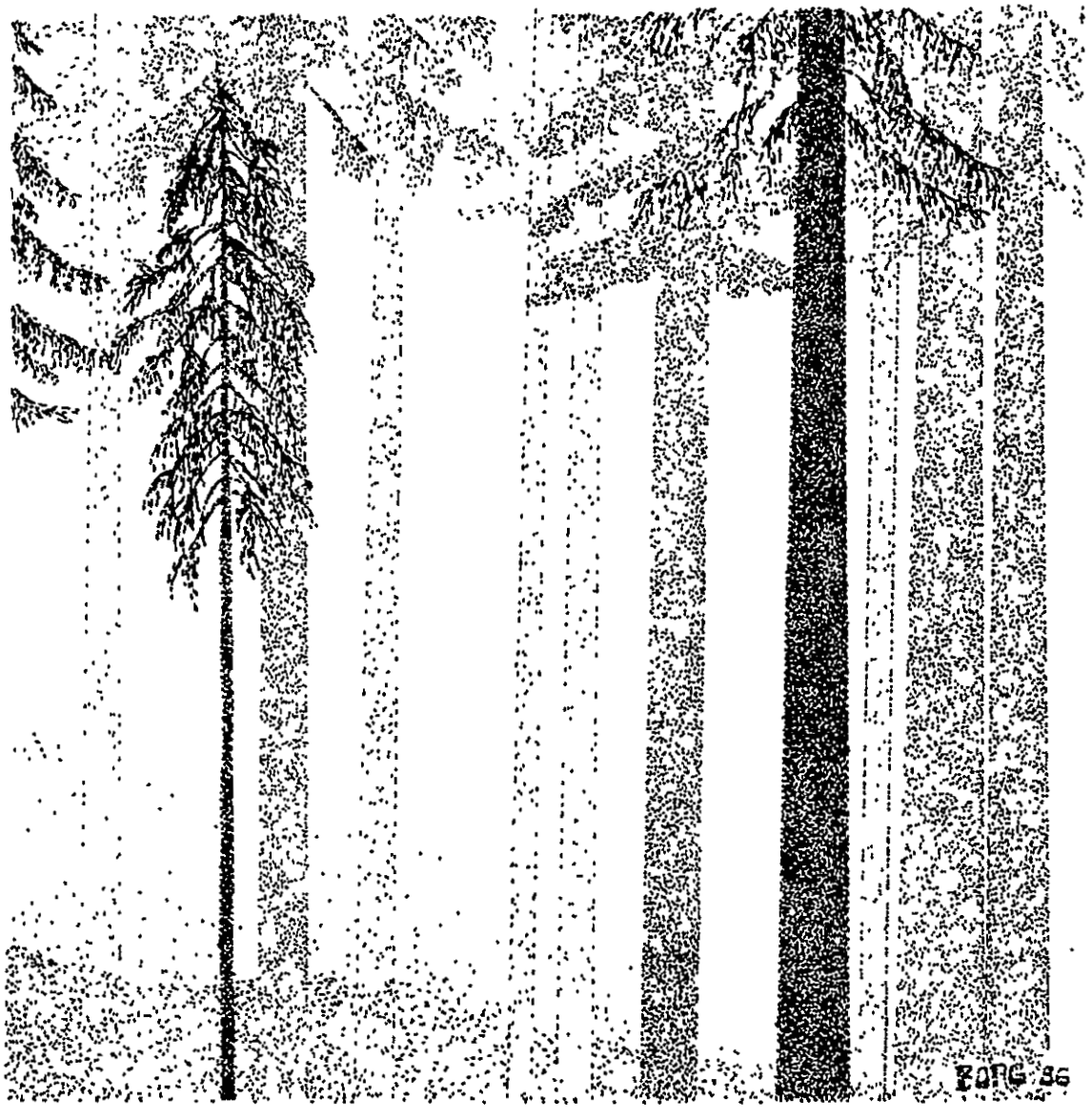
Table F-BOT-22. Unusual Plants in the Proposed Windy Collier Botanical Area

Scientific Name	Common Name
Watch/Review Species	
Darlingtonia californica	California pitcher-plant
Lilium vollmeri	Vollmer's lily





NARRATIVES
OLD-GROWTH BOTANICAL AREAS



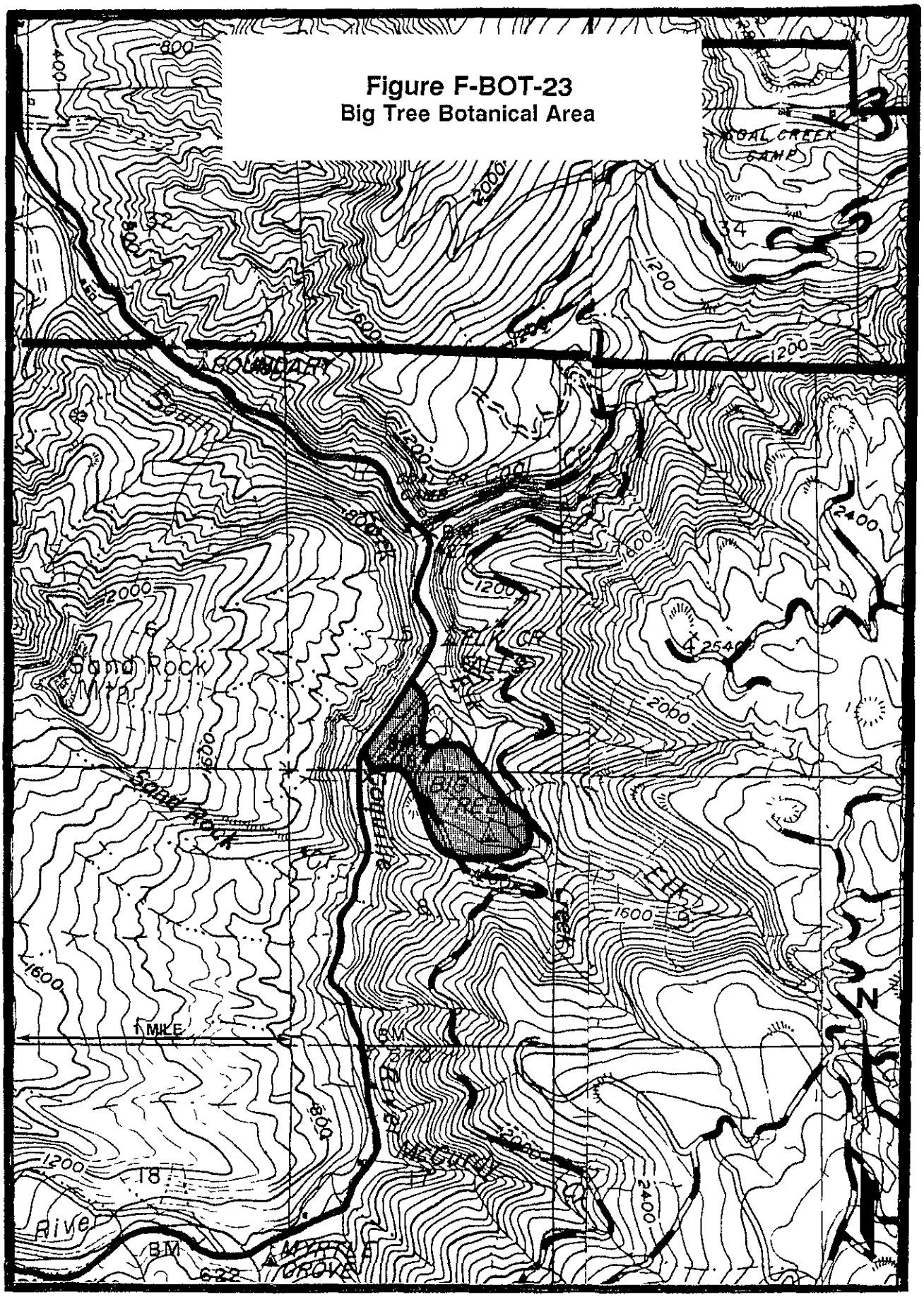


Figure F-BOT-23
Big Tree Botanical Area

OLD-GROWTH BOTANICAL AREAS - PROPOSED

BIG TREE - F-BOT-23

The 127 acre proposed Big Tree Botanical area is located along the South Fork of the Coquille River south of the mouth of Elk Creek, on the Powers Ranger District (T.32S., R.11W., Sections 5, 8) (Figure F-BOT-23). Elevation range is 500 to 1,200 feet.

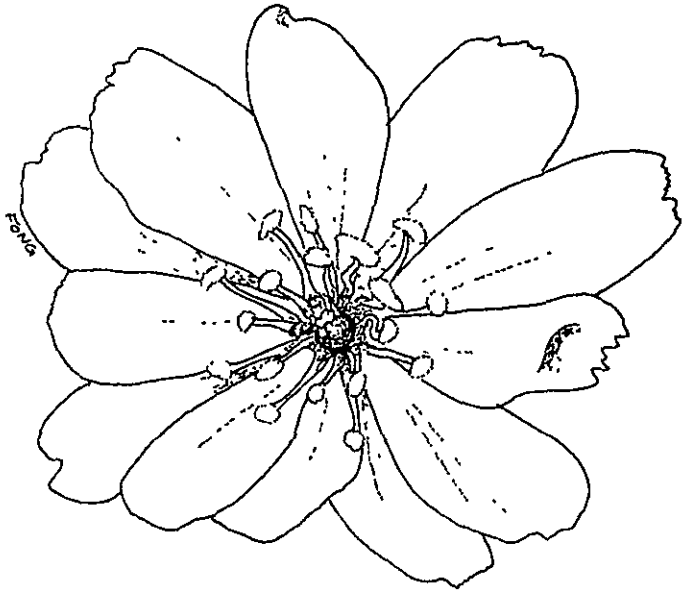
This is an old-growth site; no sensitive plants are known. The value of the site lies not with rare plants, but with its old-growth plant community. The world's largest Port-Orford-cedar is located within the area. Very large Douglas-fir are also present. Big-leaf maple and western hemlock dominate the subcanopy. The understory is composed of rhododendron, tanoak, alder, and sword fern.

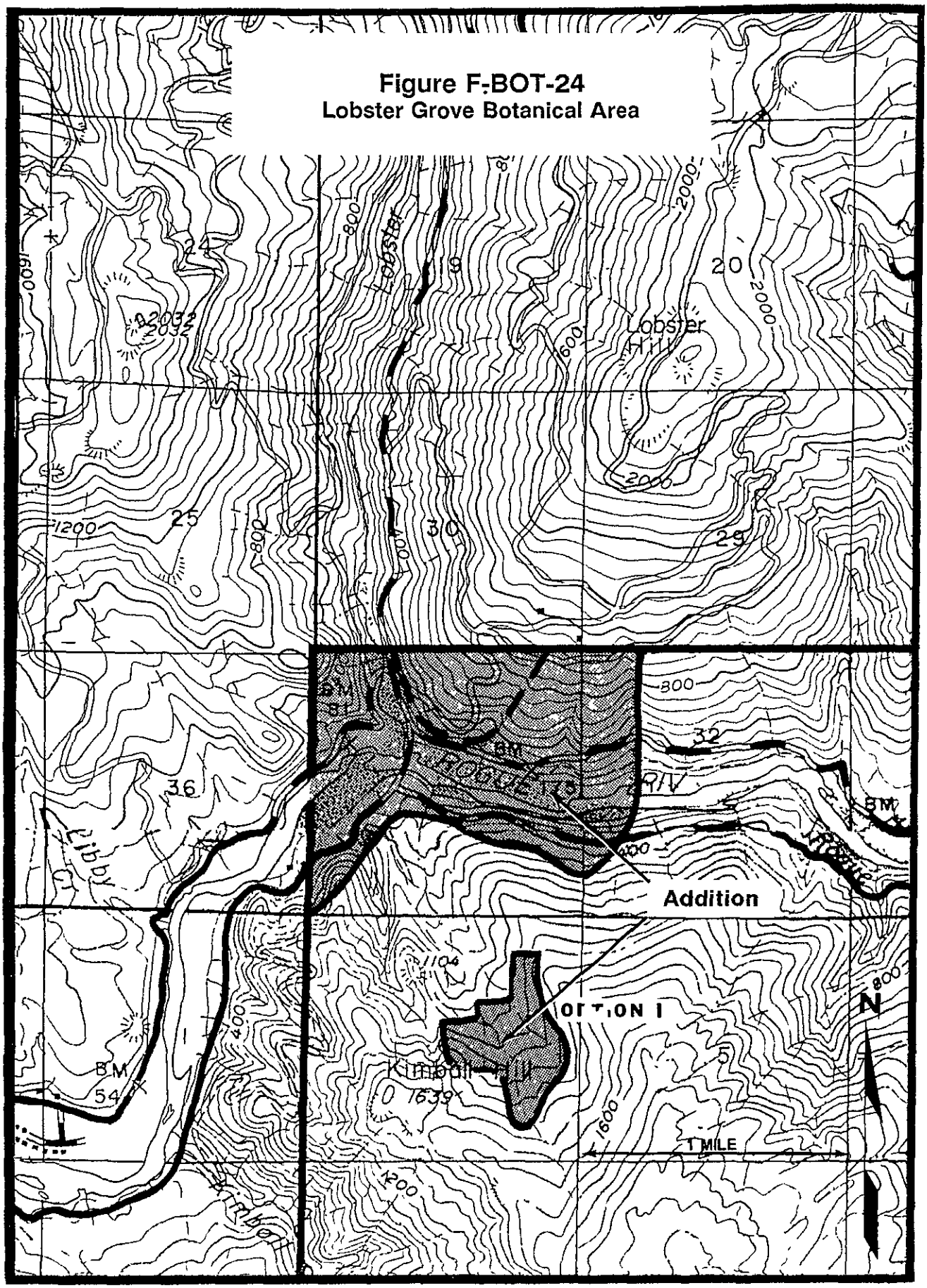
Access to the area is a trail (1150) which connects Elk Creek Falls along road 42 to Big Tree Picnic Area on road 3358. The area is also partially accessible by spur roads 3358-090 and -091. The old-growth site is visible from road 42 and the South Fork of the Coquille River.

About 116 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 63 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Soils in this area are derived from marine sedimentary rock, primarily siltstones and mudstones (Umpqua Formation) (Beaulieu 1971).

The site was listed as a Supplemental Resource area in the DEIS. In Alternative S of the FEIS (the Preferred Alternative) Big Tree is recommended as a Botanical Area.




Figure F-BOT-24
Lobster Grove Botanical Area
Lobster Hill
Addition
Kimball Hill
1639
1 MILE
N
Libby Cr
Lobster Cr
24
25
30
29
20
32
36
5
9

LOBSTER GROVE - F-BOT-24

The 534 acre proposed Lobster Grove Botanical Area is located on the banks of the Rogue River at the mouth of Lobster Creek, on the Gold Beach Ranger District (T.35S.,R.13W., Sections 31, 32, and T 36S ,R.13W., Section 6) (Figure F-BOT-24). Elevation range is 81 to 1,500 feet. The Lobster Grove site has been divided into two sections; this provides flexibility to land managers who must make decisions on land allocations. For further information on these options see Figures F-1 and F-BOT-24

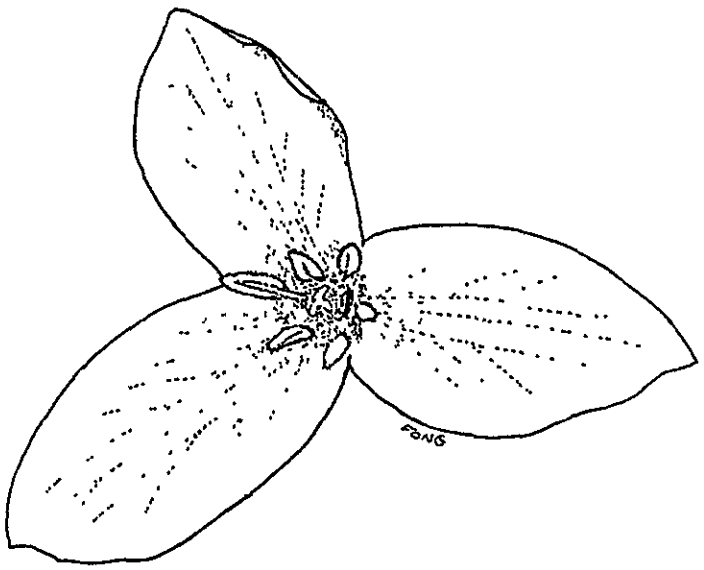
This is an old-growth site; no sensitive plants are known. The value of the site lies not with rare plants, but with its old growth plant community. This is an area of very large Douglas-fir and Port-Orford-cedar; some individual trees approach 8 feet in diameter. The 10-15 large trees per acre dominate the site, the heavily shaded understory is composed of sword fern, willow (wet sites), tanoak, madrone, and Oregon-myrtle (the world's largest myrtle tree is located within the Grove).

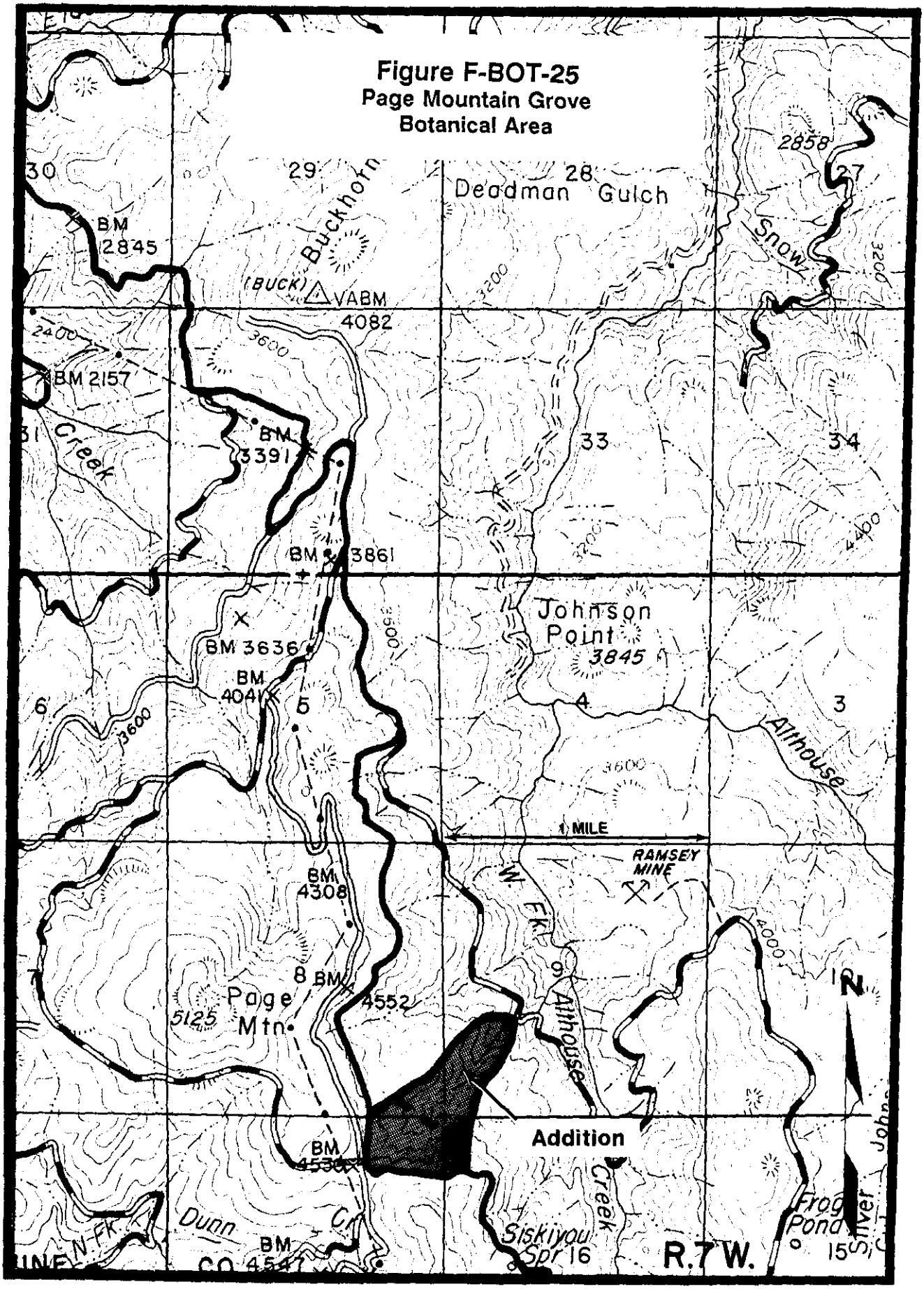
In the steeper areas slopes average 50 percent. Access to a significant portion of the area north of the river is a jeep road through private land. Most of the old-growth site is visible from the Agness road, and a portion is visible to boaters on the Rogue River. Groves of large old-growth trees are increasingly rare, especially in an area visited by thousands of recreationists each year. In the future this site may receive considerable use by the public

About 312 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 169 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Soils in this area are derived mainly from Colebrooke schist, with quaternary unconsolidated sediments present along the river No mineral deposits are known (Ramp and others 1977).

In response to public comments on the DEIS, an 89 acre parcel was "added" to the Addition, this site is south of the main area, near Kimball Hill. A loop trail though this outstanding old-growth site winds through groves of very large Douglas-fir, tanoak, and other species; sword fern and beargrass are common on the Forest floor. Access to the trailhead is via Road 090. The entire 534 acres is recommended as a Botanical Area in the Preferred Alternative (S).




Figure F-BOT-25
Page Mountain Grove
Botanical Area
30
29
28
27
Deadman Gulch
Buckhorn
BM 2845
(BUCK) VABM 4082
2858
Snow
3200
2400
3600
BM 2157
BM 3391
Creek
33
34
BM 3861
4400
Johnson Point 3845
BM 3636
BM 4041
3500
6
5
4
3
Althouse
1 MILE
RAMSEY MINE
W FK
BM 4308
8 BM
Page Mtn
5125
4552
9
4000
N
Althouse
Addition
BM 4530
Dunn Cr
N FK
BM 4547
Siskiyou Spr 16
Creek
Frog Pond
15
R.7W.

PAGE MOUNTAIN GROVE - F-BOT-25

The 128 acre proposed Page Mountain Grove Botanical Area is located in Oregon near Page Mountain, adjacent to the border of the Siskiyou and Klamath National Forests, and along Road 48 within the Illinois Valley Ranger District (T.41S., R.7W., at the corner common to Sections 8, 9, 16, 17) (Figure F-BOT-25). Elevation range is 3,800 to 4,530 feet. The Page Grove site has been divided into two sections, this provides flexibility to land managers who must make decisions on land allocations. The primary area contains the heart of the site. For further information on these options see Figures F-1 and F-BOT-25.

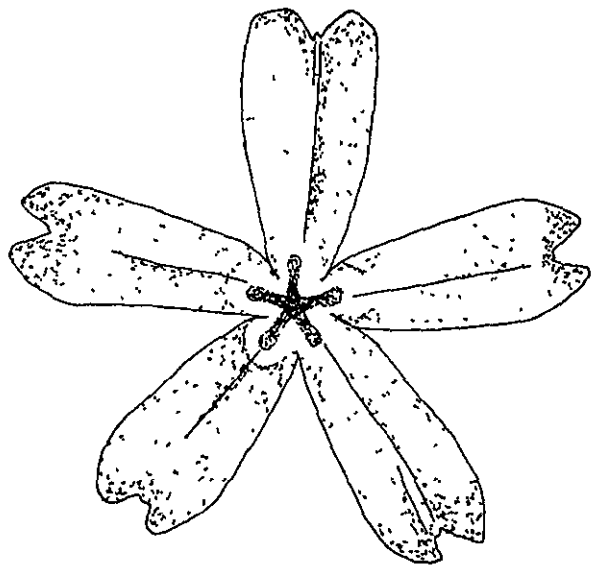
This is an old-growth site on benchy ground; no sensitive plants are known. The value of the site lies not with rare plants, but with its old growth plant community. The overstory consists mainly of Douglas-fir, with some white fir; Port-Orford-cedar is present in the draws. Tree diameters average 45 inches (diameter breast high), with individual trees as large as 90 inches. White fir is present in the understory, very little shrub growth is present, with the exception of scattered areas of Sadler's oak. Brewer spruce occurs outside the area at slightly higher elevations.

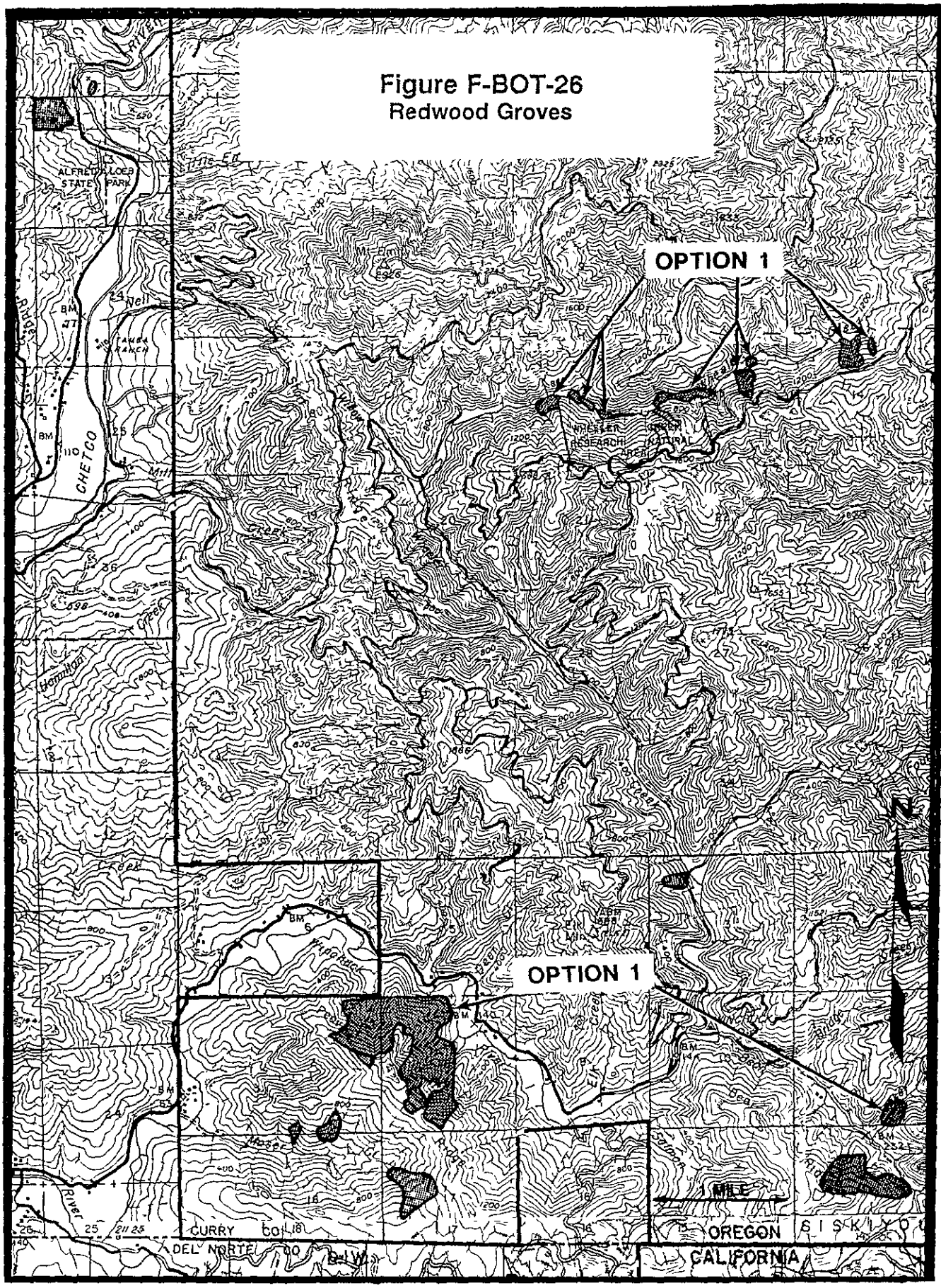
This old growth site is adjacent to the Happy Camp Road (48), and easily accessible to the public. A potential recreation trail in the upper end of the area was laid out on the ground ("flagged") in 1980. Groves of large old-growth trees are increasingly rare, especially at sites easily visited by the public. Potentially, in the future this site could receive considerable use by the public.

About 123 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 67 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Soils in this area are derived from metasedimentary rocks of the Applegate group. A gold prospect (Ramsey mine) is located a mile to the southeast (Ramp and Peterson 1979).

The primary portion of the area (not the Addition) is recommended as a Botanical area in the Preferred Alternative (S) (see Figure F-3(b) for a summary of effects on timber harvest).




Figure F-BOT-26
Redwood Groves
OPTION 1
OPTION 1
ALFRED A. LOEB STATE PARK
CHETCO
WHEELER CREEK RESEARCH NATURAL AREA
Mt. Emily
Hamilton
Wildcat
Mosier
Samson
Elk
Indian
Hilgard
CURRY
DEL NORTE
OREGON
CALIFORNIA
1 MILE

REDWOOD GROVES - F-BOT-26

The 511 acre proposed Redwood Groves Botanical Area has been identified as an outgrowth of a Redwood Management Plan written by personnel of the Chetco Ranger District. The management plan was written in response to public comments received on the DEIS. The area is a collection of the best remaining old growth redwood stands in Oregon. The stands are in the Winchuck River and Wheeler Creek drainages on the Chetco Ranger District. Thirteen stands ranging from about 4 to 280 acres in size are included. The stands are located in T.41S., R 12W., Sections 3, 7, 8, 11, 14, 17, and T 40S , R.12W., Sections 14, 15, and 16 Access to the stands is limited in many cases. Some trails are expected to provide access in the future For further information on Redwood Groves see Figures F-1 and F-BOT-26

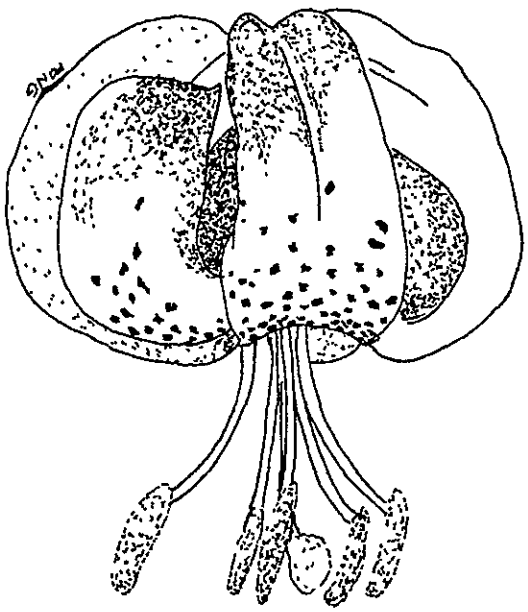
About two-thirds of the acreage currently receives special management as Designated Habitat for pileated woodpeckers (Management Area 8). Several of the northerly stands are adjacent to the existing Wheeler Creek Research Natural Area.

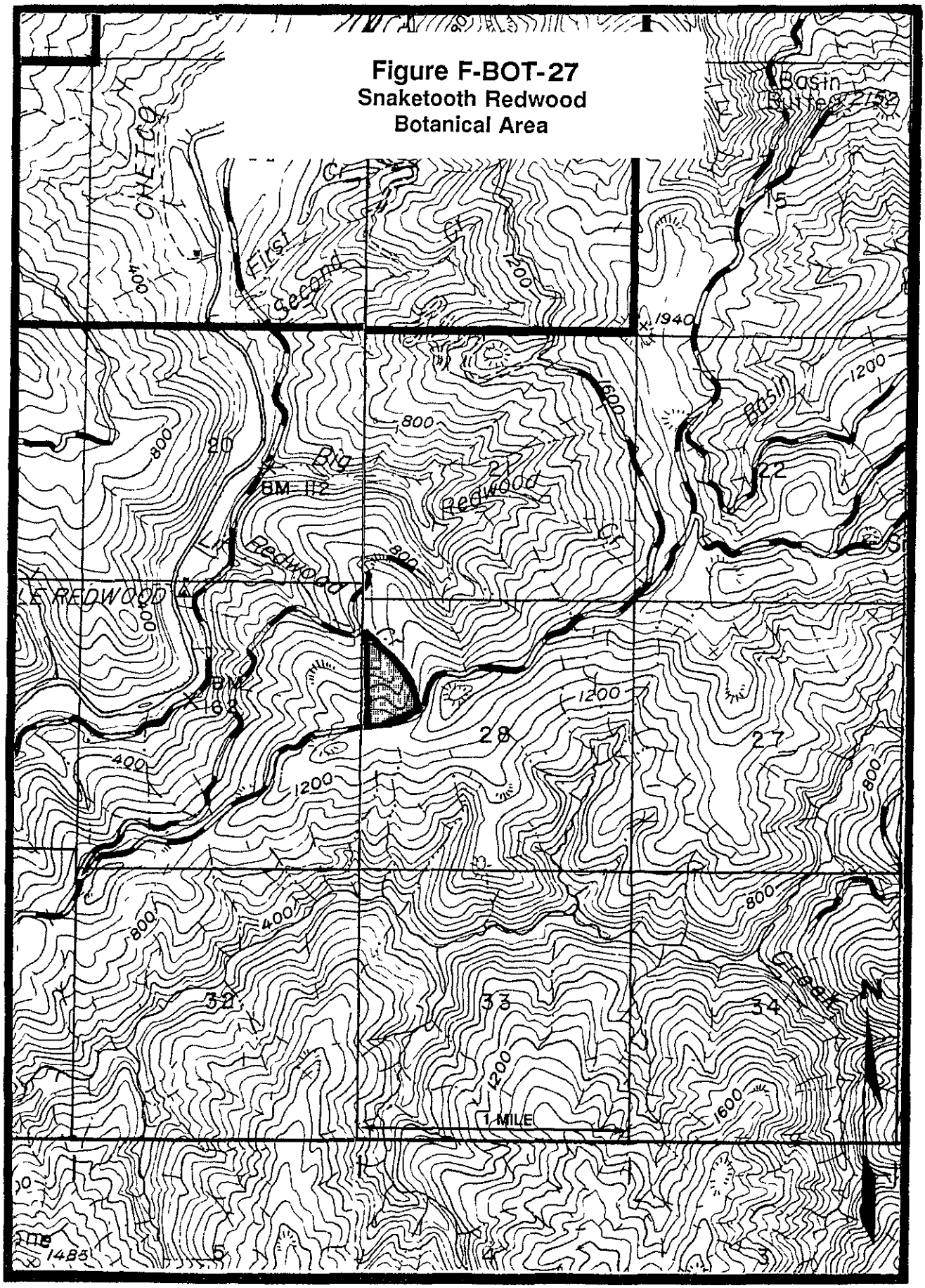
Redwood is at the northern limit of its range in southwestern Oregon. It appears that redwood has extended its range north in the last several centuries. These stands have a characteristic lack of sprouting clumps. Trees are generally not older than 300 years and large downed redwood logs are absent. Redwoods in these stands share the overstory with Douglas-fir and tanoak and scattered western Hemlock. Understory trees are younger and suppressed individuals of the above species, plus myrtlewood, alder and madrone Huckleberry, rhododendron, sword fern, and salal are the most common understory plants.

About 496 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 268 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Soils in this area are derived from sedimentary rocks of the Dothan Formation (Ramp and others 1977).

Public concern over preservation of remaining old growth redwoods has prompted the Forest to recommend this new Botanical area in the Preferred Alternative (S).




Figure F-BOT-27
Snaketooth Redwood
Botanical Area
CHETCO
First
Second
Big
Redwood
Redwood
Basin
Basin
BM 112
BM 162
1940
1485
1 MILE
Creek
20
21
22
27
28
32
33
34
15
5
800
1200
1600
400

SNAKETOOTH REDWOOD - F-BOT-27

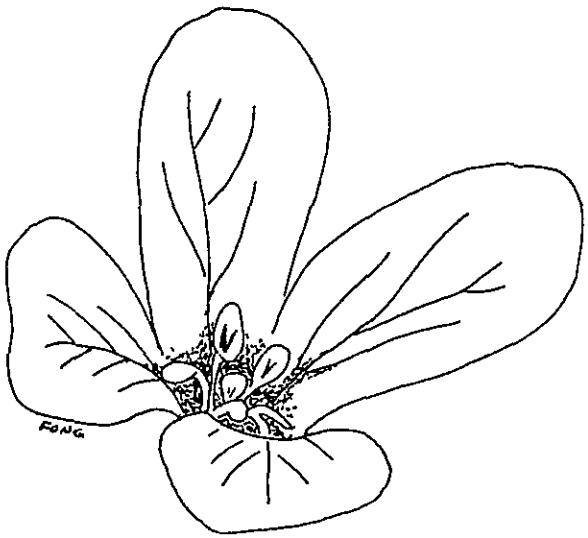
The 21 acre proposed Snaketooth Redwood Botanical Area is located on the Checto Ranger District a mile south of the Chetco River on Little Redwood Creek (T.39S , R 12W , Section 28 NW) (Figure F-BOT-27) Elevation range is 900 to 1,400 feet

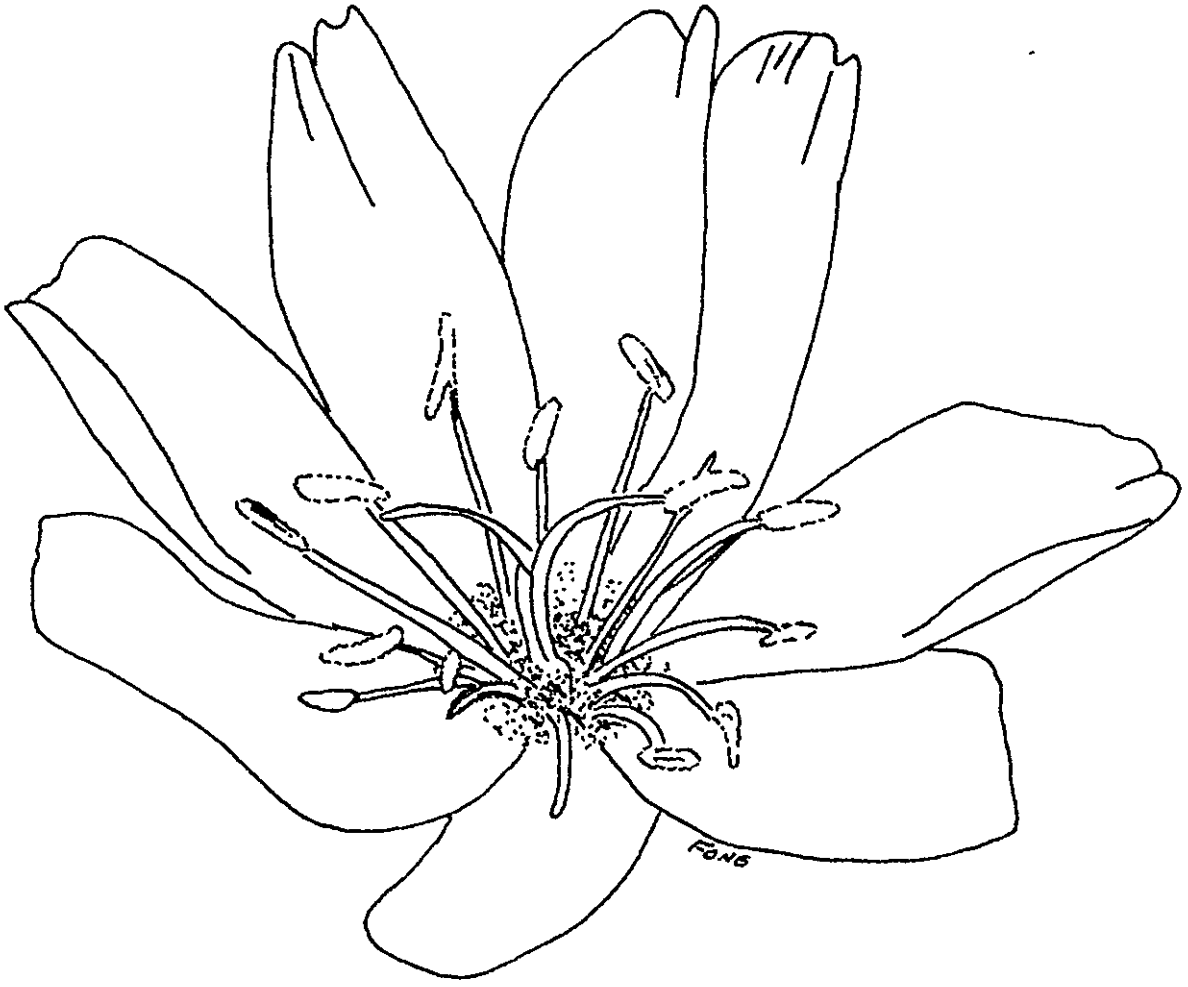
This is the site of the northernmost naturally occurring redwood grove. Part of the grove was harvested in the early 1960's; the 21 acres proposed as a Botanical area is all that remains of the original grove. Douglas-fir is intermixed with coastal redwood; tree diameters are 36 to 40 inches or more.

About 20 acres in this proposed Botanical area are tentatively available and suitable for timber production; this land is capable of producing about 11 thousand board feet (MBF) of harvestable timber annually on a long-term sustained yield (LTSY) basis (see Table F-3).

Soils in this area are derived from Latest Jurassic sedimentary and volcanic rock (Ramp and others 1977).

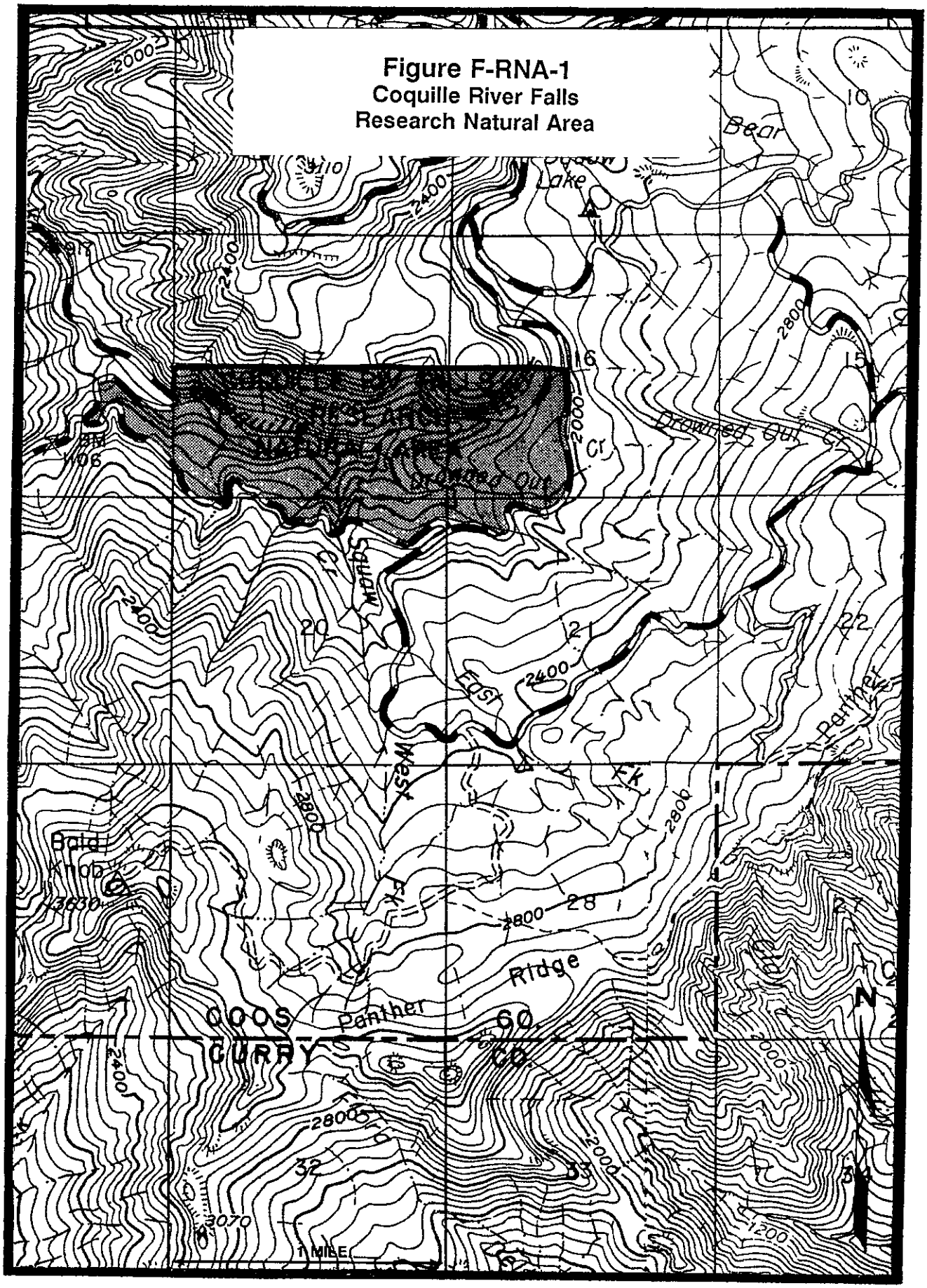
This site is recommended as a Botanical area in the Preferred Alternative (S)




FONG

NARRATIVES
RESEARCH NATURAL AREAS




Figure F-RNA-1
Coquille River Falls
Research Natural Area
Bear
Lake
Drowned Out
Cr.
Squaw
East
Fk.
Panther
Bald
Knob
Ridge
COOS
CURRY
CO.
1 MILE
N

RESEARCH NATURAL AREAS - EXISTING

COQUILLE RIVER FALLS - F-RNA-1

The following is excerpted from Franklin and others (1972)

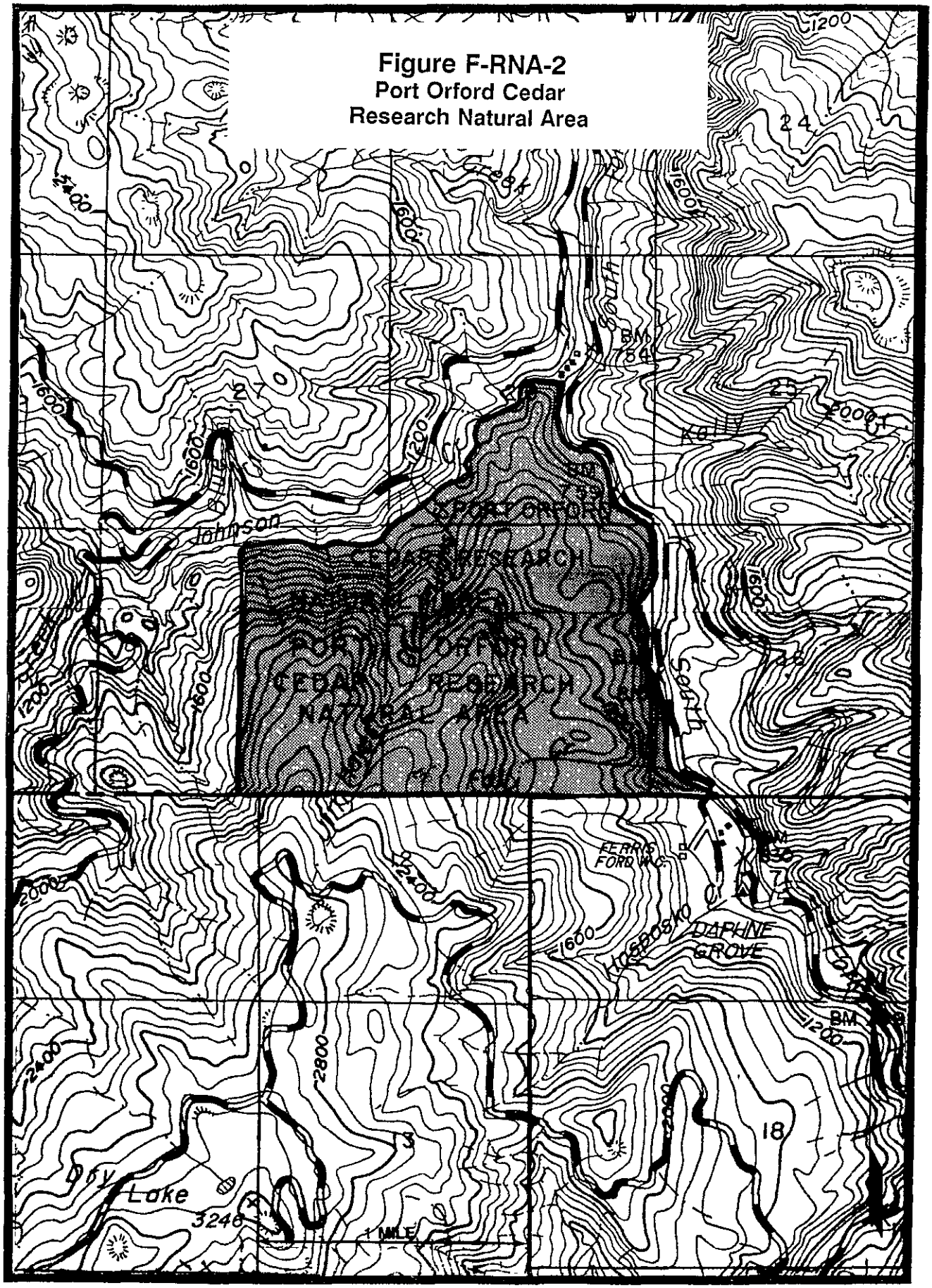
The Coquille River Falls Research Natural Area was established on January 31, 1945, to provide examples of virgin old-growth Port-Orford-cedar (*Chamaecyparis lawsoniana*) stands. The 500 acre tract is located in Coos County, Oregon, and is administered by the Powers Ranger District The Research Natural Area (RNA) occupies portion of Sections 16, 17, 18, 20, and 21, T 33S , R.11W (Figure F-RNA-1)

The Coquille River Falls Research Natural Area occupies a topographically rugged canyon area Except for a few benches along Road 3348, slopes are moderate to very steep Cliffs and rock outcrops are occasionally encountered and are very common along the river itself The South Fork of the Coquille River and numerous other streams such as Squaw and Drowned Out Creeks flow through the southern part of the RNA Spring and seep areas are also common. Elevations within the RNA range from 1,000 to 2,500 feet

The RNA is relatively simple geologically Bedrock is composed of sedimentary materials, primarily sand and siltstones, belonging to the Tyee formation of Eocene age. Soils vary greatly in depth throughout the area. The profiles typically are not strongly developed

The climate is wet and mild Precipitation is seasonal, with a peak in December and January and a minimum in July and August The summer drought period is more pronounced than in the northern Oregon and Washington coastal mountains. Annual precipitation is between 80 and 90 inches (Figure F-3)

Port-Orford-cedar and Douglas-fir (*Pseudotsuga menziesii*) are the most important tree species within the RNA, composing approximately 22 percent and 69 percent of the total timber volume There are particularly fine specimens of Port-Orford-cedar on the benches along Forest Road 3346 Western hemlock (*Tsuga heterophylla*), grand fir (*Abies grandis*), sugar pine (*Pinus lambertiana*), and Pacific yew (*Taxus brevifolia*) are other coniferous tree species found within the tract Hardwoods are well represented though not necessarily in the highest canopy levels These include red alder (*Alnus rubra*), tanoak (*Lithocarpus densiflorus*), golden chinkapin (*Castanopsis chrysophylla*), and Pacific madrone (*Arbutus menziesii*).


Figure F-RNA-2
Port Orford Cedar
Research Natural Area
PORT ORFORD CEDAR RESEARCH
PORT ORFORD CEDAR NATURAL AREA
Johnson
South
Dry Lake
3246
DAPHNE GROVE
FERRYS FORD W.C.
1 MILE

PORT ORFORD CEDAR - F-RNA-2

The following is excerpted from Franklin and others (1972):

The Port Orford Cedar Research Natural Area was established on October 26, 1937, as a sample of virgin old-growth Port-Orford-cedar (*Chamaecyparis lawsoniana*). The 1,122 acre tract is located in Coos County, Oregon, and is administered by the Powers Ranger District, Siskiyou National Forest The Research Natural Area (RNA) occupies Section 35, a portion of the E1/2 of Section 34 located south of Johnson Creek, that part of Section 26 located south of Johnson Creek and west of the Coquille River, and a small part of Section 36 which lies west of the Coquille River, all in T.32S , R12W., (Figure F-RNA-2)

The Port Orford Cedar Research Natural Area is topographically rugged except for occasional benches and some broad ridgetops. Slopes are particularly steep along Johnson Creek and the Coquille River. Elevations range from 850 feet along these streams to nearly 2,500 feet on the ridgetop in the southeast corner. Two small streams, Jim Hays and Fall Creeks, lie mostly within the RNA.

The RNA is complex geologically. Sedimentary materials (sandstones, siltstones and conglomerates) make up most of the bedrock. Soil profiles are not strongly developed in the area although soils are often deep.

The climate is wet and mild. Precipitation is seasonal, with a peak in December and January, and a minimum in July and August. The summer drought period is more pronounced than in the northern Oregon and Washington coastal mountains Annual precipitation is between 90 and 100 inches (Figure F-3).

Douglas-fir (*Pseudotsuga menziesii*) and Port-Orford-cedar are the most important tree species present, composing approximately 75 and 25 percent, respectively, of the old-growth forests which dominate the areas. Grand fir (*Abies grandis*), western hemlock (*Tsuga heterophylla*), western redcedar (*Thuja plicata*), sugar pine (*Pinus lambertiana*), western white pine (*Pinus monticola*), and Pacific yew (*Taxus brevifolia*) are also present. Hardwoods are well represented although not usually in the highest canopy level Tanoak (*Lithocarpus densiflorus*), golden chinkapin (*Castanopsis chrysophylla*), and Pacific madrone (*Arbutus menziesii*) are most abundant and widespread; occurrences of bigleaf maple (*Acer macrophyllum*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*), and Oregon myrtle (*Umbellularia californica*) are more localized. Most of the RNA is covered with forests of large, old trees. Although ages are not accurately known, many of the dominant specimens are undoubtedly 400 to 500 years old.

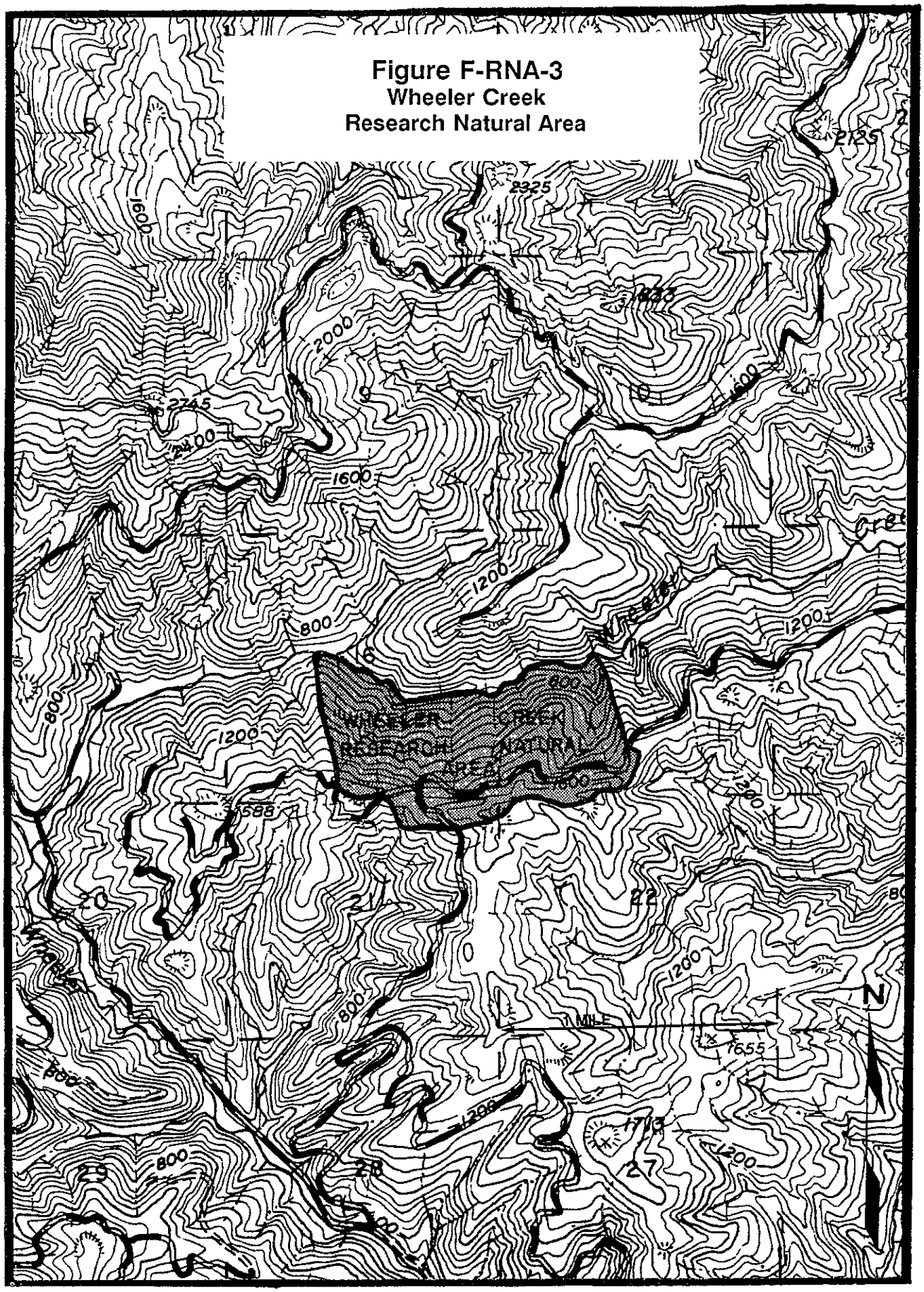


Figure F-RNA-3
Wheeler Creek
Research Natural Area

WHEELER CREEK - F-RNA-3

The following is excerpted from Dyrness and others (1972):

The Wheeler Creek Research Natural Area was established on August 10, 1972, to preserve an example of redwood forest near the northern limits of its range. The 334 acre tract is located in Curry County and is administered by the Chetco Ranger District, Siskiyou National Forest. The Research Natural Area (RNA) lies principally in Sections 15 and 16, T.40S., R.12W., but includes small portions of Sections 21 and 22 in the same township The southern boundary of the RNA lies atop a major dividing ridge, the east and west boundaries are on subsidiary ridgetops, and the northern boundary parallels Wheeler Creek 200 feet to the north of the stream (Figure F-RNA-3).

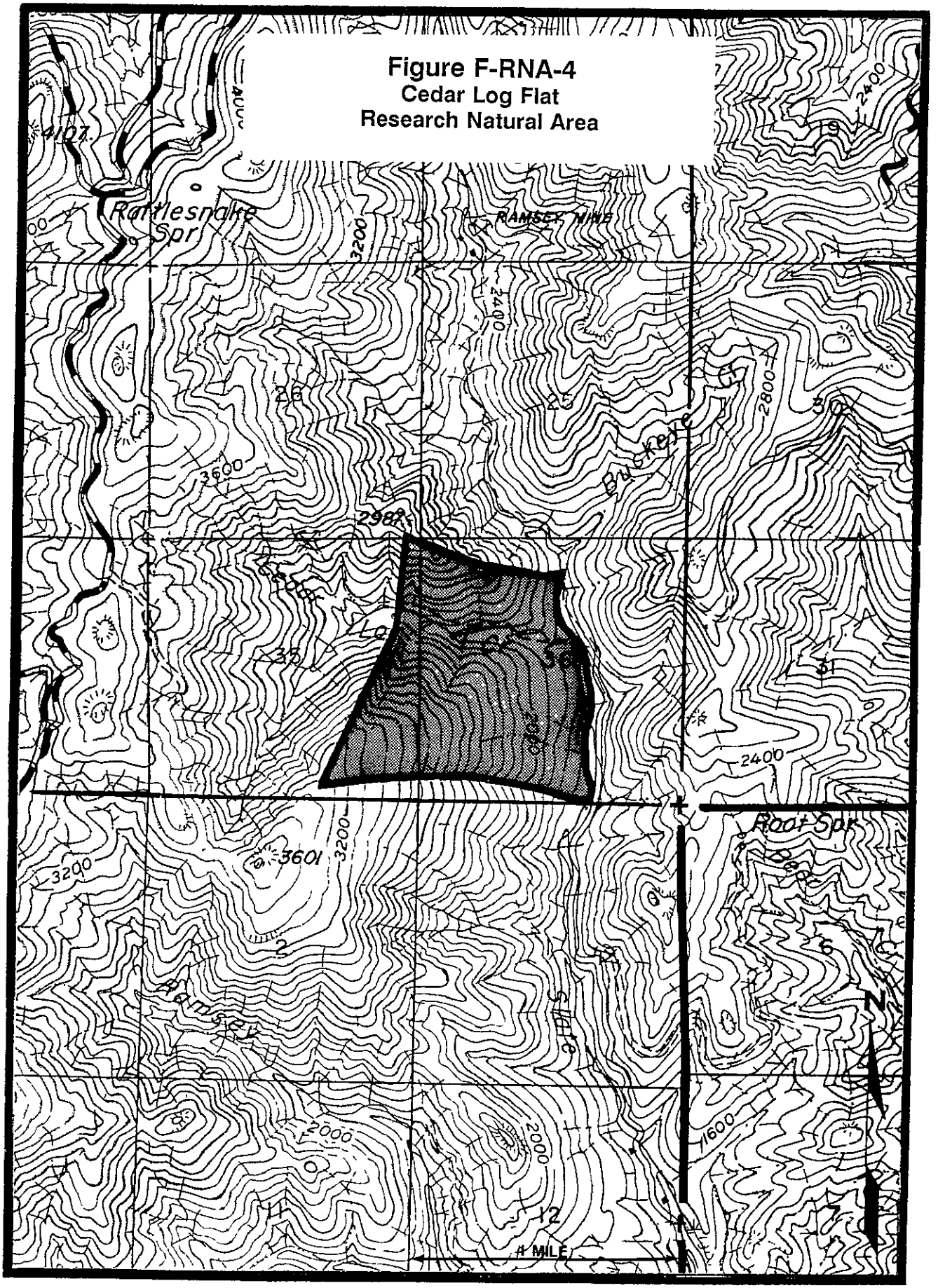
The Wheeler Creek Research Natural Area occupies, for the most part, a steep north-facing slope extending from ridgetop to Wheeler Creek. With the exception of the saddle area near the southwestern corner and a few small benches, the slopes range from 60 to 80 percent and are smooth and uninterrupted. Six incised drainage channels, three of which contain perennial streams, drain the area. Elevations range from 550 feet along Wheeler Creek to 1,771 feet on the ridgetop constituting the southern boundary of the area.

Bedrock in the area is composed of massive beds of sandstone intercalated with relatively thin beds of shaley mudstone. Soils in the RNA generally exhibit poorly developed profiles derived from sandstone and mudstone colluvium.

The climate is typically wet and mild in the winter, with a dry summer season beginning in June and extending into September. The lack of rain in the summer is sometimes ameliorated by dense coastal fogs. The area is also characterized by strong southwesterly winds and infrequent snowfalls. Annual precipitation is between 140 and 150 inches (Figure F-3).

Except for about 30 acres of road clearing, the RNA is forested by a mosaic of redwood and Pacific Douglas-fir cover types, with the former predominating.

The major tree species within the RNA are redwood, Douglas-fir, and tanoak (*Lithocarpus densiflorus*). In moister habitats, e.g., in ravines, on lower slopes, and along Wheeler Creek, bigleaf maple (*Acer macrophyllum*), California laurel (*Umbellularia californica*), and red alder (*Alnus rubra*) are common. Western hemlock (*Tsuga heterophylla*) occurs sporadically throughout all but the driest portions of the tract. Pacific madrone (*Arbutus menziesii*) is occasional to common on drier habitats. Knobcone pine (*Pinus attenuata*) is found along some portions of the ridgetop which forms the southern boundary of the tract.


Figure F-RNA-4
Cedar Log Flat
Research Natural Area
Rattlesnake Spr
RAMSEY MTN
3200
2400
2800
3600
2982
Ramsey
Spr
Road Spr
3601
2000
1600
1 MILE
N

RESEARCH NATURAL AREAS PROPOSED

CEDAR LOG FLAT - F-RNA-4

The following report was written by Dennis Vroman (Galice Ranger District) in 1985 He gathered the data in 1984-1985 Cedar Log Flat has been recommended as an RNA in the Preferred Alternative (S)

The proposed Cedar Log Flat Research Natural Area covers 441 acres and is located near the center of the eastern boundary of the Siskiyou National Forest (T.36S., R 8W., Sections 35, 36, (Figure F-RNA-4). About 19 road miles from Grants Pass, the area is part of the Slate Creek drainage and flows into the Applegate River. Cedar Log Creek, a permanent stream, flows easterly through the area and is flanked by north and south aspects Located within the area is a large, grassy meadow on a gentle east-facing slope which is bound on the north by Cedar Log Creek and to the east by Slate Creek. The rest of the proposed RNA has easterly aspects and slopes are steeper. Elevation ranges from 1,700 to 3,300 feet within the area

Bedrock in the area consists of serpentine and peridotite; soils are shallow. Large areas exist of mostly bare parent material, with little or limited amounts of soil and vegetation. Some of these barren areas consist of a blend of massive boulders, rocks, rock fragments and strips of parent material. The deepest soils appear to be located on the gentle-sloping meadow area See Ramp and Peterson (1979) for more information on geology and mineral resources of the general area.

Vegetation of the area varies in type and amounts, depending upon the soil depth, slope, aspect and other site variables. Average rainfall within the proposed RNA is approximately 55 inches per year (Isohyetal Map, Oregon State University Extension Service). The older conifers are approximately 180 to 215 years. The larger conifers are approximately 40 inches Diameter Breast Height (DBH) and 130 feet in height. Among the more than 160 woody or herbaceous plants in the area are many sensitive plant species Other sensitive species may exist; more inventory work is needed.

Past evidence of wildfire is present throughout the entire area. Fire-caused basal scars are present on many of the older trees, even on the more barren south slopes. Along Cedar Log Creek are many blackened snags, some burned a great distance above the ground.

Ten sensitive plant species (USDA Forest Service designation) are found within the proposed RNA; some are otherwise not known outside of the Illinois Valley area. Five plants designated as watch or review species by the Forest Service are also present. Sensitive and Watch/Review list plants are included in the attached species list.

Cedar Log Flat Research Natural Area fills the following forest-type cell need in the Siskiyou Mountains Province (Dyrness and others 1975).

from Table 53

15. Jeffrey Pine-Grass on serpentine at low elevation

North of Cedar Log Creek. The area north of Cedar Log Creek has the most open ground, although dense brush can be found in the several side draws. The area has an average aspect and slope of 187 degrees and 48 percent respectively. The area averages 15 conifer trees/acre (50 percent *Pinus jeffreyi*, 33.3 percent *Calocedrus decurrens*, and 16.7 percent *Pseudotsuga menziesii* with a trace of *Pinus attenuata*). Hardwood trees average approximately three per acre and are 100 percent *Arbutus menziesii*. There are 5 conifer snags per acre (50 percent *P. jeffreyi*, 25 percent each of *C. decurrens* and *P. menziesii*). Lineal footage of downed conifer boles averages 201 feet per acre. Brush species cover 25.8 percent per acre on the average, with 36.5 percent *Arctostaphylos viscida*, 28.1 percent *Quercus vaccinifolia*, 14.1 percent *Quercus chrysolepis*, 7.8 percent *Garrya buxifolia*, 7 percent *Umbelluaria californica*, 3.5 percent

Ceanothus pumilus, 1 3 percent *Eriodictyon californicum*, 1 percent *Ceanothus cuneatus* and less than 1 percent of other species.

Four sensitive and two "watch or review list" species (USDA Forest Service designation), are known from the area Sensitive species present are *Thlaspi montanum* var. *siskiyouensis*, *Arabis koehleri var. stipitata*, *Fritillaria glauca* and *Eriogonum pendulum* (the last was confirmed by Dr. Kenton Chambers, Curator of the Oregon State University Herbarium, who noted that the discovery "is a very nice range extension from its known area"). Watch/review species are *Arabis aculeolata* and *Phacelia corymbosa*

Two distinct surface terrain types occur north of Cedar Log Creek. The eastern part has soils somewhat deeper, with more grass cover Also, fewer rocks and boulders are present; *Arabis aculeolata* populates the higher areas. The western part has soils somewhat shallower, with little grass cover. Also present are large amounts of rocks, boulders and long stretches of barren outcrops. Here *A. koehleri* var *stipitata* and *E. pendulum* are found *F. glauca* is found in the ravel at the base of the rock outcrops

Interesting birds and animals inhabiting this area include the canyon wren (*Catherpes mexicanus*), which appears to nest here. Mountain lion (*Felis concolor*) and black bear (*Ursus americanus*) sign has been found in this area.

Along Cedar Log Creek. Average estimated data for the 200 foot wide strip each side of Cedar Log Creek includes the following

Direction of stream flow is 98 degrees with slope of 7 percent. Conifer trees average 268 per acre (66 percent *Chamaecyparis lawsoniana*, 27.2 percent *P. menziesii*, 3.4 percent *Pinus lambertiana* and 1.7 percent each of *C decurrens* and *Taxus brevifolia*) There are 36 conifer snags per acre (83 3 percent *C. lawsoniana* and 16 7 percent *P. menizıesii*). Lineal footage of downed conifer boles averages 1859 feet per acre. Hardwoods per acre average 68 (46.6 percent *Q. chrysolepis*, 26.8 percent *Lithocarpus densiflorus*, 19 9 percent *A. menziesii*, 6.7 percent others). Brush species cover averages 39.7 percent per acre: 33.5 percent *Rhododendron occidentale*, 16 1 percent *Q. vaccinifolia*, 15.1 percent *U. californica*, 10.7 percent *L. densiflorus*, 9 3 percent *Ledum columbianum*, 7.7 percent *Q. chrysolepis*, 5.9 percent *Rhamnus californica*, and others of less than 0.5 percent each.

Two sensitive species found here are also in the meadow area: *Cypripedium californicum* and *Epilobium oreganum*. Two watch/review species occur here. *Lilium vollmeri* occurs here and in the boggy areas within the meadow; *Dicentra formosa ssp. oregana* occurs only here within the proposed RNA.

Native cutthroat trout (*Salmo clarki*) inhabit Cedar Log Creek. According to Don King (Fisheries Biologist, Siskiyou National Forest,) Pacific salmon species are impeded from reaching the upper regions of Slate Creek, and therefore Cedar Log Creek. Adult steelhead (*Salmo gairdneri*) were seen at the mouth of Cedar Log Creek in April 1985.

Ringtails (*Bassariscus astutus*), secretive nocturnal mammals, frequent the Slate Creek area near the mouth of Cedar Log Creek During the 1983-1984 trapping season, two of these animals were trapped here and released by a local fur trapper (G Sublette, personal communication, November 20, 1985). Ringtails may den near or within the proposed RNA.

Dense thickets of brush and trees, located both along Cedar Log Creek and at edges of bogs, provide nesting sites for numerous bird species requiring this habitat type. Such bird species include: Lincoln's sparrow (*Melospiza lincolnii*), MacGillivray's warbler (*Oporornis tolmiei*), black-headed grosbeak (*Pheucticus melanocephalus*) and western wood peewee (*Contopus sordidulus*).

South of Cedar Log Creek. The area south of Cedar Log Creek contains the densest amounts of brushy ground cover. Some massive boulders and large rocks are located here, interspersed with more open

areas of moss and herb cover. The species present reflect the cooler microclimate of the area, as illustrated by *Polypodium hesperium* growing from thick moss mats formed on the surface layer of rock. *Darlingtonia californica* is found here, on slopes ranging to 60 percent in some places. In the western section is a cool, northeast-facing side draw that has close to 100 percent brushy ground cover, with *Darlingtonia* dispersed throughout. Sensitive species which occur here (and within the meadow area) are *C. californicum* and *E. oreganum*

Average aspect and slope are 44 degrees and 45 percent respectively. Conifer trees average 279 to the acre (50 percent *C. decurrens*, 24.4 percent *P. menziesii*, 19.2 percent *P. jeffreyi*, 5 1 percent *P lambertiana*, 1.3 percent *C lawsoniana*). Conifer snags average 22 per acre (33 4 percent each of *P menziesii* and *C. decurrens*, 16.6 percent each of *C. lawsoniana* and *P. lambertiana*) Hardwoods average 25 per acre and are 100 percent *A. menziesii*. Lineal footage of downed conifer boles per acre averages 597 feet. Brush species cover an average of 50 percent of each acre, with 47.4 percent *Q vaccinifolia*, 15,3 percent *G. buxifolia*, 11 1 percent *U. californica*, 9.3 percent *Q. chrysolepis*, 4.6 percent *R californica*, 3 6 percent each of *L. columbianum* and *L. densiflorus*, 2.1 percent *Quercus breweri*, 1 4 percent *R occidentale*, and others with less than 0 5 percent each.

Meadow or "Flat". The meadow appears park-like with its open stand of conifers, dominated by *P. jeffreyi*. The major ground cover is made up of grasses (*Festuca* and *Poa*). A large variety of herbs occur; however, due to seasonal dominance, different species stand out when they are in bloom. Several bogs which remain wet throughout the year occur within the meadow or along the edge. Two sensitive species inhabit the bogs: *Cypripedium californicum* and *Epilobium oreganum*. The discovery of *E. oreganum* "is an important find" (Dr. Kenton Chambers). *L. vollmeri*, a watch/review species, also occurs here. Large populations of *Darlingtonia californica* inhabit the bogs. One bog along the southern edge runs through the entire length of the meadow. Two sensitive species occur on the meadow: *Microseris howellii* and *Senecio hesperius*. Prior to their recent discovery here, neither species had been found outside of the Illinois Valley area.

Many cavity nesting birds rear their broods in the meadow area. Species included are: western bluebird (*Sialia mexicana*), hairy woodpecker (*Picoides villosus*), northern flicker (red-shafted) (*Caolaptes auratus*) and red-breasted nuthatch (*Sitta canadensis*).

The meadow has an average aspect of 93 degrees and slope of 17 percent. Conifers average 50 per acre (100 percent *P. jeffreyi*, with traces of *C. decurrens*, *C. lawsoniana*, and *P. menizesii* near the edges. Conifer snags average 13 per acre (75 percent *P. jeffreyi* with 25 percent other species). Downed conifer boles average 334 feet per acre. Brush cover averages 7.1 percent per acre (71.5 percent *C. chrysolepis*, 19 6 percent *R. californica*, 4.2 percent *A. viscida*, 3.7 percent *C. pumilus* and small percentage of others).

Timber Resources. Timber resource values within the proposed RNA are low; existing stand volumes average approximately 6 thousand board feet (MBF) per acre. Site quality and management potential are poor, mainly due to low fertility of the serpentine and peridotite soils. Because of the rocky nature of the soils, stands with the larger volumes of harvestable timber are unplantable.

The Proposed RNA contains 441 acres; only 145 acres (mostly low site) is classified as tentatively suitable for timber harvest. For tentatively suitable land within the area, the Douglas-fir site index is approximately 75 and pine species is 50. Tentatively suitable for timber land within the RNA is capable of producing approximately 78 MBF per year on a long-term sustained yield (LTSY) basis (Table F-3).

Mineral Resources. Mining activity has occurred in the past outside the proposed RNA A chromite mine, located about one-half mile to the northwest, was in operation more than 25-30 years ago At that time the mine was operated under a government subsidy. One open shaft and the road to the mine are all that remain

There are numerous placer claims (gold-located 1980) and one lode claim (chrome-Del Norte Chrome-located 1980) existing within the area (Ramp and Peterson 1979). One of the placer claims is located on Cedar Log Creek None of the claims appear to have had any activity within the last one or two years.

A professional mineral examination of the area has not been conducted. This will be necessary if a decision is made to seek mineral withdrawal

The old mining road through the proposed RNA is still navigable by four-wheel drive vehicles; Slate Creek must first be forded. This path allows vehicle access to the meadow area, it may be necessary to control access in the future to prevent damage to the meadow

Research Project of Interest (within the proposed RNA). A bird banding project was conducted by Dennis Vroman during the 1985-1986 field seasons. Although smaller songbirds made up the bulk of species banded, records were kept of all bird species observed. This project provided the following information species occurrence, abundance, and seasonal trends. The study also provided basic information for long-term population trends

The following data (Tables F-RNA-4(a) and F-RNA-4(b) was compiled by Dennis Vroman During 1984-1985 (some data from Tom Atzet)·

Table F-RNA-4(a) List of Plant Species in the Proposed Cedar Log Flat Research Natural Area

Scientific Name	Documented Flowering Dates
Herbaceous Species:	
Achillea millefolium	6-2-80 (Atzet), 6-19-85
Adiantum pedatum var. *aleuticum*	
Allium falcifolium	5-20-84
Allium spp.	
Apocynum spp	
Aquilegia spp. (*formosa* ?)	
Arabis aculeolata 2/	4-7-84, 4-17-84
Arabis koehleri var. *stipitata* 1/ 3/	2-12-84, 3-16-84, 3-20-84
Arabis subpinnatifida	3-20-84
Arabis spp (4th spp)	
Arceuthobium campylopodum	
Arnica spp (*discoidea* ?)	5-20-84
Asarum caudatum	5-20-84
Aspidotis densa	
Aster spp.	8-24-84, 8-13-85
Balsamorhiza deltoidea	5-20-84
Blepharipappus scaber	7-27-84, 6-19-85
Boschniakia strobilaceae (spp)	
Brickellia greenei	9-23-84
Brodiaea hendersonii	
Calochortus tolmiei	6-2-80 (Atzet), 5-20-84
Calypso bulbosa	4-17-84
Camassia quamash	5-2-84
Campanula prenanthoides	
Carex spp.	

Table F-RNA-4(a) List of Plant Species in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

Scientific Name	Documented Flowering Date
Castilleja applegatei	6-2-80 (Atzet)
Castilleja brevilobata	5-2-84, 5-20-84, 5-29-84
Castilleja elata	7-27-84, 6-19-85
Castilleja pruinosa	5-20-84
Cerastium spp	4-27-85
Chimaphila umbellata	
Claytonia lanceolata	3-16-84
Collinsia grandiflora	6-2-80 (Atzet)
Collomia tinctoria	5-29-84
Convolvulus spp. (*polymorphus* ?)	6-19-85
Cypripedium californicum 1/ 3/	5-20-84
Darlingtonia californica 2/	4-27-85 (few)
Delphinium spp (*sonnei* or *decorum*?)	
Dentaria tenella	3-15-85
Dicentra formosa ssp. *oregana* 2/	4-17-84
Disporum hookeri	5-20-84
Dodecatheon hendersonii	3-16-84, 4-7-84
Elymus glaucus	6-2-80 (Atzet)
Epilobium minutum	5-29-84
Epilobium oreganum 1/	8-24-84
Epilobium paniculatum	8-24-84
Erigeron bloomeri var. (*nudatus*?)	5-22-85
Eriogonum nudum	
Eriogonum pendulum 1/	7-27-84
Eriophyllum lanatum var. *lanceolatum*	5-20-84
Erysimum capitatum	5-20-84
Erythronium citrinum (Slate Creek)	
Erythronium hendersonii	3-16-84, 4-7-84
Festuca rubra	6-2-80 (Atzet)
Fritillaria glauca 1/	3-20-84, 4-7-84
Fritillaria lanceolata	3-16-84, 4-17-84
Galium ambigum	4-17-84
Gilia capitata	5-30-85
Goodyera oblongifolia	
Habenaria sparsiflora	5-20-84
Haplopappus racemosus spp *congestus*	7-27-84, 8-24-84, 9-23-84
Hastingsia (*Schoenolirion*) *album*	6-2-80 (Atzet), 5-20-84
Helenium bigelovii	7-27-84, 6-19-85
Hieracium spp. (*bolanderi* ?) 1/	
Hieracium spp. (*greenei* ?)	
Hieracium gracile	6-19-85
Horkelia sericata	6-2-80 (Atzet),7-27-84,8-24-84
Iris chrysophylla	5-2-84, 5-20-84
Lathyrus nevadensis	5-2-84, 5-20-84
Ligusticum spp. (*apiifolium* ?)	
Lillium spp (Second)	
Lillium vollmeri 2/	6-19-85

Table F-RNA-4(a). List of Plant Species in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

Scientific Name	Documented Flowering Date
Linnaea borealis	
Lithophragma heterophylla	
Lithospermum spp (*californicum* ?)	
Lomatium howellii	
Lomatium macrocarpum	
Lomatium triternatum	5-20-84
Lotus oblongifolius	5-29-84, 6-19-85
Madia madioides	6-2-80 (Atzet)
Melica geyeri	6-2-80 (Atzet)
Microseris howellii 1/	5-20-84
Mimulus guttatus	5-2-84, 5-20-84
Monardella odoratissima	7-27-84
Montia (*parvifolia* ?)	
Narthecium californicum	7-27-84, 6-19-85
Orobanche uniflora	
Orthocarpus bracteosus	9-23-84, 6-19-85
Orthocarpus hispidus	6-2-80 (Atzet),5-20-84,5-29-84
Osmorhiza occidentalis	
Parnassia palustris	8-24-84, 9-23-84
Penstemon spp.	6-9-84
Perideridia oregana	7-27-84, 8-24-84
Phacelia corymbosa 2/	5-20-84
Plagiobothrys spp.	4-27-85
Pityrogramma triangularis	
Polygonum californicum	9-23-84
Polypodium hesperium	
Polystichum munitum	
Poa sandbergii	6-2-80 (Atzet)
Pteridium aquilinum	
Pyrola spp	
Ranunculus occidentalis	4-7-84
Rudbeckia californica	7-27-84
Rumex occidentalis	6-2-80 (Atzet)
Sanguisorba officinalis (*microcephala* ?)	
Saxifraga spp. (*integrifolia* ?)	3-20-84, 4-7-84
Sedum laxum (spp. *heckneri* ?) 1/ 3/	
Senecio canus	
Senecio hesperius 1/	5-20-84, 5-29-84
Senecio integerrimus	6-2-80 (Atzet)
Silene campanulata	5-29-84
Silene hookeri	5-29-84, 6-2-80 (Atzet)
Sisyrinchium idahoense	5-29-84, 6-19-85
Smilacina racemosa	5-20-84
Smilacina stellata	5-20-84
Stipa lemmonii	6-2-80 (Atzet)
Synthyris reniformis	2-25-84, 3-16-84, 4-7-84
Thlaspi montanum var. *siskiyouensis* 1/	3-20-84, 4-27-85

Table F-RNA-4(a) List of Plant Species in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

Scientific Name	Documented Flowering Date
Tofieldia glutinosa	7-27-84
Trientalis latifolia	
Trifolium eriocephalum	6-2-80 (Atzet), 5-20-84
Trillium rivale	3-16&20-84, 4-7-84, 4-17-84
Viola adunca	5-2-84, 5-20-84
Viola cuneata	5-2-84, 5-20-84
Whipplea modesta	5-2-84
Wyethia spp	6-19-85
Xerophyllum tenax	
Zigadenus venenosus	5-2-84
Shrub Species:	
Amelanchier spp	
Arctostaphylos patula (near Slate Creek)	
Arctostaphylos viscida	
Berberis nervosa	
Berberis pumilus	
Ceanothus cuneatus	
Ceanothus integerrimus (Slate Creek)	
Ceanothus pumilus	
Cercocarpus spp. (*betuloides* ?)	
Chrysothamnus parryi	
Clematis spp. (*ligusticifolia* ?) (Slate Creek)	
Cornus nuttallii (Slate Creek)	
Cornus occidentalis (Slate Creek)	
Corylus cornuta var. *californica* (Slate Creek)	
Eriodictyon californicum	
Garrya buxifolia	
Gaultheria shallon	
Gaultheria ovatifolia	
Holodiscus discolor	
Ledum spp (*columbianum* ?)	
Lonicera spp.	
Physocarpus spp. (*malvaceus* ?) (Slate Creek)	
Quercus breweri	
Quercus vaccinifolia	
Rhamnus californica	
Rhododendron occidentale	
Rhus diversiloba	
Ribes spp.	
Rosa gymnocarpa	
Rosa spp. (2nd spp?)	
Rubus parviflorus	
Rubus spp. (2nd spp.)	
Vaccinium parvifolium	

Table F-RNA-4(a). List of Plant Species in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

Scientific Name
Tree Species:
Acer macrophyllum
Alnus rubra
Arbutus menzeisii
Calocedrus decurrens
Chamaecyparis lawsoniana
Lithocarpus densiflorus
Pinus attenuata
Pinus jeffreyi
Pinus lambertiana
Pinus ponderosa (small number)
Pseudotsuga menziesii
Quercus chrysolepis
Quercus kelloggii
Salix spp
Taxus brevifolia
Umbelluaria californica

1/ Sensitive Plant Species (USDA Forest Service Designation)
2/ Watch List (USDA Forest Service Designation)
3/ Potential candidate for the Regional Forester's sensitive list.

Table F-RNA-4(b). Wildlife Species Identified or Known to be Present in the Proposed Cedar Log Flat Research Natural Area

Scientific Name	Common Name
Birds:	
Bonasa umbellus	ruffed grouse
Buteo jamaicensis	red-tailed hawk
Callipepla californica	California quail
Caolaptes auratus	northern flicker, red-shafted
Carduelis psaltria	lesser goldfinch
Carpodacus purpureus	purple finch
Cathartes aura	turkey vulture
Catharus guttatus	hermit thrush
Catherpes mexicanus	canyon wren
Certhis americana	brown creeper
Ceryle alcyon	belted kingfisher
Chamaea fasciata	wrentit
Columba fasciata	band-tailed pigeon
Contopus borealis	olive-sided flycatcher
Contopus sordidulus	western wood-pewee
Corvus corax	common raven
Cyanocitta stelleri	Steller's jay
Dendroica coronata	Yellow-rumped warbler, Audubon's
Dendroica nigrescens	black-throated gray warbler
Dryocopus pileatus	pileated woodpecker
Empidonax difficilis	western flycatcher
Falco columbarius	merlin
Glaucidium gnoma	pygmy owl
Ixoreus naevius	varied thrush
Junco hyemalis	dark-eyed junco, Oregon
Melospiza lincolnii	Lincoln's sparrow
Myadestes townsendi	Townsend's solitaire
Oporornis tolmiei	MacGillivray's warbler
Oreortyx pictus	mountain quail
Parus atricapillus	black-capped chickadee
Parus rufescens	chestnut-backed chickadee
Passerella iliaca	fox sparrow
Pheucticus melanocephalus	black-headed grosbeak
Picoides villosus	hairy woodpecker
Pipilo erythrophthalmus	rufous-sided towhee
Piranga ludoviciana	western tanager
Psaltriparus minimus	common bushtit
Regulus calendula	ruby-crowned kinglet
Regulus satrapa	golden-crowned kinglet

Table F-RNA-4A(b) Wildlife Species Identified or Known to be Present in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

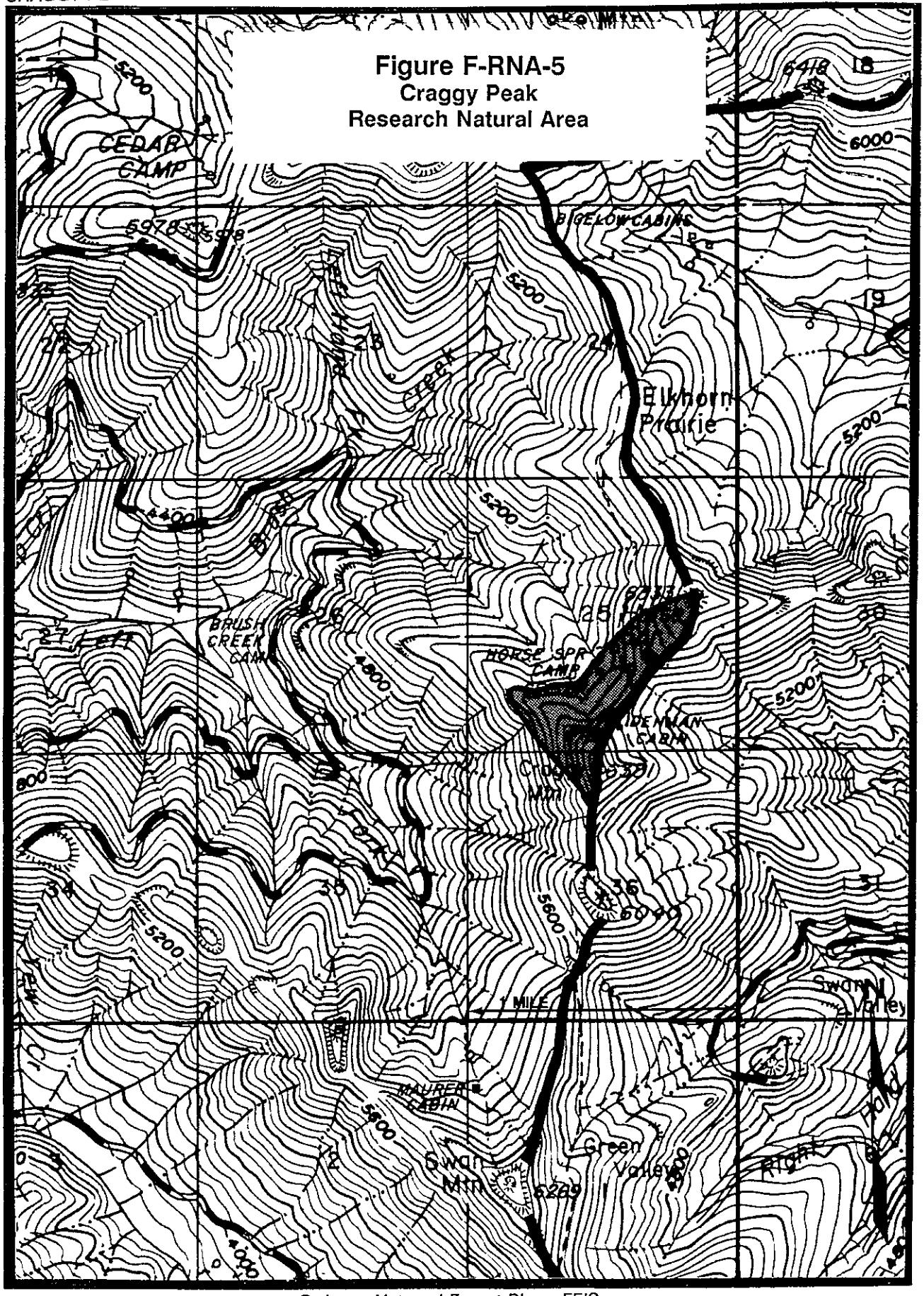
Scientific Name	Common Name
Selasphorus rufus	rufous hummingbird
Sialia mexicana	western bluebird
Sitta canadensis	red-breasted nuthatch
Sitta carolinensis	white-breasted nuthatch
Sphyrapicus ruber	red-breasted sapsucker
Stellula calliope	calliope hummingbird
Thryomanes bewickii	Bewick's wren
Troglodytes trolodytes	winter wren
Turdus migratorius	American robin
Vermivora celata	orange-crowned warbler
Vermivora ruficapilla	Nashville warbler
Vireo solitarius	solitary vireo
Wilsonia pusilla	Wilson's warbler
Zenaida macroura	mourning dove
Zonotrichia atricapilla	golden-crowned sparrow
Mammals:	
Bassariscus astutus 2/	ringtail
Canis latrans 2/	coyote
Citellus beecheyi	California ground squirrel
Eptesicus fuscus 1/	big brown bat
Erethizon dorsatum	porcupine (sign)
Eutamias towsendii	Townsend's chipmunk
Felis concolor	mountain lion (sign)
Lasionycteris noctivagans 1/	silver-haired bat
Lepus californicus	black-tailed jackrabbit (sign)
Lynx rufus	bobcat
Mephitis mephitis 2/	striped skunk
Microtus spp.	vole spp
Myotis californicus 1/	California myotis
Myotis evotis 1/	long-eared myotis
Neotoma fuscipes (spp?)	dusky-footed woodrat (sign)
Odocoileus hemionus	black-tailed deer
Procyon lotor	raccoon
Sciurus griseus	western gray squirrel
Spilogale putorius 2/	spotted skunk
Sylvilagus idahoensis	brush rabbit
Urocyon cinereoargenteus 2/	gray fox
Ursus americanus	black bear (sign)

Table F-RNA-4(b). Wildlife Species Identified or Known to be Present in the Proposed Cedar Log Flat Research Natural Area (Cont'd)

Scientific Name	Common Name
Reptiles:	
Crotalus viridis	western rattlesnake
Eumeces skiltonianus	western skink
Gerrhonotus multicarinatus	southern alligator lizard
Pituphis malanoleucus catenifer	gopher snake (Pacific ssp.)
Sceloporus occidentalis	western fence lizard
Thamnophis elegans elegans	western terrestrial garter snake
Amphibians:	
Hyla regilla	Pacific tree frog
Rana boylei	foothill yellow-legged frog
Butterflies:	
Adelpha berdowii	California sister
Anthocharis sara flora	Sara orange tip
Celastrina argiolus echo	echo blue
Cercyonis pegala	large wood nymph
Chlosyme (Charidryas) palla spp.	northern checkerspot
Coenonympha spp	ringlet spp.
Neophasia menapia	pine butterfly
Nymphalis californica	California tortoiseshell
Ochlodes sylvanoides	woodland skipper
Papilio spp.	black swallowtail spp
Phyciodes spp	crescentspot spp.
Pterourus spp	yellow swallowtail spp.
Speyeris spp.	fritillary spp.

1/ Bat species likely present in proposed RNA. This assumption based on data collected from a survey site approximately 3 75 air miles south of the center of the RNA Site is described in *A Survey of Bat Populations and their Habitat Preferences in Southern Oregon* 1977. Southern Oregon State College Student Originated Study Project (S Cross, Faculty Advisor).

2/ Mammals trapped, or their sign seen (1983-1984 trapping season) within proposed RNA Data compiled from conversation with trapper, Gary Sublette, on November 20, 1985.


Figure F-RNA-5
Craggy Peak
Research Natural Area
CEDAR CAMP
BIGELOW CABIN
Elkhorn Prairie
BRUSH CREEK CAMP
HORSE SPR CAMP
IDEMIAN CABIN
MAURER CABIN
Swan Mtn
Green Valley
Swanni Valley
1 MILE
5200
6000
5600
4400
4800
5209

CRAGGY PEAK - F-RNA-5

The Craggy Peak area is on the Applegate Ranger District of the Rogue River National Forest and the Illinois Valley Ranger District of the Siskiyou National Forest, with the smaller part of the area (100 of 1,200 acres) on the Siskiyou (the portion on the Rogue River National Forest is called the Oliver Matthews RNA) The 1,200 acres lie in Sections 21, 28, 29, and 30 of T.40S , R.5W , and Section 25 of T 40S , R 6W The soils and ecology are varied. Most material is metavolcanic; however, there are small inclusions of granitic and ultrabasic materials Soils range from extremely shallow to deep. See Ramp and Peterson (1979) for more information on geology and mineral resources of the general area The Siskiyou National Forest portion of the area contains no land tentatively available and suitable for timber production (Table F-3). One unusual plant is known from the area (Table F-RNA-5); others will probably be discovered. Craggy Peak has been recommended as an RNA in the Preferred Alternative (S).

The Craggy Peak proposed RNA fills the need for six plant community "cells" (Dyrness and others 1975; Tables 53 and 54), (a) vernal pond at mid to high elevation; (b) cold springs; (c) Shasta red fir - white fir forest; (d) Brewer spruce showing maximum development; (e) Baker cypress in the eastern Siskiyous; and, (f) mountain herblands at high elevation. Cells b and f are on the Siskiyou portion of the area; the cold springs cell is especially important.

The range of vegetation is great but white fir/dwarf Oregon grape/prince's-pine is most common. Douglas-fir is common in the overstory but is definitely seral. Incense-cedar and white pine are sparsely represented.

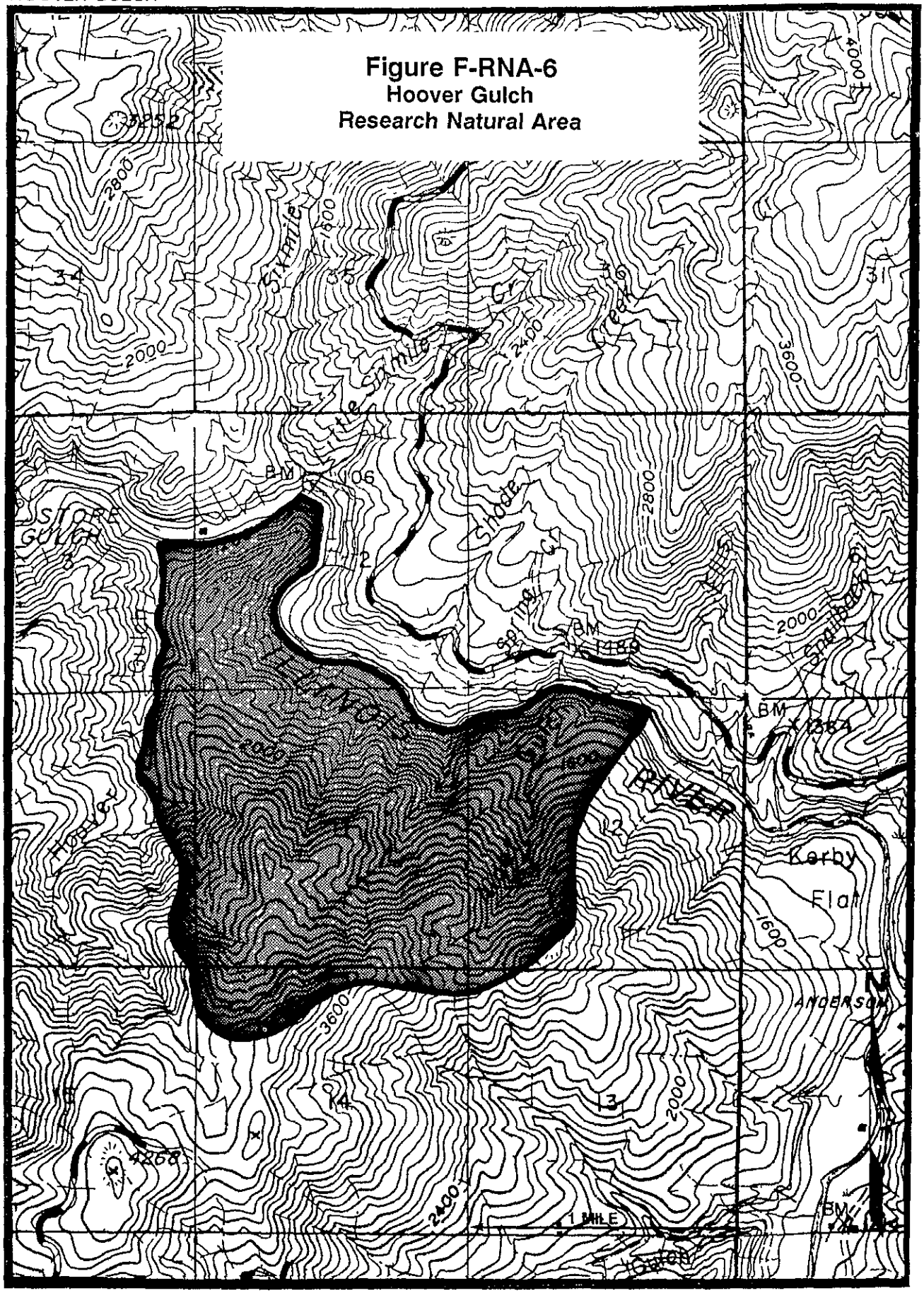
The Baker cypress stand is within a north facing concavity between Miller Lake and the proposed eastern boundary. There are approximately 200 individuals with very little variation in age class and no regeneration. Brewer spruce is common in the north facing concavities and there are several areas with large individuals. On the ridge near the top, mountain hemlock dominates the north aspect. The south aspect has been burned more often and has several seral shrubs. The west end of the area has the only possible high elevation bald in the Siskiyous. It is extremely disturbed as is the surrounding area, and is dominated by green fescue (positive identification not made). However, it is suitable if grazing can be eliminated.

Alternatives to these cells are few. There are no other known Baker cypress stands in the Siskiyou Mountains. A site in the Cascade Mountains was considered, near Prospect, Oregon. The other mountain herbland sites considered, Elkhorn Prairie Site and the "meadows" along the "backbone" of the Siskiyous, have all been overgrazed and grazing continues today.

The Shasta red fir-white fir mix is more common; however, it would fit well within the proposed area rather than a separate RNA elsewhere.

Table F-RNA-5. Unusual Plants in the Proposed Craggy Peak Research Natural Area

Scientific Name	Common Name
Watch/Review Species	
Darlingtonia californica	California pitcher-plant


Figure F-RNA-6
Hoover Gulch
Research Natural Area
Sixmile Cr
Sixmile
Shade Cr
Shade
Hoover Gulch
Hoover
Smiley Creek
Smiley
Korby Flat
Korby
ANDERSON
RIVER
BM
1 MILE
4268
2800
2000
1600
2400
3600
4000

HOOVER GULCH - F-RNA-6

The proposed Hoover Gulch Research Natural Area is a 1,292 acre area in the eastern portion of the Siskiyou National Forest, adjacent to the Illinois River (T.38S., R.9W., Sections 2, 3, 10, 11, 12, 13, 14), (Figure F-RNA-6). Hoover Gulch has been recommended as an RNA in the Preferred Alternative (S). The following description is excerpted from a April 1980 draft Establishment Report on file at the Supervisor's Office.

The proposed Hoover Gulch Research Natural Area occupies the Alder Gulch drainage, and an unnamed small stream basin between them. These streams are tributaries to the Illinois River. The Research Natural Area (RNA) contains approximately 1,200 acres of a variety of mixed-evergreen forest, some open forest types associated with ultrabasic parent materials, and two permanent small streams. The predominant rock type in the RNA is metavolcanic (greenstones of the Rogue and Galice Formations) The mixed-evergreen/canyon live oak (*Quercus chrysolepis*), tanoak (*Lithocarpus densiflorus*) Pacific madrone (*Arbutus menziesii*), Douglas-fir (*Pseudotsuga menziesii*), and sugar pine (*Pinus lambertiana*) forests vary from almost pure hardwood on the steep slopes of the Illinois River Canyon to nearly-pure closed canopy stands of Douglas-fir on benches or ridge tops. On rock outcrops, gnarled canyon live oak and Pacific madrone exhibit the effects of a hot, dry habitat on tree form Small outcrops of ultrabasic parent materials support distinctive open forests of Jeffrey pine (*Pinus jeffreyi*) and incense-cedar (*Calocedrus decurrens*) due to the special soils formed by these minerals.

The need for an RNA with plant communities such as those in the Hoover/Alder Gulch area was recognized by the Pacific Northwest Natural Area Needs Task Force. Hoover Gulch Research Natural Area can fill the following cell needs in the Siskiyou Mountains province (Dyrness and others 1975):

from Table 53

8 Mixed evergreen forest (Douglas-fir and evergreen hardwoods) (Major component)

10. Canyon live oak

from Table 54

2. Major stream drainage in mixed-evergreen forest.

The Hoover Gulch Research Natural Area fills two specific needs identified by the Pacific Northwest Natural Area Committee in 1973, and has several unique features which will contribute to scientific and educational needs in the future. It fills the identified need for an area with the mixed-evergreen forest type, which is recognized as a major community type in North America. This mixed-evergreen zone (Douglas-fir and evergreen forests) occupies large areas at low elevations in southwestern Oregon and northern California The Hoover Gulch Area contains representatives of both the relatively undisturbed and more recently burned mixed-evergreen forest of the Siskiyou Mountains. It provides a rich diversity of communities and habitat types of the mixed-evergreen zone on a wide range of slopes, aspects, elevations, and soils

The RNA would provide representative area of important tree species at the dry end of their environmental range, including Douglas-fir, sugar pine, and ponderosa pine (*Pinus ponderosa*). Douglas-fir dominates in the stands occupying rock mulch soils on the canyon walls. Sugar and ponderosa pine are found on deeper soils on benches and ridge tops. Tanoak, canyon live oak, and Pacific madrone occur in situations where they are part of the climax community, as well as in seral stages of community development On the driest rocky slopes, canyon live oak has the highest cover of any tree and tanoak is nearly absent. On better soils tanoak predominates. The diversity of landform, aspect, and elevation produce forest stands which vary not only in composition and structure, but in productivity, thus providing an excellent opportunity to study the factors which affect productivity in this Region.

The proposed area also fills the identified need for a permanent stream in mixed-evergreen forest Since entire watersheds are included in the RNA, this would provide an ideal setup for watershed/nutrient cycling studies.

Several special features add to the value of this area as a research natural area The area contains several outcrops of ultrabasic (serpentine) parent material which supports distinctive plant communities where Jeffrey pine and incense-cedar are the major tree species. These outcrops provide an opportunity to compare these special communities on patches of serpentine with similar communities on the large land masses of the same parent material a few miles away. One unusual plant, *Darlingtonia californica*, is present within the RNA (Table F-RNA-6).

The proposed area is known to be inhabited by the northern spotted owl. Study of the owl in this area could provide better information about its habitat requirements.

The Illinois River Canyon is one of the most floristically rich areas of Oregon. Hoover Gulch would add diversity to the habitats now set aside in Botanical areas and other research natural areas.

Timber Resources. Timber management options for the area are limited. All timber within one-fourth mile of the Wild and Scenic Illinois River is excluded from harvest. In addition, Hoover Gulch serves as Spotted Owl Habitat Area (see the Proposed LRMP, Chapter IV, Management Area 8). Given these land allocations, none of the proposed RNA is available for timber management. However, if the Hoover Gulch site were not used to help meet minimum management requirements for spotted owls, and if no other land allocations were made for other resources (such as visuals), commercial timber land within the RNA would be capable of producing approximately 593 thousand board feet (MBF) per year on a long-term sustained yield (LTSY) basis (Table F-3).

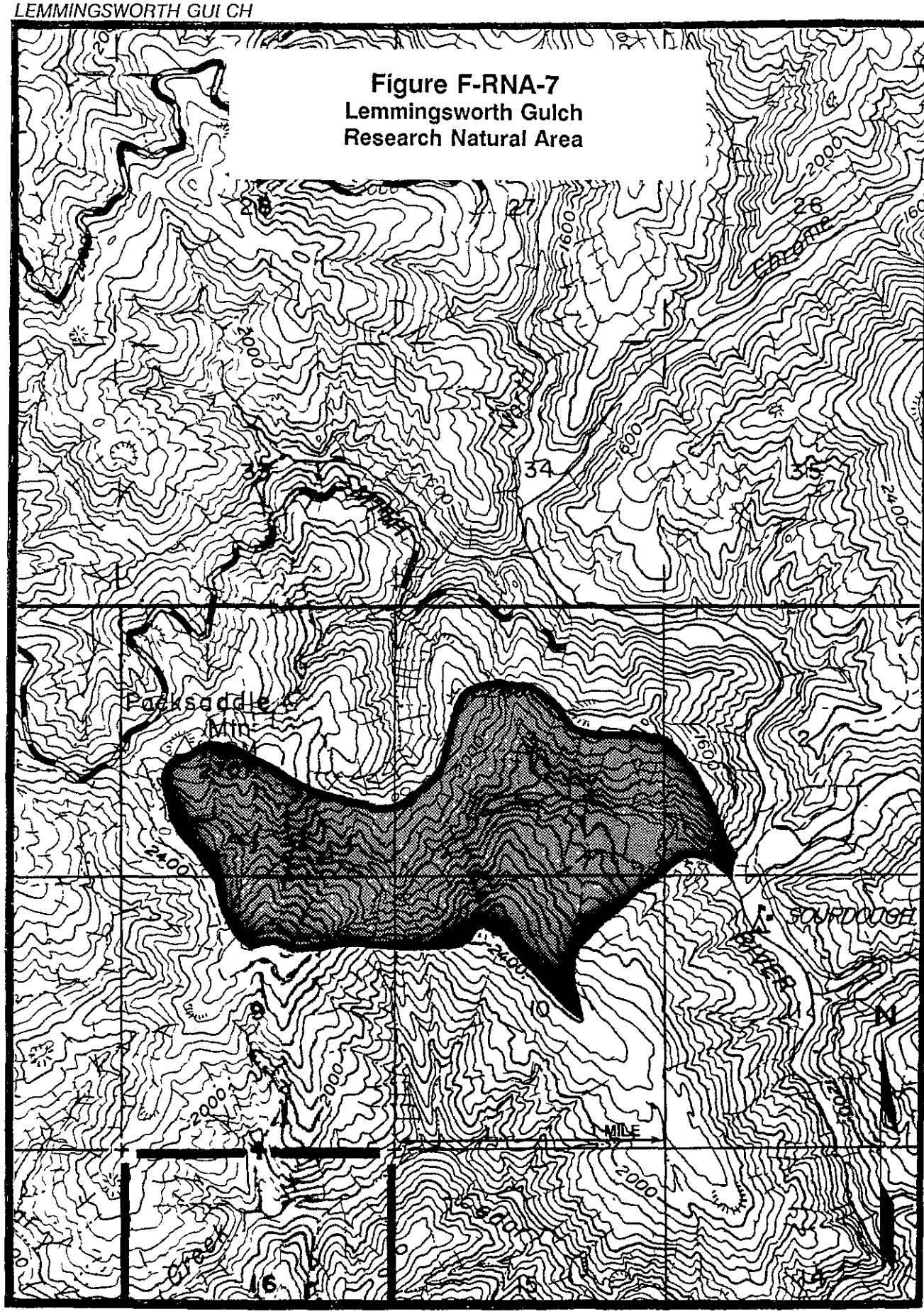
Mineral Resources. A professional mineral examination of the proposed Hoover Gulch Research Natural Area was conducted on October 19-20, 1982 and July 26, 1983 (report on file at the Supervisor's Office). The mining engineer noted that gravels along the Illinois River and the ridgeline area in Section 14 are mineral in character. The lands drained by Alder Gulch and west to the ridge east of Hoover gulch are nonmineral in character. When an area is allocated for RNA purposes, an Establishment Report must be written and approved. The decision on whether or not to recommend a RNA for withdrawal from mineral entry would be addressed in the Establishment Report.

Five historical gold placer prospects are located within or near the edge of the RNA (Ramp and Peterson 1979). The future potential of these sites is considered low. A few placer claims presently exist at various locations in the RNA (Bureau of Land Management (BLM) records, as of May 27, 1982). Their validity has not been determined.

Table F-RNA-6. Unusual Plants in the Proposed Hoover Gulch Research Natural Area

Scientific Name	*Common Name*
Watch/Review	
Darlingtonia californica	California pitcher-plant




Figure F-RNA-7
Lemmingsworth Gulch
Research Natural Area
Packsaddle
Mtn
SOUTH
FORK
1 MILE
N

LEMMINGSWORTH GULCH - F-RNA-1

The proposed Lemmingsworth Gulch Research Natural Area is an 818 acre area in the southwest corner of the Siskiyou National Forest (T.41S., R 11W., Sections 2, 3, 4, 9, 10) (Figure F-RNA-7). Lemmingsworth has been recommended as an RNA in the Preferred Alternative (S). The following description is excerpted from a March 1980 draft Establishment Report on file at the Supervisor's Office

The proposed RNA is marked by a sharp contrast between geologic substrates, which results in a dramatic contrast in vegetation types. Peridotite substrates are sparsely forested with a mosaic of knobcone pine (*Pinus attenuata*) in nearly pure stands, Jeffrey pine (*P. jeffreyi*) woodlands, Douglas-fir (*Pseudotsuga menziesii*) forests, and mixed forests dominated by Douglas-fir and evergreen hardwoods. Tree cover drops to near zero in many areas, so that some portions are dominated by shrublands Normal substrates, on Dothan Formation, are more densely forested, with either older stands of Douglas-fir or younger stands of tanoak (*Lithocarpus densiflorus*) and Pacific madrone (*Arbutus menziesii*). The topography, typical of the western Siskiyou Mountains, consists of dissected drainages, steep slopes, and narrow ridges. The Research Natural Area (RNA) encompasses a single entire watershed that drains eastward into the North Fork of the Smith River Elevation range is from 1,100 to 2,707 feet.

Topographic variety, elevation range, and a variety of geologic substrates produce a highly diverse flora. The Siskiyou Mountains are noted for plant endemism, or extremely localized species. Many of these species are restricted to serpentine. The proposed Lemmingsworth Gulch Research Natural Area is noteworthy for its extremely high concentration of endemic and rare plant species. Lemmingsworth Gulch contains at least seven sensitive species and ten species on the Review or Watch lists (Table F-RNA-7).

The western Siskiyou Mountains contain the Josephine peridotite sheet, the largest continuous body of serpentine and peridotite in Oregon Along the margins of this sheet, at the point of contact with other substrates, there is often a dramatic and abrupt change in vegetation so that it is possible to step from one distinctive community type across the line to another. Peridotite is well known for its relatively depauperate tree strata and very diverse shrub and herb layers.

Research on stand structure, composition, and succession in forests on peridotite in the western Siskiyou Mountains is extremely limited. A research natural area which contains a peridotite area and a contact with "normal" substrates is a logical addition to a natural area system whose aim is to preserve examples of significant natural ecosystems for comparison with those influenced by man Comparative studies of the extreme conditions on peridotite should yield valuable information which will aid in understanding management of forests and adjoining "normal" substrates The need for such an area was recognized by the Pacific Northwest Natural Area Needs Task Force (Dyrness and others 1975). As a priority item, Table 58 of their report lists the need for a mid- to high-elevation area with serpentine vegetation matrix with normal soil contact.

Little study on stand dynamics, productivity, and nutrient flow has been done on forest types found on peridotite. Inclusion in the research natural area system of knobcone pine forests and Jeffrey pine forests is important so that their peculiar adaptation to the abnormal soil conditions found on peridotite can be studied. These forest type needs are identified as priority items in Table 58 of Dyrness and others (1975).

In addition to these needs forests found on normal soil in the western Siskiyous have received little study. The tanoak-madrone forests and mixed-evergreen forests of the western Siskiyous are both identified as priority needs by Dyrness and others (1975).

In summary, the RNA will preserve forest types found on serpentine in the western Siskiyou Mountains. The presence of an entire watershed and an excellent bedrock exposure at the point of exit of the stream

into the North Fork of the Smith River will allow comparative studies of nutrient outflow and water quality. Lemmingsworth Gulch Research Natural Area can fill the following **forest type cell needs** in the Siskiyou Mountains Province (Dyrness and others 1975):

from Table 53

8. Mixed-evergreen forest (Douglas-fir and evergreen hardwoods) (Minor component)
9. Tanoak/madrone forest
11. Knobcone pine
16. Jeffrey pine/grass on serpentine at high elevation
17. Port-Orford-cedar (*Chamaecyparis lawsoniana*)/Douglas-fir on serpentine soils
18. Serpentine vegetation matrix and normal soil island with good representation of contacts

The following **aquatic cell needs** (Dyrness and others 1975) will also be filled:

from Table 54

10. Stream drainage in serpentine at mid- to high-elevation
14. Mountain bog in serpentine area with *Darlingtonia*

Timber Resources. Timber resource values are low on this tract in terms of standing volumes or site quality and management potential, largely due to the poor serpentine soils. The area is generally covered with young stands of Douglas-fir, knobcone pine, Jeffrey pine, and associated species. Average volumes of tentatively suitable timber stands are estimated at 10 MBF per acre, but vary widely with the substrates. Average site index for tentatively suitable stands is approximately 75. Tentatively suitable timber land within the proposed RNA is capable of producing approximately 141 thousand board feet (MBF) per year on a long-term sustained yield (LTSY) basis (Table F-3). However, the site as a whole is basically noncommercial. The central portion of the proposed RNA has extremely steep, rocky soils, which are subject to rapid erosion and landslides. Past erosion following wildfires is evident. Establishment of the RNA would create no access problems to adjacent forest areas.

Mineral Resources. A Forest Service mining engineer examined Lemmingsworth Gulch on November 15, 1977. He found that the proposed site of the RNA was mineral in character. In a report dated January 5, 1978, he noted that laterites containing at least 0.7 percent nickel exist in the northwest portion of the area. The small laterite deposits in this area, by themselves, would not be of economic interest, but combined with other nearby deposits they could someday become valuable. Figure F-RNA-7A shows the laterite sites within the Lemmingsworth Gulch area.

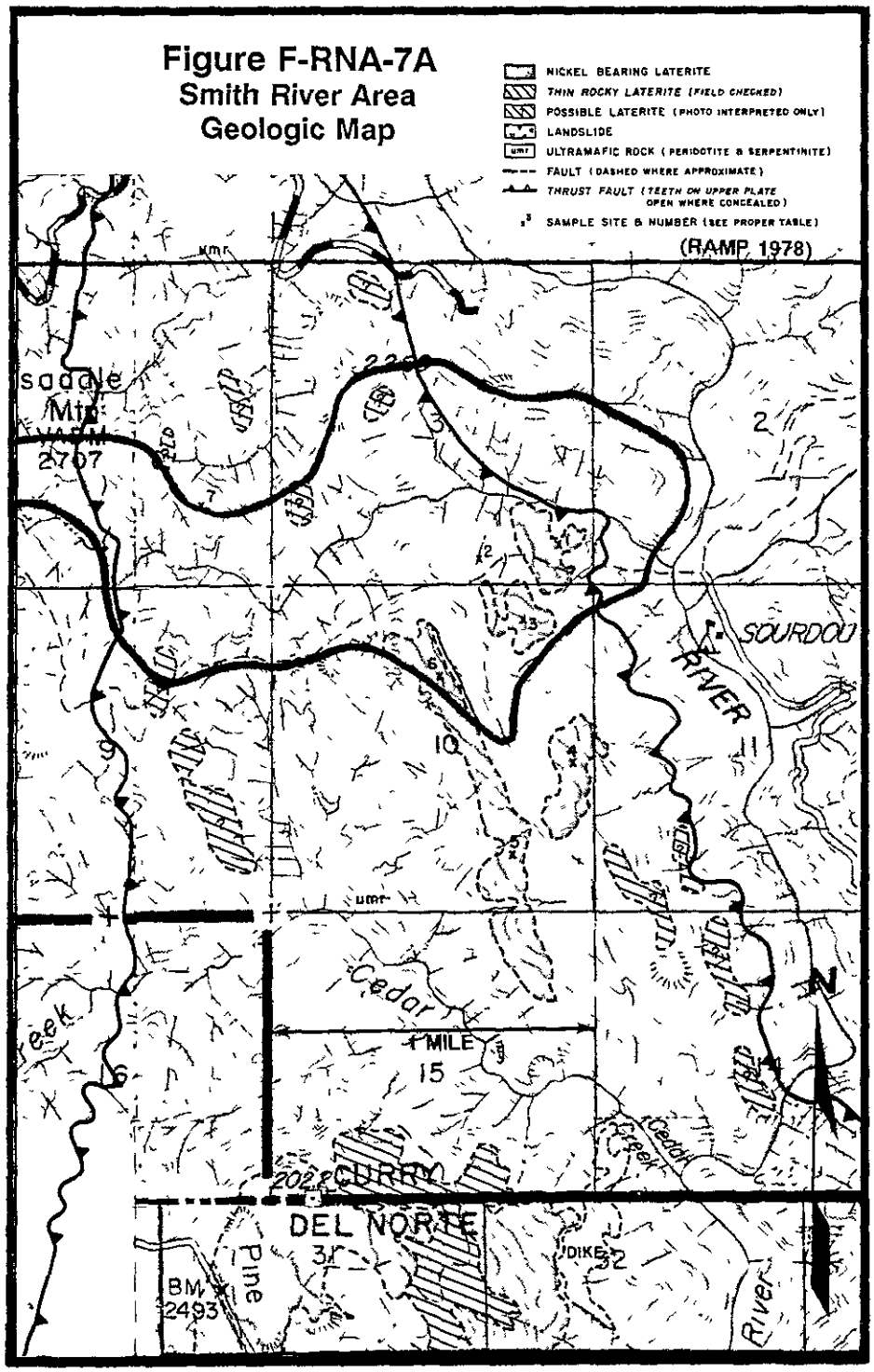
There has been no known mineral production from within this area. Chromite has been mined within 1 mile of this area, and the geology is favorable for this mineral to be found within the proposed RNA

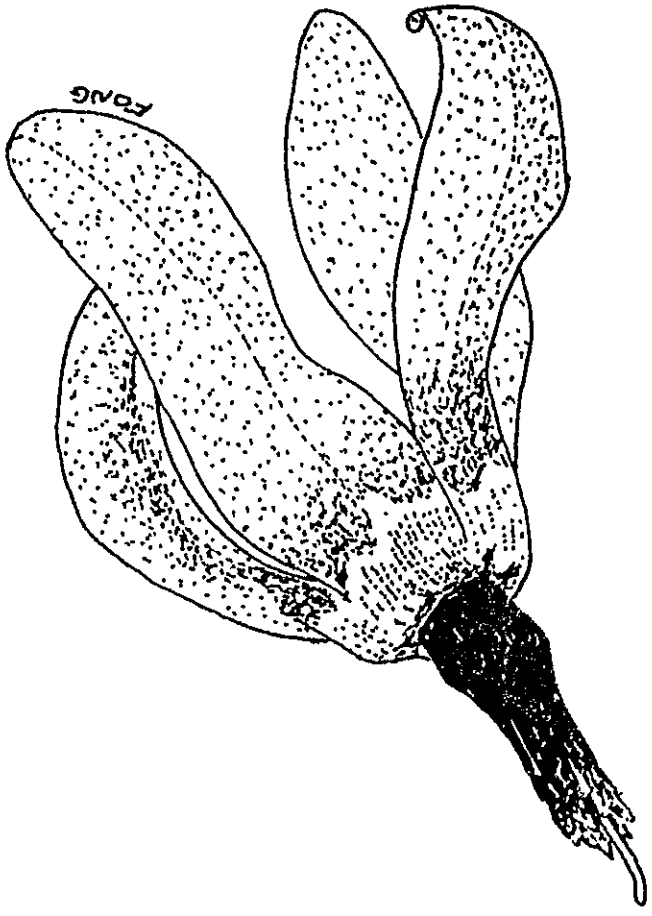
There are several mining claims in the area; they are not expected to cause any problems in the near future. The research natural area could be recommended for withdrawal from mineral entry. Mining action would nullify much of the value of the area for research. See Ramp and others (1977) for more information on geology and mineral resources of the general area.

Table F-RNA-7. Unusual Plants in the Proposed Lemmingsworth Gulch Research Natural Area

Scientific Name	Common Name
Sensitive Species	
Epilobium rigidum	rigid willow-herb
Gentiana bisetaea	Waldo gentian
Hieracium bolanderi	Bolander's hawkweed
Monardella purpurea	Siskiyou mondardella
Streptanthus howellii	Howell's streptanthus
Thlaspi montanum var. *siskiyouense*	Siskiyou pennycress
Viola occidentalis	western violet
Watch/Review Species	
Arabis aculeolata	Waldo rockcress
Cypripedium californicum	California lady's-slipper
Darlingtonia californica	California pitcher-plant
Dicentra formosa ssp *oregana*	Oregon bleedingheart
Eriogonum pendulum	long-stalked buckwheat
Eriogonum ternatum	Waldo buckwheat
Erythronium revolutum	pink fawn-lily
Hieracium parryi	Parry's hawkweed
Lilium vollmeri	Volmer's lily
Vancouveria chrysanta	yellow inside-out-flower




Figure F-RNA-7A
Smith River Area
Geologic Map
NICKEL BEARING LATERITE
THIN ROCKY LATERITE (FIELD CHECKED)
POSSIBLE LATERITE (PHOTO INTERPRETED ONLY)
LANDSLIDE
ULTRAMAFIC ROCK (PERIDOTITE & SERPENTINITE)
FAULT (DASHED WHERE APPROXIMATE)
THRUST FAULT (TEETH ON UPPER PLATE OPEN WHERE CONCEALED)
SAMPLE SITE & NUMBER (SEE PROPER TABLE)
(RAMP 1978)
Saddle Mtn
2707
SOURDOU
RIVER
Cedar
1 MILE
15
CURRY
DEL NORTE
Pine
BM
2493
DIKE
River



LITERATURE CITED

Beaulieu, John D. 1971. Geologic Formations of Western Oregon (West of Longitude 121o 30') Bulletin 70. State of Oregon Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201. 72 pp, map.

Dyrness, C T., Jerry F Franklin, and Chris Mazer. 1972. Supplement No. 1 to Franklin and others (1972)

Dyrness, C. T., Jerry F. Franklin, Chris Maser, Stanton A. Cook, James D. Hall, and Glenda Faxon 1975 Research Natural Area needs in the Pacific Northwest, a contribution to land-use planning USDA Forest Service General Technical Report PNW-38. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. 231 pp

Franklin, Jerry, Fred Hall, C T. Dyrness, and Chris Mazer. 1972. Federal Research Natural Areas in Oregon and Washington: a guidebook for scientists and educators. USDA Forest Service Pacific Northwest Forest and Range Experiment Station. Portland, Oregon. 498 pp.

Franklin, Jerry, and C. T. Dyrness. 1973. Natural Vegetation of Oregon and Washington. USDA Forest Service General Technical Report PNW-8. Pacific Northwest Forest and Range Experiment Station, Portland, Oregon. 417 pp.

ONHDB 1987. Rare, Threatened and Endangered Plants and Animals of Oregon. Oregon Natural Heritage Data Base. 1234 N W. 25th Avenue, Portland, Oregon 97210 ($4.00). 39 pp

Smith, James P Jr, and Richard York. 1984. Inventory of Rare and Endangered Vascular Plants of California. Special Publication No. 1 (3rd Edition). California Native Plant Society, 2380 Ellsworth, Suite D, Berkeley, California 94704. 174 pp.

Ramp, Len, Herbert Schlicker, and Jerry Gray 1977 Geology, Mineral Resources, and Rock Material of Curry County, Oregon Bulletin 93. State of Oregon Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201. 79 pp, maps.

Ramp, Len. 1978 Investigations of Nickel in Oregon Miscellaneous Paper 20. State of Oregon Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201. 68 pp, maps.

Ramp, Len, and Norman Peterson. 1979 Geology and Mineral Resources of Josephine County, Oregon. Bulletin 100. State of Oregon Department of Geology and Mineral Industries, 1069 State Office Building, Portland, Oregon 97201 45 pp, maps.

Webb, Lee 1988. A Guide to Sensitive Plants of the Siskiyou National Forest. Pub No R6-11-023-86. Siskiyou National Forest, 200 Greenfield Road (Box 440), Grants Pass, Oregon 97526. 255 pp

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United States
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Forest Service

**Pacific
Northwest
Region**

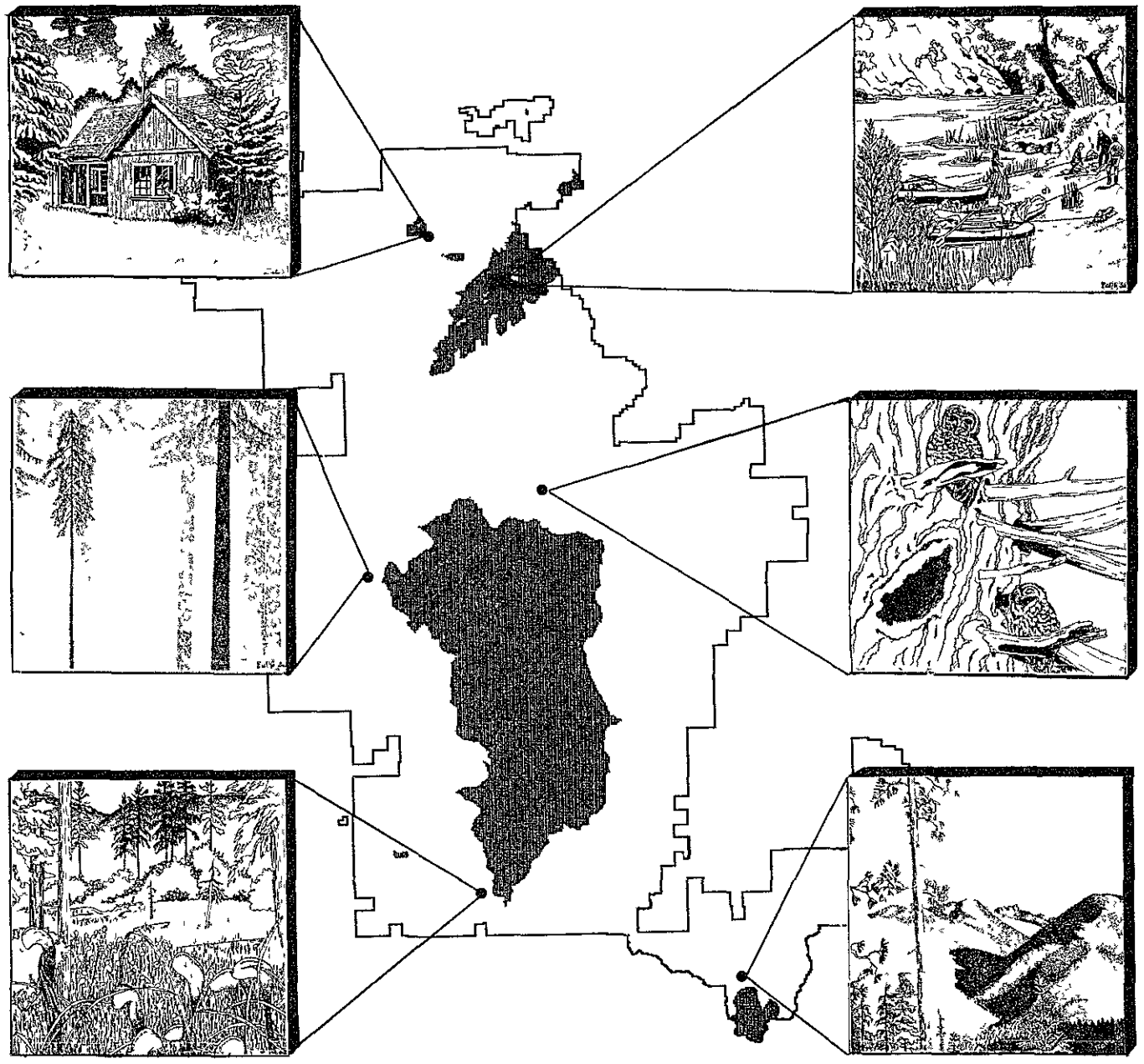
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Appendices – Volume II

Final Environmental Impact Statement

Land and Resource Management Plan

Siskiyou National Forest



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VOLUME II

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SELECTION OF SILVICULTURAL SYSTEMS



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SELECTION OF SILVICULTURAL SYSTEMS

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INTRODUCTION AND SUMMARY

The selection of silvicultural systems is a key element in the management of the Forest The systems used will strongly influence forest conditions and the ability to provide the outputs desired by society This facet of forest management has received considerable public attention in recent years, particularly in the form of concern over clearcutting and the application of even-aged systems in general This controversy escalated to a national issue, and Congress expressed that even-aged systems will be used only where determined to be appropriate to meet the objectives and requirements of the relevant plan, and more specifically, that clearcutting will be used only where determined to be the optimum method (Public Law 94-588).

It is often suggested that the Forest Service should consider alternatives comprised wholly of one type of system evaluated against another, implying that adoption of one type of system could provide the optimum management of the entire Forest This view ignores the tremendous variation found within this Forest and the multiple objectives that the Forest is managed to achieve. No single silvicultural system is applicable throughout the mixed conifer forests (Minore and Kingsley, 1983). In addition, adherence to the criteria for vegetative manipulation in the regulations (36 CFR 219 27(b)) will lead to selection of different systems for specific combinations of management objectives, site characteristics, and stand conditions In other words, the land itself often provides the best clues as to its appropriate management

This appendix describes the primary silvicultural systems available, the key site and stand conditions found on the Siskiyou National Forest, and the management goals and objectives associated with the alternatives of the Final Environmental Impact Statement (FEIS) for the Land and Resource Management Plan (LRMP). It provides a comparison of systems and anticipated results of each; then identifies the most appropriate systems for given combinations of the above factors. While the indicated systems should be those most often used, it is not intended that other systems should not be used when site specific conditions warrant Final selection of a silvicultural system and harvest method for a specific site is best left for the silvicultural prescription as provided for in Management Standards and Guidelines 1-1, selection criterion six of the Regional Guide for the Pacific Northwest Region, 1984 (USDA-FS, 1984).

Each of the systems described will be used to some extent. Uneven-aged systems will be used more frequently on sites that naturally tend toward uneven-aged structures (ultrabasic soils), or where they will best meet resource objectives. At a minimum, they will be tried in a few stands to gain experience on the Forest with uneven-aged management.

Due to the particular combinations of environmental conditions and management objectives, even-aged systems will be the most commonly used, with clearcutting the most common method of regeneration in this group The discussion presented here provides much of the rationale for the frequent selection of clearcutting as the optimum method Although many factors influence this decision, some have been over-emphasized. "Economics often bears the brunt of arguments for conversion to clear-cut systems In fact, these decisions originate in the practice of the art of forestry" (Brodie, 1981). Key factors in the determination of appropriate systems on this Forest are the intensity of vegetative competition commonly encountered, the difficulty of protecting residual trees through harvest operations on steep slopes, and the desirability of perpetuating high proportions of shade intolerant species.

DESCRIPTION OF SILVICULTURAL SYSTEMS

Silvicultural systems fall into two categories: Even-aged, and uneven-aged. With even-aged systems, all the trees in the stand are approximately the same age throughout most of the life of the stand. Uneven-aged systems produce stands with no beginning or end points in time, the trees within the stand are of distinctly different ages with at least three classes present.

Stand development and management options are strongly influenced by the regeneration cutting. The major silvicultural systems are known by the type of regeneration cutting employed Clearcutting, shelterwood, and seed tree are methods of regeneration within the even-aged system, single-tree selection and group selection are uneven-aged systems Each of these systems includes regeneration cutting, establishment of new seedlings or sprouts, and intermediate cutting or stand improvement treatments (commercial and precommercial thinnings) as needed to encourage the stand characteristics desired to achieve management objectives. The classification of silvicultural systems presented here is after Burns (1983), with additional descriptive information from Smith (1962)

EVEN-AGED SYSTEMS

Clearcutting involves harvesting of all the merchantable trees in a stand or large part of a stand to clear the way for the establishment of a new even-aged stand. The complete cycle of one generation from seedlings to final harvest is termed a rotation Virtually all of the trees are removed except those designated to fulfill resource needs or those which are unmerchantable and deemed not a hindrance to the establishment and growth of the new stand The new stand could be created by natural or artificial seeding, planting of seedlings, or sprouting from stumps or roots of cut trees. On the Siskiyou National Forest, most stands are regenerated by planting seedlings due to the unpredictable nature of the seed crops and the threat of falling behind the growth of less desirable vegetation if establishment of conifers is delayed. Most of the desirable timber species found here do not sprout readily, and the method of stump or root sprouting is generally not used (The Forest does contain a small amount of redwood which could be an exception)

The **shelterwood** method involves removal of the stand in a series of two or more harvests designed to establish a new crop before removal of the last of the mature stand These harvests span a relatively short period of time, only a fraction of the rotation, and the new stand produced is essentially even-aged The shelterwood method is used primarily to create a protected environment in which seedling survival and establishment may be enhanced, and in some cases to encourage the establishment of natural seedlings

The **seed-tree** method involves leaving a few trees at the time of the regeneration harvest to produce seed to reforest the cut-over area Depending on the amount of seed expected to be produced and the distance of dispersal from each tree, from three to ten trees per acre would be left. The seed trees may be removed in a second cutting or left indefinitely. This method differs from the shelterwood method in that the few trees left in seed-tree cutting do not significantly protect the seedling environment. Again, the new stand created would be essentially even-aged, varying only a few years or a small fraction of the rotation

UNEVEN-AGED SYSTEM

In the **single-tree selection** method, the mature timber is removed as single scattered trees. Such cuttings are repeated indefinitely at relatively short intervals (as often as every ten years on better sites) with the purpose of creating or maintaining an uneven-aged stand Removal of mature trees and thinning of the residual crop trees are both normally part of each harvest entry The regeneration of seedlings occurs in the spaces created by the removal of the individual trees

The **group selection** method is similar to the single-tree selection method except small groups of trees are removed at each harvest entry Openings created may vary from the width of a few tree crowns up to an acre or two in area and would resemble miniature clearcuts The uneven-aged stand created is a mosaic of very small even-aged groups or aggregations Many of the treatments used in the even-aged systems could be used except that any given treatment would be applied to small groups scattered through the stand

KEY SISKIYOU NATIONAL FOREST CONDITIONS

PLANT SERIES AND SOILS

Many site specific factors influence the selection of a silvicultural system The characteristics of the site itself are important to predict response to treatment and long-term effects of applying various systems The slope, aspect, elevation, soil, and climate, along with animals, pathogens, and sometimes fire, all interact to create the environment for vegetation response Plant communities (associations of particular plants) are an expression of the environment. A classification system covering the Forest defines environments according to their potential natural vegetation, or climax species, and site characteristics (Atzet and Wheeler, 1984). The smallest unit in the classification system is the plant association which can be used to resolve environmental differences for silvicultural prescriptions It can also be used to estimate productivity and extrapolate the response that could be expected under different conditions or following different management treatments Plant associations have been grouped into series with the same climax dominants The series lacks the resolution needed at the project level, but can be used for planning purposes and will be used here to indicate the long-term biological response expected under the various silvicultural systems.

PLANT SERIES

Although the mapping of plant associations or series has not been completed, an estimate of the relative occurrence of the individual series can be derived from the frequency with which the series was encountered in the ecology plot sampling There are seven commonly occurring series that represent most of the land area of the Forest. These series, their codes, and estimated proportion of the forest are displayed in the following table.

Series	Code	Percent Proportion
Shasta Red Fir	(ABMAS)	8
White Fir	(ABCO)	18
Western Hemlock	(TSHE)	8
Port-Orford-cedar	(CHLA)	5
Tanoak	(LIDE3)	41
Douglas-fir	(PSME)	13
Jeffrey Pine	(PIJE)	5

Shasta Red Fir Series (ABMAS). This series is found at elevations from 3,800 to 7,300 feet. It is most often found on northerly aspects and increasingly so at lower elevations. These sites generally have a heavy winter snow pack, and occur on all slopes and a wide variety of soil conditions. The predominate conifer species found in this series are Shasta red fir and white fir Other species occurring less frequently include western white pine, Douglas-fir, sugar pine, and mountain hemlock.

This series contains some of the coldest sites on the Forest and have extreme temperature fluctuations Exposed soil surface temperatures can fluctuate daily from 100 degrees Fahrenheit to freezing, creating an unfavorable environment for conifer regeneration The planting window is often very short as the soil condition goes from being too cold to support significant conifer root growth, to one of depleted moisture within a few weeks

Competing vegetation affects seedling establishment more than it affects long-term stand development and growth The species found on these sites are generally lower growing shrubs in contrast to the

hardwood trees more prevalent to warmer series However, vegetative competition may be significant If shrubs take over a site, they can dominate for two to three decades retarding regeneration and stand establishment.

White Fir Series (ABCO). This is the most prevalent series on the Forest It covers a wide range of environmental conditions and supports many species of conifers as well as other vegetation The most common conifers are Douglas-fir, white fir, Shasta red fir, ponderosa pine, incense-cedar, and sugar pine. The variation of this series encompasses a wide range of soils, elevations, and aspects Because of this variation it is difficult to make generalizations about regeneration potential, and management implications associated with regeneration. Important, however, is the relative absence of competitive hardwood tree species in the understories of stands in this series. This is not to say that these sites will not have vegetative competition, they often contain dormant seeds of shrub species, such as ceanothus, which may germinate following disturbance However, the competition from germinating seedlings is generally much less intense than that from hardwood stump sprouts

Western Hemlock Series (TSHE). This series is generally only found on the windward side of the coastal crest and north of the Rogue River It characteristically has deep soils, cool temperatures, and ample moisture. It is found more frequently on north aspects as distance from the coast increases Most common conifer tree species are Douglas-fir, western hemlock, and Port-Orford-cedar Red alder, tanoak, golden chinquapin, and California laurel (Oregon myrtle) are also common

With deep soils, ample moisture, and favorable temperatures, the most serious impediment to reforestation is competition from shrubs and hardwood trees. Even though conifers regenerate in disturbed areas quite readily from natural seedlings; species, such as, huckleberry, rhododendron, alder, and tanoak are often quite competitive

Port-Orford-cedar Series (CHLA). This series is scattered over broad areas on the extreme northwesterly portion of the Forest; however, it occurs principally along streams and in some areas with perched water tables east of the coastal crest. It is weakly associated with , but not limited to, ultrabasic soils It occurs over a variety of soil, slope, aspect, and elevation conditions. The major conifer species are Douglas-fir, Port-Orford-cedar, and white fir. Having ample moisture, this series supports a wide variety of species and is particularly important to riparian area management along streams where water, fish, wildlife, and recreation values are high.

Most of the sites in this series have favorable physical environments for establishment of conifer regeneration. The potential for vegetative competition is quite variable and could be severe on some sites.

Tanoak Series (LIDE3). This is the second most prevalent series on the Forest. It occurs on all slopes and aspects, often on deep soils, and is not found at higher elevations where it is limited by cooler temperatures. Although it supports a wide variety of conifer species, the most prevalent are Douglas-fir and sugar pine. Hardwood tree species common in this series include tanoak, madrone, golden chinquapin, and canyon live oak. Shrubs that often have a high percent cover are· salal, evergreen huckleberry, and rhododendron

Most of the sites in this series have favorable physical environments for the establishment of conifer regeneration However, the warmer and drier associations may not have enough moisture available to sustain seedlings into the growing season, resulting in poor survival The variety of shrub and hardwood species in this series tend to have high potential for prolific seeding and sprouting. Competition is encountered on most sites and is intense, with the potential to last well into the rotation if the site is not quickly reforested with conifers.

Douglas-fir Series (PSME). The Douglas-fir series is also common on the Forest It covers fairly wide range of elevations and all slope and aspects. It tends to occur on shallow to moderately deep soils and is the

driest series that supports commercial forest production Even on the more moist sites within the series, moisture is most often the limiting factor to conifer survival and growth. The most common conifers are· Douglas-fir, ponderosa pine, sugar pine, and white fir. Common shrubs or hardwoods are. madrone, tanoak, golden chinquapin, canyon live oak, and California black oak.

This series encompasses a variety of environmental conditions, but can be broken into three groupings of associations with similar management problems: Douglas-fir - white fir, Douglas-fir - tanoak, and those with no specific modifier. The **Douglas-fir - white fir group (PSME-ABCO)** is the coolest of the three, although it spans a range of moisture availability from dry to relatively moist. It has no characteristically dominating silvicultural problem; potential reforestation problems include competition, animal damage, moisture stress, and physical barriers

The **Douglas-fir - tanoak group (PSME-LIDE3)** has many of the reforestation characteristics as the Douglas-fir - white fir group. But, the potential for competition from tanoak is extremely high and is a dominating factor for this group. This competition not only influences reforestation, but also can influence conifer growth and production well into the life of a stand or even through the entire rotation Soils are generally deeper than the other groups, temperatures more moderate, and atmospheric moisture more plentiful.

The remaining group of associations has no modifier. They are simply the **Douglas-fir associations (PSME)**. In terms of plant growth, these are the least productive of the series. Shallow soils with low water holding capacity, high evaporative demand, and high radiation loads combine to significantly limit growth. High soil surface temperatures and drought make reforestation difficult on many sites in this group.

Jeffrey Pine Series (PIJE). This series only occurs on serpentinite/peridotite derived soils. These soils are both clayey and shallow, and are high in magnesium relative to calcium and in heavy metals such as nickel and chromium which have growth retarding effects on most conifers. These are the least productive forested sites in the Siskiyou mountains. The series is found over a fairly wide range of elevations and on all slopes and aspects. The vegetation is diverse both in the number of species present and the structure in terms of size and age. Incense-cedar and Jeffrey pine are the most common conifers, although western white pine, Douglas-fir, and Port-Orford-cedar occur frequently as well.

Sites in this series may be difficult to reforest due to the shallow soils with nutrient imbalance and heavy metals. They are also not very productive; therefore, substantial investments in silvicultural treatments may not be warranted Many of these sites have existing understories of conifer regeneration, or even several age classes comprising natural uneven-aged stands. Though artificial regeneration may be difficult to achieve, these sites tend to regenerate naturally to Jeffrey pine and Douglas-fir.

ULTRABASIC SOILS

The soils of the Forest are diverse, and no attempt will be made here to characterize individual soil types. There is a major dichotomy that is useful in understanding vegetation development, projecting treatment response, and assessing management opportunities. This division separates those soils characterized as ultrabasic from those with a more normal balance of minerals. Ultrabasic soils are derived from serpentinite/peridotite and gabbro parent materials. These soils tend to be both clayey and shallow, are high in magnesium relative to calcium, and often are high in heavy metals such as nickel and chromium. Productivity is generally low, and reforestation though artificial means may be difficult. Sites with these soils often have greater diversity of vegetation in both species and structure. On these soils there are often more species of conifers growing in mixed stands, and there is often a diversity of sizes and ages. They tend to have some natural conifer regeneration following disturbance and are less dominated by sprouting shrubs and hardwoods than other soils. Because of the lower productivity, the fuel loadings tend to be lower, and fires are seldom intense enough to eliminate the younger age classes of conifers

The management problems and opportunities are substantially different on ultrabasic soils than on other soils with even-aged stands and where sites are likely to be dominated by shrubs and hardwoods following disturbance The potential to meet short and long-term management objectives with uneven-aged systems is greater for many of these areas with ultrabasic soils. Regeneration is often present or predictable, and competing vegetation is less.

SUMMARY OF PLANT SERIES AND SOIL GROUPS

The important considerations from the plant series and soil types relating to this analysis are the level of vegetative competition expected, and the tendency toward natural conifer regeneration. Many of the plant series or associations have similar characteristics in terms of the general factors considered. To facilitate the analysis and avoid redundancy, the plant series and soils are grouped into the following three categories

Plant Series and Soil Group 1: High Competition. This group includes those sites where vegetative competition with young conifers is expected to be high The tendency is to produce hardwood trees, particularly tanoak, stump sprouts following logging and slashing for site preparation commonly outgrow conifer seedlings. Plant series in this group are·

LIDE3
TSHE
PSME-LIDE3
CHLA except CHLA/QUVA and CHLA/GABU associations
ABCO/LIDE3 and ABCO/CHLA associations

Plant Series and Soil Group 2: Moderate Competition. Sites in this group are expected to have less vegetative competition than Group 1, although it will still be significant. The competition is more likely to be from shrubs or forbs than faster growing hardwood sprouts. This group includes:

ABMAS
PSME-ABCO
ABCO except ABCO/LIDE3 and ABCO/CHLA associations

Plant Series and Soil Group 3: Low Competition - Ultrabasic Soils. This group includes sites where the vegetation is sparse, and there is less competition for sunlight (plant growth is more limited by the availability of moisture and nutrients). Stands tend to be fairly open and competition is more from low growing shrubs, forbs and grasses. Sites with ultrabasic soil generally have a variety of conifer species Although growth may be slow, these sites tend to produce natural conifer regeneration. This group includes·

PIJE
CHLA/QUVA and CHLA/GABU associations
PSME - all associations not in groups 1 and 2

EXISTING STAND CONDITIONS

The nature and condition of the existing vegetation are important to predict response to silvicultural treatments, and to evaluate the potential of the current stand to meet objectives under the various options for silvicultural systems. Forest-wide inventories currently available do not include the resolution in stratification needed to adequately assess the opportunities and effects associated with the different silvicultural systems Site specific stand conditions will be assessed intensively in the preparation of the silvicultural prescriptions for field implementation. The discussion here is somewhat general and is intended to provide a framework to aid in that site specific analysis. The existing conditions will be

discussed in the framework of a stratification into a few categories that have implications for the broad treatment of silvicultural systems presented here.

MATURE AND OVER-MATURE CONIFER STANDS

Many stands on the Forest initiated following natural disturbances, primarily wildfires, which destroyed the previous stand and opened the growing space for new seedings. These stands are essentially even-aged and often composed of trees of advanced age and declining vigor. Use of selection systems in such stands have consistently resulted in high mortality among the residual trees and are better suited to stands with more variation in age, size, and vigor (Burns, 1983). Some stands have had minor disturbances, such as low intensity fire or scattered windthrow, which did not completely destroy previous age classes, but opened growing space and created more than one age class. These stands contain more than one age class, but younger age trees are usually suppressed with low vigor. There are not enough vigorous seedlings with the growth potential to meet management goals and objectives.

IMMATURE STANDS

There are some pole and small timber size stands on the Forest, regenerated after fires or early logging, currently less than rotation age. These stands may or may not have excess stocking that would provide an opportunity for commercial thinning. Many of them are even-aged 60 to 90 years old, approaching rotation age.

The Forest now has approximately 135,000 acres of seedling and sapling stands, most of which are plantations created following timber harvests. These are predominately less than 30 years old The condition of these stands varies somewhat, but Forest-wide most are well stocked and many are growing rapidly following precommercial thinning treatments accomplished in the last two decades.

UNEVEN-AGED OR MULTI-AGED STANDS

There are stands occurring on sites with ultrabasic soils that have naturally developed uneven-aged structures. These stands have developed over a period of time as individual trees have slowly seeded in, often following low intensity fires or other minor disturbances. They tend to be quite slow growing and have not formed closed canopies that would suppress the further development of the younger age classes. These stands often have healthy stocking in a variety of age classes presenting a range of silvicultural options.

There are also a few stands occurring on more normal soils that have several age classes resulting from repeated low intensity disturbances, or from shade tolerant species seeding in under an established conifer overstory. In these cases it may not be feasible to perpetuate and reproduce multi-aged stand conditions under management. Short term silvicultural options for these stands may be different than the long term strategy suggested by the potential vegetation for the site.

MANAGEMENT GOALS AND OBJECTIVES

FOREST-WIDE

The goals and objectives most affecting the choice of silvicultural systems are those that relate to producing timber, and those that in some way conflict with or modify the way timber is produced. Most of the alternatives specify a fairly intensive level of management for those areas allocated to management emphasis that include programmed timber harvests. There are also goals for providing habitats to support all native wildlife species, protecting soil and water, and providing recreation opportunities. Resource values are to be protected or enhanced through fire and fuels management programs. Throughout all of the management programs and activities, implementation should be accomplished in an efficient and cost effective way

MANAGEMENT AREAS

Some of the management objectives relating to selection of silvicultural systems vary by the Management Areas defined for alternative land allocations Many of the 14 Management Areas do not have objectives for timber management and any incidental harvest done would be prescribed to achieve specific objectives for another resource. Management Areas with programmed timber harvest are 10, 11, 12, 13 and 14, Scenic/Recreation River, Riparian, Retention Visual, Partial Retention Visual, and General Forest, respectively. Although all of these areas are managed for multiple-use, the emphasis or priority changes by Management Area Management Area 10, Scenic/Recreation River, may have timber harvest, but any harvest must be designed to meet the Retention Visual Quality Objective (VQO) For purposes of selecting a silvicultural system, Management Area 10 can be considered the same as Retention.

MANAGEMENT AREA 11 - RIPARIAN

This is the area of riparian ecosystem along all perennial streams within areas selected for timber production. The width of this area will vary according to site specific conditions, although the minimum area of consideration is 100 feet measured horizontally from each side of the stream The primary goal for management is to maintain the integrity of the riparian ecosystem which includes streambank stability, vegetation, and terrestrial and aquatic habitats.

To accomplish the objectives of maintaining water temperatures through stream shade and providing large conifers for wildlife habitat, the proportion of conifers that can be removed through timber harvest is constrained Although hardwoods provide significant amounts of shade on many streams, conifers will also be left to meet multiple resource objectives The level of the constraint varies by stream class, and also by the Riparian Management Prescription option selected Riparian Management Prescriptions B and C provide for different levels of protection Different Planning Basins on the Forest may be allocated to one prescription or the other depending on the theme of the alternative. (Prescription A was also developed, but determined to not provide the minimum legal requirements for stream protection due to a projected increase in summer stream temperatures)

Prescription C allows minimal timber removal, primarily to facilitate harvest of adjacent stands. Harvest operations may not reduce the basal area of conifers below 80 percent of natural levels along Class I and II streams; or below 60 percent of natural levels along Class III streams

Prescription B provides a higher level of timber production while still emphasizing the protection and enhancement of riparian ecosystem values. The basal area of conifers should be maintained at or about 70 percent of natural conditions along Class I and II streams; and 30 percent along Class III streams.

MANAGEMENT AREA 12 - RETENTION VISUAL

Areas considered for allocation to the Retention VQO are generally immediately adjacent to and visible from major travel routes, rivers, and other high use recreation areas. The objective is to provide attractive scenery by maintaining the area in a natural or near natural condition. Multiple-use goals for these areas also include the production of wood products, maintenance of wildlife habitat diversity, and protection of watershed resources. Management activities will be conducted so they are completely subordinate to the character of the landscape and are not evident to the casual forest visitor (USDA-FS, 1962).

Implications for timber management include limits on the size and shape of openings, limits on the amount of area that can be in openings at one time, and the desire to retain and reproduce large trees in foreground areas It is expected that created openings will be less than five acres in size and that they will appear natural in the view area Not more than eight percent of seen areas are expected to be in visually perceived openings at one time. Harvest units are considered to be openings until the vegetation has reached a height of 20 feet, or for about two decades. This may result in rotations of up to 250 years. Some foreground

areas also have the objective of maintaining large trees for their aesthetic quality Producing large trees (36 inches Diameter Breast Height (DBH)) should not be of much concern with these long rotations, but practices such as precommercial and commercial thinning could result in meeting this goal over a greater portion of the rotation.

Important considerations for timber management involve the timing of the volume harvested from these areas Not only is the harvest of the existing volume contributing to current outputs, but the opportunities for commercial thinnings during the first rotation could contribute to timber production during a critical time in the Forest's schedule

MANAGEMENT AREA 13 - PARTIAL RETENTION VISUAL

Areas considered for allocation to the Partial Retention VQO are generally visible from major and secondary travel routes, rivers, and other high use recreation areas (often in the middle to background) The objective is to provide attractive scenery by maintaining the area in a near natural condition. Multiple-use goals for these areas also include production of wood products, maintenance of wildlife habitat diversity, and protection of watershed resources. Management activities will be conducted so they are subordinate to the character of the landscape (USDA-FS, 1962)

Implications for timber management are similar to those of Management Area 12, though less constraining. They include limits on the size and shape of openings, limits on the amount of area that can be in openings at one time, and the desire to retain and reproduce large trees in foreground areas. It is expected that created openings will be less than eight acres in size Not more than 16 percent of seen areas are expected to be in visually perceived openings at one time. Harvest units are perceived as openings until the vegetation has reached a height of 20 feet, or for about two decades. This may result in rotations of up to 130 years. Producing large trees (30 inches DBH) may require practices such as precommercial and commercial thinning in at least some of the stands.

Again, important considerations for timber management involve the timing of the volume harvested from these areas. The harvest of existing volume can contribute to current outputs, and the opportunities for commercial thinnings during the first rotation could contribute volume during a critical time in the Forest's schedule.

MANAGEMENT AREA 14 - GENERAL FOREST

This is the major timber producing area of the Forest. The primary goal is to obtain a full yield of timber within the capability of the land and the management requirements of other resources. Timber harvest is programmed on suitable lands throughout the area In addition, this area provides many recreation opportunities. It also provides habitat for many species of wildlife and is particularly important for those using openings and early seral stages.

To meet short and long term timber production goals, the majority of the existing available volume will be harvested in the next seven to nine decades. Young stands will be managed to capture the growth potential of the sites in usable wood volume. Managed stands should be relatively free of significant vegetative competition, and should contain stocking in sufficient number and quality to near fully utilize the site's tree producing capacity Losses to destructive agents such as wind-throw, animal damage, and disease should also be minimized

COMPARISON OF SYSTEMS

This comparison is provided to facilitate the understanding of the thought processes and considerations behind the selection of a silvicultural system. Where definitive results from research or experience are not available, the discussion relies on knowledge of silvicultural characteristics and experience in forest

management to extrapolate the expected results of the different systems. The comparison is organized by resource or program, and consists of those elements most important to, or most affected by, the choice of systems. The comparative evaluation focuses on factors specific to the Siskiyou National Forest Differences between even-aged and uneven-aged management are emphasized more than the intricacies of variations within them The discussion is general in nature, many exceptions would be expected in specific situations

VEGETATIVE DIVERSITY

Vegetative diversity can be broken into three parts for discussion species diversity, genetic diversity, and structural diversity over time and space

SPECIES DIVERSITY

Species diversity will depend on the specific environment and how the stands are managed On the moderate to highly productive lands, uneven-aged management would tend to result in a shift toward more shade-tolerant species (Gordon, 1978, Franklin, 1978) This would be more true for single-tree selection as group selection would create some holes in the canopy which could provide sun light for shade-intolerant species. Stands previously dominated by pines and Douglas-fir would shift toward hemlock, white fir, incense-cedar, and tanoak. The grasses, forbs and shrubs that normally flourish in openings following fires or harvests would be less prevalent in deference to shade-tolerant forbs and hardwoods. On many sites with ultrabasic soils, uneven-aged management would not greatly alter the species composition These sites are relatively open and slow growing, regeneration would not be under the influence of a closed canopy.

Even-aged systems have the potential to increase or decrease the species composition on a specific site, depending on the selection of species for planting, the success of the plantings, and the success and variety of natural regeneration Often when one or two major species are selected for planting, minor species can be regenerated from natural seeding. Management can influence this by leaving seed trees of selected species, designing for seeding from adjacent stands, or by prescribing for species consideration during precommercial thinning treatments. If regeneration fails, diversity may be reduced and species that were minor components of previous stands may predominate on some sites.

GENETIC DIVERSITY

Genetic diversity could be adversely influenced by any of the silvicultural systems if improperly applied When regeneration is successful, either natural or artificial, from a local seed source with a large number of parents, the diversity of the gene pool is not significantly changed There are a number of ways in which the genetic diversity or quality may be reduced. Regeneration failures with any of the systems could result in a loss of diversity for those species that fail Harvest methods that remove the largest and highest quality trees (i.e highgrading) could result in the regeneration being produced by the remaining lower quality, and possibly slower growing trees If regeneration is produced from a small number of parents or isolated trees, there is increased risk of reducing genetic quality or increasing inbreeding Natural or artificial regeneration from a large number of parents exhibiting desirable characteristics of growth and form can maintain a broad genetic base, and move the genetic composition toward a higher frequency of desirable traits Regardless of the system, management will strive to maintain genetic diversity

STRUCTURAL DIVERSITY

Structural diversity will be strongly influenced by the selection of silvicultural systems and management practices. Diversity varies both horizontally (spatially) and vertically Even-aged systems have little vertical diversity. They tend to have a single dominate layer of seedlings, saplings, or larger trees Older stands may or may not develop understories of shrubs or young trees Managed stands will tend to have less understory as stocking is kept at or near closed canopy levels, permitting insufficient sunlight to reach the

ground to promote shrub and tree growth Spatial diversity would be great as stands of all ages and stages of development would be interspersed across the Management Areas where timber management is practiced

Uneven-aged systems would create the reverse situation, there would be great vertical diversity within each stand, but there would be less spatial diversity between stands. Within each stand there would be an array of sizes and ages from seedlings or young saplings to trees near rotation age. If large areas were managed with uneven-aged systems, all the stands would have similar structure and differences between stands would be minor. Group selection could have somewhat greater spatial diversity as group removals would create some small even-aged clumps

VISUAL RESOURCE

Any of the systems may be appropriate to achieve the desired character depending on the circumstances Uneven-aged systems may be better for creating or maintaining naturally appearing landscapes, particularly when the viewer is close to the area Although the activities may be widespread, the change in character is more subtle and not as obtrusive to the casual forest visitor as even-aged openings might appear.

On the other hand, vast areas in uneven-aged stands would have little diversity Even-aged systems may facilitate the creation of designed openings or the reshaping and enhancement of existing ones The differences between clearcut and shelterwood are short term. Initially they may appear quite different, but the shelterwood trees left at the first entry will need to be removed when the regeneration is quite small to minimize damage to the seedings. Following removal of the shelter trees, there will be little difference in the visual character from that of a recently harvested clearcut Shelterwood units should be designed to meet VQO's when the shelter trees are removed.

WILDLIFE HABITAT

All forest conditions provide habitat for some type of wildlife. Management that favors one species group will be unfavorable for some other group. Most wildlife species are adapted to thrive under conditions of specific structure and species composition For example, a mosaic of openings and cover, such as that created by even-aged systems, is optimum for species such as deer and elk that forage on herbaceous and shrubby vegetation produced in openings (Witmer and others, 1985). Uneven-aged or multi-layered stands with substantial vertical diversity would favor species such as tree squirrels and spotted owls Yet others, such as soaring hawks, require large openings and would do poorly without this habitat.

The selection of silvicultural systems will influence the proportions of species and when and how they could use the stands as habitat Even-aged systems with a mosaic of diverse stands would provide habitat for a large number of species as stands progress through various seral stages (Logan and others, 1985, Thomas and others, 1975). If large contiguous areas are managed with uneven-aged systems, habitat diversity could be significantly diminished (Hall, McComb, and Ruediger, 1985) A mix of silvicultural systems, with the vertical diversity of uneven-aged stands and the spatial diversity created by even-aged blocks, might well produce the balance of habitat that would best achieve wildlife management objectives.

FISHERIES

The Riparian Management Area Prescription is designed to protect and enhance the fisheries and watershed values. To accomplish the objectives for these areas, continuous vegetative cover is needed along perennial streams for shade and streambank stability Even-aged systems would not provide this continuous cover. The single-tree selection or group selection methods are more appropriate for managing these areas while maintaining protective cover. Entries in these riparian "strips" will generally need to be coordinated with entries on adjacent areas Uneven-aged prescriptions with regular cutting cycles and intensive

cultural treatments would not be feasible The only feasible timber management may be modifications of systems; designing prescriptions to take advantage of opportunities as they occur over the long term

SOIL AND WATER

The risks of soil and water impacts are often more a function of the watershed characteristics and the logging and roading methods used, than the silvicultural system Possible adverse effects are erosion, sedimentation, landslides, soil compaction, and loss of productivity through soil or nutrient loss

The risk of erosion and landslides increases with the amount of protective vegetation and surface litter removed This risk is generally greatest with the clearcutting method because more cover is removed at one time Other even-aged methods may be as high depending on the amount of clearing done to prepare the sites for seedling establishment The risk would be lower for the selection systems for any one treatment entry; however, the loss of soil by erosion may be offset by the increased frequency of entries. Repeated logging at ten to twenty year intervals could keep soils of landings and skid roads exposed a high percentage of the time and result in more erosion over the long term than the even-aged systems with one or two thinnings and the final harvest for each rotation

The risk of soil nutrient loss also increases with the amount of vegetation and litter removed Again, the *risk for any one entry is greater from the even-aged systems because of the greater degree of clearing* Clearcutting with yarding of cull material and burning of residue has the greatest potential for significant *nutrient reduction However, the effects on long term cycles of nutrient capital that might result from any* of the systems is not well understood.

Frequent and extensive use of heavy equipment has the potential to cause significant compaction of some soils This is predominately a function of the logging method used, timing of activity, and soil types rather than the silvicultural system. However, if large stands are managed with uneven-aged systems, there may be incentive to use more ground based logging systems to accomplish the selection harvests, and the risk of soil compaction would be increased.

Applying uneven-aged management to extensive areas on this Forest would also result in the need for higher road densities to effectively access the timber. With the greatest soil and water impacts coming from roads, any on site advantages of uneven-aged systems would be more than offset.

FIRE AND FUELS

Considerations for fire and fuel management fall in two broad categories, ability to control or manage wildfires, and ability and efficiency of treating fuels to manage risk of large wildfires A mosaic of stands *managed under the even-aged systems would contain breaks in the spatial fuel patterns that would* provide opportunities for management or control of wildfires. Uneven-aged systems would produce contiguous areas with fairly high fuel loadings and continuous vertical fuel ladders. These fuel ladders created by multiple tree layers carry ground fires into the crowns of the large trees. Under these conditions, crown fires could be expected more frequently, and fires would tend to be larger and burn at higher intensities. Control would be more difficult and costly and resource damage would likely be increased

Treatment of activity created residue fuel is easier and more cost efficient with the even-aged systems, particularly clearcutting Treatments following final harvests can be prescribed without the added complication of protecting residual crop trees. This facilitates the creation of breaks in the fuels complex as described above. Effectively treating residue fuels in areas managed with the uneven-aged systems would be more difficult and expensive. Providing the necessary protection for the younger residual crop trees would severely restrict treatment options Because of the greater difficulty and higher cost, increased accumulation of fuels should be expected if significant acreages are managed with the uneven-aged systems

TIMBER

Several important aspects of timber management are influenced by the selection of silvicultural systems The implications for forest regulation, the mode of operations, the complexity of administration, and yield that can be produced are important considerations.

REGULATION

A fully regulated forest has a balance of stands capable of supporting continuous production and harvesting at the long-term sustained capacity. Ideally, approximately the same number of acres would be harvested each period With uneven-aged systems, all acres would be harvested at ten to twenty year intervals with approximately equal yield from each harvest. With even-aged systems, stands would be harvested around the Forest to produce an equal yield in all periods. The Siskiyou National Forest currently has a substantial imbalance toward older aged stands, several decades will be needed before regulation is achieved. Production will be below the long-term sustained yield capacity for approximately the next eight decades, or until existing mature and understocked stands are regenerated and the first of the managed stands begin to reach rotation age

Regulation can be achieved most easily with even-aged systems for several reasons. Inventory information with the resolution that would be necessary to plan and schedule selection harvests is not available for much of the Forest; detailed information about the trees available for cutting would be needed on a stand by stand basis. Most of the existing mature stands do not have the crop tree stocking that would be needed to get them into a productive condition, regeneration would be needed to realize significant growth in these stands To achieve the equivalent growth of even-aged systems, several times more acres would need to be treated. Attempts to move these stands toward uneven-aged structures would result in major portions of the sites being occupied by very slow growing trees for several decades as regeneration of various ages is incrementally added through repeated treatments. The transition of essentially even-aged stands to balanced uneven-aged form might well require several rotations (Smith, 1962) Another factor that can affect regulation is the occurrence of wildfires or other natural events which result in the regeneration of even-aged stands. It would be difficult to regulate a forest under a selection system when significant acreages of unplanned even-aged stands occur

OPERATIONS

The choice among silvicultural systems strongly influences several aspects of harvesting and other treatment operations. Uneven-aged systems tend to be much less efficient with many more acres harvested to yield the same volume and a wide variation in tree size which precludes matching harvesting equipment for maximum efficiency. In contrast, whole stands of even-aged trees with a narrow range of sizes allow equipment to be utilized that provides for the efficient handling of the particular tree size.

The shelterwood method has the advantage of uniform tree size, but some efficiency is lost due to the needed second operation to remove the shelter trees left in the first entry. This splits the available volume into two operations essentially doubling many of the cost items. In addition, there is the added risk of mortality or damage to the seedlings from removing the residual shelter trees after the regeneration has become established. This is a critical step in the shelterwood method and often is the most difficult to achieve. This is particularly true on this Forest where many slopes are steep and convex; poor deflection for cable logging poses a difficult situation to protect established seedlings from moving logs and cables.

Treatments of uneven-aged stands are even more complex. Crop trees must be individually selected from a variety of sizes, ages, and species; and their care and protection integrated in all operations This applies to activities such as fuel treatment, site preparation, release, and precommercial thinning as well as timber harvests. Again, with uneven-aged systems, large acreages would need to be covered to achieve a modest gain due to the interspersing of treatment opportunities throughout larger stands In many cases the

treatments needed to achieve optimum production may not be feasible For example, treating residue fuels may subject residual crop trees to unacceptable risk if fire is part of the treatment prescription, or treating competing vegetation to release individual crop trees may be too expensive to consider.

ADMINISTRATION

There is a significant difference in the record keeping, inventory, and project administration required for uneven-aged systems versus even-aged systems The detailed information needed to plan and carry out treatments, as well as the frequency of treatments, make the uneven-aged systems more costly to manage (Alexander and Edminster, 1979). More accuracy is needed in the inventory information to prescribe harvest from several tree classes To achieve this resolution in data collection, stand stratification must be done to finer detail resulting in many more stands to inventory, keep records on, and administer Even with computers for data management, the level of complexity would quickly become unmanageable.

YIELD

Research studies to compare the long-term wood production associated with the different silvicultural systems have not been completed, although some studies are under way in other forest types Theoretically, the total production may be greater for the selection systems because continuous stocking of trees is maintained on the site; however, many operational and managerial factors influence the actual production of merchantable stand growth and timber yield (Curtis, 1978) Several factors affecting yield have been mentioned in previous sections, the feasibility of cultural treatments such as release and precommercial thinning, the shift in species composition toward more shade tolerant species, and the risk of logging damage to the crop trees planned for retention

There is also the complication of increased risk from disease as a result of logging damage and the carry over of disease from one generation to the next associated with uneven-aged systems In contrast, even-aged systems create a break in many disease cycles not unlike the natural events (fires) that created even-aged stands in the past While some diseases may carry over through inoculum in the soil, others, such as dwarf mistletoe, would be effectively eliminated or controlled by a break in the presence of conifers

Generalizations about the risks from insect or wildlife pests associated with the choice of silvicultural systems are difficult. Healthy vigorous trees are usually less susceptible to pests than those that are wounded or stressed Well managed stands under any of the systems, with a diversity of species and vigorous trees, will have less risk of significant pest damage. The risk of logging damage to residual crop trees with the uneven-aged systems is a critical factor on many sites. With steep slopes and long yarding distances, it is difficult to remove large trees without damaging leave trees Wounds become the entry points for insects and fungal diseases which cause decay and loss of wood volume. This is particularly critical with susceptible species, such as white fir and western hemlock, which may be favored during regeneration by the environment created by uneven-aged systems There is also risk of logging damage to crop trees during commercial thinnings in even-aged systems. However, the risk of damage is not as great since harvest trees would not be substantially larger than the crop trees; and the effect of damage is not as significant because crop trees need to last only the remaining part of the rotation from thinning to final harvest.

Release treatments to control competing vegetation will be needed in some cases regardless of the silvicultural system used if regeneration survival and growth is to be assured It has been suggested that the need for control of competing vegetation would be less with methods other than clearcutting There are no scientific studies to demonstrate this and the theoretical basis for the assertion does not seem to hold true on this Forest. Maintaining a continuous tree canopy would reduce the number of grasses, forbs, and shrubs, but this is because less of the sites plant producing resources (i.e , nutrients, moisture, light) are available These are the same resources needed by the young conifers Many of the most serious competitors are present in the stands and are capable of maintaining good vigor in shade or partial shade

(tanoak, madrone, canyon live oak, etc) The competition for the available site resources would be just as severe under the methods that retain part of the older stand. In addition, the operational feasibility of treatment would be diminished

The operational feasibility of other treatments designed to maintain or increase growth would also be diminished with uneven-aged systems Scattered needs for precommercial thinning or planting to achieve optimum production would likely not be treated Genetic gains through planting of genetically improved seedlings would not be realized to the same extent

The implications for the Forest's ability to provide timber outputs in the short-term are related to the current inventory structure. The Siskiyou National Forest is characterized as a "deficit inventory forest"; the current inventory must be metered out until second-growth stands become available for harvest, at which time the harvest level is projected to increase The period of time over which this existing volume must be metered out (the critical scheduling period) is approximately eight or nine decades for most alternatives. Even though the FORPLAN analysis is done with even-aged yield tables, the scheduled short-term Forest-wide outputs would not be affected by application of uneven-aged management on some stands, as long as harvest of the standing volume in these areas occurs during the critical scheduling period.

ECONOMIC IMPLICATIONS

Many of the factors affecting operational efficiency have economic implications. The size of the treatment area is a major factor in cost determination and efficiency Costs per acre for management treatments generally increase as the unit size decreases. This is true for logging costs as well as most cultural treatments Logging costs are also increased for uneven-aged systems due to the added complexity of harvesting needed to protect residual crop trees that are small and vulnerable to damage. Administration costs would also be much higher for uneven-aged systems for the reasons addressed above.

Within the even-aged systems, clearcutting is the most economically efficient in most cases The need for removal of the shelter trees in a second operation with the shelterwood method, or the potential loss of wood volume with the seed-tree method if seed trees are left on the site, make these methods more costly Exceptions would include those sites where regeneration would be difficult and more expensive to achieve with the clearcut method However, this should be evaluated carefully for each site, it may be cheaper to invest in artificial shading for seedlings than to use the shelterwood method (Tesch, 1984).

Theoretically, the cost of natural regeneration would be less than that of artificial regeneration favoring the uneven-aged systems or the shelterwood and seed-tree methods The costs of seed collection, nursery operations, seedling handling, and planting are significant However, the uncertainty of natural regeneration for much of the Forest make depending on naturals a risky proposition and brings up several complications. The sporadic seed crops and the variation of extreme weather team up with the competition of sprouting shrubs and hardwoods to delay or prevent natural regeneration. After sites are taken over by shrubs and hardwoods, it becomes much more difficult and expensive to achieve reforestation Often additional site preparation and planting are needed to accomplish the reforestation objectives. In the mean time, potential production from the site has been lost due to the period of inadequate stocking In addition, the opportunity to improve the genetic composition of future stands through the use of seedlings from selected parents is lost if natural regeneration is depended on exclusively.

In general, and without regard to special resource objectives, the cost efficiency of the methods falls into the following order from least cost to most cost· Clearcut, shelterwood, seed-tree, group selection, and single-tree selection.

SOCIAL IMPLICATIONS

Many of the concerns people express over the effects of the silvicultural systems are addressed by the discussions in the various sections above A large number of people seem to have a general dislike for clearcutting The concerns expressed include: clearcuts are visually unattractive, are difficult to reforest, adversely impact wildlife habitat, increase risks to soil and watershed values, require the high cost of artificial regeneration, cause loss of vegetative diversity, and increase vegetative competition and thus the use of herbicides. The implications of these specific concerns have both pros and cons as discussed, often satisfying one may involve intensifying another For example, reduction of even-aged openings to avoid visual impacts may reduce the forage available for big game, adversely affecting the habitat quality and recreation opportunities for some segments of the population. Also, use of less efficient systems to achieve different environmental effects may result in higher costs or lower outputs with accompanying adverse effects on local or national economies and employment.

The land allocations of the alternatives address these concerns to some degree The application of the silvicultural systems may be constrained or altered in the different Management Areas in response to these concerns and the various resource needs The social values derived from the use of the different systems remains somewhat a function of personal preferences; each of the described systems has a sound scientific basis when applied appropriately and matched to the management objectives and site specific conditions.

DIRECTION AND GUIDELINES

REGIONAL GUIDE CRITERIA

The Regional Guide for the Pacific Northwest Region, May 1984, provides selection criteria to guide the choice of silvicultural systems. These criteria will guide the selection of silvicultural systems and harvest cutting methods for site specific prescription. The final selection of harvest method for any specific site will be part of the silvicultural prescription as provided for in Management Standards and Guidelines 1-1, as provided for in selection criterion six. The selection criteria are:

1. The selected harvest cutting method must permit the production of a volume of marketable trees sufficient to utilize all trees that meet utilization standards and are designated for harvest

2 The selected harvest cutting method must permit the use of an available and acceptable logging method that can remove logs and other products without excessive damage to the identified desirable residual vegetation

3. The selected harvest cutting method must be capable of providing special conditions, such as a continuous canopy or continuous high-density live root mats, when required by critical soil conditions or as needed to achieve particular management objectives, such as streamside protection, wildlife needs, and visual enhancement

4 The selected harvest cutting method must permit control of vegetation to establish desired numbers and rates of growth of trees, as well as vegetation needed to achieve other management objectives identified in site-specific silvicultural prescriptions

5. The harvest cutting method selected will promote a stand structure and species composition that minimizes serious risk of damage caused by mammals, insects, disease, or wildfire, and it will allow treatment of existing insect, disease, or fuel conditions

6. The harvest cutting method selected must meet resource and vegetation management objectives identified in the Regional Guide and Forest Plans Harvest cutting methods to be used on specific

areas may be identified in Forest Plans, in Environmental Assessments (EA's), or in silvicultural prescriptions that are written or reviewed by a certified silviculturist

RECOMMENDED SYSTEMS

The remaining part of this section pulls together the implications from the previous sections and provides suggested applications of the various silvicultural systems. The rationale for the recommendations and guidelines to use in the site specific decision process are displayed here The intent is to consider the combinations of management objectives, site conditions, and silvicultural systems; arriving at specific recommendations based on the comparison of systems in the previous section and the selection criteria above The harvest cutting methods identified for the combinations are generally the most appropriate, however, there is no intent that other methods should not be used when site specific conditions warrant (e g., considerations for slope stability may modify prescriptions) Combinations of site and stand characteristics that have similar recommendations are grouped in this section The results are summarized in Figure G-1.

The determination of where clearcutting is the optimum method will also be based on site specific factors (environmental, biological, esthetic, engineering, and economic) related to the selection criteria above and the objectives and requirements of the Forest Plan The comparison of systems from the previous section provides rationale relevant to the selection of clearcutting. Where clearcutting is among the appropriate methods identified, it will typically be advantageous in terms of engineering and economics Other systems may have advantages in terms of biologic or esthetic factors for some sites Shelterwood should generally only be used where regeneration goals could better be met with this method, although it may be used to accomplish short term mitigation of visual impacts in specific cases. The identification of clearcutting as the optimum method for sites on the Siskiyou will often be influenced by the key factors mentioned earlier in this appendix: the intensity of vegetative competition, the difficulty of protecting residual trees through harvest operations on steep slopes, and the desirability of perpetuating high proportions of shade intolerant species.

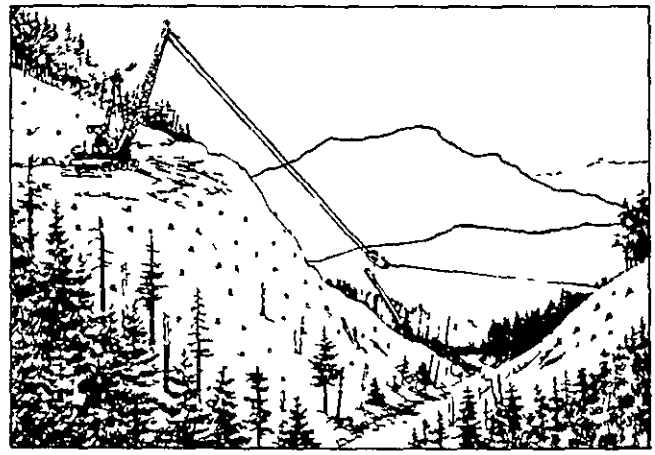
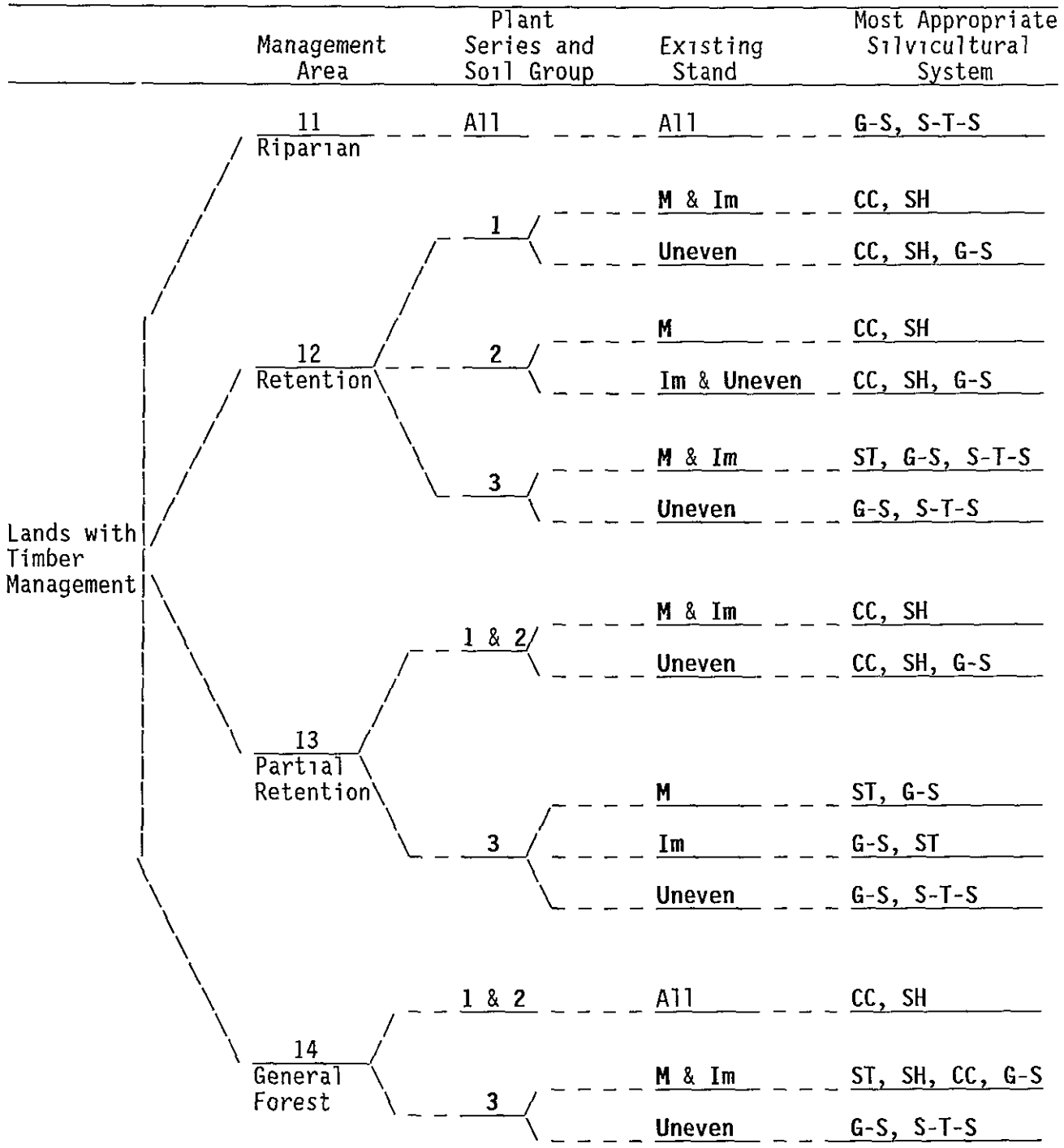


Figure G-1. Silvicultural Systems Analysis



Symbols Used: SH = Shelterwood, CC = Clearcut, ST = Seed-tree, G-S = Group Selection, Uneven = Uneven-aged, S-T-S = Single-tree Selection, M = Mature Stand, Im = Immature Stand

Plant Series and Soil Groups: 1 = High Vegetative Competition - Balanced Soils
2 = Moderate Competition - Balanced Soils
3 = Lower Competition - Ultrabasic Soils

MANAGEMENT AREA 11 - RIPARIAN

All Plant and Soil Groups
All Existing Stand Conditions
Most Appropriate Methods group selection, single-tree selection

The objectives for this management area generally can not be met with even-aged systems. Maintaining the continuous canopy cover can be accomplished with the single-tree selection method, or in some cases, the group selection method Along smaller streams (Class III), group selection may be most appropriate when regeneration of small clumps is desirable. Stands in the riparian areas are not likely to follow the classical uneven-aged distribution These narrow strips of land along the streams are generally some distance down a steep slope from the closest road. Management of these areas will be constrained by the need to coordinate timing of activities with entries in adjacent stands. In many cases it may only be feasible to do occasional salvage or overstory removal Stands will generally have a few widely spread age classes as harvest entries are made infrequently as opportunities occur. Initially many stands may have only two age classes and significant amounts of hardwoods and noncommercial species may occupy part of the growing space; yield projections are substantially reduced for this Management Area.

MANAGEMENT AREA 12 - RETENTION VISUAL *

Plant Series and Soil Group 1
Mature and Immature Stands (even-aged)
Most Appropriate Methods: clearcut, shelterwood

* (also Management Area 10, Scenic/Recreation River)

With intense vegetative competition expected, it is unlikely that the the combined objectives for this Management Area would be met with the uneven-aged systems. If uneven-aged management were applied to this area, the results would probably be a shift in stand composition toward a higher proportion of shrubs and hardwoods and neither visual or timber objectives would be met. The seed-tree method could be used, but with the expected competition and the uncertainty of rapid natural regeneration, it would involve considerable risk and would probably need to be augmented with planted seedlings. Shelterwood should be prescribed when it optimizes the regeneration goals for the site In some cases where it may provide some mitigation of short term visual impacts, a modification of the shelterwood method could be used, leaving trees for esthetic value rather than shelter for seedlings.

The implications for the immature stands in this group are similar to those for the the mature stands It is unlikely that immature stands in this group could be reasonably moved toward uneven-aged structures. Areas could be commercially thinned if excess stocking is available. Treatments should be designed to maintain the stands in healthy condition until they would be scheduled for regeneration harvest.

Plant Series and Soil Group 1
Uneven-aged Stands
Most Appropriate Methods· clearcut, shelterwood, group selection

Occasionally, stands may be found on this site group that have several age classes present. They generally also have large numbers of shrubs and hardwoods. It is unlikely that uneven-aged structures could be perpetuated with a reasonable level of management activity due to the propensity toward intense vegetative competition, even though natural events have resulted in sporadic replacement in the past. It may be possible to manage some of these stands to produce the desired benefits utilizing the potential crop trees already on the site; removing existing overstories and excess stocking to provide space for the crop trees In many cases it be may more efficient and as productive to regenerate with even-aged seedlings. In any event, the general trend for stands on these sites would be to move toward even-aged stands or groups

Plant Series and Soil Group 2
Mature Stands
Most Appropriate Methods: clearcut, shelterwood

Vegetative competition is expected to be a significant factor in this group, although not as severe as in Group 1. It is unlikely that mature stands could reasonable be moved toward uneven-aged structures in a acceptable period of time, consistent with meeting the goals of this Management Area Again, shelterwood could be prescribed when it optimizes the regeneration goals for the site In some cases where it may provide some mitigation of short term visual impacts, a modification of the shelterwood method could be used

Plant Series and Soil Group 2
Immature and Uneven-aged Stands
Most Appropriate Methods: clearcut, shelterwood, group selection

Considerations here would be similar to the mature stands, however immature and uneven-aged stands provide some opportunities to manage the existing crop trees and move into uneven-aged management. Group selection may be appropriate for some stands.

Plant Series and Soil Group 3
Mature and Immature Stands
Most Appropriate Methods: seed-tree, group selection, single-tree selection

With this plant and soil group's propensity to produce natural conifer regeneration, the seed-tree method or uneven-aged systems would be most appropriate for meeting the Management Area objectives Mature stands could be regenerated through the seed-tree method to produce another even-aged stand, or the future stand could be moved toward uneven-aged management

Plant Series and Soil Group 3
Uneven-aged
Most Appropriate Methods: group selection, single-tree selection

With an existing uneven-aged structure and the tendency to produce natural conifer regeneration, this combination would lend itself to uneven-aged management

MANAGEMENT AREA 13 - PARTIAL RETENTION VISUAL

Plant Series and Soil Group 1 and 2
Mature and Immature Stands
Most Appropriate Methods· clearcut, shelterwood

The rationale is similar to that presented under Management Area 12 With moderate to high levels of vegetative competition expected and the need to efficiently treat fuels and achieve regeneration, it would be difficult to meet the objectives for this area with uneven-aged systems In this Management Area where visual objectives are reduced below Management Area 12 and timber objectives are increased, adaptations of the shelterwood or selection methods to meet visual objectives would be less appropriate

Plant Series and Soil Group 1 and 2
Uneven-aged Stands
Most Appropriate Methods: clearcut, shelterwood, group selection

Occasional stands with several age classes may present opportunities to manage the existing crop trees through application of the group selection method. The difficulty and inefficiency associated with uneven-aged management of these sites will make clearcut or shelterwood more favorable in most cases.

Plant Series and Soil Group 3
Mature Stands
Most Appropriate Methods. seed-tree, group selection

Mature stands could be regenerated with the seed-tree method in this group where natural conifer regeneration is common. Future stands could be managed as even-aged or moved toward uneven-aged structures with future entries.

Plant Series and Soil Group 3
Immature Stands
Most Appropriate Methods group selection, seed-tree

Groups of existing immature trees capable of acceptable growth could be managed to produce future uneven-aged stands. Where objectives can be better met with even-aged stands, the seed-tree method would be appropriate to regenerate stands in this category.

Plant Series and Soil Group 3
Uneven-aged Stands
Most Appropriate Methods: group selection, single-tree selection

On these sites that lend themselves to uneven-aged systems, and which currently support uneven-aged stands, the most appropriate methods are the uneven-aged selection methods

MANAGEMENT AREA 14 - GENERAL FOREST

Plant Series and Soil Group 1 and 2
All Stand Types
Most Appropriate Methods: clearcut, shelterwood

In this Management Area with emphasis on timber production and in the plant series and soil groups that are not particularly conducive to the uneven-aged systems, the most appropriate prescriptions will be clearcut or shelterwood. Many of the reasons for this conclusion have been stated in the comparisons of the systems and in the discussions under Management Areas 12 and 13 above. In general, the even-aged systems offer the greatest combination of benefits at the least cost. The shelterwood method should be used where it optimizes the regeneration goals for the site Where regeneration can be achieved without shelter, clearcutting will most often be the optimum method.

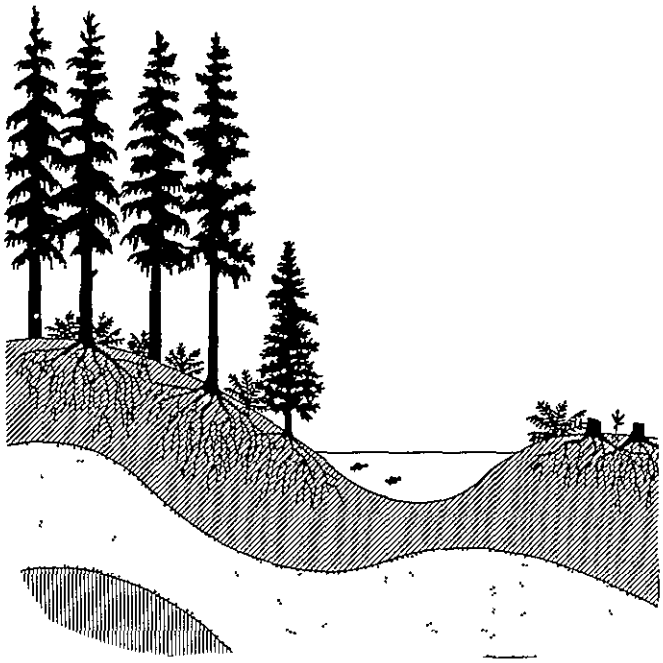
Plant Series and Soil Group 3
Mature and Immature Stands
Most Appropriate Methods. seed-tree, shelterwood, clearcut, group selection

This category may appropriately be managed with a number of methods depending on site specific conditions. Regeneration of even-aged stands may be accomplished by seed-tree, shelterwood, or clearcut methods as needed to assure adequate restocking and efficiently accomplish management

objectives. Immature stands (existing or future) may present opportunities to move toward uneven-aged management on sites that are specifically suited to it.

Plant Series and Soil Group 3
Uneven-aged Stands
Most Appropriate Methods. group selection, single-tree selection

On these sites that lend themselves to uneven-aged systems, and which currently support uneven-aged stands, the most appropriate methods are the uneven-aged selection methods



LITERATURE CITED

Alexander, Robert R and Carleton B Edminster.
1977 Regulation and control of cut under uneven-aged management. USDA-FS , Research Paper, RM-182, Rocky Mountain Forest and Range Experiment Station, Fort Collins, Colorado. 7 p.

Atzet, Thomas and David L. Wheeler
1984. Preliminary plant associations of the Siskiyou Mountain Province. USDA-FS, Pacific Northwest Region, Siskiyou National Forest, Grants Pass, Oregon 314 p

Brodie, Douglas J
1981. General economic considerations in selecting regeneration systems for the multi-site multi-species conditions of southwestern Oregon Paper presented at FIR regeneration conference, June 8, 1986, Roseburg, Oregon. 5 p.

Burns, Russell M., Technical Compiler
1983 Silvicultural systems for the major forest types of the United States USDA-FS, Agriculture Handbook, 445 Revision. 191 p

Curtis, Robert O.
1978 Growth and yield in uneven-aged stands In Uneven-aged silviculture and management in the United States Combined proceedings of two in-service workshops. Morgantown, West Virginia, July 15-17, 1975, and Redding, California, October 19-21, 1976, USDA-FS, General Technical Report, WO-24. 234 p

Franklin, Jerry F.
1978 Effects of uneven-aged management on species composition. In Uneven-aged silviculture and management in the United States Combined proceedings of two in-service workshops. Morgantown, West Virginia, July 15-17, 1975, and Redding, California, October 19-21, 1976. USDA-FS, General Technical Report, WO-24 234 p

Gordon, Donald T.
1978 Regeneration In Uneven-aged silviculture and management in the United States. Combined proceedings of two in-service workshops Morgantown, West Virginia, July 15-17, 1975, and Redding, California, October 19-21, 1976 USDA-FS, General Technical Report, WO-24 234 p.

Hall, Fredrick C , Charles McComb, and William Ruediger
1985. Silvicultural options. In Management of wildlife and fish habitats in forests of western Oregon and Washington. E. Reade Brown., Technical Editor, USDA-FS, Pacific Northwest Region, Portland, Oregon. 332 p.

Logan, Wayne, E Reade Brown, Dean Longrie, Gene Herb, and Robert A Corthell
1985 Edges In Management of wildlife and fish habitats in forests of western Oregon and Washington E. Reade Brown, Technical Editor, USDA-FS, Pacific Northwest Region, Portland, Oregon 332 p.

Minore, Don and Duane Kingsley
1983. Mixed conifers of southwestern Oregon In Silvicultural systems for the major forest types of the United States. Russell M. Burns, Technical Compiler USDA-FS, Agriculture Handbook, 445 Revision. 191 p.

Smith, David Martyn
1962 The practice of silviculture 7th edition. John Wiley and Sons. 578 p

Tesch, Steven D.
1984. Are shelterwoods overprescribed? Paper presented at FIR conference, Reforestation research advances in southwestern Oregon April 16-17, Grants Pass, Oregon. 11 p

Thomas, Jack Ward, Glenn L. Crouch, Roger S. Bumstead, and Larry D Bryant
1975 Silvicultural options and habitat values in coniferous forests In Proceeding symposium on management of forest and range habitats for nongame birds. USDA-FS, General Technical Report, WO-1 272-287 p.

USDA-FS.
1962. National forest landscape management volume 2. USDA-FS, Agriculture Handbook 462 47 p.

USDA-FS
1984 Regional Guide for the Pacific Northwest Region. USDA-FS, Pacific Northwest Region, Portland, Oregon.

Witmer, Gary W., and others
1985. Deer and elk. In Management of wildlife and fish habitats in forests of western Oregon and Washington E Reade Brown , Technical Editor USDA-FS, Pacific Northwest Region, Portland, Oregon 332 p.

APPENDIX I

MANAGEMENT AREA CONTRIBUTIONS TO THE RESOLUTION OF PLANNING PROBLEMS



APPENDIX I

MANAGEMENT AREA CONTRIBUTIONS TO THE RESOLUTION OF PLANNING PROBLEMS

APPENDIX I

MANAGEMENT AREA CONTRIBUTIONS TO THE RESOLUTION OF PLANNING PROBLEMS

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Note: Just before printing this FEIS, the Chetco, Elk and North Fork Smith were designated Wild and Scenic Rivers. Under the Omnibus Oregon Wild and Scenic Rivers Act, Alternative S fully represents the newly designated Wild and Scenic Rivers. Other alternatives presented different management options to assess Wild River and Scenic/Recreation River allocations. If another alternative is selected, it would have to be brought into conformance with the new Act.

INTRODUCTION

This appendix contains the tables referenced in Chapter II of the FEIS Organized by Alternative, each table demonstrates how Management Areas contribute to the resolution of Planning Problems

PLANNING PROBLEM 1

Table I-1. Acreage Selected as Suitable for Timber Production by Management Area

Alternative NC

Management Area Name	Acres Management Area	Acres Selected Suitable
Wilderness	232,495	0
Wild River	3,120	0
Research Natural Area	3,249	0
Botanical	1,067	0
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	0
Designated Wildlife Habitat	5,082	0
Special Wildlife Site	6,261	0
Scenic/Recreation River	15,248	7,000
Riparian	122,279	85,000
Prescription B - 18 Basins	(84,517)	
Prescription C - 0 Basins	(0)	
Minimum Level	(37,762)	
Retention Visual	50,715	29,000
Partial Retention Visual	229,802	148,000
General Forest	393,395	307,000
TOTAL	1,092,302	576,000

PLANNING PROBLEM 2

Table I-2. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative NC

Management Area Name	Acres Management Area	Acres Protected Old Growth
Wilderness	232,495	95,167
Wild River	3,120	1,099
Research Natural Area	3,249	2,731
Botanical	1,067	245
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	13,541
Designated Wildlife Habitat	5,082	3,989
Special Wildlife Site	6,261	1,051
Scenic/Recreation River	15,248	1,173 1/
Riparian	122,279	240 1/
Retention Visual	50,715	3,687 1/
Partial Retention Visual	229,802	11,287 1/
General Forest	393,395	18,780 1/
TOTAL	1,092,302	152,990

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-3. Protected and Managed Riparian Vegetation by Management Area

Alternative NC

Management Area Name	Acres		
	Management Area	Riparian Vegetation Protected	Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	3,120	891	0
Research Natural Area	3,249	559	0
Botanical	1,067	42	0
Unique Interest	0	0	0
Backcountry Recreation	0	0	0
Supplemental Resource	29,589	6,931	0
Designated Wildlife Habitat	5,082	1,161	0
Special Wildlife Site	6,261	637	0
Scenic/Recreation River	15,248	0	3,722
Riparian	122,279	37,762	84,517
Prescription B - 18 Basins	(84,517)		
Prescription C - 0 Basins	(0)		
Minimum Level	(37,762)		
Retention Visual	50,715	0	0
Partial Retention Visual	229,802	0	0
General Forest	393,395	0	0
TOTAL	1,092,302	87,254	88,239

PLANNING PROBLEM 4

Table I-4. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Alternative NC

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values Rogue/ Illinois	Contributing to Wild & Scenic River Values Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	3,120	1,894	1,076
Research Natural Area	3,249	1,291	335
Botanical	1,067	0	859
Unique Interest	0	0	0
Backcountry Recreation	0	0	0
Supplemental Resource	29,589	5,291	4,672
Designated Wildlife Habitat	5,082	1,302	684
Special Wildlife Site	6,261	2,401	655
Scenic/Recreation River	15,248	10,983	4,266
Riparian	122,279	10,606	16,498
Retention Visual	50,715	13,373	5,993
Partial Retention Visual	229,802	49,603	33,836
General Forest	393,395	8,538	40,569
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative NC

Table I-5. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	3,120	75
Research Natural Area	3,249	25
Botanical	1,067	100
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	20
Designated Wildlife Habitat	5,082	5
Special Wildlife Site	6,261	35
Scenic/Recreation River	15,248	75
Riparian	122,279	35
Retention Visual	50,715	35
Partial Retention Visual	229,802	35
General Forest	393,395	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Alternative NC

Table I-6. Allocated Visual Management Objectives by Management Area

Management Area Name	Acres Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	3,249	3,249	0	0	0
Botanical	1,067	1,067	0	0	0
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	29,589 1/	0	0	0
Desig. Wildlife Hab.	5,082	5,082 1/	0	0	0
Special Wildlife Site	6,261	6,261 1/	0	0	0
Scenic/Rec. River	15,248	0	15,248	0	0
Riparian	122,279	37,762 1/	6,360	28,820	49,337
Prescription B - 18	(84,517)				
Prescription C - 0	(0)				
Minimum Level -	(37,762)				
Retention Visual	50,715	0	50,715	0	0
Partial Reten. Visual	229,802	0	0	229,802	0
General Forest	393,395	0	0	0	393,395
TOTAL	1,092,302	318,625	72,323	258,622	442,732

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-7. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative NC

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec
Wilderness	232,495	0	95,167	34,165	100
Wild River	3,120	0	1,099	2,043	100
Research Natural Area	3,249	0	2,731	411	100
Botanical	1,067	0	245	0	100
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	0	13,541	2,597	100
Desig. Wildlife Hab.	5,082	0	3,989	502	100
Special Wildlife Site	6,261	0	1,051	570	100
Scenic/Rec. River	15,248	7,000	1,173 1/	14,527	80
Riparian	122,279	85,000	240 1/	0	70
Retention Visual	50,715	29,000	3,687 1/	0	80
Partial Reten. Visual	229,802	148,000	11,287 1/	0	70
General Forest	393,395	307,000	18,780 1/	0	60
TOTAL	1,092,302	576,000	152,990	54,815	75

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Table I-8. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Alternative NC

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	3,120	1,299
Research Natural Area	3,249	0
Botanical	1,067	0
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	0
Designated Wildlife Habitat	5,082	0
Special Wildlife Site	6,261	0
Scenic/Recreation River	15,248	0
Riparian	122,279	0
Retention Visual	50,715	0
Partial Retention Visual	229,802	0
General Forest	393,395	27,711
TOTAL	1,092,302	261,505

PLANNING PROBLEM 9

Table I-9. Level of Mineral Exploration/Development Restriction by Management Area

Alternative NC

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	3,249	1,985	1,264	0	0
Botanical	1,067	1,034	33	0	0
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	3,008	26,581	0	0
Desig. Wildlife Hab.	5,082	84	0	4,998	0
Special Wildlife Site	6,261	911	5,350	0	0
Scenic/Rec. River	15,248	8,665	6,583	0	0
Riparian	122,279	0	0	122,279	0
Retention Visual	50,715	3,955	0	46,760	0
Partial Reten. Visual	229,802	4,098	0	0	225,704
General Forest	393,395	7,095	0	0	386,300
TOTAL	1,092,302	266,450	39,811	174,037	612,004

PLANNING PROBLEM 1

Table I-10. Acreage Selected as Suitable for Timber Production by Management Area

Alternatives A and A-Departure

Management Area Name	Acres	
	Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	3,120	0
Research Natural Area	3,249	0
Botanical	1,067	0
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	0
Designated Wildlife Habitat	52,053	0
Special Wildlife Site	5,883	0
Scenic/Recreation River	13,642	6,000
Riparian	110,465	81,000
Prescription B - 18 Basins	(81,318)	
Prescription C - 0 Basins	(0)	
Minimum Level	(29,147)	
Retention Visual	46,050	27,000
Partial Retention Visual	218,545	145,000
General Forest	376,144	298,000
TOTAL	1,092,302	557,000

PLANNING PROBLEM 2

Table I-11. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternatives A and A-Departure

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	3,120	1,099
Research Natural Area	3,249	2,731
Botanical	1,067	245
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	13,541
Designated Wildlife Habitat	52,053	45,882
Special Wildlife Site	5,883	917
Scenic/Recreation River	13,642	613 1/
Riparian	110,465	226 1/
Retention Visual	46,050	1,589 1/
Partial Retention Visual	218,545	4,461 1/
General Forest	376,144	7,283 1/
TOTAL	1,092,302	173,754

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-12. Protected and Managed Riparian Vegetation by Management Area

Alternatives A and A-Departure

Management Area Name	Acres: Management Area	Acres: Riparian Vegetation Protected	Acres: Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	3,120	891	0
Research Natural Area	3,249	559	0
Botanical	1,067	42	0
Unique Interest	0	0	0
Backcountry Recreation	0	0	0
Supplemental Resource	29,589	6,931	0
Designated Wildlife Habitat	52,053	13,496	0
Special Wildlife Site	5,883	558	0
Scenic/Recreation River	13,642	0	3,280
Riparian	110,465	29,147	81,318
Prescription B - 18 Basins	(81,318)		
Prescription C - 0 Basins	(0)		
Minimum Level	(29,147)		
Retention Visual	46,050	0	0
Partial Retention Visual	218,545	0	0
General Forest	376,144	0	0
TOTAL	1,092,302	90,895	84,598

PLANNING PROBLEM 4

Alternatives A and A-Departure

Table I-13. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	3,120	1,894	1,076
Research Natural Area	3,249	1,291	335
Botanical	1,067	0	859
Unique Interest	0	0	0
Backcountry Recreation	0	0	0
Supplemental Resource	29,589	5,291	4,672
Designated Wildlife Habitat	52,053	7,003	7,846
Special Wildlife Site	5,883	2,182	644
Scenic/Recreation River	13,642	9,694	3,948
Riparian	110,465	9,762	14,004
Retention Visual	46,050	12,537	5,689
Partial Retention Visual	218,545	47,588	31,859
General Forest	376,144	8,040	38,511
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternatives A and A-Departure

Table I-14. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	3,120	75
Research Natural Area	3,249	25
Botanical	1,067	100
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	20
Designated Wildlife Habitat	52,053	10
Special Wildlife Site	5,883	35
Scenic/Recreation River	13,642	75
Riparian	110,465	35
Retention Visual	46,050	35
Partial Retention Visual	218,545	35
General Forest	376,144	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Table I-15. Allocated Visual Management Objectives by Management Area

Alternatives A and A-Departure

	Acres				
Management Area Name	Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	3,249	3,249	0	0	0
Botanical	1,067	1,067	0	0	0
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	29,589 1/	0	0	0
Desig. Wildlife Hab.	52,053	52,053 1/	0	0	0
Special Wildlife Site	5,883	5,883 1/	0	0	0
Scenic/Rec. River	13,642	0	13,642	0	0
Riparian	110,465	29,147 1/	5,844	27,736	47,738
Prescription B - 18	(81,318)				
Prescription C - 0	(0)				
Minimum Level -	(29,147)				
Retention Visual	46,050	0	46,050	0	0
Partial Reten. Visual	218,545	0	0	218,545	0
General Forest	376,144	0	0	0	376,144
TOTAL	1,092,302	356,603	65,536	246,281	423,882

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-16. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternatives A and A-Departure

	Acres				Percent
Management Area Name	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	3,120	0	1,099	2,043	100
Research Natural Area	3,249	0	2,731	411	100
Botanical	1,067	0	245	0	100
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	0	13,541	2,090	100
Desig. Wildlife Hab.	52,053	0	45,882	2,501	100
Special Wildlife Site	5,883	0	917	565	100
Scenic/Rec. River	13,642	6,000	613 1/	12,944	80
Riparian	110,465	81,000	226 1/	0	70
Retention Visual	46,050	27,000	1,589 1/	0	80
Partial Reten. Visual	218,545	145,000	4,461 1/	0	70
General Forest	376,144	298,000	7,283 1/	0	60
TOTAL	1,092,302	557,000	173,754	54,719	76

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Table I-17. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Alternatives A and A-Departure

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	3,120	1,299
Research Natural Area	3,249	0
Botanical	1,067	0
Unique Interest	0	0
Backcountry Recreation	0	0
Supplemental Resource	29,589	0
Designated Wildlife Habitat	52,053	0
Special Wildlife Site	5,883	0
Scenic/Recreation River	13,642	0
Riparian	110,465	0
Retention Visual	46,050	0
Partial Retention Visual	218,545	0
General Forest	376,144	27,711
TOTAL	1,092,302	261,505

PLANNING PROBLEM 9

Table I-18. Level of Mineral Exploration/Development Restriction by Management Area

Alternatives A and A-Departure

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	3,249	1,985	1,264	0	0
Botanical	1,067	1,034	33	0	0
Unique Interest	0	0	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	29,589	3,008	26,581	0	0
Desig. Wildlife Hab.	52,053	2,758	0	49,295	0
Special Wildlife Site	5,883	863	5,020	0	0
Scenic/Rec. River	13,642	7,842	5,800	0	0
Riparian	110,465	0	0	110,465	0
Retention Visual	46,050	3,262	0	42,788	0
Partial Reten. Visual	218,545	3,910	0	0	214,635
General Forest	376,144	6,622	0	0	369,522
TOTAL	1,092,302	266,899	38,698	202,548	584,157

PLANNING PROBLEM 1

Alternative B

Table I-19. Acreage Selected as Suitable for Timber Production by Management Area

Management Area Name	Acres: Management Area	Acres: Selected Suitable
Wilderness	232,495	0
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	13,739	0
Designated Wildlife Habitat	52,885	0
Special Wildlife Site	9,195	0
Scenic/Recreation River	9,526	3,000
Riparian	111,749	82,000
Prescription B - 12 Basins	(48,747)	
Prescription C - 6 Basins	(33,044)	
Minimum Level	(29,958)	
Retention Visual	7,678	3,000
Partial Retention Visual	94,282	78,000
General Forest	549,318	392,000
TOTAL	1,092,302	558,000

PLANNING PROBLEM 2

Alternatives B, D and D1

Table I-20. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	2,043	763
Research Natural Area	3,349	2,757
Botanical	5,648	315
Unique Interest	395	53
Backcountry Recreation	0	0
Supplemental Resource	13,739	8,400
Designated Wildlife Habitat	52,885	46,581
Special Wildlife Site	9,195	2,048
Scenic/Recreation River	9,526	533 1/
Riparian	111,749	114 1/
Retention Visual	7,678	349 1/
Partial Retention Visual	94,282	1,849 1/
General Forest	549,318	12,025 1/
TOTAL	1,092,302	170,954

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-21. Protected and Managed Riparian Vegetation by Management Area

Alternative B

Management Area Name	Acres		
	Management Area	Riparian Vegetation Protected	Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	2,043	598	0
Research Natural Area	3,349	559	0
Botanical	5,648	553	0
Unique Interest	395	30	0
Backcountry Recreation	0	0	0
Supplemental Resource	13,739	5,783	0
Designated Wildlife Habitat	52,885	13,490	0
Special Wildlife Site	9,195	960	0
Scenic/Recreation River	9,526	0	2,500
Riparian	111,749	29,958	81,791
Prescription B - 12 Basins	(48,747)		
Prescription C - 6 Basins	(33,044)		
Minimum Level	(29,958)		
Retention Visual	7,678	0	0
Partial Retention Visual	94,282	0	0
General Forest	549,318	0	0
TOTAL	1,092,302	91,202	84,291

PLANNING PROBLEM 4

Table I-22. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Alternatives B, D and D1

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values Rogue/ Illinois	Contributing to Wild & Scenic River Values Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	2,043	1,894	0
Research Natural Area	3,349	1,291	335
Botanical	5,648	2,880	1,040
Unique Interest	395	0	53
Backcountry Recreation	0	0	0
Supplemental Resource	13,739	853	5,856
Designated Wildlife Habitat	52,885	7,056	8,008
Special Wildlife Site	9,195	3,094	1,039
Scenic/Recreation River	9,526	9,525	0
Riparian	111,749	9,871	14,504
Retention Visual	7,678	5,459	0
Partial Retention Visual	94,282	54,911	20,088
General Forest	549,318	8,448	58,520
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternatives B, D and D1

Table I-23. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	2,043	75
Research Natural Area	3,349	20
Botanical	5,648	95
Unique Interest	395	25
Backcountry Recreation	0	0
Supplemental Resource	13,739	10
Designated Wildlife Habitat	52,885	5
Special Wildlife Site	9,195	5
Scenic/Recreation River	9,526	75
Riparian	111,749	35
Retention Visual	7,678	35
Partial Retention Visual	94,282	35
General Forest	549,318	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Alternatives B and D

Table I-24. Allocated Visual Management Objectives by Management Area

Management Area Name	Acres Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	3,349	3,349	0	0	0
Botanical	5,648	5,648	0	0	0
Unique Interest	395	395	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	13,739	13,739 1/	0	0	0
Desig. Wildlife Hab.	52,885	52,885 1/	0	0	0
Special Wildlife Site	9,195	9,195 1/	0	0	0
Scenic/Rec. River	9,526	0	9,526	0	0
Riparian	111,749	29,958 1/	964	11,841	68,986
Prescription B - 12	(48,747)				
Prescription C - 6	(33,044)				
Minimum Level	(29,958)				
Retention Visual	7,678	0	7,678	0	0
Partial Reten. Visual	94,282	0	0	94,282	0
General Forest	549,318	0	0	0	549,318
TOTAL	1,092,302	349,707	18,168	106,123	618,304

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-25. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternatives B and D

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	2,043	0	763	2,043	100
Research Natural Area	3,349	0	2,757	411	100
Botanical	5,648	0	315	0	100
Unique Interest	395	0	53	0	100
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	13,739	0	8,400	0	100
Desig. Wildlife Hab.	52,885	0	46,581	1,787	100
Special Wildlife Site	9,195	0	2,048	688	100
Scenic/Rec. River	9,526	3,000	533 1/	9,526	40
Riparian	111,749	82,000	114 1/	0	30
Retention Visual	7,678	3,000	349 1/	0	40
Partial Reten. Visual	94,282	78,000	1,849 1/	0	30
General Forest	549,318	392,000	12,025 1/	0	20
TOTAL	1,092,302	558,000	170,954	48,620	46

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Table I-26. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Alternatives B, D and D1

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	13,739	0
Designated Wildlife Habitat	52,885	0
Special Wildlife Site	9,195	0
Scenic/Recreation River	9,526	0
Riparian	111,749	0
Retention Visual	7,678	0
Partial Retention Visual	94,282	0
General Forest	549,318	29,000
TOTAL	1,092,302	261,495

PLANNING PROBLEM 9

Alternatives B, D and DI

Table I-27. Level of Mineral Exploration/Development Restriction by Management Area

Management Area Name	Management Area	Level of Restriction (Acres) Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	3,349	1,985	1,364	0	0
Botanical	5,648	1,321	4,327	0	0
Unique Interest	395	21	374	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	13,739	1,230	12,509	0	0
Desig. Wildlife Hab.	52,885	2,796	0	50,089	0
Special Wildlife Site	9,195	1,268	7,927	0	0
Scenic/Rec. River	9,526	7,647	1,879	0	0
Riparian	111,749	0	0	111,749	0
Retention Visual	7,678	1,523	0	6,155	0
Partial Reten. Visual	94,282	4,310	0	0	89,972
General Forest	549,318	9,035	0	0	540,283
TOTAL	1,092,302	265,674	28,380	167,993	630,255

PLANNING PROBLEM 1

Alternative C

Table I-28. Acreage Selected as Suitable for Timber Production by Management Area

Management Area Name	Acres Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	1,285	0
Designated Wildlife Habitat	55,109	0
Special Wildlife Site	9,477	0
Scenic/Recreation River	9,526	3,000
Riparian	115,743	84,000
Prescription B - 18 Basins	(83,528)	
Prescription C - 0 Basin	(0)	
Minimum Level	(32,215)	
Retention Visual	0	0
Partial Retention Visual	86,551	68,000
General Forest	570,681	411,000
TOTAL	1,092,302	566,000

PLANNING PROBLEM 2

Table I-29. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative C

Management Area Name	Acres Management Area	Acres Protected Old Growth
Wilderness	232,495	95,167
Wild River	2,043	763
Research Natural Area	3,349	2,757
Botanical	5,648	315
Unique Interest	395	53
Backcountry Recreation	0	0
Supplemental Resource	1,285	848
Designated Wildlife Habitat	55,109	48,485
Special Wildlife Site	9,477	2,155
Scenic/Recreation River	9,526	533 1/
Riparian	115,743	116 1/
Retention Visual	0	0 1/
Partial Retention Visual	86,551	1,967 1/
General Forest	570,681	12,904 1/
TOTAL	1,092,302	166,063

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-30. Protected and Managed Riparian Vegetation by Management Area

Alternative C

Management Area Name	Acres Management Area	Riparian Vegetation Protected	Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	2,043	598	0
Research Natural Area	3,349	559	0
Botanical	5,648	553	0
Unique Interest	395	30	0
Backcountry Recreation	0	0	0
Supplemental Resource	1,285	643	0
Designated Wildlife Habitat	55,109	14,527	0
Special Wildlife Site	9,477	1,069	0
Scenic/Recreation River	9,526	0	2,500
Riparian	115,743	32,215	83,528
Prescription B - 18 Basins	(83,528)		
Prescription C - 0 Basins	(0)		
Minimum Level	(32,215)		
Retention Visual	0	0	0
Partial Retention Visual	86,551	0	0
General Forest	570,681	0	0
TOTAL	1,092,302	89,465	86,028

PLANNING PROBLEM 4

Alternative C

Table I-31. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	2,043	1,894	0
Research Natural Area	3,349	1,291	335
Botanical	5,648	2,880	1,040
Unique Interest	395	0	53
Backcountry Recreation	0	0	0
Supplemental Resource	1,285	0	741
Designated Wildlife Habitat	55,109	7,334	8,813
Special Wildlife Site	9,477	3,258	1,135
Scenic/Recreation River	9,526	9,526	0
Riparian	115,743	10,011	16,301
Retention Visual	0	0	0
Partial Retention Visual	86,551	60,611	20,452
General Forest	570,681	8,477	60,573
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative C

Table I-32. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	2,043	75
Research Natural Area	3,349	30
Botanical	5,648	95
Unique Interest	395	25
Backcountry Recreation	0	0
Supplemental Resource	1,285	10
Designated Wildlife Habitat	55,109	5
Special Wildlife Site	9,477	5
Scenic/Recreation River	9,526	75
Riparian	115,743	35
Retention Visual	0	35
Partial Retention Visual	86,551	35
General Forest	570,681	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Table I-33. Allocated Visual Management Objectives by Management Area

Alternative C

Management Area Name	Acres				
	Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	3,349	3,349	0	0	0
Botanical	5,648	5,648	0	0	0
Unique Interest	395	395	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	1,285	1,285 1/	0	0	0
Desig. Wildlife Hab.	55,109	55,109 1/	0	0	0
Special Wildlife Site	9,477	9,477 1/	0	0	0
Scenic/Recreation River	9,526	0	9,526	0	0
Riparian	115,743	32,215 1/	0	11,000	72,528
Prescription B - 18	(83,528)				
Prescription C - 0	(0)				
Minimum Level	(32,215)				
Retention Visual	0	0	0	0	0
Partial Retention	86,551	0	0	86,551	0
General Forest	570,681	0	0	0	570,681
TOTAL	1,092,302	342,016	9,526	97,551	643,209

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-34. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative C

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	2,043	0	763	2,043	100
Research Natural Area	3,349	0	2,757	411	100
Botanical	5,648	0	315	0	100
Unique Interest	395	0	53	0	100
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	1,285	0	848	0	100
Desig. Wildlife Hab.	55,109	0	48,485	1,787	100
Special Wildlife Site	9,477	0	2,155	688	100
Scenic/Rec. River	9,526	3,000	533 1/	9,526	40
Riparian	115,743	84,000	116 1/	0	30
Retention Visual	0	0	0 1/	0	0
Partial Reten. Visual	86,551	68,000	1,967 1/	0	30
General Forest	570,681	411,000	12,904 1/	0	20
TOTAL	1,092,302	566,000	166,063	48,620	45

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Alternative C

Table I-35. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Management Area Name	Acres: Management Area	Acres: Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	1,285	0
Designated Wildlife Habitat	55,109	0
Special Wildlife Site	9,477	0
Scenic/Recreation River	9,526	0
Riparian	115,743	0
Retention Visual	0	0
Partial Retention Visual	86,551	0
General Forest	570,681	29,000
TOTAL	1,092,302	261,495

PLANNING PROBLEM 9

Alternative C

Table I-36. Level of Mineral Exploration/Development Restriction by Management Area

Management Area Name	Level of Restriction (Acres): Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	3,349	1,985	1,364	0	0
Botanical	5,648	1,323	4,325	0	0
Unique Interest	395	21	374	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	1,285	0	1,285	0	0
Desig. Wildlife Hab.	55,109	3,035	0	52,074	0
Special Wildlife Site	9,477	1,386	8,091	0	0
Scenic/Rec. River	9,526	7,647	1,879	0	0
Riparian	115,743	0	0	115,743	0
Retention Visual	0	0	0	0	0
Partial Reten. Visual	86,551	5,103	0	0	81,448
General Forest	570,681	10,297	0	0	560,384
TOTAL	1,092,302	265,335	17,318	167,817	641,832

PLANNING PROBLEM 1

Alternative D

Table I-37. Acreage Selected as Suitable for Timber Production by Management Area

Management Area Name	Acres: Management Area	Acres: Selected Suitable
Wilderness	232,495	0
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	13,739	0
Designated Wildlife Habitat	52,885	0
Special Wildlife Site	9,195	0
Scenic/Recreation River	9,526	3,000
Riparian	111,749	82,000
Prescription B - 12 Basins	(48,770)	
Prescription C - 6 Basin	(33,059)	
Minimum Level	(29,920)	
Retention Visual	7,678	3,000
Partial Retention Visual	94,282	78,000
General Forest	549,318	394,000
TOTAL	1,092,302	560,000

PLANNING PROBLEM 3

Alternative D

Table I-38. Protected and Managed Riparian Vegetation by Management Area

Management Area Name	Acres: Management Area	Acres: Riparian Vegetation Protected	Acres: Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	2,043	598	0
Research Natural Area	3,349	559	0
Botanical	5,648	553	0
Unique Interest	395	30	0
Backcountry Recreation	0	0	0
Supplemental Resource	13,739	5,783	0
Designated Wildlife Habitat	52,885	13,490	0
Special Wildlife Site	9,195	960	0
Scenic/Recreation River	9,526	0	2,500
Riparian	111,749	29,920	81,829
Prescription B - 12 Basins	(48,770)		
Prescription C - 6 Basins	(33,059)		
Minimum Level	(29,920)		
Retention Visual	7,678	0	0
Partial Retention Visual	94,282	0	0
General Forest	549,318	0	0
TOTAL	1,092,302	91,164	84,329

PLANNING PROBLEM 1

Table I-39. Acreage Selected as Suitable for Timber Production by Management Area

Alternative D1

Management Area Name	Acres: Management Area	Acres: Selected Suitable
Wilderness	232,495	0
Wild River	2,043	0
Research Natural Area	3,349	0
Botanical	5,648	0
Unique Interest	395	0
Backcountry Recreation	0	0
Supplemental Resource	13,739	0
Designated Wildlife Habitat	52,885	0
Special Wildlife Site	9,195	0
Scenic/Recreation River	9,526	3,000
Riparian	111,749	75,000
Prescription B - 12 Basins	(44,664)	
Prescription C - 6 Basins	(30,276)	
Minimum Level	(36,809)	
Retention Visual	7,678	3,000
Partial Retention Visual	94,282	78,000
General Forest	549,318	391,000
TOTAL	1,092,302	550,000

PLANNING PROBLEM 3

Table I-40. Protected and Managed Riparian Vegetation by Management Area

Alternative D1

Management Area Name	Acres: Management Area	Acres: Riparian Vegetation Protected	Acres: Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	2,043	598	0
Research Natural Area	3,349	559	0
Botanical	5,648	553	0
Unique Interest	395	30	0
Backcountry Recreation	0	0	0
Supplemental Resource	13,739	5,783	0
Designated Wildlife Habitat	52,885	13,490	0
Special Wildlife Site	9,195	960	0
Scenic/Recreation River	9,526	0	2,500
Riparian	111,749	36,809	74,940
Prescription B - 12 Basins	(44,664)		
Prescription C - 6 Basins	(30,276)		
Minimum Level	(36,809)		
Retention Visual	7,678	0	0
Partial Retention Visual	94,282	0	0
General Forest	549,318	0	0
TOTAL	1,092,302	98,053	77,440

PLANNING PROBLEM 6

Table I-41. Allocated Visual Management Objectives by Management Area

Alternative D1

	Acres				
Management Area Name	Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	3,349	3,349	0	0	0
Botanical	5,648	5,648	0	0	0
Unique Interest	395	395	0	0	0
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	13,739	13,739 1/	0	0	0
Desig. Wildlife Hab.	52,885	52,885 1/	0	0	0
Special Wildlife Site	9,195	9,195 1/	0	0	0
Scenic/Recreation River	9,526	0	9,526	0	0
Riparian	111,749	36,809 1/	883	10,849	63,208
Prescription B - 12	(44,664)				
Prescription C - 6	(30,276)				
Minimum Level	(36,809)				
Retention Visual	7,678	0	7,678	0	0
Partial Retention	94,282	0	0	94,282	0
General Forest	549,318	0	0	0	549,318
TOTAL	1,092,302	356,558	18,087	105,131	612,526

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-42. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative D1

	Acres				Percent
Management Area Name	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	2,043	0	763	2,043	100
Research Natural Area	3,349	0	2,757	411	100
Botanical	5,648	0	315	0	100
Unique Interest	395	0	53	0	100
Backcountry Recreation	0	0	0	0	0
Supplemental Resource	13,739	0	8,400	0	100
Desig. Wildlife Hab.	52,885	0	46,581	1,787	100
Special Wildlife Site	9,195	0	2,048	688	100
Scenic/Rec. River	9,526	3,000	533 1/	9,526	40
Riparian	111,749	75,000	114 1/	0	30
Retention Visual	7,678	3,000	349 1/	0	40
Partial Reten. Visual	94,282	78,000	1,849 1/	0	30
General Forest	549,318	391,000	12,025 1/	0	20
TOTAL	1,092,302	550,000	170,954	48,620	46

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 1

Table I-43. Acreage Selected as Suitable for Timber Production by Management Area

Alternative E

Management Area Name	Acres: Management Area	Acres: Selected Suitable
Wilderness	232,495	0
Wild River	3,120	0
Research Natural Area	4,693	0
Botanical	24,267	0
Unique Interest	1,568	0
Backcountry Recreation	301,737	0
Supplemental Resource	27,680	0
Designated Wildlife Habitat	39,242	0
Special Wildlife Site	7,547	0
Scenic/Recreation River	6,192	3,000
Riparian	62,337	0
Prescription B - 0 Basins	(0)	
Prescription C - 0 Basins	(0)	
Minimum Level	(62,337)	
Retention Visual	19,622	14,000
Partial Retention Visual	116,281	94,000
General Forest	245,521	176,000
TOTAL	1,092,302	287,000

PLANNING PROBLEM 2

Table I-44. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative E

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	3,120	1,099
Research Natural Area	4,693	2,757
Botanical	24,267	6,208
Unique Interest	1,568	485
Backcountry Recreation	301,737	120,047
Supplemental Resource	27,680	11,659
Designated Wildlife Habitat	39,242	32,426
Special Wildlife Site	7,547	1,355
Scenic/Recreation River	6,192	64 1/
Riparian	62,337	27 1/
Retention Visual	19,622	104 1/
Partial Retention Visual	116,281	630 1/
General Forest	245,521	1,042 1/
TOTAL	1,092,302	273,070

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-45. Protected and Managed Riparian Vegetation by Management Area

Alternative E

Management Area Name	Acres		
	Management Area	Riparian Vegetation	
		Protected	Managed
Wilderness	232,495	39,271	0
Wild River	3,120	891	0
Research Natural Area	4,693	760	0
Botanical	24,267	3,017	0
Unique Interest	1,568	86	0
Backcountry Recreation	301,737	51,424	0
Supplemental Resource	27,680	6,163	0
Designated Wildlife Habitat	39,242	9,348	0
Special Wildlife Site	7,547	925	0
Scenic/Recreation River	6,192	1,271	0
Riparian	62,337	62,337	0
Prescription B - 0 Basins	(0)		
Prescription C - 0 Basins	(0)		
Minimum Level	(62,337)		
Retention Visual	19,622	0	0
Partial Retention Visual	116,281	0	0
General Forest	245,521	0	0
TOTAL	1,092,302	175,493	0

PLANNING PROBLEM 4

Table I-46. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Alternative E

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	3,120	1,894	1,076
Research Natural Area	4,693	1,291	1,238
Botanical	24,267	3,483	879
Unique Interest	1,568	160	53
Backcountry Recreation	301,737	37,291	37,632
Supplemental Resource	27,680	9,093	4,115
Designated Wildlife Habitat	39,242	3,873	3,627
Special Wildlife Site	7,547	1,738	939
Scenic/Recreation River	6,192	2,785	3,408
Riparian	62,337	5,368	8,609
Retention Visual	19,622	4,988	3,620
Partial Retention Visual	116,281	27,770	18,292
General Forest	245,521	5,548	25,955
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative E

Table I-47. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	3,120	75
Research Natural Area	4,693	65
Botanical	24,267	95
Unique Interest	1,568	25
Backcountry Recreation	301,737	50
Supplemental Resource	27,680	20
Designated Wildlife Habitat	39,242	5
Special Wildlife Site	7,547	15
Scenic/Recreation River	6,192	75
Riparian	62,337	35
Retention Visual	19,662	35
Partial Retention Visual	116,281	35
General Forest	245,521	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Alternative E

Table I-48. Allocated Visual Management Objectives by Management Area

Management Area Name	Acres Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	4,693	0	0	0
Botanical	24,267	24,267	0	0	0
Unique Interest	1,568	1,568	0	0	0
Backcountry Recreation	301,737	301,737	0	0	0
Supplemental Resource	27,680	27,680 1/	0	0	0
Desig. Wildlife Hab.	39,242	39,242 1/	0	0	0
Special Wildlife Site	7,547	7,547 1/	0	0	0
Scenic/Recreation River	6,192	0	6,192	0	0
Riparian	62,337	62,337 1/	0	0	0
Prescription B - 0	(0)				
Prescription C - 0	(0)				
Minimum Level	(62,337)				
Retention Visual	19,622	0	19,622	0	0
Partial Retention	116,281	0	0	116,281	0
General Forest	245,521	0	0	0	245,521
TOTAL	1,092,302	704,686	25,814	116,281	245,521

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-49. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative E

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	3,120	0	1,099	2,043	100
Research Natural Area	4,693	0	2,757	411	100
Botanical	24,267	0	6,208	240	100
Unique Interest	1,568	0	485	0	100
Backcountry Recreation	301,737	0	120,047	4,314	100
Supplemental Resource	27,680	0	11,659	10,670	100
Desig. Wildlife Hab.	39,242	0	32,426	598	100
Special Wildlife Site	7,547	0	1,355	187	100
Scenic/Recreation River	6,192	3,000	64 1/	5,632	80
Riparian	62,337	0	27 1/	0	70
Retention Visual	19,622	14,000	104 1/	0	80
Partial Retention	116,281	94,000	630 1/	0	70
General Forest	245,521	176,000	1,042 1/	0	60
TOTAL	1,092,302	287,000	273,070	58,260	86

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Table I-50. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Alternative E

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	3,120	1,299
Research Natural Area	4,693	0
Botanical	24,267	0
Unique Interest	1,568	0
Backcountry Recreation	301,737	109,704
Supplemental Resource	27,680	0
Designated Wildlife Habitat	39,242	0
Special Wildlife Site	7,547	0
Scenic/Recreation River	6,192	0
Riparian	62,337	0
Retention Visual	19,622	0
Partial Retention Visual	116,281	0
General Forest	245,521	0
TOTAL	1,092,302	343,498

PLANNING PROBLEM 9

Table I-51. Level of Mineral Exploration/Development Restriction by Management Area

Alternative E

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	2,000	2,693	0	0
Botanical	24,267	2,362	21,905	0	0
Unique Interest	1,568	96	1,472	0	0
Backcountry Recreation	301,737	7,988	0	293,749	0
Supplemental Resource	27,680	4,486	23,194	0	0
Desig. Wildlife Hab.	39,242	1,999	0	37,243	0
Special Wildlife Site	7,547	721	6,826	0	0
Scenic/Rec. River	6,192	2,789	3,403	0	0
Riparian	62,337	0	0	62,337	0
Retention Visual	19,622	1,580	0	18,042	0
Partial Reten. Visual	116,281	2,361	0	0	113,920
General Forest	245,521	5,726	0	0	239,795
TOTAL	1,092,302	267,723	59,493	411,371	353,715

PLANNING PROBLEM 1

Table I-52. Acreage Selected as Suitable for Timber Production by Management Area

Alternative G

Management Area Name	Acres	
	Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	3,120	0
Research Natural Area	4,693	0
Botanical	35,658	0
Unique Interest	1,333	0
Backcountry Recreation	150,431	0
Supplemental Resource	50,453	0
Designated Wildlife Habitat	70,858	0
Special Wildlife Site	8,640	0
Scenic/Recreation River	5,963	3,000
Riparian	72,483	45,000
Prescription B - 0 Basins	(0)	
Prescription C - 18 Basins	(45,212)	
Minimum Level	(27,271)	
Retention Visual	23,060	16,000
Partial Retention Visual	149,830	115,000
General Forest	283,285	227,000
TOTAL	1,092,302	406,000

PLANNING PROBLEM 2

Table I-53. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative G

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	3,120	1,099
Research Natural Area	4,693	2,757
Botanical	35,658	8,229
Unique Interest	1,333	395
Backcountry Recreation	150,431	58,932
Supplemental Resource	50,453	25,813
Designated Wildlife Habitat	70,858	57,952
Special Wildlife Site	8,640	1,435
Scenic/Recreation River	5,963	46 1/
Riparian	72,483	12 1/
Retention Visual	23,060	155 1/
Partial Retention Visual	149,830	760 1/
General Forest	283,285	1,214 1/
TOTAL	1,092,302	253,966

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-54. Protected and Managed Riparian Vegetation by Management Area

Alternative G

Management Area Name	Acres: Management Area	Acres: Riparian Vegetation Protected	Acres: Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	3,120	891	0
Research Natural Area	4,693	760	0
Botanical	35,658	4,269	0
Unique Interest	1,333	116	0
Backcountry Recreation	150,431	24,717	0
Supplemental Resource	50,453	15,498	0
Designated Wildlife Habitat	70,858	15,315	0
Special Wildlife Site	8,640	1,003	0
Scenic/Recreation River	5,963	0	1,170
Riparian	72,483	27,271	45,212
Prescription B - 0 Basins	(0)		
Prescription C - 18 Basins	(45,212)		
Minimum Level	(27,271)		
Retention Visual	23,060	0	0
Partial Retention Visual	149,830	0	0
General Forest	283,285	0	0
TOTAL	1,092,302	129,111	46,382

PLANNING PROBLEM 4

Alternative G

Table I-55. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	3,120	1,894	1,076
Research Natural Area	4,693	1,291	1,238
Botanical	35,658	4,026	1,307
Unique Interest	1,333	160	53
Backcountry Recreation	150,431	19,216	13,804
Supplemental Resource	50,453	13,633	6,077
Designated Wildlife Habitat	70,858	6,128	8,981
Special Wildlife Site	8,640	2,272	928
Scenic/Recreation River	5,963	2,731	3,232
Riparian	72,483	6,682	10,948
Retention Visual	23,060	6,103	4,372
Partial Retention Visual	149,830	34,800	23,566
General Forest	283,285	6,346	33,861
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative G

Table I-56. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	3,120	75
Research Natural Area	4,693	65
Botanical	35,658	95
Unique Interest	1,333	25
Backcountry Recreation	150,431	50
Supplemental Resource	50,453	20
Designated Wildlife Habitat	70,858	5
Special Wildlife Site	8,640	15
Scenic/Recreation River	5,963	75
Riparian	72,483	35
Retention Visual	23,060	35
Partial Retention Visual	149,830	35
General Forest	283,285	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Table I-57. Allocated Visual Management Objectives by Management Area

Alternative G

Management Area Name	Acres				
	Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	4,693	0	0	0
Botanical	35,658	35,658	0	0	0
Unique Interest	1,333	1,333	0	0	0
Backcountry Recreation	150,431	150,431	0	0	0
Supplemental Resource	50,453	50,453 1/	0	0	0
Desig. Wildlife Hab.	70,858	70,858 1/	0	0	0
Special Wildlife Site	8,640	8,640 1/	0	0	0
Scenic/Rec. River	5,963	0	5,963	0	0
Riparian	72,483	27,271 1/	2,286	14,850	28,076
Prescription B - 0	(0)				
Prescription C -18	(45,212)				
Minimum Level	(27,271)				
Retention Visual	23,060	0	23,060	0	0
Partial Retention	149,830	0	0	149,830	0
General Forest	283,285	0	0	0	283,285
TOTAL	1,092,302	584,952	31,309	164,680	311,361

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-58. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative G

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	3,120	0	1,099	2,043	100
Research Natural Area	4,693	0	2,757	411	100
Botanical	35,658	0	8,229	240	100
Unique Interest	1,333	0	395	0	100
Backcountry Recreation	150,431	0	58,932	2,416	100
Supplemental Resource	50,453	0	25,813	12,399	100
Desig. Wildlife Hab.	70,858	0	57,952	1,029	100
Special Wildlife Site	8,640	0	1,435	155	100
Scenic/Rec. River	5,963	3,000	46 1/	5,402	80
Riparian	72,483	45,000	12 1/	0	70
Retention Visual	23,060	16,000	155 1/	0	80
Partial Reten. Visual	149,830	115,000	760 1/	0	70
General Forest	283,285	227,000	1,214 1/	0	60
TOTAL	1,092,302	406,000	253,966	58,260	83

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Alternative G

Table I-59. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild Rivers	3,120	1,819
Research Natural Area	4,693	0
Botanical	35,658	0
Unique Interest	1,333	0
Backcountry Recreation	150,431	105,591
Supplemental Resource	50,453	2,595
Designated Wildlife Habitat	70,858	0
Special Wildlife Site	8,640	0
Scenic/Recreation River	5,963	0
Riparian	72,483	0
Retention Visual	23,060	0
Partial Retention Visual	149,830	0
General Forest	283,285	0
TOTAL	1,092,302	342,490

PLANNING PROBLEM 9

Alternative G

Table I-60. Level of Mineral Exploration/Development Restriction by Management Area

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	2,000	2,693	0	0
Botanical	35,658	2,404	33,254	0	0
Unique Interest	1,333	96	1,237	0	0
Backcountry Recreation	150,431	6,011	0	144,420	0
Supplemental Resource	50,453	6,652	43,801	0	0
Desig. Wildlife Hab.	70,858	2,404	0	68,454	0
Special Wildlife Site	8,640	688	7,952	0	0
Scenic/Rec. River	5,963	2,734	3,229	0	0
Riparian	72,483	0	0	72,483	0
Retention Visual	23,060	1,521	0	21,539	0
Partial Reten. Visual	149,830	2,565	0	0	147,265
General Forest	283,285	5,269	0	0	278,016
TOTAL	1,092,302	267,959	92,166	306,896	425,281

PLANNING PROBLEM 1

Table I-61. Acreage Selected as Suitable for Timber Production by Management Area

Alternative K

Management Area Name	Acres: Management Area	Acres: Selected Suitable
Wilderness	232,495	0
Wild River	2,043	0
Research Natural Area	4,704	0
Botanical	7,296	0
Unique Interest	1,595	0
Backcountry Recreation	13,691	0
Supplemental Resource	39,498	0
Designated Wildlife Habitat	59,477	0
Special Wildlife Site	14,581	0
Scenic/Recreation River	3,557	1,000
Riparian	102,944	76,000
Prescription B - 17 Basins	(69,895)	
Prescription C - 1 Basin	(6,161)	
Minimum Level	(26,888)	
Retention Visual	10,280	6,000
Partial Retention Visual	129,323	97,000
General Forest	470,818	349,000
TOTAL	1,092,302	529,000

PLANNING PROBLEM 2

Table I-62. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative K

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	2,043	763
Research Natural Area	4,704	2,757
Botanical	7,296	2,048
Unique Interest	1,595	475
Backcountry Recreation	13,691	6,821
Supplemental Resource	39,498	20,869
Designated Wildlife Habitat	59,477	50,000
Special Wildlife Site	14,581	2,304
Scenic/Recreation River	3,557	47 1/
Riparian	102,944	37 1/
Retention Visual	10,280	46 1/
Partial Retention Visual	129,323	901 1/
General Forest	470,818	2,455 1/
TOTAL	1,092,302	184,690

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Alternative K

Table I-63. Protected and Managed Riparian Vegetation by Management Area

Management Area Name	Acres		
	Management Area	Riparian Vegetation	
		Protected	Managed
Wilderness	232,495	39,271	0
Wild River	2,043	598	0
Research Natural Area	4,704	760	0
Botanical	7,296	736	0
Unique Interest	1,595	86	0
Backcountry Recreation	13,691	1,868	0
Supplemental Resource	39,498	11,702	0
Designated Wildlife Habitat	59,477	15,134	0
Special Wildlife Site	14,581	1,576	0
Scenic/Recreation River	3,557	0	818
Riparian	102,944	26,888	76,056
Prescription B - 17 Basins	(69,895)		
Prescription C - 1 Basin	(6,161)		
Minimum Level	(26,888)		
Retention Visual	10,280	0	0
Partial Retention Visual	129,323	0	0
General Forest	470,818	0	0
TOTAL	1,092,302	98,619	76,874

PLANNING PROBLEM 4

Alternative K

Table I-64. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	2,043	1,894	0
Research Natural Area	4,704	1,291	1,248
Botanical	7,296	2,964	879
Unique Interest	1,595	160	53
Backcountry Recreation	13,691	10,479	0
Supplemental Resource	39,498	11,306	9,899
Designated Wildlife Habitat	59,477	5,674	8,623
Special Wildlife Site	14,581	3,387	982
Scenic/Recreation River	3,557	3,557	0
Riparian	102,944	7,849	13,674
Retention Visual	10,280	8,360	0
Partial Retention Visual	129,323	40,939	10,513
General Forest	470,818	7,422	63,572
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative K

Table I-65. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	2,043	75
Research Natural Area	4,704	65
Botanical	7,296	95
Unique Interest	1,595	65
Backcountry Recreation	13,691	75
Supplemental Resource	39,498	20
Designated Wildlife Habitat	59,477	5
Special Wildlife Site	14,581	15
Scenic/Recreation River	3,557	75
Riparian	102,944	35
Retention Visual	10,280	35
Partial Retention Visual	129,323	35
General Forest	470,818	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Alternative K

Table I-66. Allocated Visual Management Objectives by Management Area

Management Area Name	Acres Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	4,704	4,704	0	0	0
Botanical	7,296	7,296	0	0	0
Unique Interest	1,595	1,595	0	0	0
Backcountry Recreation	13,691	13,691	0	0	0
Supplemental Resource	39,498	39,498 1/	0	0	0
Desig. Wildlife Hab.	59,477	59,477 1/	0	0	0
Special Wildlife Site	14,581	14,581 1/	0	0	0
Scenic/Rec. River	3,557	0	3,557	0	0
Riparian	102,944	26,888 1/	1,281	16,113	58,662
Prescription B - 17	(69,895)				
Prescription C - 1	(6,161)				
Minimum Level - 1	(26,888)				
Retention Visual	10,280	0	10,280	0	0
Partial Reten. Visual	129,323	0	0	129,323	0
General Forest	470,818	0	0	0	470,818
TOTAL	1,092,302	402,268	15,118	145,436	529,480

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-67. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative K

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	2,043	0	763	2,043	100
Research Natural Area	4,704	0	2,757	411	100
Botanical	7,296	0	2,048	32	100
Unique Interest	1,595	0	475	0	100
Backcountry Recreation	13,691	0	6,821	1,269	100
Supplemental Resource	39,498	0	20,869	9,843	100
Desig. Wildlife Hab.	59,477	0	50,000	363	100
Special Wildlife Site	14,581	0	2,304	379	100
Scenic/Rec. River	3,557	1,000	47 1/	3,557	80
Riparian	102,944	76,000	37 1/	0	70
Retention Visual	10,280	6,000	46 1/	0	80
Partial Retention	129,323	97,000	901 1/	0	70
General Forest	470,818	349,000	2,455 1/	0	60
TOTAL	1,092,302	529,000	184,690	52,062	76

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Table I-68. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Alternative K

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	2,043	1,299
Research Natural Area	4,704	0
Botanical	7,296	0
Unique Interest	1,595	0
Backcountry Recreation	13,691	6,189
Supplemental Resource	39,498	0
Designated Wildlife Habitat	59,477	0
Special Wildlife Site	14,581	0
Scenic/Recreation River	3,557	0
Riparian	102,944	0
Retention Visual	10,280	0
Partial Retention Visual	129,323	0
General Forest	470,818	29,517
TOTAL	1,092,302	269,500

PLANNING PROBLEM 9

Table I-69. Level of Mineral Exploration/Development Restriction by Management Area

Alternative K

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	2,043	2,043	0	0	0
Research Natural Area	4,704	2,000	2,704	0	0
Botanical	7,296	1,433	5,863	0	0
Unique Interest	1,595	96	1,499	0	0
Backcountry Recreation	13,691	3,931	0	9,760	0
Supplemental Resource	39,498	5,057	34,441	0	0
Desig. Wildlife Hab.	59,477	2,293	0	57,184	0
Special Wildlife Site	14,581	1,205	13,376	0	0
Scenic/Rec. River	3,557	3,446	111	0	0
Riparian	102,944	0	0	102,944	0
Retention Visual	10,280	1,588	0	8,692	0
Partial Retention Visual	129,323	3,146	0	0	126,177
General Forest	470,818	7,460	0	0	463,358
TOTAL	1,092,302	266,193	57,994	178,580	589,535

PLANNING PROBLEM 1

Table I-70. Acreage Selected as Suitable for Timber Production by Management Area

Alternative M

Management Area Name	Acres	
	Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	3,120	0
Research Natural Area	4,693	0
Botanical	35,658	0
Unique Interest	1,333	0
Backcountry Recreation	296,520	0
Supplemental Resource	36,144	0
Designated Wildlife Habitat	53,125	0
Special Wildlife Site	7,029	0
Scenic/Recreation River	5,850	0
Riparian	56,139	0
Prescription B - 0 Basins	(0)	
Prescription C - 0 Basins	(0)	
Minimum Level	(56,139)	
Retention Visual	17,479	12,000
Partial Retention Visual	109,448	90,000
General Forest	233,269	105,000
TOTAL	1,092,302	207,000

PLANNING PROBLEM 2

Table I-71. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative M

Management Area Name	Acres: Management Area	Acres: Protected Old Growth
Wilderness	232,495	95,167
Wild River	3,120	1,099
Research Natural Area	4,693	2,757
Botanical	35,658	8,229
Unique Interest	1,333	395
Backcountry Recreation	296,520	119,247
Supplemental Resource	36,144	16,427
Designated Wildlife Habitat	53,125	43,482
Special Wildlife Site	7,029	1,227
Scenic/Recreation River	5,850	47 1/
Riparian	56,139	23 1/
Retention Visual	17,479	93 1/
Partial Retention Visual	109,448	547 1/
General Forest	233,269	893 1/
TOTAL	1,092,302	289,633

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Table I-72. Protected and Managed Riparian Vegetation by Management Area

Alternative M

Management Area Name	Acres: Management Area	Acres: Riparian Vegetation Protected	Acres: Riparian Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	3,120	891	0
Research Natural Area	4,693	760	0
Botanical	35,658	4,269	0
Unique Interest	1,333	74	0
Backcountry Recreation	296,520	50,755	0
Supplemental Resource	36,144	10,631	0
Designated Wildlife Habitat	53,125	10,725	0
Special Wildlife Site	7,029	822	0
Scenic/Recreation River	5,850	1,156	0
Riparian	56,139	56,139	0
Prescription B - 0 Basins	(0)		
Prescription C - 0 Basins	(0)		
Minimum Level	(56,139)		
Retention Visual	17,479	0	0
Partial Retention Visual	109,448	0	0
General Forest	233,269	0	0
TOTAL	1,092,302	175,493	0

PLANNING PROBLEM 4

Alternative M

Table I-73. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres		
	Management Area	Contributing to Wild & Scenic River Values	
		Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	3,120	1,894	1,076
Research Natural Area	4,693	1,291	1,238
Botanical	35,658	4,026	1,307
Unique Interest	1,333	160	53
Backcountry Recreation	296,520	36,874	37,275
Supplemental Resource	36,144	9,193	4,396
Designated Wildlife Habitat	53,125	4,934	4,267
Special Wildlife Site	7,029	1,616	907
Scenic/Recreation River	5,850	2,682	3,168
Riparian	56,139	5,242	8,364
Retention Visual	17,479	4,828	3,552
Partial Retention Visual	109,448	27,119	18,214
General Forest	233,269	5,423	25,626
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative M

Table I-74. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	3,120	75
Research Natural Area	4,693	65
Botanical	35,658	95
Unique Interest	1,333	25
Backcountry Recreation	296,520	50
Supplemental Resource	36,144	20
Designated Wildlife Habitat	53,125	5
Special Wildlife Site	7,029	15
Scenic/Recreation River	5,850	75
Riparian	56,139	35
Retention Visual	17,479	35
Partial Retention Visual	109,448	35
General Forest	233,269	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Table I-75. Allocated Visual Management Objectives by Management Area

Alternative M

Management Area Name	Acres				
	Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	4,693	0	0	0
Botanical	35,658	35,658	0	0	0
Unique Interest	1,333	1,333	0	0	0
Backcountry Recreation	296,520	296,520	0	0	0
Supplemental Resource	36,144	36,144 1/	0	0	0
Desig. Wildlife Hab.	53,125	53,125 1/	0	0	0
Special Wildlife Site	7,029	7,029 1/	0	0	0
Scenic/Rec. River	5,850	0	5,850	0	0
Riparian	56,139	56,139 1/	0	0	0
Prescription B - 0	*(0)*				
Prescription C - 0	*(0)*				
Minimum Level	*(56,139)*				
Retention Visual	17,479	0	17,479	0	0
Partial Reten. Visual	109,448	0	0	109,448	0
General Forest	233,269	0	0	0	233,269
TOTAL	1,092,302	726,256	23,329	109,448	233,269

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Table I-76. Contributions to Selected Wildlife Habitat Conditions by Management Area

Alternative M

Management Area Name	Acres				Percent
	Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	3,120	0	1,099	2,043	100
Research Natural Area	4,693	0	2,757	411	100
Botanical	35,658	0	8,229	240	100
Unique Interest	1,333	0	395	0	100
Backcountry Recreation	296,520	0	119,247	4,314	100
Supplemental Resource	36,144	0	16,427	10,671	100
Desig. Wildlife Hab.	53,125	0	43,482	976	100
Special Wildlife Site	7,029	0	1,227	150	100
Scenic/Rec. River	5,850	0	47 1/	5,290	80
Riparian	56,139	0	23 1/	0	70
Retention Visual	17,479	12,000	93 1/	0	80
Partial Retention	109,448	90,000	547 1/	0	70
General Forest	233,269	105,000	893 1/	0	60
TOTAL	1,092,302	207,000	289,633	58,260	86

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Alternative M

Table I-77. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Management Area Name	Acres	
	Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild Rivers	3,120	1,819
Research Natural Area	4,693	0
Botanical	35,658	1,067
Unique Interest	1,333	0
Backcountry Recreation	296,520	107,529
Supplemental Resource	36,144	4,490
Designated Wildlife Habitat	53,125	0
Special Wildlife Site	7,029	0
Scenic/Recreation River	5,850	0
Riparian	56,139	0
Retention Visual	17,479	0
Partial Retention Visual	109,448	0
General Forest	233,269	0
TOTAL	1,092,302	347,400

PLANNING PROBLEM 9

Alternative M

Table I-78. Level of Mineral Exploration/Development Restriction by Management Area

Management Area Name	Level of Restriction (Acres)				
	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	3,120	3,120	0	0	0
Research Natural Area	4,693	2,000	2,693	0	0
Botanical	35,658	2,404	33,254	0	0
Unique Interest	1,333	96	1,237	0	0
Backcountry Recreation	296,520	7,983	0	288,537	0
Supplemental Resource	36,144	5,270	30,874	0	0
Desig. Wildife Hab.	53,125	2,373	0	50,752	0
Special Wildlife Site	7,029	629	6,400	0	0
Scenic/Rec. River	5,850	2,686	3,164	0	0
Riparian	56,139	0	0	56,139	0
Retention Visual	17,479	1,419	0	16,060	0
Partial Reten. Visual	109,448	2,292	0	0	107,156
General Forest	233,269	5,264	0	0	228,005
TOTAL	1,092,302	268,031	77,622	411,488	335,161

PLANNING PROBLEM 1

Table I-79. Acreage Selected as Suitable for Timber Production by Management Area

Alternative S

Management Area Name	Acres (1984 Inventory) Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	5,029	0
Research Natural Area	4,608	0
Botanical	16,275	0
Unique Interest	2,015	0
Backcountry Recreation	108,092	0
Supplemental Resource	21,412	0
Designated Wildlife Habitat	47,354	0
Special Wildlife Site	27,450	0
Scenic/Recreation River	10,317	8,000
Riparian	89,206	67,000
Prescription B - 11 Basins	(39,836)	
Prescription C - 7 Basin	(27,130)	
Minimum Level	(22,240)	
Retention Visual	9,717	7,000
Partial Retention Visual	131,822	113,000
General Forest	386,510	310,000
TOTAL	1,092,302	505,000

PLANNING PROBLEM 2

Table I-80. Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

Alternative S

Management Area Name	Acres (1984 Inventory) Management Area	Protected Old Growth
Wilderness	232,495	95,167
Wild River	5,029	1,915
Research Natural Area	4,608	2,757
Botanical	16,275	3,563
Unique Interest	2,015	624
Backcountry Recreation	108,092	25,712
Supplemental Resource	21,412	12,619
Designated Wildlife Habitat	47,354	39,898
Special Wildlife Site	27,450	11,717
Scenic/Recreation River	10,317	169 1/
Riparian	89,206	48 1/
Retention Visual	9,717	48 1/
Partial Retention Visual	131,822	1,260 1/
General Forest	386,510	2,600 1/
TOTAL	1,092,302	198,097

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 3

Alternative S

Table I-81. Protected and Managed Riparian Vegetation by Management Area

Management Area Name	Acres (1984 Inventory) Management Area	Riparian Vegetation Protected	Managed
Wilderness	232,495	39,271	0
Wild River	5,029	1,450	0
Research Natural Area	4,608	760	0
Botanical	16,275	2,088	0
Unique Interest	2,015	200	0
Backcountry Recreation	108,092	16,031	0
Supplemental Resource	21,412	7,226	0
Designated Wildlife Habitat	47,354	12,071	0
Special Wildlife Site	27,450	4,586	0
Scenic/Recreation River	10,317	0	2,604
Riparian	89,206	22,240	66,966
Prescription B - 11 Basins	(39,836)		
Prescription C - 7 Basin	(27,130)		
Minimum Level	(22,240)		
Retention Visual	9,717	0	0
Partial Retention Visual	131,822	0	0
General Forest	386,510	0	0
TOTAL	1,092,302	105,923	69,570

PLANNING PROBLEM 4

Alternative S

Table I-82. Land Allocations Directly Affecting Wild and Scenic River Attributes in and Around Established and Eligible River Corridors by Management Area

Management Area Name	Acres Management Area	Contributing to Wild & Scenic River Values Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	5,029	1,894	2,379
Research Natural Area	4,608	1,291	1,153
Botanical	16,275	4,271	1,226
Unique Interest	2,015	160	53
Backcountry Recreation	108,092	17,376	9,029
Supplemental Resource	21,412	10,502	2,054
Designated Wildlife Habitat	47,354	4,230	7,509
Special Wildlife Site	27,450	5,249	3,071
Scenic/Recreation River	10,317	2,409	6,532
Riparian	89,206	7,069	11,938
Retention Visual	9,717	4,208	609
Partial Retention Visual	131,822	39,441	13,145
General Forest	386,510	7,182	50,745
TOTAL	1,092,302	105,282	109,443

PLANNING PROBLEM 5

Alternative S

Table I-83. Sensitive Plant Distributions by Management Area

Management Area Name	Acres Management Area	Percent Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	5,029	75
Research Natural Area	4,608	65
Botanical	16,275	95
Unique Interest	2,015	65
Backcountry Recreation	108,092	75
Supplemental Resource	21,412	20
Designated Wildlife Habitat	47,354	5
Special Wildlife Site	27,450	15
Scenic/Recreation River	10,317	75
Riparian	89,206	35
Retention Visual	9,717	35
Partial Retention Visual	131,822	35
General Forest	386,510	35
TOTAL	1,092,302	--

PLANNING PROBLEM 6

Alternative S

Table I-84. Allocated Visual Management Objectives by Management Area

Management Area Name	Acres Management Area	Preservation	Reten.	P.Reten.	Mod./ Max. Mod.
Wilderness	232,495	232,495	0	0	0
Wild River	5,029	5,029	0	0	0
Research Natural Area	4,608	4,608	0	0	0
Botanical	16,275	16,275	0	0	0
Unique Interest	2,015	2,015	0	0	0
Backcountry Rec.	108,092	108,092	0	0	0
Supplemental Resource	21,412	21,412	0	0	0
Desig. Wildlife Hab.	47,354	47,354	0	0	0
Special Wildlife Site	27,450	27,450	0	0	0
Scenic/Rec. River	10,317	0	10,317	0	0
Riparian	89,206	22,240 1/	1,232	16,717	49,017
Prescription B - 11	(39,836)				
Prescription C - 7	(27,130)				
Minimum Level - 1	(22,240)				
Retention Visual	9,717	0	9,717	0	0
Partial Reten. Visual	131,822	0	0	131,822	0
General Forest	386,510	0	0	0	386,510
TOTAL	1,092,302	486,970	21,266	148,539	435,527

1/ These areas do not have Preservation Visual Quality Objectives. They are managed to preserve the natural character except, or until, facilities such as roads/campgrounds are constructed.

PLANNING PROBLEM 7

Alternative S

Table I-85. Contributions to Selected Wildlife Habitat Conditions by Management Area

Management Area Name	Acres (1984 Inventory) Management Area	Managed Deer/Elk Forage	Inv.Old-Growth Wldf Hab	Protect Suit.Hab B.Eag/Os	Percent Habitat Cap.for Woodpec.
Wilderness	232,495	0	95,167	34,165	100
Wild River	5,029	0	1,915	2,043	100
Research Natural Area	4,608	0	2,757	411	100
Botanical	16,275	0	3,563	1,125	100
Unique Interest	2,015	0	624	0	100
Backcountry Rec.	108,092	0	25,712	1,627	100
Supplemental Resource	21,412	0	12,619	6,191	100
Desig. Wildlife Hab.	47,354	0	39,898	719	100
Special Wildlife Site	27,450	0	11,717	618	100
Scenic/Rec. River	10,317	8,000	169 1/	7,096	80
Riparian	89,206	67,000	48 1/	0	70
Retention Visual	9,717	7,000	48 1/	0	80
Partial Retention	131,822	113,000	1,260 1/	0	70
General Forest	386,510	310,000	2,600 1/	0	60
TOTAL	1,092,302	505,000	198,097	53,995	79

1/ Old-Growth Stands Unsuitable for Timber Management.

PLANNING PROBLEM 8

Alternative S

Table I-86. Acres of Unroaded Primitive and Semi-Primitive Recreation Opportunities by Management Area

Management Area Name	Acres Management Area	Unroaded Primitive/ Semi-Primitive
Wilderness	232,495	232,495
Wild River	5,029	1,956
Research Natural Area	4,608	869
Botanical	16,275	0
Unique Interest	2,015	0
Backcountry Recreation	108,092	58 180
Supplemental Resource	21,412	0
Designated Wildlife Habitat	47,354	0
Special Wildlife Site	27,450	0
Scenic/Recreation River	10,317	0
Riparian	89,206	0
Retention Visual	9,717	0
Partial Retention Visual	131,822	0
General Forest	386,510	0
TOTAL	1,092,302	293,500

PLANNING PROBLEM 9

Table I-87. Level of Mineral Exploration/Development Restriction by Management Area

Alternative S

Management Area Name	Level of Restriction (Acres/1984 Inventory) Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	5,029	5,029	0	0	0
Research Natural Area	4,608	2,000	2,608	0	0
Botanical	16,275	3,009	13,266	0	0
Unique Interest	2,015	128	1,887	0	0
Backcountry Recreation	108,092	4,658	0	40,814	62,620
Supplemental Resource	21,412	4,496	16,916	0	0
Desig. Wildlife Hab.	47,354	2,111	0	45,243	0
Special Wildlife Site	27,450	1,362	26,088	0	0
Scenic/Rec. River	10,317	2,642	7,675	0	0
Riparian	89,206	0	0	89,206	0
Retention Visual	9,717	1,858	0	7,859	0
Partial Retention Visual	131,822	2,573	0	0	129,249
General Forest	386,510	6,969	0	0	379,541
TOTAL	1,092,302	269,330	68,440	183,122	571,410

APPENDIX J

MANAGEMENT REQUIREMENTS



APPENDIX J

MANAGEMENT REQUIREMENTS

APPENDIX J

MANAGEMENT REQUIREMENTS

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INTRODUCTION

This appendix is included in the Final Environmental Impact Statement for the Forest Plan in response to decisions of the Chief of the Forest Service and the Deputy Assistant Secretary of Agriculture regarding appeal No 1770, brought by the Northwest Forest Resource Council on September 18, 1986. The appeal centered on direction from the Regional Forester to incorporate "minimum management requirements" (MMR's) in forest plan alternatives. The appellant requested that the appropriateness of the MMR's be examined through the environmental impact statement process. The information in this appendix also responds to comments about Management Requirements that were raised during the review of the Draft Environmental Impact Statement.

A summary of Management Requirements is provided in Chapter II, "Management Requirements" section. Additional information is in Appendix B "Development of Management Requirements " The Standards and Guidelines (or specifications) for implementation of the management requirements are found in the Forest Plan.

This appendix addresses the issue raised by the appellant: For those management requirements which cause significant reductions in allowable sale quantity (ASQ) or present net value (PNV), alternate ways of meeting the management requirements are examined and their opportunity costs (reductions in ASQ and PNV) are compared.

Appendix J of the Draft Environmental Impact Statement, "Sensitivity Analysis for Minimum Management Requirements" has been completely replaced by the material presented here. The Appendix J of the Draft is part of the planning record.

BACKGROUND OF MANAGEMENT REQUIREMENTS

WHAT ARE MANAGEMENT REQUIREMENTS?

Many laws and regulations guide Forest Service activities. One law in particular, the National Forest Management Act of 1976 (NFMA), and its implementing regulations provide direction for the Forest planning process. The direction for National Forest Systems Land and Resource Management Planning, in Section 36 of the Code of Federal Regulations, Part 219 [36 CFR] specify. (1) the minimum specific management requirements to be met in accomplishing the goals and objectives of the National Forest System [36 CFR 219 27] and (2) the minimum requirements for integrating individual forest resource planning into the Forest Plan [36 CFR 219.14 through 219.26]. The term "management requirements (MR's)" will be used in this appendix to refer to these NFMA regulations instead of "minimum management requirements (MMR's) which were used in the Draft Environmental Impact Statement and Proposed Forest Plan.

Some management requirements are procedural in nature and need not be dealt with here. Some requirements were analyzed and were available for review during the Regional Guide Environmental Impact Statement process and are not dealt with here. See Appendix B for a more complete discussion. The management requirements which have not been fully dealt with elsewhere, and which require additional analysis due to significant opportunity costs associated with implementation are:

1. Maintenance of habitat to assure viable populations of fish and wildlife populations particularly mature and old growth habitat and,

2. Protection of water resources, particularly water temperatures.

These management requirements are described in greater detail in later sections of this appendix MR's for dispersal of created openings, other wildlife habitats and other requirements noted in 36 CFR 219 27 which

have not been addressed in other Environmental Impact Statements do not cause significant opportunity costs when implemented.

LEGAL REQUIREMENTS VERSUS IMPLEMENTATION METHODS

The management requirements from NFMA and its implementing regulations are legal requirements. They represent "ends" which must be met during forest plan implementation. For example, the NFMA implementing regulations require that "fish and wildlife habitat shall be managed to maintain viable populations of existing and desired non-native vertebrate species in the planning area." It is mandatory that, whatever implementation methods are chosen, the management requirement be met.

Specifications or standards for achievement for each management requirement are established at the national level or through analysis at the regional level for most of the management requirements. These are listed in the regulations or as Standards and Guidelines in the Regional Guide Additional specifications identified on the Forest are listed as Standards and Guidelines in the FEIS, Appendix D, and the Land and Resource Management Plan, Chapter IV. The specifications must be based on knowledge of the resources involved For example, in meeting the management requirement for viable populations of vertebrate species it is necessary to define the type of habitat required by the species, the maximum distance between habitats which will still provide reasonable assurance of genetic interaction, and the size of habitat area needed to support a breeding pair.

Often, the pool of scientific knowledge is insufficient to provide the entire basis for defining the specific conditions or standards that will satisfy or meet a management requirement. When this happens it is necessary to rely on the field experience and the professional judgement of knowledgeable professionals and to establish monitoring and research that will provide better information for future planning efforts.

Implementation methods are the "means" or "ways" in which the management requirements will be met. Usually there is more than one way in which a management requirement can be met. Determining the most appropriate means of meeting the specifications for each management requirement involves careful analysis at the Forest level. Considering and analyzing different means or ways of meeting a specific management requirement are particularly important if there are potentially significant reductions in present net worth (PNV) or allowable sale quantity (ASQ) involved

HOW IMPLEMENTATION METHODS TO MEET THE MANAGEMENT REQUIREMENTS ARE DEVELOPED

The selection of means sufficient to meet management requirements is based on effectiveness in meeting resource protection and on minimizing reductions to PNV or ASQ. The general process used in evaluating alternative ways of meeting the management requirements is as follows:

1 Identify the desired "end" for each management requirement

2 Assemble existing information about the resources addressed by the management requirement.

3 Analyze the existing information to determine what conditions or specifications need to exist on-the-ground to assure meeting the "ends" of the management requirement. (See Table J-1.)

4. Develop various ways or means to meet the management requirement. (See Table J-2)

5. Evaluate the effectiveness of the alternative means in meeting the management requirements Estimate the environmental effects of each set of means.

6 For each set of means, estimate the effects on economic efficiency (as measured by changes in present net value) and the effects on timber availability (as measured by allowable sale quantity)

7 Where opportunity costs of meeting a management requirement exceed two percent of PNV or ASQ of the present net value benchmark, the analysis used to select the means are presented Two percent was used because differences less than two percent would not be significant in terms of opportunity costs of alternative means. A higher threshold would preclude evaluation of many alternatives.

For discussion purposes, opportunity costs are reductions in present net value (PNV) and reductions in allowable sale quantity (ASQ) that result from implementing resource protection measures (means or ways) to meet the management requirements set forth in NFMA regulations. In order to provide protection for water quality and wildlife habitat on Siskiyou National Forest land, some opportunities to maximize present net value or to maximize timber production must be foregone.

Discussions are grouped by water quality management requirements and by wildlife management requirements in separate sections. In each section, the management requirements are displayed along with relevant specifications from national and regional guidelines, and alternative implementation methods (means or ways) are analyzed.

Table J-1 summarizes each of the management requirements (ends) subject to analysis of opportunity costs on the Siskiyou National Forest and summarizes the specifications or standards of achievement for those ends. Table J-2 shows the alternative means considered for implementing each management requirement where the opportunity costs exceeded two percent.

Table J-1. Summary of Management Requirements and Associated Specifications.

Ends	Summary of Specifications
Protect water quality	Temperature increases of two degrees Fahrenheit or less.
Habitat provided that maintains viable populations of existing native and non-native vertebrate species	
- Pileated Woodpecker and Pine Marten	Maintain mature conifer stands (for nesting and feeding) of adequate size and distribution to permit interaction among breeding pairs of dependent species. [See Tables J-6 and J-7.]
- Northern Spotted Owl	Maintain old growth conifer stands (for nesting and feeding) of adequate size and distribution to permit interaction among breeding pairs of dependent species

Table J-2 Summary of Alternative Means Considered for Implementing Each Management Requirement

Management Requirements	Alternative Means
Protect streams and streambanks	Set-aside stream side streambanks vegetation (no scheduled timber harvest) Selective harvest of streamside vegetation (scheduled timber harvest)
Provide for adequate habitat to maintain viable populations of existing native and desired non-native vertebrate species	
- Pileated Woodpecker and Pine Marten	Dedicate habitat sites for no timber harvest Manage habitat sites on 140-year rotations
- Northern Spotted Owl	Dedicate habitat sites for no timber harvest Manage habitat sites on 300-year rotations

In analyzing the effects of the alternative means of meeting the MR's on present net value (PNV) and allowable sale quantity (ASQ), FORPLAN runs were made with and without constraints designed to simulate meeting the management requirement. The PNV benchmark was used for this analysis. This benchmark is a FORPLAN run which identifies the mix of management activities which would result in the highest level of economic efficiency (i.e., the highest PNV) in managing Siskiyou National Forest resources. It also identifies the ASQ associated with the most economically-efficient mix of management activities

A benchmark was chosen to use in the with and without constraint comparison, rather than an issue-based Forest Plan alternative, because management practices necessary to meet other objectives of the issue-based alternatives may partially or fully meet the MR, thus clouding any analysis of opportunity costs induced by the management requirement. The true effect when measured against a fully developed alternative is significantly less because the objectives of that alternative may satisfy the management requirements to a large extent.

IMPLEMENTATION METHODS WITH HIGH OPPORTUNITY COSTS

Table J-3 displays the opportunity costs of the implementation measures selected for meeting management requirements on the Siskiyou National Forest. Only those implementation measures with opportunity costs of two percent or larger are shown: water quality, mature conifer (for pileated woodpecker and pine marten) and old-growth conifer (for spotted owl)

IMPLEMENTATION METHODS WITH LOW OPPORTUNITY COSTS

Management requirements for other wildlife habitat requirements for threatened and endangered species, sensitive species (except spotted owl), special habitats, and dead and defective tree habitat are not addressed in this analysis because opportunity costs of providing sufficient habitat to maintain viable populations are less than two percent.

IMPLEMENTATION METHODS THAT MEET MORE THAN ONE MANAGEMENT REQUIREMENT

Implementation methods selected to meet water quality management requirements also provide fish habitat in streams and riparian habitat adjacent to streams to assure the maintenance of viable populations of species dependent on these habitats. In addition, the water quality implementation methods meet the harvest dispersion management requirement. Alternative implementation methods for meeting water quality management requirements will also meet fish habitat and riparian habitat requirements No additional discussion or analysis is displayed in Appendix J for these management requirements.

WATER QUALITY MANAGEMENT REQUIREMENTS

SOURCE OF THE WATER QUALITY MANAGEMENTS REQUIREMENTS

Management requirements for water quality are based on NFMA which states: Forest planning shall provide for compliance with requirements of the Clean Water Act, the Safe Drinking Water Act, and all substantive and procedural requirements of Federal, State, and local governmental bodies with respect to the provision of public water systems and the disposal of waste water [36 CFR 219.23(d)].

Special attention shall be given to land and vegetation for approximately 100 feet from the edges of all perennial streams, lakes and other bodies of water. This area shall correspond to at least the recognizable area dominated by the riparian vegetation. No management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment shall be permitted within these areas which seriously and adversely affect water conditions or fish habitat [36 CFR 219 27 (e)].

The Clean Water Act seeks to control nonpoint sources of water pollution To comply with Section 208 of the Act, Forest Service Region Six, the states of Oregon and Washington (which manage implementation of the Act in the respective states), and the Environmental Protection Agency agreed on a process whereby each state reviews Forest Service management practices to determine if they meet or exceed state water quality standards. Practices that are judged to meet or exceed the standards are certified as Best Management Practices (BMP's) which the Forest Service then agrees to continue

Table J-3. Opportunity Cost of Meeting the Management Requirements with the Selected Implementation

Selected Implementation Method	First Decade ASQ MMCF/Year (MMBF/Year)	Change in ASQ 1/ Percent	PNV MM $	Change in PNV Percent
PNV Benchmark with No Protection Measures	39 8 (215 3)	–	1,814 6	–
Opportunity Cost of Water Quality	5 2 (28 1)	13	228 0	13
Opportunity Cost of Mature Conifer for Pileated Woodpecker and Pine Marten	1 0 (5 5)	3	54 7	3
Opportunity Cost of Mature Conifer and Old Growth for Spotted Owl	1 7 (9 1)	4	89 3	5

1/ Percent change calculated on cubic foot basis

SPECIFICATIONS FOR THE WATER QUALITY MANAGEMENT REQUIREMENTS

State of Oregon water quality standards (Oregon Administrative Rules 340-41-205 through 325) provide specifications to be met by implementation methods selected by the Forest. They are summarized below:

1. Dissolved oxygen concentration shall not be less than 90 percent of saturation at the seasonal low, or less than 95 percent of saturation in spawning areas, during spawning, incubation, hatching, and fry stages of salmonid fishes.

2. No measurable increases shall be allowed ..when stream temperatures are 58 degrees Fahrenheit or greater .or more than two degrees Fahrenheit increase due to all sources combined when stream temperatures are 56 degrees Fahrenheit or less...

3. No more than a 10 percent cumulative increase in natural stream turbidity shall be allowed, as measured relative to a control point immediately upstream of the turbidity-causing activity

4. pH values shall not fall outside.. 6.5 to 8 5.

On the Siskiyou National Forest, most of the activities which affect water quality are related to timber harvesting. They include removal of trees, road construction, and burning of brush and organic debris (For more discussion, see FEIS, Chapter IV, "Soil and Water" section)

The primary approach to maintaining water quality on Siskiyou National Forest lands is to. (1) limit or prohibit timber harvest on certain unstable slopes (by designating such lands as unsuitable for timber production), (2) disperse timber harvest through time and space to avoid potential for cumulative impacts, and (3) on lands designated suitable for timber production, maintain sufficient shade producing vegetation along stream banks to maintain stream temperatures within acceptable limits.

Scheduling harvest from unsuitable lands would not be consistent with NFMA. Timber harvest is dispersed to meet the Management Requirement by limiting harvest in each planning basin to no more than 20 percent of the area; opportunity costs are negligible at this level. Maintaining sufficient vegetation to meet temperature requirements is the subject of additional examination here.

In the FEIS, the specifications established by the Forest are called Standards and Guidelines. The required watershed condition, and the standards that indicate achievement of the water quality management requirement, are described in the Land and Resource Management Plan, Chapter IV. The following specifications are addressed in this appendix.

Riparian Area Standard and Guideline: Maintain stream temperatures. (Any increase in summer stream temperatures would violate Oregon State Water Quality Standards.)

ALTERNATIVE WAYS OF MEETING THE MANAGEMENT REQUIREMENTS FOR WATER QUALITY

Alternative ways for the meeting specifications shown above could be modeled in FORPLAN to simulate the required end conditions. These become alternative constraints in the model that set limits on how FORPLAN schedules timber harvest to maximize PNV. (FORPLAN constraints are discussed in the FEIS, Appendix B, "Development of Management Requirements ") The following alternatives were considered:

ALTERNATIVES CONSIDERED IN DETAIL

Alternative 1: Set-aside Shade Producing Streamside vegetation (no scheduled timber harvest).

This alternative is designed to minimize vegetation disturbance and schedules no timber harvest in riparian areas No shade providing vegetation would be removed by timber harvest in riparian areas.

Alternative 2: Selective Harvest of Shade Producing Streamside vegetation (scheduled timber harvest).

This alternative allows a moderate level of removal of shade producing vegetation from the riparian area. A maximum of 70 percent and 30 percent removal of the basal area from Class III, and Class I and II streams are allowed. The actual average harvest used for the FORPLAN model was 50 percent and 20 percent removal because the maximum amount of timber could not be removed in all cases. This alternative is designed to maintain existing water temperatures in streams within a planning basin as regrowth of shade producing vegetation (previously removed as a result of past activities) balances removal associated with new projects. These prescriptions are applied to a basin as a whole and the expected results are viewed as a net change over time. This riparian management option is designed to produce zero net change over time.

EVALUATION OF IMPLEMENTATION METHODS TO MEET WATER QUALITY MANAGEMENT REQUIREMENTS

Either of the alternative means or implementation methods noted above would meet management requirements and warranted more detailed analysis

OPPORTUNITY COSTS

The opportunity costs of implementation methods for meeting water quality management requirements were estimated by comparing the differences in PNV and ASQ that would occur with and without the constraints that simulate the means for accomplishing the required condition

Table J-4 compares the PNV and ASQ opportunity costs of the alternative implementation methods (means) for water quality protection.

Table J-4 Opportunity Costs Associated with Alternative Means for Meeting the Water Quality Management Requirements

	First Decade ASQ MMCF/Year (MMBF/Year)	Change in ASQ 1/ Percent	PNV MM $	Change in PNV Percent
PNV Benchmark with no Protection Measures	39 8 (215.3)	–	1,814 6	–
Opportunity Cost of Meeting Management Requirements with Alternative 1 (No Vegetative Removal)	27 3 (39 3)	18	320 0	18
Opportunity Cost of Meeting Management Requirements with Alternative 2 (Moderate Vegetative Removal)	5.2 (28 1)	13	228 0	13

1/ Percent change calculated on cubic foot basis

CONSEQUENCES OF ALTERNATIVE WAYS OR MEANS OF MEETING WATER QUALITY

The opportunity costs of the option of removing no vegetation from the riparian areas is approximately five percent greater than the moderate shade removal alternative. This alternative would go beyond meeting the requirement of protecting stream temperatures; over time, the temperature would be enhanced (lowered) as more shade would be provided. In those basins where past activities have removed substantial shade producing vegetation along streams, the no vegetative removal alternative could enhance fish habitat

RATIONALE FOR THE SELECTED IMPLEMENTATION MEANS

Implementation methods (means) for meeting the management requirements for water quality are based on practices that existed before the NFMA regulations. Consequently, interpretations and processes for meeting these requirements are already established on the ground.

Alternative 2 represents current practices consistent with the Siskiyou Riparian Policy This policy has evolved over a number of years incorporating results of scientific research as methodology and expertise become available. The stream temperature modeling has been facilitated by work pioneered on this Forest using a solar pathfinder to correlate changes in the vegetation (growth or removal) with changes in actual stream shade during critical times of the year The riparian policy has developed with the involvement of experienced resource professionals from all disciplines and has been the object of numerous field reviews attended by professionals from all levels of the Forest Service, as well as university faculty members, representatives from the timber industry, the State of Oregon, and other interested publics The Siskiyou's riparian policy and

streamside management are considered state-of-the-art in multiple-use management in an area with high resource values and conflicting interests.

By implementing Alternative 2 the Forest would meet state water quality standards throughout the planning period while minimizing PNV and ASQ opportunity costs.

IMPLICATIONS FOR FOREST PLAN ALTERNATIVES

FEIS Chapter II and Appendix B discuss the effects of this alternative way of meeting water quality requirements in FEIS alternatives. The analysis of opportunity costs of selected means of water quality protection shown in Table J-4 shows the maximum PNV and ASQ effects. Actual Plan alternatives will have somewhat less opportunity costs as overlaps from lands withdrawn for wildlife, scenery, recreation or other nontimber objectives will help to provide shade producing vegetation

ROLE OF MONITORING AND RESEARCH

The assumption that leaving shade producing vegetation on riparian areas in necessary to maintain viable populations of fish is based on extensive research that describes the importance of water temperature for water quality and habitat

Continued monitoring will be done on water temperature fluctuations due to removal and growth of stream shade producing vegetation. See the Forest Plan monitoring program

MANAGEMENT REQUIREMENT FOR VIABLE POPULATIONS OF EXISTING NATIVE VERTEBRATE SPECIES

SOURCE OF THE MANAGEMENT REQUIREMENT

The NFMA regulations require that:

"Fish and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native vertebrate species in the planning area. For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure continued existence in the planning area In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area." (36 CFR 219.19)

DESCRIPTION OF THE MANAGEMENT REQUIREMENT

All vertebrate species in Region Six were assessed with regard to population numbers and/or distribution that could result in either Forest or Regional extinction during the next five decades. Management requirements were developed for species whose viability would be at risk if no management actions were taken to protect their habitats.

The focus was on habitats that were likely to be limiting in the future (in short supply either in total acreage or in distribution) and on identification of particular species that could be used to represent all species dependent on those habitats. This identification was done on a subregional basis, recognizing the variability of situations within the Region. Once these species were identified, the Region defined their habitat requirements and biological characteristics The species are included in the list of Management Indicator Species (MIS) that the Forests address in forest planning and subsequent monitoring

Table J-5 displays current Regional management requirement direction regarding limited habitats and wildlife species by sub-regional zones The Siskiyou National Forest is in Zone II (mountain goat not included)

Northern spotted owl, pileated woodpecker and pine marten are the only species for which alternative ways of meeting management requirements are evaluated. Management requirements for threatened and endangered species, sensitive species (except spotted owl), special habitats, and dead and defective tree habitat are not addressed in this analysis because opportunity costs associated with providing sufficient habitat to maintain viable populations are less than two percent. The management requirements for fish are met with the same management practices which provide the requirements for water quality and riparian area management, therefore further analysis is not provided.

Table J-5. Species Matrix for Addressing Management Requirements for Wildlife and Threatened and Endangered Species.

Zone Habitat	Zone 1 North Coastal	Zone 2 Westside Cascades	Zone 3 Eastside Cascades	Zone 4 Blue Mountains
Mature and Old Growth (Seral Stages V and VI)	*Northern Spotted Owl Pine Marten Pileated Woodpecker	*Northern Spotted Owl Pine Marten Pileated Woodpecker	*Northern Spotted Owl Pine Marten Pileated Woodpecker Northern three-toed Woodpecker	Pine Marten Pileated Woodpecker Northern three-toed Woodpecker
	*The Final Supplemental Environmental Impact Statement and subsequent Record of Decision provide direction for management of spotted owl habitat in Region Six			
Dead and Defective	Primary Cavity Excavators	Primary Cavity Excavators	Primary Cavity Excavators	Primary Cavity Excavators
Riparian	The Forest determined and documented as part of the planning records, whether it needed to address wildlife in addition to fish, and if so which wildlife species would represent the riparian habitat Coordination of this process with adjacent Forests was necessary to determine consistency			
Big Game		Mountain Goat	Mountain Goat (Wenatchee)	
Threatened and Endangered Species	Bald Eagle Peregrine Falcon Brown Pelican Aleutian Canada Goose	Bald Eagle Peregrine Falcon	Bald Eagle Peregrine Falcon Grizzly Bear Woodland Caribou (Colville)	Bald Eagle Peregrine Falcon

HABITAT NEEDS

Once the species needing management requirements were identified, the Region defined habitat requirements and biological characteristics These are the basis for providing habitat and also for deciding how best to represent the species' needs in the planning process and in the FORPLAN Model

Habitat needs were defined using information from existing research whenever possible (see bibliography). This information was used to define the habitat conditions, habitat dispersal, and habitat size necessary to meet the management requirement. When information was available, but did not fit exactly the management requirement context, professional judgement was used to apply the information in estimating habitat needs. When information was not available, habitat needs were developed using professional judgment of a number of the more knowledgeable biologists on the subject Information from existing research was used whenever possible (Note: Habitat needs of spotted owls are described in the Final Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide, USDA Forest Service 1988).

Specific information on habitat needs, specifications for meeting habitat requirements, and alternative ways of meeting the management requirements for pine marten, pileated woodpecker, and spotted owls are presented in the following sections For each species, information is provided for these three habitat factors:

Principal Habitats Used

Information about the seral stages and Kuchler vegetation types which are used by the various species is documented in many research papers for individual species. Information as to which Kuchler type and/or seral stage are primary or secondary habitat, and the amount of dependency upon each habitat, is based mostly on professional judgment (Guenther and Kucera 1978, Phillips and others, 1981).

Dispersal Distance Between Habitats

Usually no research information is available for optimum dispersal distance between habitats As a result, dispersal distance is often determined on the basis of observations, experience, and professional judgment Dispersal distance is based on the ability of an individual species to travel to the next habitat often enough to prevent isolation of sub-populations Distances are adjusted to consider the network and overlap of habitat formed by the species (e.g , pileated woodpecker and pine marten).

Size of Habitat Areas

The size of individual habitat areas provided for each wildlife species is based on the habitat acreage needed to support the basic social or reproductive unit of the species, i.e., breeding pairs. Both home range and species density information are used to estimate the needed size of habitat area. This was supplemented with professional judgement where no data were available for the specific habitat types being managed

SPECIFICATIONS FOR MEETING HABITAT REQUIREMENTS FOR PILEATED WOODPECKER AND PINE MARTEN

Approximately 40-50 wildlife species are known to depend on or prefer mature conifer habitat during some part of their life cycleon the Siskiyou National Forest. By providing a dispersion of mature conifer habitat sites for the pileated woodpecker and pine marten, we are assuming that the other species preferring mature conifer habitats will have adequate habitat to maintain viable populations throughout the planning period

Regional specifications for pileated woodpecker and pine marten are discussed in the following sections The specifications are summarized from "A Report on Minimum Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, USDA Forest Service" (USDA Forest Service, June 1986). In developing the report, various habitat sizes and dispersal distances were considered. Based on that analysis, minimum habitat sizes and maximum dispersal distances were identified for each species. This information is based on the best available data. Alternatives which addressed changes to size or distribution were not considered in developing the Forest Plan for the Siskiyou National Forest.

Habitat specifications for pileated woodpecker and pine marten are summarized in Tables J-6 and J-7.

PILEATED WOODPECKER SPECIFICATIONS

Principal Habitats Used

Pileated woodpeckers need mature or old growth stands of timber for nesting and feeding Habitats were identified in Bull and Meslow (1977), Guenther and others (1978), and Thomas (1979).

Dispersal Distance Between Habitats

An initial five-mile maximum dispersal distance between habitats resulted from professional judgment documented in Phillips and Roberts (1985). In June of 1986, the distance between habitats was modified to one habitat area for every 12,000 to 13,000 acres (about five miles apart) to allow greater flexibility in application.

Size of Habitat Areas

The size of nesting areas in Region Six for the pileated woodpecker has been identified as a range of 100 to 540 acres. To meet the needs of pileated woodpeckers both east and west of the Cascades, 300 acres of old growth or mature timber for nesting area, plus 300 acres of feeding area was defined as a Region-wide requirement. Three hundred acres of nesting area appears to be an average for different habitats As more data specific to westside and eastside habitats (eastside may be further subdivided) become available, the size of the nesting area may be adjusted (Bull and Meslow, 1977; Bull, 1975; Mannan, 1982; Mellen, 1986). A 1,000-acre unit was established as the minimum size territory that a pair of woodpeckers would defend. This was determined from research data. Snag size and density were taken from Thomas (1979), and acreage figures from Bull (1975), and Bull and Meslow (1977) See Table J-6 for summary of habitat specifications,

Table J-6 Pileated Woodpecker Habitat Requirements.

	Principal Habitats Used	Dispersal Distance Between Habitats	Size of Area to which Wildlife Prescriptions Apply	Habitat Requirements to be Used in Analyses
	Zone II (West Cascades)1/	One habitat area for every 12,000 to 13,000 acres	600 acres/pair	Within a 1,000-acre unit
A	Reproducing Seral Stages V and VI of Kuchler types K2, K5, K6, K29, and riparian			Maintain 300 acres of conifers in seral stages VI and/or V, per pair for reproducing Maintain a minimum average of two hard snags per acre greater than or equal to 12 inches dbh within the 300-acre reproductive area Forty-five of these 600 snags should be greater than or equal to 20 inches dbh
B	Feeding All seral stages of Kuchler types listed for reproducing habitat, provided snags are present			When possible, maintain reproductive area in 300 contiguous acres If not possible, habitat may be arranged in blocks no less than 50 acres and no more than 1/4 mile apart. Maintain a minimum average of two hard snags per acre greater than or equal to 10 inches dbh on an additional 30 acres for feeding

1/ Siskiyou National Forest is in Zone II, Westside Cascades Principal habitats used vary by zone in the Region

Table J-7. Pine Marten Habitat Requirements.

	Principal Habitats Used	Dispersal Distance Between Habitats	Size of Area to which Wildlife Prescriptions Apply	Habitat Requirements to be Used in Analyses
	Zone II (West Cascades)1/	One habitat area for every 4,000 to 5,000 acres	160 acres per habitat area (This figure represents the territory of one female and part of the territory for a male)	Maintain 160 contiguous acres of conifer in seral stages V or VI with a crown closure 59 percent or greater
A	Reproducing			
	Seral stages V and VI of Kuchler types K2, K5, K6, K29			Within the 160-acre unit
				Maintain an average of two hard snags per acre greater than or equal to 12 inches dbh Twenty-four of these 320 snags should be greater than or equal to 20 inches dbh
B	Feeding			
	Seral stages III-IV of Kuchler types listed for reproducing habitat			Maintain a minimum average of Six down logs per acre at least 12 inches dbh and 20 feet long

1/ Siskiyou National Forest is in Zone II, Westside Cascades Principal habitats used vary by zone in the Region

PINE MARTEN SPECIFICATIONS

Principal Habitats Used

The pine marten uses seral stages III-VI--closed sapling-pole, large mature, and old growth (Thomas, 1979; Guenther and Kucera, 1978, Phillips and others, 1981). The Kuchler types used are from Guenther and Kucera (1978) The principal habitat for pine marten is seral stages V and VI (mature and old growth).

Dispersal Distance Between Habitats

Burke (1982) recommends that the maximum dispersal distance between habitat areas for pine marten should be two miles. In 1984 the Regional Forester changed the dispersal distance from two miles to three miles. This change was made because it was felt where more than one adjacent habitat is available for dispersal, the dispersal distance can be extended to three miles for pine marten This change has been reviewed by a number of biologists within and outside the Forest Service and most agree that it would appear not to create a population viability problem for represented species. In June of 1986, the dispersal distance specification for pine marten habitat was changed to one habitat for every 4,000 to 5,000 acres (about three miles apart) to allow greater flexibility in application.

Size of Habitat Areas

In the professional judgment of the biologists listed in Phillips and Roberts (1985), a breeding female pine marten can be supported on 160 acres of quality habitat Research is variable as to the size of area needed, but the female pine marten home range is estimated to be 160 acres (Campbell, 1979). The biologists listed in Phillips and Roberts (1985) judged that this area should be contiguous to ensure that there would be enough habitat within the home range of the female. They also judged that crown closure should equal or exceed fifty percent Research papers indicate that areas with a low percent crown closure receive little or no use by pine marten Therefore, to ensure an adequate crown closure, a minimum requirement of 50 percent closure was selected.

Research shows that pine marten require dead and down material for foraging, cover, and denning. Six down logs/acre (Burke, 1982) was selected as the minimum down material requirement. The number and size of snags required was selected to ensure that the amount of down material was achieved. The specifications for pine marten habitat are summarized in Table J-7.

ALTERNATIVE WAYS OF MEETING THE MANAGEMENT REQUIREMENT FOR PILEATED WOODPECKER AND PINE MARTEN

On the Siskiyou National Forest, mature conifer habitat is defined as a stand of predominantly conifers which are over 100 years old.

Habitat areas for pine marten and pileated woodpeckers were mapped using Regional spacing, size, and habitat suitability criteria. Pine marten sites are to be located every 4,000 to 5,000 acres and pileated woodpecker sites every 12,000 to 13,000 acres.

Whenever possible, sites were placed within Wilderness, Wild Rivers, RNA's, other areas unsuitable for timber production, and in areas of reduced harvest levels, wherever these met habitat quality and distribution requirements.

Table J-8 summarizes the number of mature conifer sites for pileated woodpecker and pine marten located by unsuitable and tentatively suitable timber land. The total areas for pine marten include taking credit for pine marten habitat in pileated woodpecker and spotted owl areas; the total for pileated woodpecker also counts the pileated habitat in the owl areas

Table J-8. Mature Conifer Habitat Sites.

Species	Every M Acres Distribution Requirements	Sites Unsuitable Timber Land	Sites Suitable Timber Land
Pine Marten	4-5	136	73
Pileated Woodpecker	12-13	79	45

Once the minimum number of habitat sites was determined using Regional spacing and habitat suitability specifications, the Forest considered two options for providing mature conifer habitat. One was to dedicate the required number of acres of suitable habitat in each site. These areas would not be managed for timber production and would be expected to remain in suitable habitat condition for several decades The second option was to manage timber stands on a larger area in order to harvest timber and produce replacement stands over time.

Alternative 1: Dedicated Sites

Under a dedicated mature conifer strategy, the required amount of mature conifer is withdrawn from timber production. Dedication of mature conifer sites has the advantage that the location of the stand does not change over time, making implementation less complicated. Dedication also assures that desired structural characteristics will be available for wildlife. There may be some risk of loss of individual stands through catastrophe.

Alternative 2: Managed Sites

This option involves the projection of long rotations on enough acres to maintain the necessary habitat through time, with all areas being rotated. The "normal" rotation age for stands in General Forest is projected to be about 100 years Production of mature conifer habitat is expected to take around 100 years, rotations

of 140 are used to model a managed regime providing mature habitat from age 100 to 140 This means that for every acre of suitable habitat, 2-1/2 acres would be managed as replacement stands when the original acre is harvested.

Management of mature conifer sites assumes that existing stands can be harvested as other stands grow into a mature conifer condition to replace them. If replacement stands fail to develop desired structural characteristics (ie large diameter snags and down material) as predicted, mature conifer habitat would either be lost for a period of time or further delay in harvesting the existing mature conifer stands would occur.

Analysis of Opportunity Costs

The opportunity costs of designating the habitat areas (selected method) are displayed in Table J-3 The examination of opportunity costs and efficiency of the option for providing mature forest habitat through managed rotated stands is accomplished though an evaluation of per-acre timber production and economic efficiency of the possible regimes. The analysis if based on a Forest-wide evaluation, however, specific FORPLAN runs were not used to make a comparison (Forest-wide ASQ and PNV effects are not computed) This analysis has been explained in detail in Appendix B, Development of Management Requirements, and is summarized briefly here

The minimum time required to produce mature forest habitat is 100 years. At that time the average replacement area would contain more volume than the original habitat area. Rotating the areas would result in less timber yield than harvesting the replacement area and leaving the original area to continue providing habitat Table J-9 compares the empirical yield table volumes after 100 years with the volumes from the intensive managed yield tables at age 100

Table J-9 Comparison of Volumes After 100 Years.

Site	Volumes After 100 Years (MCF)	
	Empirical	Managed
High	9 226	11 830
Medium	5 049	9 704
Low	3 687	3 225 1/

1/ Low site would not provide mature Forest habitat at this age

Consequences of the Different Ways of Meeting the Management Requirements

Populations of pileated woodpeckers and pine marten would not be expected to differ significantly under either alternative Both would maintain the same amount and distribution of habitat. There are, however, differences in the opportunity costs as dedication of habitat areas would have the least impact on timber outputs and therefore PNV.

Rationale for the Selected Method

The Siskiyou National Forest chose to provide mature conifer habitat by dedicating sites where needed on tentatively suitable timber land. This alternative achieves the desired habitat with the least effect on timber outputs and is an economically efficient way of meeting the management requirement Modeling these areas as designated for this planning period does not preclude future planners from designating replacement areas as substitution opportunities can be identified (i e., some existing pole stands could be substituted for originally designated area by the 5th decade). Whether areas are modeled as designated or rotated, there would be little difference in implementation for the first planning period

Implications for Forest Plan Alternatives

Plan alternatives were designed to address public issues. As a result most alternatives, including the preferred, incorporate objectives for retention of mature and old growth timber for a variety of reasons, such as wildlife, scenery, and recreation. Pine marten and pileated woodpecker areas overlap with areas selected for other purposes (such as unroaded recreation areas and special interest areas) wherever these sites meet habitat suitability and distribution requirements Methods resulting in the opportunity cost shown in Table J-3 would benefit other resource uses as well.

Role of Monitoring and Research

The Forest Monitoring Plan (Forest Plan Chapter V) calls for monitoring populations and habitats of pileated woodpeckers and pine marten. At scheduled plan reviews, monitoring data will be considered in determining the suitability and effectiveness of the selected method for meeting the management requirement for viable populations This will be an important test of the appropriateness of the selected modeling assumptions.

Information needs for both pine marten and pileated woodpecker include·

1. Dispersal distances:
   a. How far can juveniles successfully disperse?
   b. As habitat becomes increasingly fragmented, what is the ability of dispersing individuals to locate habitat islands?
   c What effect does the size of habitat areas have on the ability of dispersing individuals to locate these sites?

2 Size of mature conifer habitat sites·
   a. Occupancy and use of habitat sites, particularly as the sites become more isolated.
   b. Reproductive success within habitat sites.
   c. Home range size in fragmented forests.

3. Utilization and reproductive success of pine marten and pileated woodpeckers in mature conifer sites managed on a 100 year rotation (ie. are managed sites meeting habitat needs as compared to natural stands).

4. Population density, home range size and distribution of pine marten in southwest Oregon

SPECIFICATIONS FOR MEETING THE HABITAT REQUIREMENTS FOR NORTHERN SPOTTED OWL

Specific Regional direction for the northern spotted owl is found in the Final Supplement to the Environmental Impact Statement (FSEIS) for an Amendment to the Pacific Northwest Regional Guide released in August, 1988. In response to an appeal of the R-6 Regional Guide, the Supplement was prepared to address planning direction for spotted owl habitat management Standards and guidelines adopted as a result of the Supplement will be used by National Forests in the Region to meet the management requirement to maintain viable populations of spotted owls.

The Final SEIS was prepared after a series of public meetings and study of the nearly 42,000 comments received on the Draft Supplement issued in the summer of 1986. A summary of the analysis of public comments, substantive comments, and copies of letters received from government agencies and elected officials can be found in Appendix G of the FSEIS.

The Forest Service Preferred Alternative (F) directs that the amount of suitable habitat at each designated SOHA will vary by physiographic province. Specific criteria were followed in locating designated SOHA's on

the Siskiyou Current distribution of owl habitat on lands unsuitable for timber production was evaluated for adequacy of distribution SOHA's were designated on lands suitable for timber production only where necessary to meet distribution standards Standards and Guidelines for the Forest Service preferred alternative (F) are briefly summarized in the following discussion Chapter II of the Final Supplement should be reviewed for a detailed description of the direction. These Regional Standards and Guidelines provide specifications or standards for achievement of management requirements for northern spotted owls

1. **Amount of suitable habitat in designated habitat areas.** Designated habitat areas shall contain the following amount of suitable habitat in the Klamath Mountain physiographic province. 1000 acres within 1.5 miles of the nest site... Habitat shall occur as one contiguous stand if possible or, as a 300-acre stand containing the known or suspected nest site with the remaining habitat as contiguous as possible. Each stand shall be larger than 60 acres.

2 **Spacing of Designated Habitat Areas:** Designate habitat areas where· greater than six miles separates areas which occur in reserved lands or in lands unsuited for timber production, and which are capable of supporting less than three breeding pairs of spotted owls; or where greater than 12 miles separates such areas capable of supporting three or more pairs.

3 **Threatened and Endangered Species:** No spotted owl habitat management activities shall adversely effect Federally listed threatened or endangered species or their habitat.

4. **Identification of Suitable Habitat** Suitable habitat shall be identified in Forest Plans according to the *general definition in the spotted owl Final Supplement and with concurrence by the Regional Forester*

5. **Management of Habitat.** Spotted owl habitat can be provided through prescriptions using even-aged or uneven-aged silvicultural systems, or no scheduled harvest. Prescriptions to be used and where they will apply shall be specified in the Forest Plans.

6. **Location of designated Habitat Areas:** Designate habitat areas only on lands suitable for timber production as needed to meet spacing standards.

7 **Priority for Locating Designated Areas:** Priority for locating designated areas follows status of occupancy by spotted owls The highest priority is given to locations with verified occupancy by spotted owl pairs; next highest to locations with confirmed sightings of owls; lowest priority to locations where the presence or absence of owls is unknown.

The Final Supplemental Environmental Impact Statement (FSEIS) to the Regional Guide (for spotted owl habitat management guidelines) does not include the number of designated habitat areas as part of any alternative. The number of habitat areas are not specified in the Regional Guide, but will be a consequence of applying standards and guidelines in Forest Plans.

ALTERNATIVE WAYS OF MEETING THE MANAGEMENT REQUIREMENTS FOR NORTHERN SPOTTED OWL

The Forest considered two ways or means for providing spotted owl habitat One is to dedicate the required number of acres of suitable habitat in each site These areas would not be managed for timber production and would be expected to remain in suitable spotted owl habitat over time. The second way is to manage timber stands through long rotations in order to produce replacement stands over time. The Siskiyou National Forest chose to provide spotted owl habitat by dedicating the required amount of habitat.

Alternative 1: Dedicated Sites

Under a dedicated habitat strategy, each acre of spotted owl habitat is withdrawn from timber production. Dedication of existing stands assures that desired structural characteristics will be available, but may risk loss of individual stands through catastrophe or decay Recent literature on old-growth suggests this risk is much less than once thought.

Alternative 2: Managed Sites

Management of sites assumes that existing old growth stands can be harvested as they are replaced by other stands that grow into an old-growth condition Delay in harvesting the existing old-growth stands would occur if replacement stands fail to develop desired structural characteristics on schedule Management of old growth on a harvest basis and replacing it removes structural characteristics important to old-growth and may hasten the decline of the residual stand (Franklin 1981).

Analysis of Opportunity Costs

The opportunity costs of designating the habitat areas (selected method) are displayed in Table J-3. The examination of opportunity costs and efficiency of the option for providing mature forest habitat through managed (rotated) stands is accomplished though an evaluation of the per-acre timber production and economic efficiency of the possible regimes The analysis summarized briefly here is similar to that described for mature forest habitat above and is explained in detail in Appendix B, Development of Management Requirements.

The minimum time required to produce old-growth forest habitat is 200 years. At that time the average replacement area would contain more volume than the original habitat area. Rotating the areas would result in less timber yield than harvesting the potential replacement area and leaving the original area to continue providing habitat. Dedicating the habitat minimizes the opportunity costs of ASQ and PNV.

Consequences of the Different Ways of Meeting the Management Requirements

Populations of spotted owls would not be expected to differ significantly under any of the options available to meet the management requirement. There are, however, differences in the opportunity costs.

Rationale for the Selected Method

The Siskiyou National Forest chose to provide spotted owl habitat by dedicating habitat sites. This alternative maintains necessary habitat, and has the least effect on timber outputs; it is an economically efficient way of meeting the management requirement with the least opportunity costs

The dedicated habitat approach has the advantage that the location of the habitat site does not change over time, making implementation less complicated than continuously relocating the habitat site as the stands are harvested and replaced.

Implications for Forest Plan Alternatives

Plan alternatives were designed to address public issues. As a result most alternatives, including the preferred, incorporate objectives for retention of old-growth and mature timber for a variety of reasons, such as wildlife, visual, and recreation To the extent possible, spotted owl habitat areas overlap with areas selected for other purposes (such as Wilderness, unroaded recreation areas, special interest areas and other lands determined as not appropriate or unsuited for timber production), wherever these meet habitat suitability and distribution requirements. The analysis of opportunity costs of selected means of spotted owl protection displayed in this appendix are gross PNV and ASQ effects caused by the selected implementation methods.

The costs do not take into account any overlap that may occur among implementation methods where lands selected for spotted owl habitat may also meet other wildlife, scenery or recreation objectives on lands suitable for timber harvest.

Role of Monitoring and Research

The Forest Monitoring Plan (Forest Plan Chapter V) calls for monitoring populations and habitats of spotted owls.

The Final Supplemental Environmental Impact Statement to the Regional Guide (Appendix D) identifies specific monitoring and research needs and describes how the information will be obtained. Intensive inventory, monitoring, and research being conducted by the Spotted Owl Research, Development, and Application Program will provide new information This should allow an opportunity to re-evaluate and possibly adjust management direction within five years.

LITERATURE CITED

Bull, Evelyn L. and E Charles Meslow. 1977. Habitat requirements of the pileated woodpecker in Northeastern Oregon. Journal of Forestry 1975 (6). p. 334-337.

Bull, Evelyn L. 1975 Habitat utilization of the pileated woodpecker, Blue Mountains, Or M.S. Thesis OSU, Corvallis. 58 p

Burke, T.E. 1982. Marten Unpublished manuscript. Colville National Forest, Washington.

Campbell, T.M. 1979 Short-term effects of timber harvest on pine marten ecology. M S Thesis Colorado State University Ft.Collins, Colorado. 71 p.

Franklin, Jerry F *et al.* 1981 Ecological characteristics of old-growth Douglas-fir forests. Gen Tech. Rep. PNW-118. USDA Forest Service Pacific Northwest Forest and Range Experiment Station

Guenther, K and T. Kucera. October 1978. Wildlife of the Pacific Northwest USDA Forest Service, Pacific Northwest Region.

Mannan, R W 1982. Territory size and habitat preferences of pileated woodpeckers in Western Oregon. OSU Corvallis Ag. Exp Stat Tech. Paper 000

Mellen, T K. 1987. Home range and habitat use of pileated woodpeckers, Western Oregon MS Thesis, Oregon State University. 96 p.

Phillips, C.A. and R. Roberts. June 4, 1985. Documentation of Wildlife MMR's USDA Forest Service Memo.

Phillips, *et al.* January 1981. Wildlife habitats and species management relationship program.

Thomas, J W. ed. 1979 Wildlife habitats in managed forests. The Blue Mountains of Oregon and Washington USDA Agric Handbook No. 553 Washington, D. C.

USDA Forest Service. June 1986. A report on minimum management requirements for Forest planning on the National Forests of the Pacific Northwest Region.

USDA, Forest Service. 1988. Final supplement to the environmental impact statement for an amendment to the Pacific Northwest Regional Guide (two volumes). spotted owl guidelines. Pacific Northwest Region, Portland, OR.

APPENDIX K

ANALYSIS OF PUBLIC RESPONSE



"Public sentiment is everything. With public sentiment, nothing can fail. Without it, nothing can succeed. Consequently, he who moulds public sentiment goes deeper than he who enacts statutes or pronounces decisions. He makes statutes and decisions possible or impossible to execute."

Abraham Lincoln

APPENDIX K

ANALYSIS OF PUBLIC RESPONSE

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RELEASE AND DISTRIBUTION TO THE PUBLIC

On August 28, 1987, the Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan (Proposed LRMP) were formally released to the public. An initial 350 copies of the document were mailed to government agencies, local libraries, and interested members of the public. A total of 750 copies were printed, all of which have been distributed In addition, a 40-page Reviewer's Digest was distributed to hundreds of individuals and a slightly condensed version titled "An Invitation to Comment" was printed and circulated to 62,000 through the local newspapers.

The comment period was originally scheduled to end on November 27 Two days after the DEIS and Proposed LRMP were released, dry lightning storms ignited fires which lasted for several months and burned over 110,000 acres of the Siskiyou National Forest. The Forest and local communities were unable to carry out the review of the DEIS as resources were committed to the fire-fighting effort Regional Forester Jim Torrence immediately extended the comment period to December 24 In response to members of the public who maintained that even more time was needed to fully analyze the draft documents and formulate comments on the proposal, the Regional Forester extended the formal review period an additional 30 days. After 150 days of review, the close of the public input period came on January 25, 1988.

During the review period, the Proposed LRMP was the featured topic at 37 open meetings attended by more than 600 people. Forest personnel attended each meeting to describe how the DEIS was prepared and to answer questions from the public. They presented an introduction to the Forest Planning process, an overview of the DEIS and the range of alternatives examined, and detailed information on the Current Direction Alternative and the Preferred Alternative. Briefings were also held in Washington, D C for Congressional aides, professional societies, and lobby groups

The Forest received a total of 16,983 responses during the review period, containing 17,277 signatures. The majority of the responses (97 percent) carried one signature One hundred fifty-one responses were unsigned Six petition responses carried 101 signatures.

Responses were received from 49 states (only North Dakota was missing), the District of Columbia, and five foreign countries (Canada, Australia, Germany, Greece, and Yugoslavia) Oregon was responsible for the greatest number of responses (10,469), followed by Illinois (1,601), Texas (1,592), Wisconsin (877), and California (649)

The majority of the responses were from individuals acting for themselves (99 percent). The second, third, and fourth largest groups of respondents were environmental/conservation groups (36 responses), timber industry (27 responses),and city/municipal officials (13 responses). Seven county officials, six state officials, and four Federal officials also responded (see Table K-1).

Campaigns initiated by interest groups resulted in the majority of responses Southern Oregon Timber Industry Association (SOTIA) generated 5,479 form letters in support of their proposed Evergreen Alternative Most of these (97 percent) came from the Pacific Northwest, with less than 14 responses coming from 8 other states. Their input accounted for 49 percent of Oregon's total response, 31 percent of California's, and 1 percent of Washington's.

Table K-1. Synopsis of Responses Received

Total Number of Responses	**16,983**
Total Number of Signatures	**17,277**
Form of Responses	
Form Letters and Coupons	15,524
Letters and Postcards	1,219
Forest Mailers	221
Resolutions	8
Petitions	6
Other	5
Who Responded	
Federal Agencies and Elected Officials	4
State Agencies and Elected Officials	6
County Agencies and Elected Officials	7
City/Municipal Governments/Officials	13
Academia	11
Professional Societies	2
Conservationists/Environmentalists	36
Civic Groups	9
Businesses	12
Timber Industry	27
Timber Resource Groups	12
Associations/Unions	5
Recreation Groups	9
Indian Tribes	1
Other	3
Individuals/Families	16,826

The most popular form of response was the form letter (91 percent), followed by the letter or post card (7 percent). Resolutions, petitions, and Forest mailers made up the remainder of the responses (see Figure K-1).

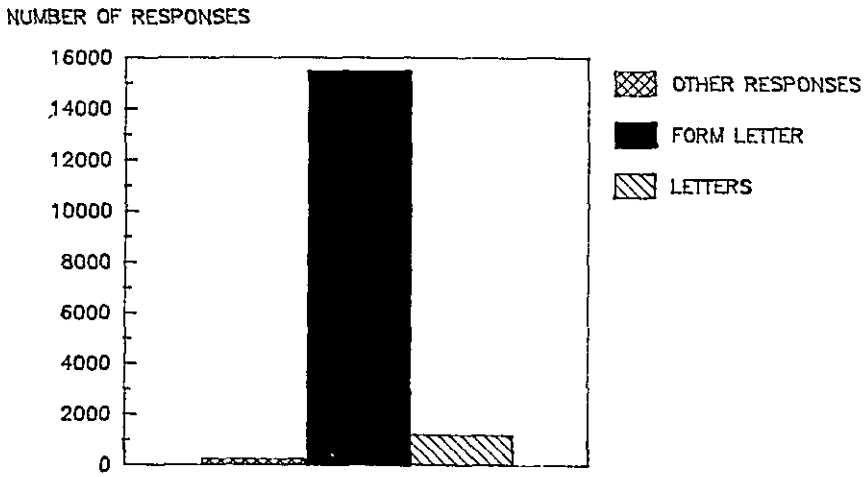


Figure K-1 Responses Received

Form letters (9,155) in response to a campaign proposing a Siskiyou National Park, on the other hand, came from nearly every state in the Nation, and constituted 33 percent of Oregon's total response, 99 percent of Illinois', 97 percent of Texas', 99 percent of Wisconsin's, and 51 percent of California's. Most of the Park campaign responses came from a few university towns in these states; the concentrated mailings are attributed primarily to one individual who made the speaking engagements on selected campuses

The number of responses received from states with the most response, and the portion of responses resulting from the campaigns by SOTIA and Siskiyou National Park proponents, are graphically depicted in Figure K-2. Similar information for the cities with the largest number of responses is depicted in Figure K-3

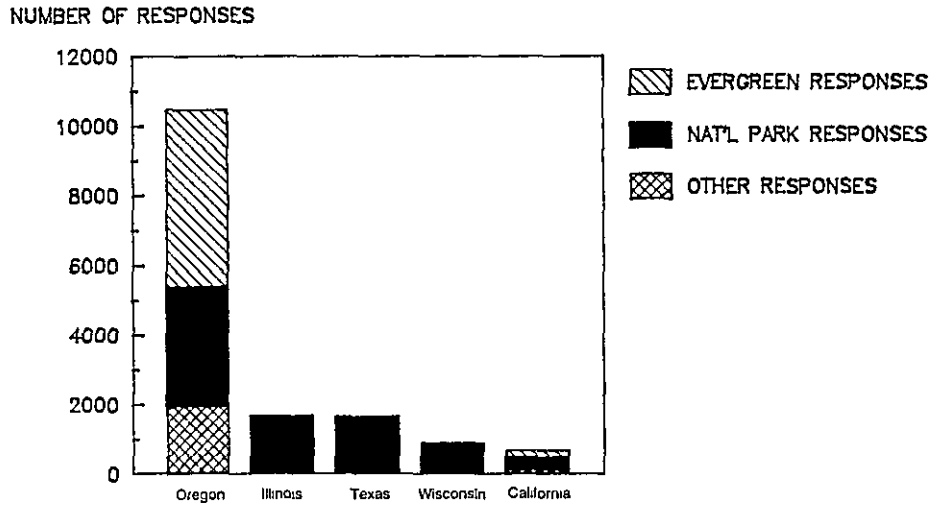


Figure K-2. States With Highest Number of Responses

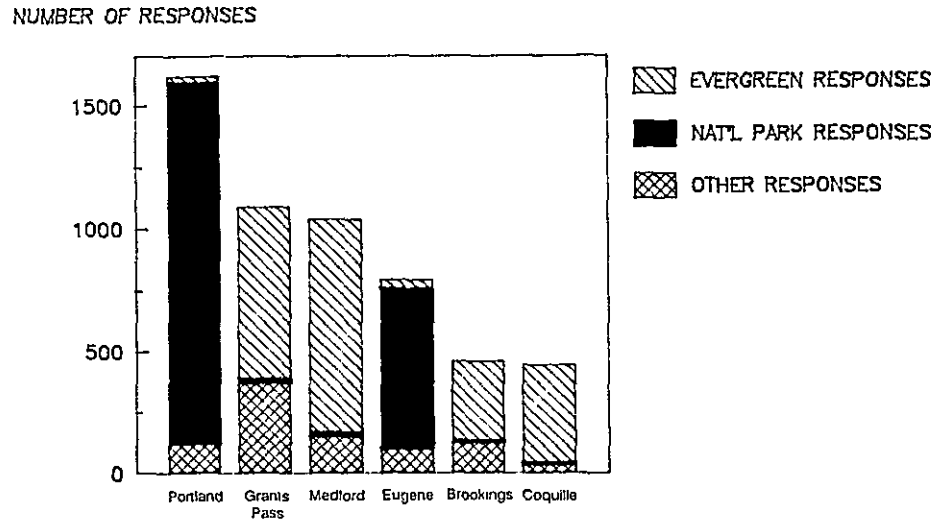


Figure K-3. Oregon Cities With Highest Number of Responses

SUMMARY OF PUBLIC COMMENT ANALYSIS

Appendix K includes a summary of the analysis of public comments, substantive comments summarized by subject matter, and copies of letters received from government agencies and elected officials.

All comments received by January 25, 1988 (the end of the 150 day formal review period) were reviewed, analyzed, and considered in preparing the Final Environmental Impact Statement (FEIS) All responses to the DEIS are available for review at the Supervisor's Office, Siskiyou National Forest, 200 N E Greenfield Road, Grants Pass, Oregon.

The largest group of respondents (23 percent) commented on the broad area of socioeconomics There was a direct correlation indicated between jobs and timber harvest levels and, as a result, community stability. This subject area also included social considerations, such as the effects on people, families, and communities, not directly economic in nature. Respondents are concerned with maintaining lifestyles and occupations consistent with family tradition.

The second largest group of respondents (18 percent) commented on timber management, an issue which continues to be highly polarized and emotionally charged. Many respondents asked that old-growth forests be protected, and unroaded areas preserved. Some feel that the level of harvest is over-optimistic, reforestation is inadequate, and yield tables project unrealistic growth Many objected to clearcutting, suggesting that monocultures are being created. Others point out the dependence of local communities on the supply of timber to maintain jobs and social and economic stability. They maintain that the Forest is capable of significantly higher timber outputs than projected in the DEIS.

Sixteen percent of respondents commented on the roadless issue, which was also very polarized. Timber and mining interests perceive a critical need to maintain a land base The environmental community feels the unroaded tracts of low elevation, coastal old-growth Douglas-fir are the last large vestiges of a rapidly vanishing ecosystem.

A large group of respondents (10 percent) commented on the issues of fisheries and water quality. They are concerned about basin constraints, riparian prescriptions, water temperature, and cumulative effects of sedimentation. Some think that the Forest is not doing enough to protect the fishery and water quality values; others think there is too much being done, resulting in less timber production.

The issues of tourism and recreation were commented on by 8 percent of the respondents Many want to develop and enhance the recreational use of the Siskiyou National Forest. Local counties have chosen tourism as their "Oregon Economic Comeback Strategy," and look for support and participation by the National Forests in this strategy. Thousands of comments urge the development of a National Park alternative, emphasizing the natural beauty and recreational opportunities on the Forest.

There was broad support for designation of the inventoried Chetco and North Fork Smith Rivers as Wild and Scenic Comments went beyond the present scope of the DEIS to include suggestions that other rivers, such as the Elk, Pistol, Winchuck, South Fork Coquille, South Fork Chetco, and South Fork Sixes Rivers be added to the National Wild and Scenic River System as well.

RESPONSE TO PUBLIC COMMENT

A substantive comment is defined as: "A comment that provides factual information, professional opinion or informed judgement germane to the action being proposed" (Forest Service Handbook 1090 5). The comments in this Appendix contain not only "substantive" comments, but also many that expressed a "resource preference" or value These were included to give the reader a feeling for the broad range of comments the Forest received.

Comments to the DEIS are grouped by general subject matter, as outlined below, and summarized because the public response has been exceptionally voluminous (see 40 CFR 1503 4(b)). Comments were extracted from the letters and may be paraphrased. Every attempt has been made to accurately capture each substantive comment and display them. The comment is presented in uppercase; the Forest Service response follows each comment. There is direct tie between the responses to the public comments and the content of the FEIS and Forest Plan. Whenever possible, a reference is made in the response to the exact location in the documents wherein the reader may find changes and (or) supporting information. Abbreviations have been used throughout the appendix; a list of acronyms can be found in the FEIS.

Many local responses expressed concern that since the Forest Plan affects local jobs and lifestyles, more emphasis should be given to those responses that came from the Pacific Northwest. Responses received from outside the Northwest held the opposing viewpoint; they stressed that the national forests belong to all Americans, thus, responses from across the nation should be considered as well.

Comments in this Appendix were included without regard to the author's location, occupation, or lifestyle. Each comment is valuable whether "substantive" or not; opinions, feelings, suggestions, and observations were all read carefully and considered. Use of public comments is not merely a vote-counting process. Each comment was weighed on its own merit against legal, technical, and resource capability constraints. Using professional judgement, the Forest assessed and considered all of the public comments, individually and collectively. The Forest will be different as a result of the comments. The issues, concerns and opportunities for the Forest were given a new emphasis as described in Chapter I of the FEIS. Many suggestions were incorporated and changes were made to the plan, as evidenced by the Preferred Alternative. Numerous suggestions were detailed and specific; many of these are not summarized in this Appendix of comments but were, nevertheless, used in making changes and improvements

The Forest responsed to comments in a variety of ways, which involved:

(1) Modifying alternatives including the proposed action.
(2) Developing and evaluating alternatives not previously given serious consideration by the agency.
(3) Supplementing, improving, or modifying the analyses.
(4) Making factual corrections.
(5) Explaining why the rationale, authorities and sources were used in the DEIS and why the Forest's position is maintained in the FEIS.

The comments and responses are further steps in a continuing dialogue with the public. Extensive public participation has been extremely valuable in improving the future of the Forest. We hope this interest will continue with participation in Forest management planning as we amend, revise, and improve the Forest Plan as new information becomes available.

LAND MANAGEMENT

ALLOCATIONS

TRANSPORTATION
- Development
- Closures
- Effects
- Other Transportation Comments

MULTIPLE USE

TIMBER MANAGEMENT

HARVEST
- Harvest Levels
- Salvage
- Silvicultural Methods
- Harvest Methods
- Reforestation

FOREST DIVERSITY
- Biological Diversity
- Hardwoods

VEGETATION
- Insect/Disease Control
- Herbicide/Pesticide Use
- Non-sensitive Plants

OTHER FOREST PRODUCTS

SOCIOECONOMICS

JOBS AND COMMUNITY STABILITY

TOURISM AND RECREATION
- Economic Values
- Recreation Opportunities
- Trails
- Visual Resources
- Off-Road Vehicle Use

EDUCATIONAL VALUES

INVESTMENTS AND TIMBER VALUES

PLANNING

ADEQUACY/ACCURACY OF DATA
- ***Modeling (e.g. FORPLAN)***
- **Alternatives**
- **Standards and Guidelines**
- **Monitoring**

MANAGEMENT REQUIREMENTS

RESEARCH

MANAGEMENT OF THE FOREST

OTHER PLANNING COMMENTS

RESOURCE PROTECTION

ROADLESS AREAS

SOILS/WATER QUALITY/FISHERIES
- **Soil**
- **Sedimentation**
- ***Stream and River Protection***
- **Wild and Scenic Rivers**
- **Water Quality/Quantity**
- ***Water Temperature***
- **Cumulative Effects**
- **Fish Habitat**

OLD GROWTH

WILDLIFE
- **Habitat**
- **Sensitive, Threatened, and Endangered Species (Animals)**
- **Spotted Owls**
- **Management Indicator Species**
- **Game Species**
- **Other Wildlife Comments**

SENSITIVE PLANTS AND ASSOCIATIONS

MINERALS

CULTURAL RESOURCES

FIRE MANAGEMENT

FIRE

AIR QUALITY

OTHER COMMENTS

GEOLOGY

RANGE

FUELWOOD

OTHERS

LAND MANAGEMENT

ALLOCATIONS

1 *COMMENT*· ACQUIRE ALL INHOLDINGS ON ALL PUBLIC LANDS.

Response: Non-federal lands which are within the Siskiyou National Forest boundary are identified and classified according to desirability of acquisition (See LRMP, Chapter IV, "Standards & Guidelines 9-3"). Where management goals indicate that the ownership of a tract should be public, the Forest will try to acquire the tract. Our primary means of acquisition is through land exchange, which means that the Forest Service trade public land of equal value in another location in order to acquire the key tract.

2. *COMMENT*: CREATE A NATIONAL PARK ALTERNATIVE, CREATE A SISKIYOU NATIONAL PARK

Response: Several National Park proposals were considered, but eliminated from detailed study for several reasons as described in Chapter II of the FEIS ("Alternatives Considered but Eliminated from Detailed Study"). Alternatives which place lands currently administered by the Forest Service into the hands of other jurisdictions were not reasonable considering the scope of this Environmental Impact Statement for preparation of the Forest Plan The purpose of the Forest Plan, as explained in the planning regulations, is to "provide for multiple use and sustained yield of goods and services from the National Forest System in a way that maximizes long term net public benefits in an environmentally sound manner" (36 CFR 219.1(a)) National Parks are, by law, not managed under the principles of multiple use and sustained yield.

Consideration of possible inclusion in the National Park system has been specifically assigned by Congress to the Secretary of Interior; designation of a National Park requires Congressional legislation. The National Park Service has stated it has no intent to pursue additional studies regarding a National Park (letter from National Park Service, Pacific Northwest Regional Director, to Siskiyou National Forest Supervisor, 10/2/87). It is remote and speculative that Congress would designate a National Park in the very near future. Additionally, Congress has repeatedly urged the completion of Forest Plans. Nothing would preclude the National Park Service from preparing a legislative environmental impact statement with Forest Service cooperation, just as nothing precludes Congress from designating a National Park in the future.

In response to public comments, several aspects of what National Parks offer the public were seriously considered by the Forest. Suggestions for increased emphasis in tourism and recreations have resulted in increased cooperative efforts with local county and other Federal agencies. A number of capital investment projects were developed (LRMP, Appendix B). Two of the alternatives developed for detailed study (Alternatives E and G) include land allocations to the Backcountry Recreation Management Area; when combined with existing Wilderness, they resemble the boundaries of several of the National Park proposals. Environmental consequences associated with those alternatives are disclosed in the FEIS, Chapter IV. Complementary to Park proponents' interests, considerably more unroaded area would be allocated to the Backcountry Recreation Management Area in the new Preferred Alternative S. In addition, attention was given to visual allocations along high recreation travel routes (FEIS, Chapter II, "Alternative S")

3. *COMMENT*. PROTECT THE PROPOSED SISKIYOU NATIONAL PARK AREA BY SELLING IT OFF. LET ORGANIZATIONS BUY SUCH PARTS OF FORESTS FOR THE PRESERVATION OF OREGON'S OLD GROWTH.

Response: Under existing law, the Forest Service is not allowed to sell land that it administers The agency can transfer lands through an exchange process that allows exchange of parcels of land of equal value if it is in the interest of the Government to do so None of the alternatives in the FEIS consider exchange or transfer of the lands in the area proposed by some individuals for a National Park (FEIS, Chapter II, "Alternatives Considered, But Eliminated From Detailed Study").

4 *COMMENT*: INCREASE THE ALLOCATION OF MANAGEMENT AREA 7 APPLIED TO MORE STREAMS AND PUSHED UPSTREAM ON SOME OF THE STREAMS TO WHICH IT IS ALREADY APPLIED.

Response: The alternatives include a full range of options for Supplemental Resource Management Areas. More protection of fisheries and water quality was a consideration in developing the new Preferred Alternative S. Alternative S would allocate additional areas to Supplemental Resource than the Preferred Alternative K in the DEIS

5 *COMMENT*: THE SUPPLEMENTAL RESOURCE CATEGORY SHOULD BE ELIMINATED FROM THE PLAN BECAUSE THESE AREAS WERE CONSIDERED FOR PERMANENT ROADLESS DESIGNATION UNDER RARE II AND SUBSEQUENTLY RELEASED FOR MULTIPLE USE.

Response. The use of Supplemental Resource Management Areas has been in existence for over a decade. The first application of this designation was in the current Mt. Butler-Dry Creek Unit Plan (FEIS, 1976). This designation has been carried forward in the Forest Plan because it best meets the management goals established for those areas listed in Management Area 7, Chapter IV, LRMP. Restated, these goals are to protect or enhance key fish and wildlife habitats, protect sensitive watershed areas, and provide for the recreation values, all of which are multiple-use purposes.

6. *COMMENT*· THERE SHOULD NOT BE ANY MORE LARGE SET-ASIDES FOR VARIOUS TYPES OF WILDLIFE. LANDS NOT SUITABLE FOR TIMBER PRODUCTION AND THOSE NECESSARY FOR THE PROTECTION OF PLANT AND ANIMAL LIFE CAN AND SHOULD BE RESERVED OTHER THAN FOR THOSE PURPOSES, THE LAND SHOULD BE AT WORK GROWING TREES.

Response: Growing trees is an important role for the Siskiyou National Forest However, the Forest has other roles, too, such as maintenance of viable populations of all wildlife species existing on the Forest The National Forest Management Act directs the Forest Service to provide for "diversity of plant and animal communities." Lands not suitable for timber production, but meeting habitat requirements for certain plant or animal species were selected wherever possible as potential Botanical Areas or as Designated Wildlife Areas (FEIS, Appendix F and J)

7. *COMMENT*. ALTHOUGH THE EIS DOES ADDRESS ENERGY TRANSMISSION CORRIDORS, IT DOES NOT MENTION THE PLANNING CORRIDOR THAT WOULD CONNECT THE ELECTRICAL TRANSMISSION SYSTEM NEAR MURPHY AND WILDERVILLE TO THE SYSTEM NEAR AGNESS AND GOLD BEACH THIS CORRIDOR, WHICH PROVIDES A FUTURE CORRIDOR OPTION ACROSS THE COAST RANGE IN SOUTHWESTERN OREGON, IS LISTED IN THE THE 1980 WESTERN REGIONAL CORRIDOR STUDY. PLEASE REFER TO THE STUDY FOR CORRIDOR INFORMATION. INCLUDE A MAP IN THE EIS SHOWING THE ABOVE-MENTIONED FUTURE CORRIDOR ALONG WITH THE EXISTING CORRIDORS THAT WERE MENTIONED IN THE DRAFT EIS.

Response: This corridor was originally included to tie in a hydroelectric project at the proposed Buzzard Roost Dam on the Illinois River. The dam site has since been removed from consideration following the designation of the Illinois River as a Wild and Scenic River. The corridor mentioned in the 1980 Western Regional Corridor Study is not feasible since the Act prohibits licensing water-related projects such as dams (FEIS, Chapter III, "Utility and Transportation Corridors"). Secondly, the corridor is very speculative relative to a proposed route across areas of extremely steep and unstable ground, this is coupled with a multitude of conflicting resource values. Last, the proponents of such a venture have remained somewhat silent as to the specifics of need and location. Therefore, without a concrete proposal, little of substance existed for analysis.

8. *COMMENT*: THE ILLINOIS RIVER SHOULD BE REOPENED TO SMALL DREDGES FROM DEER CREEK TO McCALEB RANCH, BUT WITH A SEASON SO THAT IT WOULDN'T BOTHER THE RAFTERS OR THE FISHERMEN.

Response: This issue was considered in the Illinois Wild and Scenic River Management Plan. The DEIS did not attempt to open management decision issues for the Illinois Wild and Scenic River, but simply incorporated the existing River Management Plan. The Illinois Valley Ranger District will solicit and consider public input when the River Management Plan is due to be revised.

9. *COMMENT*: THE AREA BETWEEN BOLAN LAKE, RED BUTTES, AND GRAYBACK MOUNTAIN HAS TREMENDOUS RECREATION POTENTIAL. IT IS HIGH ALTITUDE WITH ATTENDANT REFORESTATION PROBLEMS. THAT TIMBER HARVEST BE RESTRICTED IN THIS AREA, AND THAT FURTHER ROADS NOT BE BUILT WHILE THE COUNTIES DEVELOP TOURISM AND RECREATION PLANS. THIS IS A RELATIVELY SMALL AREA, PERHAPS 5,000 ACRES IN ALL, THAT IS BETTER SUITED TO NON-TIMBER MANAGEMENT.

Response: The alternatives examine a range of allocations for this area, including allocations to Supplemental Resource, Research Natural Areas, Botanical, and Backcountry Recreation Management Areas. The Preferred Alternative S would allocate approximately 3,000 acres of this area to the Backcountry Recreation and other Management Areas with no programmed harvest.

10. *COMMENT*: THE FOREST MUST EXPLAIN TO THE PUBLIC WHY IT HAS ALREADY MADE THE LAND MANAGEMENT DECISION WITHOUT PUBLIC INPUT. A SIGNIFICANT PORTION OF THE PLANNING PROCESS PRESCRIBES THE LAND ALLOCATIONS BEFORE THE PUBLIC HAS HAD AN OPPORTUNITY TO REVIEW THE LIKELIHOOD OF SUCH LAND ALLOCATIONS.

Response: Extensive public participation has characterized the development of the Siskiyou National Forest LRMP and the accompanying FEIS. Public input influenced land allocations to the Management Areas (14 areas). These allocations vary greatly by alternative and strongly reflect public preferences. See the FEIS, Chapter II, for the acreage in Management Areas by alternative. The final decision regarding land allocations will consider the significant public involvement; the Record of Decision be the instrument which provides explanation relative to the decision and response to public input.

11. *COMMENT*: SILVER CREEK FALLS IS OMITTED AS A UNIQUE INTEREST AREA UNDER THE PROPOSED PLAN, BUT THIS MUST BE A GENUINE MISTAKE. THE PROPOSED BUDGET, FOR EXAMPLE, INCLUDES PROJECTS AT THE FALLS.

Response: In the DEIS, Silver Creek Falls was allocated to the Supplemental Resource Management Area It has been reclassified as a Unique Interest Area in the Preferred Alternative S of the FEIS (Table II-3, "Special Area Assignments").

12. *COMMENT*: THE STANDARDS FOR MANAGEMENT AREA 5 (UNIQUE INTEREST AREAS) MEET SOME IMPORTANT PROTECTION CRITERIA. ALL UNIQUE INTEREST AREAS SHOULD BE ALLOCATED TO MA 5.

Response: All inventoried Unique Interest areas are allocated to Management Area 5 in the Preferred Alternative S.

13. *COMMENT*: THE MA 7 (SUPPLEMENTAL RESOURCE) ALLOCATIONS IN DEIS ALTERNATIVE "K" IS SUPPORTED ALSO, THE ADDITION OF ALL RIPARIAN AREAS IN THE ELK/SIXES PLANNING BASIN TO MA 7 IS RECOMMENDED. THE HIGH FISH VALUES OF THE ELK/SIXES PLANNING BASIN WARRANT THE PROTECTION LEVEL OF THE SUPPLEMENTAL RESOURCES PRESCRIPTION THE MA 7 ALLOCATION WOULD ALSO HELP PROTECT THE STATE OF OREGON'S ELK RIVER HATCHERY

Response: The additional protection proposed by overlaying Supplemental Resource Management Areas on the existing, Congressionally designated, and proposed Management Areas in Alternative S is considered unnecessary for enhancement of fish and water quality. More restrictive land allocations to complement the resource values in Elk/Sixes Planning Basin have been installed by Congress (Grassy Knob Wilderness of 1984, Omnibus Oregon Wild and Scenic River Act of 1988). The Forest Plan land allocations move beyond this with additional protection which includes, in part, the following: Supplemental Resource Areas on the North Fork Elk, South Fork Sixes, and along a small reach of the mainstem of Elk River, Partial Retention Visual in the Elk River corridor, the large Iron Mountain Botanical Area; and several Designated Wildlife Habitat areas). In addition, Riparian Prescription C has been applied to all rivers and streams in the basin Management for visual quality will also be applied to both the upper reaches of the North and South Forks of Elk River as a result of the recent (November 1988) addition of the State Scenic Waterways system.

Standards and Guidelines and associated Best Management Practices have also been strengthened to protect fish and water quality (LRMP, Chapter IV, "Management Prescriptions"). The benefits to fisheries in the Elk/Sixes Planning Basin are expected to accrue simultaneoulsy with the current trends of improving water quality (particularly temperature). Adding the extensive network of very constraining Supplemental Resource areas on the main rivers and tributaries of the basin serve little purpose other than severely constrain other compatible, multiple-use opportunities

14 *COMMENT*: THE ALLOCATION OF MA 8 (DESIGNATED WILDLIFE HABITAT) IN DEIS ALTERNATIVE "K" IS SUPPORTED THIS MANAGEMENT PRESCRIPTION, ALONG WITH MORE RESTRICTIVE MANAGEMENT AREAS AT RECOMMENDED LEVELS, SHOULD MAINTAIN A SATISFACTORY LEVEL OF OLD-GROWTH ECOSYSTEMS.

Response. Allocations in the FEIS Preferred Alternative S are slightly greater than Alternative K to meet the Standards and Guidelines in the Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines, 1988b)

15. *COMMENT*. ALL SPECIAL WILDLIFE SITES (24,004 ACRES) NOT ALLOCATED TO MORE RESTRICTIVE MANAGEMENT AREAS SHOULD BE ALLOCATED TO MA 9 THE LIMITED AMOUNT

OF MEADOWS IN THIS MANAGEMENT STRATEGY REPRESENT THE ONLY PERMANENT BIG-GAME FORAGE SITES OFFERED IN THE ALTERNATIVES.

Response: In response to public comments to provide connecting habitat, allocations of Special Wildlife Sites in the FEIS Preferred Alternative S are somewhat higher than Alternative K

TRANSPORTATION

Development

16. *COMMENT*. NO ROAD CONSTRUCTION ON BALD MOUNTAIN OR SILVER PEAK SHOULD OCCUR. THE TREES ARE NOW MUCH LESS VALUABLE FOR LUMBER THAN BEFORE THE FIRE, WHILE THE ENVIRONMENTAL DAMAGE WOULD BE COMPOUNDED BY LOGGING.

Response: The interaction between road construction, economic values, and fire effects on Bald Mountain and Silver Peak have been analyzed in detail in the Silver Fire Recovery Project FEIS which includes the site-specific analysis required for projects The Silver Fire Recover Project FEIS and Record of Decision is incorporated by reference into the Forest Plan FEIS and LRMP (FEIS, Chapter I, "Introduction").

17. *COMMENT*. AT PRESENT, A LARGE PART OF THE SISKIYOU NATIONAL FOREST IS NOT AVAILABLE FOR ENJOYMENT BY THE RETIRED ELDERLY AND DISABLED AMERICANS. BUILD A ROAD SYSTEM INTO ALL OF THE SISKIYOU NATIONAL FOREST WILDERNESS AREAS ALLOWING ALL AMERICANS ACCESS TO THEIR RESOURCES

Response: We recognize the need to provide facilities that accommodate the needs of retired elderly and disabled Americans and seek to provide those opportunities throughout the Forest. While there is road access to trailheads that lead into Wilderness, construction of these types of facilities and a road system within the Wilderness is specifically precluded in the Wilderness Act. The intent of the Wilderness Act is to retain vestiges of Wild America. Wilderness values are overriding and recreation is an activity that may occur, but is subordinate to the maintenance of wilderness character Road construction is not allowed under any circumstances except in situations where a valid mining claim (pre-dating the Wilderness designation) may require access. These situations are strictly regulated and are intended to provide access only to the miner Motorized access to the public is not permitted in Wilderness. Many other scenic areas of the Forest are accessible by road, however (See FEIS, Chapter III).

18. *COMMENT*: THE ESTIMATE OF ROAD MILES/SECTION SHOWN IN APPENDIX B (PAGE B-36) SEEMS VERY HIGH FOR UNROADED AREAS IN MANY PLANNING BASINS RELATIVE TO THE ACTUAL MILEAGE PER SECTION IN ROADED AREAS. THIS WOULD TEND TO OVERESTIMATE COSTS OF DEVELOPMENT. THE TABLES OF ROAD CONSTRUCTION SHOULD HAVE INCLUDED ALL POTENTIAL ROADS, PERMANENT OR TEMPORARY.

Response· The DEIS displayed the new road construction miles per acre harvested coefficients used in the FORPLAN model for each Planning Basin and its miles per square mile equivalent The "roaded area" values represent an estimate of only those new roads needed in the presently roaded area to access timber not economically within reach from present roads. The text in the FEIS preceding this table has been strengthened to emphasize that these were new mileage factors and not area total factors as for the unroaded areas The text in the "Improvements" section of FEIS (Chapter III) has also been strengthened to indicate the same If the existing road system were embodied with these "roaded area" coefficients, the total for the "roaded areas" would generally exceed the "unroaded area" factors by from one to two miles per square miles

It is nearly impossible to estimate all potential temporary roads Temporary roads are normally discouraged, and those constructed should be obliterated as part of the work for a particular project. The Forest-wide Standards and Guidelines (LRMP, Chapter IV) give direction for appropriate use and mitigation of temporary roads

19. *COMMENT*· BUILD A PUBLIC HIGHWAY FROM GRANTS PASS TO GOLD BEACH OR O'BRIENTO BROOKINGS.

Response: Various studies on the desirability of a public highway, other than the existing U S. Highway 199 and State Route 42, from the inland valley areas to the southern Oregon coast indicate the favored route to be along the Grants Pass to Merlin to Galice to Agness to Gold Beach corridor. The road management agencies along this route include· Oregon State Highway Division, Josephine County Public Works, USDI-Bureau of Land Management, USDA-Forest Service, and Curry County Road Department The Forest Service section is primarily double-lane paved standard on the west half and single-lane paved standard on the east half. From the standpoint of managing the National Forest, these standards are adequate at this time The Forest Service would support State and County proposals to provide a public highway through this corridor.

20. *COMMENT*: THE ILLINOIS RIVER ROAD IS IN NEED OF IMPROVEMENT FROM SELMA TO OAK FLAT AND ON DOWN TO THE TRAILHEAD AT BRIGGS CREEK.

Response: Agree The first 2.5 miles of this road out of Selma is a Josephine County road. From that point on the road is managed by the Forest Service. The next 4 6 miles to Six Mile Road has a bituminous surface treatment on it The balance of the road (11 3 miles) is on the capital investment program for improvement (See LRMP, Appendix B, "Road and Bridge Capital Investments"). The schedule for improvement identifies the first 4.2 miles of this latter segment for capital investment reconstruction in Fiscal Year 1989, the rest of the road to be improved in 1992. This will bring that segment up to a standard suitable for passenger car travel

21. *COMMENT*: THE OLD MINING ROAD FROM SELMA TO BRIGGS CREEK SHOULD NOT BE UNIFORMLY IMPROVED THROUGHOUT THE ENTIRE LENGTH. DEVELOPMENTS, IMPROVEMENTS, AND CAMPGROUNDS SHOULD BE PLACED NEAR THE SELMA END. MAJOR CHANGES WILL DESTROY THE LANDSCAPE AND CHARACTER OF THE CANYON AND DEGRADE THE EXPERIENCE OF BEING THERE.

Response. This route provides access to a long section of the Illinois Wild and Scenic River. The anticipated scale of public use along this route supports making safety improvements. Facilities to support the recreational use (campgrounds, trailheads, boating sites, etc.) will be provided and maintained to enhance their experience The loss of landscape character and degradation of experience is not anticipated as a result of improving the access road There will be a change in use, however land allocations, capital investments, maintenance of facilities, and monitoring are provided to complement the scenic and recreation attributes of the Illinois River canyon (FEIS, Chapter IV; LRMP, Chapter IV, V, and Appendix B).

22. *COMMENT*: GOOD, WELL-MAINTAINED ROADS TO SERVE THE AREA BETWEEN AGNESS AND CAVE JUNCTION WOULD SEEM TO BE IMPERATIVE TO GET THE GREATEST BENEFIT FOR THE GREATEST NUMBER IN RELATION TO SCENIC AND RECREATIONAL RESOURCES, WILDLIFE HABITAT AND TIMBER PRODUCTIVITY.

Response: There are several roads serving the area between Cave Junction and Agness, but no direct road linkage The Illinois River Trail completes the direct link between these two communities Three collector roads serve as access to the Illinois Wild and Scenic River, five or six collector and local roads access trail heads to the Kalmiopsis Wilderness, and at least six collector and numerous local roads access the area for recreational, mineral, and timber management purposes.

At present, only some of the collector roads and few of the local roads in this area would be considered suitable for passenger car use Some improvements are scheduled for one of the roads (Collector Road 4103). As future projects are planned for this area, road management objectives will be developed and revised to provide a transportation system capable of supporting anticipated multiple uses However, no plans exist for a direct linkage between these two areas.

23. *COMMENT*: THERE SHOULD BE ACCESS ROADS INTO ALL AREAS OF THE FOREST, FOR PROTECTION, FIRE FIGHTING, OR TOURISM. ALL FORESTS SHOULD HAVE GATED FIRE ROADS FOR PROPER MANAGEMENT WHAT IS THE DIRECTION FOR MANAGING THE 135 (PLUS) GATES ON THE FOREST?

Response It is not physically, environmentally, or economically feasible to construct access to every part of this Forest Road construction is expensive. Timber sales are the primary means of funding, but these funds have limits. Helicopter access is possible for fire fighting purposes to most areas of the Forest where sufficient lateral clearances can be maintained.

Very few roads have been built specifically for fire management purposes. Those that have are primarily to lookout sites As the Forest road system developed over time, initial administrative roads became multiple-use roads On this Forest, roads that have gates are usually closed for a multitude of resource reasons such as protection of wildlife, soil and water, and occasionally to protect areas during periods of extreme fire risk. Road management objectives are set for specific areas as part of the road management planning process. Depending on the objectives, gates may be routinely closed. This will be one of the topics addressed in the deer and elk management plan to be prepared within three years of implementation of the Forest Plan (LRMP, Chapter I and IV, "Forest-wide Standards and Guidelines).

Closures

24. *COMMENT*. NO NEW ROADS SHOULD BE BUILT ON THE SISKIYOU NATIONAL FOREST. NEW ROADS SHOULD BE CONSIDERED ONLY AFTER ALL OTHER ALTERNATIVES HAVE BEEN EXAMINED. NEW ROADS SHOULD BE EXCLUDED FROM RIPARIAN AREAS AND FLOODPLAINS TO PREVENT EROSION, SILTATION AND SEDIMENTATION ANY SALVAGE LOGGING SHOULD BE DONE BY AERIAL TRANSPORT

Response: Land allocations in the alternatives considered in the FEIS (Chapter II) identify the proposed uses of the Forest land areas When such designation is for commercial timber or developed recreation uses, roads are the present method of access. Costs usually determine the means for harvesting timber and hauling the product to the mill. All present economical harvesting methods require roads for haul; even helicopter logging has an economic flying distance of only one mile. Until the economic situation changes or technology is improved, or the land allocation is changed, roads are the only economic method of access Alternative M was specifically developed to evaluate the consequences of managing the Forest with no new road construction.

Standards and Guidelines for Riparian Management Areas (LRMP, Chapter IV) include instructions to exclude roads from riparian zones unless justifiable reasons exists Whereas avoidance is the first option evaluated, such justification might pose an unacceptable or unrealistic hardship or expense on other

resource opportunities (LRMP, Chapter IV, "Management Prescriptions"). At the project level, site-specific environmental analysis would be used to make such a determination, and appropriate mitigation measures would be specified Several of the Forest-wide Standards and Guidelines and associated Best Management Practices (LRMP, Chapter IV and Appendix F) are designed to minimize or prevent erosion, stream siltation, and to protect water quality for its established beneficial uses Any necessary crossings of wet areas would use methods that minimize impacts to water quality and fisheries However, it is unreasonable to assume that a road system would not require at least some degree of stream crossing in areas of the Forest heavily laced with channels. Therefore, with the expected road construction and drainage density experienced on the Siskiyou, impacts on the soil and water resource have been evaluated for each alternative (FEIS, Chapter IV).

25 *COMMENT*: MORE ROADS SHOULD BE CLOSED.

Response· The FEIS considered a range of alternatives that included various levels of road closures. Tables II-11 and II-12 (FEIS, Chapter II) give estimates of mileage for each alternative The "Significant Interactions" section (FEIS, Chapter IV, "Improvements") contains the purposes for road closures Direction and restrictions relating to road closure and road obliteration are included in the "Facilities Transportation System" section of the LRMP, Chapter IV ("Forest-wide Standards and Guidelines"). Road closures may be implemented to meet a number of economic and resource objectives, including protection of soil, water, and wildlife.

26. *COMMENT*: EXISTING ROADS SHOULD BE SURVEYED, AND THOSE FOUND TO BE ENVIRONMENTALLY HARMFUL SHOULD BE CLOSED AND ALLOWED TO RETURN TO A NATURAL STATE. RECENT FIRE ROADS, OR "CAT TRACKS" OR "FIRE BREAKS" NEED TO BE RESTORED TO THEIR NATURAL CONDITION IN AREAS THAT WERE PREVIOUSLY ROADLESS. NEW ROAD CONSTRUCTION SHOULD BE LIMITED UNTIL THE COST OF ALL LOGGING ROADS IS COVERED BY A MINIMUM REQUIRED BID FOR TIMBER.

Response· Existing roads are reviewed on a regular basis for road maintenance planning. Those roads causing environmental damage are identified and programmed for mitigation. Closure may be used as a mitigation procedure. Only roads determined not to be needed again, or those causing unacceptable resource impacts that cannot be mitigated, are returned to a natural state (deconstructed or "put to bed").

Access routes and other areas disturbed in the suppression of the recent fires were reviewed for rehabilitation needs during or immediately following the fire. Temporary roads and other disturbances were water barred, seeded with grass and covered with straw where needed to reduce the effects of erosion These mitigation measures and direction for use and obliteration of temporary roads are discussed in the Forest-wide Standards and Guidelines (LRMP, Chapter IV).

Where the need for new road construction is required to provide access to a timber sale, the cost of construction is part of the sale appraisal. There are situations where overall access needs exceed the value of one sale, and future sales will use the planned network. In this type of situation, capital investment funds are used to build the basic road network Appendix B (LRMP) gives an estimate of the road and bridge capital investments planned for the first half of the decade

27 *COMMENT*· ROAD MANAGEMENT AND SELECTIVE CLOSURE HAVE GAINED PROMINENCE IN RECENT YEARS AS A CRUCIAL ELEMENT IN MAINTAINING HABITAT FOR BIG GAME. YOU SHOULD WORK WITH OREGON DEPARTMENT OF FISH AND WILDLIFE AND OREGON STATE DEPARTMENT OF FORESTRY TO DEVELOP SPECIFIC CRITERIA FOR ESTABLISHING ROAD CLOSURES TO MEET WILDLIFE OBJECTIVES THAT ARE FAIR TO FOREST USERS. THESE

STANDARDS ARE ESPECIALLY IMPORTANT FOR ROADLESS AREAS YOU PROPOSE TO DEVELOP

Response: Road management is an important aspect of habitat management for big game Standards and Guidelines (LRMP, Chapter IV) provide for road closures to meet objectives for wildlife as well as other resource protection. A number of roads, such as those into Horse Creek Meadows, have been closed to vehicle traffic The roads and big game topic will be addressed in a comprehensive deer and elk management plan to be prepared after implementation of the Forest Plan. Appropriate State agencies have been involved in preparation of the FEIS and Forest Plan, and will be among those involved in preparing the deer and elk management plan.

28. *COMMENT*· THE PLAN STATES THAT RIGHT-OF-WAY GRANTS FOR ROADS WILL BE DENIED UNLESS NO OTHER ACCESS IS AVAILABLE. THE FSM STATES (4063.3.6) "DO NOT PERMIT ROADS, FENCES, OR SIGNS ON AN ESTABLISHED RESEARCH NATURAL AREA UNLESS THEY CONTRIBUTE TO THE OBJECTIVES OR TO THE PROTECTION OF THE AREA." THE STATEMENT IN THE PLAN SEEMS TO LEAVE THE DOOR AJAR FOR ROAD BUILDING; THIS SEEMS TO RUN COUNTER TO THE MANUAL INTENT.

Response. Standards and Guidelines concerning roads in RNA's do not run counter to FSM 4060 (LRMP, Chapter IV).

Effects

29 *COMMENT*· ROADS SHOULD BE PAVED TO REDUCE SILTATION.

Response: It is physically feasible to pave many roads, it may or may not be economically feasible Asphalt paving materials incorporate oil products, and are expensive. Where feasible and appropriate, asphalt (roads) and concrete (boat ramps) paving have been utilized on this Forest This practice will likely continue in the future Of 19 prioritized road projects for the capital investment program (see LRMP, Appendix B, "Road and Bridge Capital Investments"), six are paving projects involving over 20 miles of road.

Siltation is one of the factors considered in paving decisions. Siltation can be derived from several sources associated with roads; these include the road surface itself, the cut and fill slopes, and ditch lines. Grasses, shrubs, and trees are planted or permitted to grow on the exposed areas to reduce the soil erosion

Generally, maintenance costs for paved roads are significantly higher than for graveled roads, except where the graveled roads require substantial dust abatement or use is exceptionally high With limited maintenance funds, paving of roads is not practical unless there is an economic advantage (e.g., users fees pay for the maintenance), or resource damage such as stream siltation is a serious problem. Soil and water protection are important factors in planning construction, reconstruction and maintenance of roads (See LRMP, Chapter IV, Standards and Guidelines)

30. *COMMENT*: WHEN ROAD CUTS AND FILL ARE REVEGETATED, NATIVE PLANTS NEED TO BE USED WHAT IS THE POLICY FOR THE USE OF NATIVE PLANTS FOR REVEGETATION ON THE SISKIYOU NATIONAL FOREST?

Response. In response to increased public concern regarding use of native species and biological diversity, Forest-wide Standards and Guidelines (LRMP, Chapter IV) have been strengthened to emphasize establishment or protection of native plants on road cuts and fills A variety of plants and inert materials are used for erosion protection immediately following road construction Depending on availability, native herbs, shrubs, and trees make up a part of those materials and are used for erosion

control and stability protection Natural invasion of road cut and fill slope soil by native herbs, shrubs, and trees may take several years following construction, whereas annual grasses, legumes, and mulches may provide the needed first winter protection in some situations.

31. *COMMENT*: WHAT TYPE OF ENVIRONMENTAL ASSESSMENT IS DONE PRIOR TO ROAD CONSTRUCTION? EROSION RESULTING FROM POOR ROAD LOCATION AND CONSTRUCTION IS ONE OF THE BIGGEST THREATS TO OUR RIVERS AND STREAMS USE OF EROSION AND MASS WASTING RISK MAPS SHOULD BE REQUIRED.

Response. All road proposals are evaluated by an interdisciplinary team during the project environmental analysis to assure that erosion, mass wasting, and stream sedimentation are mitigated (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Erosion and adverse impacts associated with poor road location and construction does pose a major threat to the slopes and streams of the Forest and downstream uses. Therefore, engineers, hydrologists, foresters, soil scientists, geologists, and biologists who are trained in erosion and mass wasting processes perform these evaluations These evaluations include a risk assessment for impacts associated with erosion and mass wasting potential, and may include maps. The process of evaluation includes input and feedback at all stages of location, design, construction, operation, maintenance, and monitoring Following the environmental analysis and before construction, a "plan-in-hand" field review of the proposed road is made to further refine the project plans and eliminate or reduce potential problems

Other Transportation Comments

32 *COMMENT*· TOO MUCH OF OUR ACCESS IS DEPENDENT UPON THE TIMBER HARVEST TO BE BUILT BY THAT INDUSTRY, AND THEN USED BY THE GENERAL PUBLIC OPEN GRAVEL ROADS TO PROVIDE RECREATIONAL HUNTING, WILDLIFE VIEWING AND SIGHT SEEING.

Response. Much of the access to and within the Siskiyou National Forest has resulted from timber harvest activities The timber resource will continue to provide access in most areas until the road system to commercial timber lands is complete. Portions of the road system originated as administrative roads built by the Civilian Conservation Corps or for mining access, which replaced trail access. Most of these early roads have been upgraded to standards which accommodate timber harvest traffic. This improved system offers added recreational and other access opportunities for Forest users

In some cases, timber harvest access has "opened" areas to recreational activities, which subsequently placed limitations on the potential timber harvest Some roads, however, are built with capital investment funds primarily for recreation opportunities and other management needs. Several roads are planned to be built or upgraded for recreation as identified on the "Road and Bridge Capital Investments" in Appendix B, LRMP.

Some roads are graveled with just enough aggregate to protect the surface from rainfall and water runoff, yet not enough to permit wet weather traffic. Recreational access is one of the considerations in determining the road management objectives that decide the maintenance level (surfacing) and if a road should be closed to vehicle traffic Road management objectives are continually reviewed and revised to meet changing demands and resource protection requirements. Other factors considered in designing roads are described in the LRMP (Chapter IV, "Forest-wide Standards and Guidelines").

33. *COMMENT*: NOWHERE IN THE PLANNING DOCUMENTS IS THERE MENTION OF THE POSSIBILITY OF OBTAINING TIMBER ACCESS BY RAILROAD AS OPPOSED TO ROAD, EVEN THOUGH IT IS A LONG-ESTABLISHED TECHNOLOGY WHICH CREATES MUCH LESS SOIL DISTURBANCE.

Response. A small portion of the Siskiyou National Forest in the Powers area was harvested using railroad-based logging systems. This occurred on lands acquired by the National Forest from private ownership. A significant portion of the railway network utilized cut and fill construction, producing the same level surface as used for roadways, many long sections of railway grades were converted to roadways when log trucks became more efficient. Long gentle grades to climb or descend were required to safely transport logs by rail. Where cut and fill construction was not possible, bridges (commonly called railroad trestles) were used to span to areas which permitted cheaper cut and fill construction Rotting remains of some of these railroad trestles are still present in a few locations. Only in areas of trestle would the environmental impacts be less. The logging techniques from railways may include the same techniques available from roadways, and likely produce similar impacts on the environment. However, areas accessed by rail is generally far more gentle than the balance of the Forest terrain.

Alternative access methods for timber harvest are considered on a site-specific project level basis If rail access was feasible and economical for an area, this method could certainly be considered.

34. *COMMENT* A BETTER SYSTEM OF MONITORING THE ENTIRE ROAD AND SKID TRAIL NETWORK NEEDS TO BE DEVELOPED SO THAT PROBLEMS CAN BE IDENTIFIED AND CORRECTED. MAINTENANCE COSTS DO NOT REFLECT TRUE COSTS, INCLUDING THOSE INCURRED FROM FLOOD AND STORM DAMAGE. A WINTER ROAD MAINTENANCE PROGRAM NEEDS TO BE DEVELOPED.

Response. The road maintenance program is an integral part of the Road Management Plan, which gives additional and more specific guidance to land managers. The Road Management Plan is a dynamic document which changes from year to year. Condition surveys for road maintenance are a monitoring tool which identify and track problem areas as they develop. The maintenance portion of this plan establishes the framework for who, what, and when actions will be performed.

Due to flood, storm damage, or the lack of regular maintenance, roads can deteriorate to where normal maintenance activities cannot bring the road back to the original standards. Such restoration requires construction equipment and techniques, so it is usually handled as reconstruction. Reconstruction costs, rather than maintenance costs, include these additional expenses due to floods and storms.

Winter use is made possible only by requiring those using the roads to do the necessary maintenance A part of the Road Management Plan deals with extended timber-haul seasons. This extra-normal haul requires performance of maintenance during wet conditions on roads which have been strengthened to accommodate extended season of use.

35. *COMMENT*: ROADS NEED TO BE BETTER SIGNED SO THE PUBLIC KNOWS WHERE EACH ROAD ON THE FOREST WILL TAKE THEM.

Response: Road management objectives establish the intended use and users for a particular road. Many single-use roads are managed to discourage general public use, and therefore would not be signed in a way to attract passenger car use Many roads traverse short distances (less than a mile) to project activity areas, and not all roads have identifiable destinations.

Destination signing on each road would be very expensive to purchase and to maintain. Reflective-type signs have an effective life of three to seven years. Like many things that are not under constant surveillance, signs tend to be subject to the full gambit of vandalism -- destruction, mutilation, or theft.

It is the Forest Service objective to provide adequate signing for the public Adequacy may vary depending on the above conditions Forest recreation maps which clearly display the road system are available at Forest Service offices

MULTIPLE USE

36. *COMMENT*: SINGLE USE OR RESTRICTED USE CLASSIFICATIONS CAN AND SHOULD BE COMPLETELY ELIMINATED FROM THE PLAN.

Response. All fourteen Management Areas described in Chapter II of the FEIS and Chapter IV of the LRMP provide for multiple uses. Management Areas 1 through 9, however, do restrain or prohibit some uses (activity) considered incompatible with the values associated with these sites Much of the acreage assigned to Management Areas 1 through 9 has been either designated by Congress (Wilderness and Wild Rivers) or is considered an NFMA management requirement (Designated Wildlife Habitat). The balance, such as new Botanical, Unique Interest, and Backcountry Recreation Management Areas, are discretionary allocations evaluated through the range of alternatives and subject to public and other agency input and review in this current planning effort.

The connotation often associated with the term "Multiple Use" is that every acre of the National Forest should contain its full array of uses, including wood products, wildlife, recreation, and so forth. The Multiple Use-Sustained Yield Act of 1960 provides a slightly different interpretation; "In the administration of the national forest, due consideration shall be given to the relative values of the various resources in particular areas." The establishment of Wilderness is given as an example that is considered consistent with the purposes and provisions of this Act. The Act further states that under multiple use, ".. some land will be used for less than all of the resources; ...with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or greatest unit output."

37. *COMMENT*: TRAIL AND RECREATION SITES SHOULD HAVE ADEQUATE UNLOGGED BUFFERS TO ENSURE THE "MULTIPLE-USE" NEED OF QUIET AND SOLITUDE

Response: Most, if not all, of the Forest's developed recreation sites are located in areas of the Forest managed for Visual Quality Objectives in all alternatives considered. Forest-wide Standards and Guidelines (LRMP, Chapter IV) have been modified to ensure adequate protection to trails and related recreation experiences. Some of the sites, however, may have been constructed after occurrence of activities not now compatible with the site, or are located within view of other ownerships which do not share the same objectives.

TIMBER MANAGEMENT

HARVEST

Harvest Levels

38 *COMMENT*: FULLY ACCOUNT FOR REDUCTIONS IN TIMBER YIELD DUE TO REDUCED HARVEST AND EXTENSIVE MANAGEMENT OF STREAMSIDE MANAGEMENT UNITS

Response: The relationship between allocations to Riparian Management Areas (Streamside Management Units) and timber yield was discussed in DEIS, Appendix J, "Summary of Relationship between Timber and MR's" which is now part of the process record. This linear relationship can be

summarized as a reduction in ASQ of 180 MBF (six-tenths of the 300 MBF effect under full yield) per 1,000 acres of land otherwise suitable for timber production allocated to Riparian Prescription B for the average alternative. The reduction for Riparian Prescription C would be about eight-tenths of the potential, or about 240 MBF per 1,000 acres. These formulas may be applied to the total suitable land allocation to Riparian management in any alternative, including the Preferred, to calculate the approximate reduction in potential timber harvest (FEIS, Appendix I, "Management Area Contributions to the Resolution of Planning Problems").

39. *COMMENT*. ANY REDUCTIONS IN ASQ SHOULD BE PHASED IN OVER A TEN-YEAR PERIOD.

Response: The projected Forest outputs, including ASQ, are average annual values for the first decade (LRMP, Chapter IV, "Proposed Outputs"). Actual outputs for individual years may vary. The administrative option exists to phase in a reduction in ASQ, provided that the total for the decade remains the same Congressional direction on funding and priorities would ultimately determine whether that option can be implemented

40 *COMMENT*· THE PROPOSED PLAN WILL CREATE A SHORT-TERM OVERSUPPLY OF TIMBER, CAUSING ARTIFICIALLY LOW PRICES (NOT REFLECTING THE TRUE VALUE) AT THE EXPENSE OF ROADLESS AREAS AND THE ENVIRONMENT.

Response. The analysis of current and future timber supply and demand does not indicate that implementation of the Preferred Alternative S will create a short-term oversupply of timber The Preferred Alternative would cause a slight decrease in ASQ from the Siskiyou National Forest compared to the situation prior to Forest Plan implementation No compensating increases in harvests from other ownerships are predicted in the first decade During this time, a slight increase in demand for local wood products is anticipated. The combination of these trends does not indicate a short-term oversupply of timber.

41. *COMMENT*: COMPARE PROPOSED ASQ TO THE HARVEST LEVEL IN THE EXISTING PLAN, AND TO RECENT ACTUAL HARVEST LEVELS

Response: The ASQ proposed for Preferred Alternative S is located in the description of alternatives The harvest level of the prior plan corresponds to the harvest level for Alternative No Change, also located in the description of the alternatives (FEIS, Chapter II, "Alternatives Considered in Detail"). Recent actual harvest levels are displayed in the table titled, "Siskiyou National Forest Timber Harvest Record 1963 to 1986" (FEIS, Chapter III, ""Economic and Social")

42. *COMMENT*: THE FEIS PREFERRED ALTERNATIVE SHOULD BE DEVELOPED WITH A MAXIMUM TIMBER PRODUCTION OBJECTIVE AND NOT BE OVERRIDDEN BY A MAXIMUM PNV OBJECTIVE

Response. The Preferred Alternative (and others) use a maximum timber objective function with a PNV "rollover." This does not override the timber objective function, but produces an economically efficient solution that achieves the maximum level of timber output derived with the timber objective. To do this, the model is solved with the timber objective function. Then a value equal to 99 percent of the maximum ASQ achieved is used to set a minimum ASQ constraint, and the model is solved with a PNV objective function.

43. *COMMENT*· THE NEED FOR OLD GROWTH FOR BIOLOGICAL OR AESTHETIC REASONS CAN ALSO BE SATISFIED TO SOME DEGREE WITHOUT SACRIFICING WOOD PRODUCTS IN LARGE

STANDS OF DECADENT OLD GROWTH IT WOULD APPEAR TO BE PRUDENT TO GET THE MAXIMUM WOOD PRODUCT FROM THE RESOURCE BASE WITH THE LEAST INTERFERENCE WITH OTHER USES, AND WITH THE LEAST SACRIFICE OF INCREASED FUTURE PRODUCT.

Response: Efficient allocations of land can satisfy biological or aesthetic needs with a minimum effect on allowable sale quantity As an example, the design of the Designated Wildlife Habitat Management Area had examined lands unsuitable and unavailable for timber harvest prior to evaluating suitable lands for their appropriate allocation as an old-growth habitat Management Requirement. Other allocations were also examined to consider their efficiency for competing and compatible uses to ensure no opportunities were overlooked.

44 *COMMENT*: THE SISKIYOU'S PREFERRED ALTERNATIVE IS UNACCEPTABLE BECAUSE IT VIOLATES THE FOREST SERVICE'S MANDATE TO PRACTICE SUSTAINED YIELD IN ITS TIMBER HARVEST PROGRAM NATIONAL FORESTS ARE TO BE MANAGED SO AS TO PRODUCE A HIGH LEVEL OUTPUT OF TIMBER. OTHER RESOURCES MAY BE CONSIDERED ONLY INSOFAR AS THEY DO NOT CONFLICT WITH THE STATUTORY DIRECTIVE TO MANAGE THE FORESTS FOR MULTIPLE-USE SUSTAINED-YIELD. SUSTAINED YIELD MEANS THE ACHIEVEMENT AND MAINTENANCE IN PERPETUITY OF A HIGH-LEVEL ANNUAL OUTPUT OF THE VARIOUS RENEWABLE RESOURCES.

Response: A "high-level" output of various renewable resources has to be viewed in context of all the resources of the Forest including, recreation, range, watershed, timber, wildlife and fish. A "high-level" of all these resources necessarily requires an appropriate blend; it does not dictate that one resource will be given undue preference over another The Multiple-Use Sustained-Yield Act of 1960 directs that the several products and uses of the National Forests be administered with due consideration given to the relative values of the various resources in a particular area. The various renewable resources are to be managed "so that they are utilized in the combination that will best meet the needs of the American people, making the most judicious use of the land for some or all of these resources...; that some land will be used for less than all of the resources; and harmonious and coordinated management of the various resources.. with consideration being given to the relative values. ., and *not necessarily the combination of uses that will give the greatest unit output.*" While some alternative themes in the FEIS may weight one or several resources far heavier than others, they still appear consistent with the Organic Administration Act of 1897, the Multiple-Use Sustained-Yield Act, and NFMA The critical point is the decision which has as its basis numerous laws and regulations applicable to the future direction and management of the National Forest. None of these laws and regulations mandate the achievement and maintenance in perpetuity of a high-level annual output of timber at the expense of other resources. The Preferred Alternative S best accomplishes this appropriate blend

45. *COMMENT*. YOUR PLAN K, MANAGEMENT AREAS #1-#14, ALMOST ALL CONTEMPLATE TIMBER LANDS REDUCTIONS WHY? WE ARE LOSING TWO CROPS OF TIMBER UNDER PLAN K WHICH RUNS COUNTER TO REAL FORESTRY PRACTICE.

Response: The Forest Service is required by Congress to "include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness" (National Forest Management Act of 1976). The different Management Areas are lands which provide for coordination of the different uses of your National Forest (FEIS, Chapter II, "Management Areas"). Specific reductions in land suited for timber production vary widely by alternative and are mainly due to the addition of Backcountry Recreation and Supplemental Resource areas. The Backcountry Recreation areas are primarily adjacent to the Wild and Scenic Illinois River where timber management is expensive and potential impact on river users high. The Supplemental Resource Areas are primarily include steep, inner gorge areas with very productive fisheries.

Congress has given the Forest Service direction that rotations will not be less than 95 percent of the culmination of mean annual increment (CMAI). The rotation length used on the Siskiyou National Forest varies by site class and management intensity from 80 to 140 years within the General Forest Management Area.

46. *COMMENT* ALTERNATIVE K SEEMS TO CONTINUE LOGGING AT CURRENT LEVELS AND DAMN THE CONSEQUENCES. ANNUAL TIMBER SALE QUANTITY IS BASED ON 150 MMBF WHICH IS THE HIGHEST VOLUME HARVESTED SINCE 1979 THIS SHOULD MAKE THE LOGGERS HAPPY BUT IT IS NOT GOING TO HELP PROTECT THE ENVIRONMENT.

Response: Harvest levels in 1987 and 1988 have exceeded 150 MMBF The different land allocations, Standards and Guidelines, and capital investments for recreation, watershed, wildlife and fisheries, range, and timber will provide environmental protection under a number of resource opportunities The environmental consequences associated with each alternative are presented in Chapter IV of the FEIS

47. *COMMENT.* OUR OPPOSITION IS ALSO BASED, IN PART, ON THE FACT THAT THE MAXIMUM POTENTIAL OF THE TIMBER PRODUCING LANDS IN THE SISKIYOU NATIONAL FOREST NOT LEGALLY WITHDRAWN FROM TIMBER PRODUCTION ARE NOT BEING MANAGED AS INTENSIVELY AS THEY SHOULD BE, AND AS A CONSEQUENCE DO NOT PROVIDE THE MAXIMUM HARVEST POTENTIAL OF THESE LANDS.

Response· Many of the alternatives, including the Preferred, do not produce the maximum amount of harvests on lands available and suitable for timber production for two reasons. First, it is not cost efficient to produce the maximum amount of timber Some hardwood conversions, fertilizations, commercial thinning opportunities, and other activities will not pay for the costs of implementation (FEIS, Chapter II). Second, the Forest Plan must "provide for multiple use and sustained yield of the products and services... and include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness" (NFMA, 16 USC 1604)

48. *COMMENT*· PRODUCTIVE CAPACITY AND EFFECTS OF INTENSIVE MANAGEMENT ARE UNDERESTIMATED OR OVER-ESTIMATED, NOT ADEQUATELY DISCUSSED, AND/OR UNSUBSTANTIATED. GROWTH OF IMMATURE TIMBER (PLANTATIONS) IS OVERSTATED.

Response: Forest growth and yield ("productive capacity") and the growth effects of intensive management were both projected from 1979 Siskiyou National Forest inventory data as modeled by DFSIM. The relationships used within the DFSIM computer model to project stand growth and development were statistical regressions developed from data collected from many stands grown under different conditions throughout the Pacific Northwest Douglas-fir region. The collected data included many stands with different treatments and management intensities, which provided a basis for projections of the effects of intensive management practices. The model is considered to be "state-of-the-art", and permits further refinement for local conditions. Local tree height/age relationships were used in growth functions, and output was modified for stockability limitations of low productivity sites (Managed Yield Tables for the Siskiyou National Forest, pp. 1-19; Craig, D., 1984).

49. *COMMENT*· SOME REVIEWERS REQUEST A DEPARTURE FROM NON-DECLINING TIMBER FLOW; OTHERS STATE THAT DEPARTURES ARE NOT JUSTIFIABLE.

Response: Two alternatives are presented both with and without a departure in ASQ from non-declining timber yield constraints: Alternatives A and A-Departure, and Alternatives D and its departure, Alternative

B. Alternative A-Departure was designed to maintain current harvest levels for at least the first decade, with a temporary decline in harvest levels in later decades. Alternative B would achieve the RPA goal for ASQ in the short term with a sharp decline in later decades In the DEIS there was also a departure variation on the Preferred Alternative This alternative received little public support and offered little in terms of the range of alternatives being considered, and was subsequently eliminated from detailed study in the FEIS. The matrix of alternatives with and without departure schedules facilitates comparison of the effects of departure on selected alternatives (see FEIS Chapter II).

50 *COMMENT.* THE PREFERRED ALTERNATIVE VIOLATES SUSTAINED YIELD PRINCIPLES (HARVEST LEVELS ARE TOO HIGH TO BE SUSTAINED)

Response· The analysis process used current inventory information of adequate statistical reliability to group areas of similar biological and physical characteristics (Capability Areas). These Capability Areas were then grouped by common management opportunities and response to management activities (Analysis Areas). Timber prescriptions and yield projections were developed by the DFSIM model for various combinations of site quality and management intensity associated with these Analysis Areas (see FEIS Appendix B) DFSIM projects future timber yields based on stand data from a large number and variety of managed stands in the Pacific Northwest Douglas-fir Region. The FORPLAN linear programming model identified the most efficient set of prescriptions and schedules within the objectives and allocations of each alternative. A constraint for nondeclining yield was applied in FORPLAN for all alternatives except alternatives where a departure was specifically being analyzed. Thus, the alternatives were developed using valid inventory data, a sound, state-of-the-art analysis process, and a rigorous set of constraints so that each alternative (except identified departures) would ensure a sustained, nondeclining yield of wood products. The process is discussed in detail in FEIS, Chapter II, "Description of the Analysis Process".

51. *COMMENT*: PROVIDE FOR SUSTAINED YIELD OF PRODUCT QUALITY AS WELL AS QUANTITY.

Response: Product quality, interpreted as lumber grade, was a factor in the economic evaluation of all alternatives. Product quality was positively related to the average diameter of harvested timber. An increasing timber value was assigned in economic calculations as projected average harvested diameter increased (FEIS, Appendix B, "Determination of Economic Values"). These data were used in the economic efficiency analysis of various rotation/thinning regimes by the DP-DFSIM model. Thus, DP-DFSIM recognized a product quality value premium when it identified those regimes with the highest net benefits (*Managed Yield Tables for the Siskiyou National Forest*, "DP-DFSIM"; Craig, D , 1984) These regimes were then applied in FORPLAN alternative analyses.

The optimal rotation and thinning regimes for high and medium sites predict an average tree diameter at final harvest of approximately 17 inches (*Managed Yield Tables for the Siskiyou National Forest*, "Analysis of Thinning Regimes", Craig, D , 1984) These prescriptions would be applied to sites in the General Forest Management Area. However, prescriptions developed for other Management Areas would provide limited amounts of larger diameter timber for harvest over extended rotations. These Management Areas are Riparian, Partial Retention Visual, Retention Visual, and Scenic/Recreation River (LRMP, Chapter IV, "Management Prescriptions")

52 *COMMENT.* INCREASE AVAILABLE, SUITABLE LAND BASE TO INCREASE SUSTAINED YIELD (EITHER REDUCE NON-TIMBER ALLOCATIONS, OR INCREASE REFORESTABLE LAND BASE BASED ON FIR RESEARCH RESULTS)

Response. Land suitability is determined by the physical capability of the lands to comply with legal requirements if managed for timber production. These requirements are described in FEIS, Appendix B,

"Suitability Analysis." All available data sources were compiled and evaluated by knowledgeable District personnel (silviculturists and soil scientists) to determine and map suitable lands on a site-by-site basis The latest reforestation technology, including applicable results from Forestry Intensified Research (FIR) program in southwest Oregon, was considered when determining the potential of various sites for prompt reforestation without irreversible resource damage. Suitability determinations are based on inherent characteristic of each site.

Two potential circumstances could modify the suitable land base in the future. Further field examination of sites may refine the existing information base, and indicate that changes in suitability classification are necessary on a site-specific basis. Changes in reforestation or soil erosion control technology may permit some additional lands to be promptly reforested without irreversible resource damage. These changes will be monitored for the significance of their aggregate effect on Forest Plan projections as described in LRMP, Appendix D, "Monitoring and Evaluation Program Background "

After reductions are made to the suitable land base to meet legal requirements, a wide range of potential allocations to the various Management Areas is still possible. Alternative C, which is similar to the Maximum Timber Benchmark, represents the upper bounds of potential legal timber production The other alternatives considered a wide range of possible General Forest allocations, and associated ASQ (FEIS, Chapter II, Table II-5).

53. *COMMENT*: REDUCE TIMBER HARVEST (ASQ) TO IMPROVE ENVIRONMENTAL VALUES, PRESERVE ROADLESS AREAS.

Response: ASQ is determined for Forest Plan alternatives by the FORPLAN model based on timber yield tables for assigned prescriptions and intensities, guided by the land allocations particular to that alternative. For each alternative, land is allocated to Management Areas based on the theme and objectives for that alternative. Land areas are assigned based on how well they meet the objectives and respond to the issues while minimizing effects on other resources (FEIS, Chapter II, "Description of the Analysis Process"). This allocation process most directly influences the interaction of ASQ with environmental effects and roadless area management.

The alternatives considered in detail are well-distributed through a wide range of potential allocations to the various Management Areas. The alternatives evaluate specific combinations of resource objectives which result in various ASQ levels (FEIS, Chapter II, Table II-5). The ASQ is one of the important parts of each alternative presented for the decisionmaker.

54 *COMMENT*: INCREASE TIMBER HARVEST (ASQ) OVER PREFERRED ALTERNATIVE (WITH OR WITHOUT MAINTAINING MMR'S AND/OR DISPERSION CONSTRAINTS).

Response· The timber harvest level interacts with almost every other issue. A range of alternatives is evaluated to provide information relative to the balance of benefits that might be achieved under different options. Each alternative is designed to efficiently meet a unique set of objectives. The basic potential of the Forest is limited by the amount of suitable land available for timber production. Management Requirements (MR's) of law and regulation must be satisfied. The Forest Service has attempted to identify the most efficient (least tradeoff) methods for accomplishing the MR's (FEIS, Chapter II "Management Requirements," and Appendix J). In response to comments on the DEIS, the Forest has re-analyzed the timber harvest dispersion constraints when developing the FEIS Preferred Alternative S These constraints have been refined in this alternative to accomplish dispersion objectives with less opportunity cost to ASQ (FEIS, Chapter II " Alternatives Considered in Detail").

55. *COMMENT*: FURTHER STUDY AND DOCUMENTATION ARE NEEDED OF THE IMPACT OF REDUCED ASQ ON LOCAL/REGIONAL MILLS AND INVESTMENTS.

Response: The effects of changes in ASQ by alternative were analyzed for the four-county region which consumes nearly all timber produced by the Siskiyou National Forest (Jackson, Josephine, Curry, and Coos counties) The effects on aggregate supply and demand among all ownerships were used for the comparison of alternatives for this topic (FEIS, Chapter IV, "Economic and Social"). This analysis was updated using the latest data between the Draft and Final EIS

Salvage

56. *COMMENT*. FIRE-KILLED TIMBER SHOULD BE REMOVED AS SOON AS POSSIBLE TO AVOID GREATER DAMAGE

Response: For the 1987 fires, this issue has been decided in decisions for the Silver Fire Recovery Project (FEIS, 1988), and several Environmental Assessments for the Longwood and Galice fires. For future fires, a site-specific analysis will be completed which will consider the removal of fire-killed timber in accordance with the Forest's Standards and Guidelines.

57. *COMMENT* PRESERVATION OF STANDING TIMBER IN BURNED AREAS MUST BE CONSIDERED TO BE EQUAL TO THE PRESERVATION OF THE OLD-GROWTH AREAS.

Response: Salvage will occur only in a portion of the areas burned in the 1987 fires Most live trees will not be cut, significant areas of dead trees will be left standing. See the Silver Fire Recovery Project FEIS and Record of Decision for more detail

58. *COMMENT*: WITH THE "BLACK FOR GREEN," I'M CONCERNED ABOUT THE USES OF THE GREEN FURTHER DOWN THE ROAD, IF IT WILL JUST BE POSTPONED CUT OR COMPLETELY TAKEN OUT OF THE TIMBER YIELD OF THE FUTURE.

Response: The amount of green timber to be sold is one of the major decisions of the Forest Plan. Some green timber is postponed and others are taken out of the timber base as identified in the FEIS

59. *COMMENT*. SALVAGE LOGGING COULD OCCUR IN DESIGNATED WILDLIFE HABITAT UNDER THE EXCEPTIONS LISTED UNDER TIMBER MANAGEMENT (MA8-7) HOW WILL THIS BE REGULATED, IF A SMALL PERCENTAGE OF THE STAND ACTUALLY BLOWS DOWN?

Response: The direction has been rewritten to tighten restrictions on salvage logging in these areas (LRMP, Chapter IV, "Management Prescriptions"). It would seldom, if ever, occur.

Silvicultural Methods

60. *COMMENT*: THE BASE PERIOD USED TO ESTABLISH TIMBER VALUES OVERESTIMATES VALUES BECAUSE IT INCLUDES THE INFLATIONARY OVERBIDDING OF THE LATE 1970'S.

Response The base period of 1973-1982 was used to establish timber values It includes both high and low stumpage values, typical of timber economic cycles

61. *COMMENT*· REQUIRE RECOVERY AND RESTOCKING OF A HARVESTED AREA BEFORE HARVEST IN ADJACENT STAND IS PERMITTED.

Response· The Forest-wide Standards and Guidelines (LRMP, Chapter IV) require that a harvested stand shall be considered a created opening until reforestation meets these criteria· Crop trees are well distributed and meet acceptable stocking levels; Crop trees average at least 4-1/2 feet tall and are free to grow.

It is permissible to harvest timber stands adjacent to a created opening. However the total size of the combined harvest areas is limited to a maximum of 60 acres, with exceptions for catastrophic events and certain specified circumstances (LRMP, Chapter IV, "Timber Management").

62 *COMMENT*. EMPHASIZE NATURAL RESISTANCE TO PATHOGENS AND FIRE IN REFORESTATION PRACTICES.

Response: Forest Standards and Guidelines require that silvicultural treatments should reduce susceptibility to insect and disease damage (LRMP, Chapter IV, "Fire and Pest Management"). Where natural resistance mechanisms are identified, they would be incorporated into reforestation and stand management prescriptions (e g., blister rust resistance mechanisms in sugar pine are selected for in seed collection, and resistant seedlings are planted on hazardous sites.) Where genetic ("natural") diversity mechanisms are not known or effective, control of age class distribution, stocking levels, and species mix can best minimize both the risk and hazard of losses to pathogens. One pathogen of particular concern is Phytophthora root disease of Port-Orford-cedar. No natural resistance has yet been identified Measures have been identified to reduce the risk of introducing the disease in reforestation activities, including: emphasis on natural regeneration in uninfected areas, exclusive use of disease-free Port-Orford-cedar planting stock, and control of planting operations to minimize the risk of introducing disease spores to uninfected stands ("Port-Orford-Cedar Control Strategies", POC Consensus Group, 1988)

Forest Standards and Guidelines also require that fire hazard be managed and reduced to appropriate levels, considering all resource values (LRMP, Chapter IV, "Fire and Pest Management"). Treatment of fuels prior to reforestation is a principal means of reducing hazard for the future stand Factors that influence fire risk and hazard which are considered in prescribing stand management activities include: spatial and temporal arrangement of treatment areas, and treatment methods and specifications. Although there is variability in fire resistance among species used in reforestation on the Siskiyou National Forest, the overall adaptation of a species to site-specific conditions and resource objectives are the principal criteria by which species are prescribed for reforestation.

63. *COMMENT*. USE A VARIETY OF ROTATION AGES, INCLUDING LONGER ROTATIONS, TO PROVIDE MORE MULTIPLE USE BENEFITS AND/OR GREATER TIMBER QUALITY.

Response· A variety of rotation ages, including longer rotations, were considered and analyzed in the development of both alternatives and Management Area Standards and Guidelines.

Most Alternatives that were considered in detail analyzed environmental and economic effects using rotations that approximated CMAI (average 100 years). Alternatives D-1 and K-1 analyzed the effects of shorter rotations (average 80 years). Alternative M analyzed the effects of longer rotations (average 250 years). Reference FEIS, Chapter II, "Alternative Descriptions "

In the General Forest Management Area, the minimum stand ages for final harvest range from 80 to 140 years, depending on site quality and management intensity. These rotations are presented as minimums, and longer rotations may occur on a site-specific basis to better meet multiple resource objectives and scheduling constraints. Three Management Areas have Standards and Guidelines which include longer rotations for multiple resource benefits (LRMP, Chapter IV)

64. *COMMENT.* SUBSTANTIALLY INCREASE THE MONEY FOR RESOURCE ELEMENT TIMBER E5 (ADEQUATE REFORESTATION)

Response. The reforestation budget is a function of the amount of acres harvested. The Siskiyou National Forest has reforested areas harvested in the past and will continue to reforest future areas The funding level is adequate to achieve reforestation.

65. *COMMENT·* GENETICS, USE OF HERBICIDES, THINNING, AND FERTILIZATION SHOULD BE USED INTENSIVELY TO INCREASE GROWTH.

Response: Timber harvest outputs disclosed in the FEIS are based on the assumption that all silvicultural techniques are available to be used. Chapter IV of the LRMP discusses the timber management practices that may apply on all lands selected for timber production Commercial thinnings, fertilization, release, and use of genetically improved seedlings are examples of some of the management practices that are recommended in the FEIS However, before any cultural activities are undertaken, site-specific environmental analyses and/or silvicultural prescriptions will be prepared. In the case of herbicides, the site-specific environmental analyses will be tiered to the 1988 Regional vegetation management FEIS ("Managing Completing and Unwanted Vegetation").

66 *COMMENT·* RESEARCH IN FOREST ENTOMOLOGY BY TIM SCHOWALTER, OREGON STATE UNIVERSITY, INDICATES THAT CONVERSION OF OLD-GROWTH FORESTS TO EVEN-AGED SINGLE SPECIES STANDS INCREASES THE PROSPECTS OF SERIOUS DISEASE AND INSECT INFESTATION

Response: The Siskiyou National Forest does not manage for single species stands The choice of even- or uneven-aged management (both systems have been used on the Forest) is dependent on site potential and stand conditions. Possible insect infestation is considered in resource prescriptions.

Waring indicates that carbohydrate reserve is one of the most important factors affecting the tree's ability to resist insect attacks The even-aged stands of lodgepole pine on the east side of the Cascade Range were much more resistant to western pine beetle when fire regularly thinned the stands, keeping the survivors with a high carbohydrate reserve. On the Siskiyou, we plan to produce healthy stands through stocking level control and providing for a diversity of species.

67. *COMMENT* PLANT MORE TREES

Response: The Siskiyou National Forest's objective for reforestation is to promptly reforest all nonstocked lands which are suitable for timber management to acceptable stocking levels. In addition, certain nonstocked lands unavailable for timber production may be reforested to produce other resource benefits. The silviculturist prescribes the number of seedlings to be planted based on site productivity and anticipated seedling survival. The success in meeting reforestation objectives is monitored through periodic plantation surveys until the plantation can be certified as established and free to grow. Summaries of historic reforestation success displayed in the FEIS Chapter III indicate that current reforestation

practices meet our stocking and timeliness objectives with a very high degree of success. There is no apparent benefit to be derived from planting more trees at additional cost.

68 *COMMENT*. LEAVE ADDITIONAL TREES AND RELY MORE ON NATURAL REGENERATION.

Response: Forest-wide Standards and Guidelines require the consideration of natural regeneration potential in silvicultural prescriptions (LRMP, Chapter IV, "Timber Management"). The Siskiyou National Forest is currently studying correlations between plant associations and observed natural regeneration over time. The objective of this study is to better predict sites where natural regeneration could be expected to supplement planted stock or completely reforest a site. With reliable predictive tools available, the silviculturist must then weigh the cost savings of natural reforestation against the risks of costly site reclamation in cases of failure in prescribing for natural regeneration. Long-term costs/limitations of natural regeneration include a reduction in potential yield as compared to genetically-selected stock and, ironically, a potential reduction in genetic diversity due to the high degree of interrelatedness among potential seed trees in a single stand ("Natural Regeneration--Genetic and Seed Aspects," Friedman, Sharon T., USDA-Forest Service, Region Six Tree Improvement Paper #64, 1985).

Where natural regeneration is planned as part of a silvicultural prescription for reforestation, both seed source and site conditions would be considered. If site conditions are unfavorable for prompt natural regeneration, or if tree vigor and seed production is low, leaving additional seed trees would have little effect. Under favorable site and stand conditions, relatively few trees (3 to 10 per acre) are required to produce abundant seed In certain circumstances, more trees would be left to ameliorate harsh site conditions (heat, moisture stress, frost) for seedling establishment (shelterwood harvest).

69 *COMMENT*. REDUCE DEPENDENCE ON NURSERY STOCK FOR REFORESTATION DUE TO THE POTENTIAL REDUCTION OF GENETIC DIVERSITY

Response: Forest-wide Standards and Guidelines require the consideration of natural regeneration potential in silvicultural prescriptions (LRMP, Chapter IV, "Timber Management"). The Siskiyou National Forest is currently studying correlations between plant associations and observed natural regeneration over time. The objective of this study is to better predict where natural regeneration could be expected to supplement planted stock or completely reforest a site.

However, increased reliance on natural regeneration may actually result in a reduction in genetic diversity on a particular site. Studies have found a high degree of interrelatedness among the dominant, seed-producing trees within a small area such as a single stand. When a stand is opened up for regeneration, these trees are most likely to be left and the degree of self- and cross-pollination among related individuals would be relatively high. ("Natural Regeneration--Genetic and Seed Aspects," Friedman, Sharon T., USDA-Forest Service, Region Six Tree Improvement Paper #64, 1985.)

Guidelines for seed collection for artificial reforestation include provisions to maintain genetic diversity in nursery stock. Each seedlot groups collected seed from individual parent trees that are broadly distributed over a specified geographic area and elevation band. A minimum number of parents is required for grouping into a seedlot, and distribution requirements ensure that relatedness among parent trees is minimized (Siskiyou National Forest Ten-Year Tree Improvement Plan; Tibbs, T , Brady, G., and Vagle, N ; Rev. 1988)

70. *COMMENT* ROTATIONS AND FOREST MANAGEMENT PRACTICES SHOULD BE DEVELOPED AND USED TO MAINTAIN/REPLACE OLD-GROWTH FORESTS ON AT LEAST SOME HARVESTED LANDS

Response: Silvicultural systems and rotations have been planned for two Management Areas which will provide some degree of old-growth character. For the Retention Visual Management Area, objectives include maintenance of natural landscape character with a large tree component, and minimizing perceived openings over time Techniques are recommended to produce trees in the range of 36 inches DBH prior to final harvest The scheduling constraints for the Retention viewsheds are anticipated to result in rotation lengths of up to 250 years (LRMP, Chapter IV, Management Area 12).

For the Riparian Management Area, objectives for maintaining canopy cover and large conifer habitats will encourage the development of multi-layered stands with an old-growth component. For Class I and II streams (larger streams and rivers), at least 70-80 percent of the preexisting conifer basal area should be maintained after harvest operations. Entries should not occur more frequently than at 20-year intervals (LRMP, Chapter IV, Management Area 11).

The Forest Plan recognizes that old-growth wildlife habitat areas set aside in this Plan will not provide suitable habitat indefinitely The forest is a dynamic, rather than static, ecosystem. Conversely, change on a forest-wide basis is generally slow. It will be many decades before most of the existing old-growth stands naturally recycle to early successional stages Designated habitat areas will still be old growth well after this planning cycle has ended The Forest Service will evaluate the opportunities to substitute habitat areas in the next round of planning, and examine methods for providing future old-growth wildlife habitat (LRMP, Chapter IV, Designated Wildlife Habitat) Research in progress throughout the Pacific Northwest should help us make informed decisions when the Plan is next revised.

71 *COMMENT*. ELIMINATE USE OF CLEARCUTTING AS A REGENERATION SYSTEM

Response: The selection of a silvicultural system is guided by law and by selection criteria outlined in the Regional Guide for the Pacific Northwest Region (May, 1984). Clearcutting will be used only where determined to be the optimum method to meet the requirements and objectives of the Forest Plan (NFMA, P L. 94-588). The selection of a silvicultural system will evaluate site and stand conditions and management objectives on a site-specific basis; however there are combinations of conditions and objectives frequently encountered on the Siskiyou National Forest for which clearcutting is the optimum system These factors are discussed in detail in FEIS, Appendix G.

72. *COMMENT*: SHORTEN ROTATION OF EXISTING IMMATURE STANDS TO INCREASE SUSTAINED YIELD AND/OR FILL IN THE DEFICIT IN THE TIMBER INVENTORY.

Response: The Forest Service is directed by NFMA to schedule final harvest based on the culmination of net stand growth Policy interpretation of this law establishes the minimum rotation length for Forest Plan prescriptions at 95 percent of CMAI (FEIS, Appendix B, "Development of Management Requirements"). Alternatives with exceptions to this requirement, such as shorter rotations, may be developed to respond to particular issues or concerns (FEIS, Chapter II, "Alternatives Considered, but Eliminated from Detailed Study"). However, such an alternative must demonstrate clear multiple resource benefits (maximize net public benefits) in order to be selected and excepted from law and policy requirements.

Alternative D1 was developed with shorter rotations for all immature and managed stands. It provides another way to provide a higher level of timber outputs while projecting a nondeclining yield schedule; however, it may not meet the requirements of NFMA. Additional alternatives or variations of alternatives were considered, but eliminated from detailed study

73. *COMMENT*: DISCUSS THE COMPARATIVE EFFECTS ON ECOSYSTEMS OF THE VARIOUS REGENERATION SYSTEMS THAT WERE CONSIDERED.

Response: The effects on ecosystem components of the regeneration systems that were considered are compared in FEIS, Appendix G, "Comparison of Systems."

74. *COMMENT*: REFORESTATION SUCCESS NEEDS TO BE SUBSTANTIATED, IMPROVED, AND MONITORED.

Response: Many public comments and concerns about the success of the Siskiyou's reforestation program were received. In response, Forest personnel have reviewed and validated the reforestation records in the Total Resource Information (TRI) data base. These data have been summarized and discussed in FEIS, Chapter III, "Vegetation." They indicate a high rate of success for current reforestation practices on the Siskiyou National Forest. Additional support data for this analysis are available in the Planning Records ("Reforestation Status Report," 11/14/88)

Reforestation success will continue to be monitored in individual plantations according to prescribed exam schedules and procedures In addition, reforestation data will be summarized and monitored on a Forest-wide basis to measure attainment of Forest Plan objectives for prompt establishment and for stocking levels (LRMP, Chapter V, Table V-1, "Monitoring and Evaluation Program," and Appendix D, "Monitoring and Evaluation Program Background").

75. *COMMENT*: THE FOREST SERVICE SHOULD BE LOOKING AT OTHER HARVEST AND SILVICULTURE METHODS THAT DO NOT INVOLVE PRESCRIBED BURNING, OR SHOULD UTILIZE ALTERNATIVE SLASH TREATMENT METHODS, SUCH AS CHIPPING.

Response: The selection of a fuel treatment method is based on an interdisciplinary site-specific analysis which considers the site specific and adjacent resource needs as well as the cost of treatment (LRMP, Chapter IV, "Forest-wide Standards and Guidelines").

Chipping is a fuel treatment method that has been utilized to a limited degree on the Siskiyou National Forest Limited access, steep topography, heavy fuel loadings, and labor costs limit the effectiveness of this particular treatment.

76. *COMMENT*: THERE IS A HIGHLY SUCCESSFUL ALL-SPECIES FOREST ECOSYSTEM MANAGEMENT PROGRAM BEING PRACTICED BY SMALL WOODLAND OWNERS WHICH DOES ADDRESS ALL THE MAJOR ECONOMIC AND ENVIRONMENTAL ISSUES FROM A SUSTAINABLE POINT OF VIEW. IT IS KNOWN AS "NATURAL SELECTION FORESTRY" AND IS BASED ON THE BOOK, *THE FOREST FARMERS HANDBOOK* YOU SHOULD OPEN THE DOOR FOR AN ALL-SPECIES NATURAL SELECTION FOREST ECOSYSTEM MANAGEMENT CONCEPT.

Response: See the FEIS, Appendix G, "Selection of Silvicultural Systems," for an extensive discussion on silvicultural systems, Forest conditions, management goals and objectives, comparison of systems, and directions and guidelines for the choice of appropriate silvicultural systems.

Harvest Methods

77 *COMMENT*. ABSOLUTE RESTRICTIONS ON USE OF PARTICULAR LOGGING SYSTEMS (HORSE ONLY, OR NO HEAVY MACHINERY/CHAINSAWS) LOG FIRE SALVAGE WITH BALLOONS OR HELICOPTERS

Response: The selection of particular logging systems is not within the scope of the Forest Plan. It is a site-specific decision made in conjunction with area transportation planning and unit design needs at the project-level. No system is excluded from consideration on a Forest-wide basis. Rather, analysis of site and stand conditions and resource management objectives will guide the selection for each proposed harvest unit.

78. *COMMENT*: DEVELOP A COMPREHENSIVE LOGGING PLAN

Response: Logging systems planning will be accomplished at the project level. The selection of the most appropriate system is a site-specific decision within the context of the most cost-effective and environmentally sound area transportation plan. Logging systems planning does not affect the land allocation or resource output processes at the Forest planning level. Rather, the selection of a system will be guided by the Management Area prescriptions and Standards and Guidelines established in the Forest Plan

79. *COMMENT*· INDIVIDUALS WERE CONCERNED ABOUT THE EFFECT OF TIMBER HARVESTING ON LONG-TERM SOIL PRODUCTIVITY AND THE POTENTIAL FOR AN IRRETRIEVABLE LOSS OF SURFACE SOIL RESULTING FROM EROSION. SPECIFICALLY ONE WRITER COMMENTS THAT, "IF ONE GOES TO SHORTER ROTATIONS, WHAT WOULD BE THE EFFECT ON THE SOIL AND WATER RESOURCES?"

Response: The effect of 80- to 120-year rotations on long-term site productivity and water quality and quantity is somewhat uncertain at this time Research does not have definitive answers regarding long-term soil biology and nutrient levels There is, however, considerable research on long-term site productivity being initiated (LRMP, Chapter II, "Research and Information Needs") Basic mitigation measures such as streamside protection areas, retention of large woody material and wildlife reserve trees, site preparation and fuels treatments under high moisture conditions, and proper location of roads and harvest units will help to maintain site productivity and water quality and quantity (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Under high soil and fuel moisture conditions of spring, a small percentage of the duff and litter is consumed in the burn.

Please note, though, that measurable changes in water quality and quantity are far more correlated with the degree of treatment, or "how much" and specifically "where" than with rotation length itself. If shortening rotation causes acres of harvest and associated roading within a basin or subwatershed to change by decade, then the effects are quantifiable (See Alternatives D1 and M in Chapter IV, FEIS, under Soil and Water, and Fish sections).

Soil (and site) productivity monitoring is currently evolving in the research community Monitoring of site productivity will focus on biochemical and physical values of large woody material as described in the "Monitoring and Evaluation Program," (LRMP, Chapter V). Monitoring and evaluation of soil conditions will take advantage of the close ties that have been developed with the research communities of Oregon State University and the Pacific Northwest Experiment Station Monitoring and updating of projects will be as specific and as current as the scientific community's research

80. *COMMENT* LIMIT THE SIZE AND/OR EXTENT OF CLEARCUTS

Response: The size of clearcuts is limited by management direction for opening size from the Regional Guide for the Pacific Northwest Region (1984) Sixty acres is the general maximum limit without public notice and Regional Forester review. Up to 90 acres may be permissible, but only in certain specified circumstances Natural catastrophic events are also excepted All other exceptions would require 60-day

public notice and Regional Forester review (LRMP, Chapter IV, "Forest-Wide Standards and Guidelines--Timber Management") While these are maximum sizes, the average clearcut size has been and is anticipated to continue to be much smaller Additional restrictions on clearcut size are imposed for Management Areas other than General Forest Specifics of harvest unit size and shape would be determined in project-level environmental analysis Regeneration potential, vegetation patterns, affected resource values, and logging systems are key considerations in unit design

The extent of clearcuts is limited by four Forest-wide Standards and Guidelines (LRMP, Chapter IV, "Forest-wide Standards and Guidelines--Timber Management"). The extent of clearcut harvest is also constrained on a watershed basis to avoid adverse cumulative watershed effects. If more than 20 percent of a Watershed Analysis Area is proposed for harvest in one decade, a cumulative effects analysis is required to demonstrate that watershed conditions will not be impaired.

81. *COMMENT*: IN OVERLY-STEEPENED TERRAIN, USE OF LOW INTENSIVE FOREST MANAGEMENT WHICH MAXIMIZES THE USE OF NATURAL REGENERATION, SHELTERWOODS OR SMALL PATCH CLEARCUTS, EXTENDED ROTATIONS AND AERIAL YARDING SYSTEMS OFFER OPPORTUNITIES FOR COMPROMISE.

Response· Alternative S, as developed in the FEIS, includes areas specifically identified for this type of management These are the Extensive Management overlay in the General Forest Management Area.

82. *COMMENT*. FURTHER FUNDING IS NEEDED TO RESEARCH MODERNIZATION OF LOGGING METHODS WHICH MINIMIZE ROADBUILDING.

Response: Current logging technology with large skyline yarders and helicopters provides yarding capabilities in excess of one mile Basic research into logging technology is beyond the scope of the FEIS Private industry and other government agencies have responsibilities in this area

On project-level analyses, which will be tiered to the FEIS (Chapter I, "Introduction to the Forest Plan"), the goal of site-specific logging and transportation planning is to minimize the road density and associated impacts while meeting the timber management objectives in a cost effective manner.

83. *COMMENT*· RECONSIDER THE MASSIVE CLEARCUTTING PROPOSED IN FAVOR OF SHELTERWOOD OR SELECTIVE CUTTING METHODS.

Response. The Forest Service will consider silvicultural methods on all harvest areas to include clearcut, shelterwood, and selective cutting on a site-specific basis (FEIS, Appendix G).

84. *COMMENT*· PRIORITIZE TIMBER STANDS FOR HARVEST ACCORDING TO NET GROWTH RATES (HARVEST STANDS WITH LOWEST NET GROWTH FIRST)

Response: This proposal is not within the scope of decisions made at the Forest Plan level. The prioritizing of stands for harvest will occur in the environmental analysis at the project level as specific proposals and alternatives for timber sales are developed Priorities will be based on site-specific information including the health, vigor, and growth rates of the stands, both timber production and resource objectives will be considered

85 *COMMENT*: CONSIDER/ANALYZE/ADOPT UNEVEN-AGED MANAGEMENT SYSTEM(S) (INCLUDES "NATURAL SELECTION FORESTRY," "RESPECTFUL FORESTRY").

Response: Uneven-aged silvicultural systems would be used on a site-specific basis in all alternatives analyzed in detail. Appendix G in the FEIS discusses the analysis process that was used for recommending appropriate silvicultural systems. The other systems proposed in these comments ("Natural Selection Forestry," "Respectful Forestry") appear to be single-tree selection system variants with specific criteria to identify trees for removal. The key elements of the analysis of single-tree selection systems are applicable.

The Regional Guide for the Pacific Northwest Region (1984) provides the basic criteria for selection of appropriate silvicultural systems, based on applicable laws and policy direction. The final selection of harvest method for any specific site will be part of the silvicultural prescription in concert with the project environmental analysis (FEIS, Appendix G, "Direction and Guidelines"). Appendix G provides suggested applications of the various silvicultural systems. These recommendations are based on comparison of the capability of various systems to meet the Regional Guide criteria, evaluating the interaction of management objectives, site conditions, and stand structure Single-tree selection was identified as an appropriate system for five of the 15 different combinations of Management Area, site, and stand conditions displayed in FEIS Appendix G, Figure G-1, "Silvicultural Systems Analysis."

86. *COMMENT*: DO NOT HARVEST AREAS THAT WOULD REQUIRE ECONOMICALLY INEFFICIENT REFORESTATION AND STAND MANAGEMENT PRACTICES.

Response. The economic efficiency of individual stand management practices is only one factor that is considered in optimizing net public benefits for the entire Siskiyou National Forest. Forest planning analyzes the overall costs and benefits of management activities, including harvest and reforestation, on a Forest-wide basis The FORPLAN model calculates the most cost-effective combination of prescriptions and schedules for the entire forest within the management objectives and land allocations of each alternative (FEIS, Chapter II, "Description of the Analysis Process"). These calculations consider not only the PNV of a timber management prescription for a particular analysis area, but also the scheduling and allocation interactions with all other analysis areas. Acres that do not contribute positively to PNV within an alternative are identified as economically unsuitable. Few acres on the Siskiyou fall in this category in any of the alternatives.

87. *COMMENT*: PROTECT/INCREASE USE OF BUFFER STRIPS TO PROTECT VARIOUS ENVIRONMENTAL/SCENIC VALUES.

Response· The Forest Plan land allocation process guides harvest practices through Management Area Goals, Standards and Guidelines "Buffer strips" where timber harvest is either restricted or prohibited to protect adjacent resource values are suggested or required in the following Management Areas:

Management Area 7 (Supplemental Resource)
Management Area 9 (Special Wildlife Site)
Management Area 10 (Scenic/Recreation River)
Management Area 11 (Riparian)
Management Area 12 (Retention Visual)
Management Area 13 (Partial Retention Visual)

Refer to LRMP, Chapter IV for explanation of each Management Area Alternatives consider a wide range of land allocations to these Management Areas (FEIS, Chapter II, Table II-2: "Acreage in Management Areas").

88. *COMMENT* SUBSTITUTE HELICOPTER (AND SKYLINE) SYSTEMS ON ENVIRONMENTALLY SENSITIVE OR ROADLESS AREAS, ALSO, DECREASE OR ELIMINATE CUTTING IN ENVIRONMENTALLY SENSITIVE AREAS.

Response: In general, the selection of particular logging systems is not determined by the Forest Plan level analysis. Logging system selection will be a site-specific decision made through project level environmental analysis No system is excluded from consideration on a forest-wide basis. The Forest Plan provides resource objectives and Standards and Guidelines which should be met on a site-specific basis by the selected logging system

Alternative S, which was developed between the Draft and Final EIS based on public comments, identifies some areas for "Extensive Management" where intensive forestry practices would not be applied. The areas identified tend to be more environmentally sensitive and development would require higher than average costs, both economically and environmentally. The assignment to Extensive Management is intended to allow these areas to be managed less intensively with less road construction and more helicopter or long-span skyline logging.

89. *COMMENT*· CLARIFY WHETHER 115-YEAR, LOW SITE MATURE TIMBER (NO TIMING CHOICE) IS ALLOWED FOR HARVEST.

Response: For analysis purposes, this model class was combined with the 190 year-old Low Site model class which has similar volume and growth It is allowed for harvest with timing choices beginning in the first decade.

90. *COMMENT*: ALLOW MORE THINNING CHOICES IN THE GENERAL FOREST COMPONENT.

Response: In developing the Managed Yield Tables for the Siskiyou National Forest (Craig, 1984), DP-DFSIM was used to search a multitude of possible thinning regimes for rotation ages ranging from 55 to 175 years. The overall objective was to find the combination(s) of thinning regimes and final harvest that would maximize forest-wide yield while complying with law and policy direction. Because the Siskiyou is a deficit inventory forest, a balance of relatively short rotation lengths and higher early commercial thinning volume would best fill future gaps in available inventory. Thinning and rotation regimes were studied and optimized through DFSIM projections; these regimes were used in Forest Plan analysis. Other thinning choices were studied, but did not meet the stated goal of maximizing overall forest timber yield. They were not included in further Forest Plan analyses. For more detailed discussion of this topic, reference *Managed Yield Tables for the Siskiyou National Forest*, "Analysis of Thinning Regimes" (Craig 1984).

91. *COMMENT*: HARVEST ONLY MANAGED STANDS; FOREGO HARVEST UNTIL MANAGED PLANTATIONS ARE COMMERCIAL SIZE.

Response: This proposal was not developed into an alternative to be considered in detail. The outputs and effects associated with this proposal would be intermediate between those of Alternative M and the Minimum Level Benchmark. The Minimum Level Benchmark does not satisfy many of the issues and concerns, particularly those related to developed recreation use, dispersed motorized recreation use, and timber supply. Alternative M proposes no new road development, and provides for the least harvest of unlogged stands in roaded areas. It does, however, satisfy several other Planning Problems to some extent. Accessible, unharvested stands would be managed for old-growth character on extended rotations, although they would eventually be harvested in the General Forest Management Area. This proposal would further restrict areas available for harvest to those with previous harvest activity; the use of optimum (shorter) rotations on those areas is implied A brief comparison indicates that the proposal

provides no better resolution of any Planning Problem than Alternative M. Moreover, it would provide substantially less resolution of the timber production Planning Problem in the short term than Alternative M.

92. *COMMENT*: CONCERN CENTERS ON HEAVY HARVESTING WITHIN A WATERSHED OVER A SHORT TIME PERIOD. "DISTRIBUTE HARVEST OVER SPACE AND TIME" WITHIN A WATERSHED OR RIVER BASIN.

Response: Distribution of harvest is modeled by applying harvest dispersion constraints in the FORPLAN model (See FEIS Appendix B). Harvest constraints vary by alternative and among the 18 Planning Basins according to risks from soil erosion, sensitivity of the watershed, past activities, past natural events, and projected activities on all ownerships.

Reforestation

93. *COMMENT*. BETTER REFORESTATION INFORMATION IS NEEDED TO CONFIRM ALLOWABLE SALE QUANTITY, INCLUDING: GROWTH AND YIELD, AND PROJECTIONS OF LOSS FROM WILDLIFE, STRESS, OR POOR NURSERY STOCK.

    SINCE THE REFORESTATION PROGRAM IS THE FOUNDATION OF THE PROPOSED ACTION AND CONTAINS MANY DATA GAPS, A WORST-CASE ANALYSIS SHOULD BE ACCOMPLISHED BEFORE PROCEEDING.

Response: Reforestation surveys and evaluation are an ongoing process on the Forest. The Reforestation Handbook (2409.26bR6) requires that all plantations receive surveys in the first, third and fifth year after reforestation. These surveys show that the Forest has a highly successful reforestation program and has achieved better than 98 percent satisfactorily stocked acres of all acres of regeneration harvest (FEIS, Chapter III, "Vegetation", and in "Reforestation Status Report," 11/14/88, Planning Records). In regard to future timber yields, monitoring reforestation success will continue (LRMP, Chapter V, and Appendix D) and a young stand inventory will be contracted in 1989.

Council on Environmental Quality (CEQ) regulations contained in Title 40 CFR, Section 1502 22(b), require a worst-case analysis to evaluate environmental risk. CEQ requires a worst-case analysis if information relevant to a reasoned choice among alternatives is not known and the cost of obtaining it is exorbitant. CEQ also requires a worst-case analysis if information relevant to adverse impacts is important to the decision and the means of obtaining it are unknown since reforestation information is both known and obtainable, as noted in the previous paragraph, a worst-case analysis is not required.

94. *COMMENT*. WILL IT MAKE SENSE TO INCUR A COST TO PLANT TREES ON THE SISKIYOU AS A FINANCIAL ENDEAVOR? WHERE IN THE FOREST DOES IT MAKE SENSE TO INVEST IN TREE GROWING? HOW INTENSIVE SHOULD INVESTMENTS IN TREE GROWING BE? ARE INTENSIVE MANAGEMENT PRACTICES ECONOMICALLY JUSTIFIABLE GIVEN THAT FAIRLY RAPID GROWTH IS ONE OF THE PRECONDITIONS? WHO WILL HAVE THE RESPONSIBILITY FOR FINANCING THE REFORESTATION? WILL MASSIVE SUBSIDIES BE REQUIRED FOR INTENSIVE MANAGEMENT PRACTICES ON SECOND GROWTH FORESTS? THESE QUESTIONS ON THE NEED FOR REFORESTATION ANALYSIS REQUIRE ANSWERS BEFORE THE SISKIYOU SELECTS ITS PROPOSED ACTION OR A SIMILAR ALTERNATIVE

Response: Reforestation costs are included in the calculation of present net value for the timber management levels associated with each alternative. Discounted benefits from timber management activities exceed discounted costs, and present net value is positive for all alternatives. See the FEIS, Chapter III, "Economic Efficiency Analysis of Alternatives," and appendix B, "Development of Timber Harvest Option Intensities" and "Determination of Economic Values" for a more detailed discussion.

A portion of the value received for timber harvested is collected to finance reforestation and brush disposal requirements. Other second-growth management activities are paid with appropriated funds.

95. *COMMENT*: THERE SEEMS TO BE GENERAL AGREEMENT THAT TREES GROW RATHER SLOWLY IN SOUTHERN OREGON WHILE OTHER REGIONS IN THE NORTHWEST, SOUTH AND OTHER COUNTRIES HAVE MORE FAVORABLE BIOLOGICAL GROWING CONDITIONS. WITH THESE FACTS IN MIND, THE QUESTION IS CAN THE SISKIYOU COMPETE ECONOMICALLY WITH THESE FASTER GROWING PLANTATIONS?

Response. See the LRMP, Chapter IV, "Management Area 14 - General Forest," for a discussion of rotation ages for different growing sites and management intensities. Since the Forest contains timber stands of various condition classes (FEIS, Table III-18), it is the demand/supply relationship that determines the economic viability of timber production and not necessarily growth rate. For a discussion of timber supply and demand, see the FEIS, Chapter III, "Economic and Social," "Current Demands, Wants, and Desires."

FOREST DIVERSITY

Biological Diversity

96. *COMMENT*. PUBLIC FOREST MANAGEMENT PRESCRIPTIONS FOR HARVEST ARE BEING WRITTEN FOR THE ELIMINATION OF OLD GROWTH IN FAVOR OF YOUNG TREE FARMS. PREFERRED ALTERNATIVE K WOULD, TO A LARGE EXTENT, CARRY OUT SUCH A PRESCRIPTION. THIS IS A VIOLATION OF THE NFMA, WHICH STATES. "MANAGEMENT PRESCRIPTIONS, WHERE APPROPRIATE AND TO THE EXTENT PRACTICABLE, SHALL PRESERVE AND ENHANCE THE DIVERSITY OF PLANT AND ANIMAL COMMUNITIES, INCLUDING ENDEMIC AND DESIRABLE NATURALIZED PLANT AND ANIMAL SPECIES SO THAT IT IS AT LEAST AS GREAT AS THAT WHICH WOULD BE EXPECTED IN A NATURAL FOREST IN THE DIVERSITY OF TREE SPECIES SIMILAR TO THAT EXISTING IN THE PLANNING AREA THE PREFERRED ALTERNATIVE CLEARLY WOULD RESULT IN A LOSS OF FOREST DIVERSITY.

Response: Although the Plan calls for a reduction of "old growth" in the general forest category, old growth is not being eliminated from the Forest landscape. Old-growth stands and extensive areas of old growth are being retained in a carefully planned distribution across the Forest, including land suitable for managing timber products.

Both NFMA and the implementing regulations call for maintaining diversity under a multiple-use Forest Plan. The area of consideration is on a Forest scale Diversity is being planned for by land allocations and active management, and is addressed in the Standards and Guidelines. All activities will be monitored and results of management evaluated for their effects on diversity.

97. *COMMENT*. CLAIMS IN THE DRAFT DOCUMENTS THAT BIOLOGICAL DIVERSITY ON THE FOREST WILL BE ENHANCED THROUGH THE PREFERRED ALTERNATIVE OR THROUGH VARIOUS DEVELOPMENT PRACTICES ARE MISLEADING AND NOT BASED ON A BIOLOGICALLY VALID OR REGIONALLY APPLICABLE DEFINITION OF DIVERSITY TO IMPLY THAT TIMBER

HARVEST AND OTHER HABITAT ALTERING MANAGEMENT ACTIVITIES INCREASE DIVERSITY FAILS TO TAKE INTO ACCOUNT THE SPECIES AND HABITAT THAT ARE RARE AND AT RISK.

Response· Species diversity is higher when there is a variety of seral stages across the landscape than it would be if all forest lands were either in pioneer or climax stage. The optimum mix depends on which type of species are valued. The public value all types of species for a variety of purposes and are keenly interested in maintaining viable populations of rare species. Some rare species require frequent disturbance while others depend on stability.

The strategy of the Forest Service is to provide a variety of habitat by both allocation of lands to categories where management is minimized (for species that require stability) and by Standards and Guidelines maintaining diversity on lands that are managed for timber. All lands will be monitored to determine the trends in diversity and the condition of rare species (see Chapter V and Appendix D of the LRMP).

98. *COMMENT*· COMPARE THE LARGE AREAS OF ORIGINAL FOREST ON THE SISKIYOU WITH SIMILAR AREA ON OTHER FORESTS IN OREGON AND WASHINGTON, IN ORDER TO ASSESS THEIR SIGNIFICANCE FOR REGION-WIDE DIVERSITY.

Response: It is beyond the scope of this document to compare large areas of original forest on the Siskiyou with similar areas elsewhere. However, on a more local level, the Siskiyou National Forest is linked to the Klamath, Six Rivers, and Rogue River National Forests, and two BLM Districts. Area-wide diversity is fostered by the spotted owl habitat areas on all National Forests and BLM lands which link or mesh together. This provides for species continuity between forests in southern Oregon and northern California. In addition, Wilderness, riparian areas, and other special Management Areas provide travel corridors for plant and animal species (FEIS, Chapter III, Affected Environment, "Wildlife").

More information and knowledge is needed for this area. This issue is more properly addressed on a region-wide basis and is identified as "Information Needed" in Chapter II of the LRMP.

99. *COMMENT*: THE FINAL PLAN SHOULD INCLUDE A MORE SPECIFIC AND ENFORCEABLE SET OF FOREST-WIDE STANDARDS AND GUIDELINES FOR PROTECTING AND PRESERVING THE DIVERSITY OF NATIVE PLANT COMMUNITIES EXISTING ON THE SISKIYOU.

Response: In response to public input, a number of changes were made to the Standards and Guidelines (LRMP, Chapter IV) to better protect and preserve diversity. For example, Standard and Guideline 13-1 deals with the general concept of biological diversity The Forest Plan (LRMP, Chapter V and Appendix D) deals with monitoring of biological diversity, the Biological Diversity monitoring element (ET121(g)) is described in detail in Appendix D.

Hardwoods

100 *COMMENT*· INTERSPERSED HARDWOOD STANDS AMONGST THE PINES ARE ALSO NECESSARY TO WILDLIFE AND DISEASE BREAKS WE CANNOT SACRIFICE HARDWOOD FOR A FOREST OF HARVESTABLE PINES FOR ECONOMIC REASONS

Response· Hardwoods are important wildlife habitat. About half of the identified hardwood stands on the Forest (47,000 acres) are within land allocations that preclude timber harvesting (FEIS, Chapter II). Under the Preferred Alternative, up to 7,500 acres of hardwoods (8 percent of the Forest total) may be converted to conifer production during the first decade (FEIS, Chapter II)

101. *COMMENT* COMMENTS WERE RECEIVED CONCERNING THE LEVEL OF HARDWOOD CONVERSION AND ITS EFFECTS ON FOREST DIVERSITY. SOME SUGGEST LESS HARDWOOD AREAS BE CONVERTED; SOME SUGGEST MORE.

Response: A range of allowable hardwood conversion acreage was incorporated in the alternatives considered in the FEIS A maximum allowable acreage of 14,000 per decade was evaluated in Alternatives B, C, D, and D1 Alternatives NC, E, and M were evaluated with no hardwood conversion planned The other alternatives had intermediate conversion acreages (FEIS, Chapter II, "Comparisons of Alternatives Considered in Detail--Vegetation"). For all alternatives, these acreages represent only maximum potential harvest; actual harvest may be less because of utilization requirements for harvested material (LRMP, Chapter IV, "Forest-wide Standards and Guidelines--Timber Management"). Actual utilization would be dependent on local market conditions for hardwood material, which may not be sufficiently high to make harvest economically viable.

A range of potential conversion per decade has been evaluated for its effects on all resources, including forest diversity. The potential harvest for each alternative is compared to the total hardwood acreage on land tentatively suitable for timber production, and the total suitable forest land area (FEIS, Chapter IV, "Vegetation"). Qualitative effects are also discussed; additional analysis and discussion of biological diversity has been incorporated into the FEIS Chapters III and IV based on public comment. Better understanding of the function of hardwoods in the ecosystem is needed as identified in the LRMP Chapter II, "Information Needs "

VEGETATION

Insect/Disease Control

102. *COMMENT*: FURTHER RESEARCH IS RECOMMENDED IN THE AREA OF PORT-ORFORD-CEDAR ROOT ROT. APPLY THE APPROPRIATE SILVICULTURAL PRESCRIPTIONS AND MONITOR EFFORTS TO CONTROL THIS DISEASE. THE PORT-ORFORD-CEDAR SHOULD BE GIVEN MORE PROTECTION. IT IS BASICALLY AN ENDANGERED SPECIES. CUT ONLY DISEASED OR DEAD CEDAR AND LEAVE THE HEALTHY ONES ALONE.

Response: The Forest Service has developed an Interregional Coordinating Group (Regions 5 and 6) to monitor the Port-Orford-Cedar (POC) Program management and make recommendations for change. This consensus group includes industry, agency, and university personnel as well as conservation-minded citizens. The Forest will continue working with the Pacific Northwest Experiment Station and concerned citizens to address the problem.

POC management is a special problem and special management strategies, research, and monitoring have been developed to assure POC viability in the ecosystem. In the FEIS, Chapter IV, and LRMP, Chapter IV, specific POC management direction is discussed. The suggested practices to be found in the *Port Orford Cedar Root Rot on the Siskiyou National Forest* (Harvey and others 1985) and *Ecology, Pathology and Management of Port Orford Cedar* (Zobel and others 1985) will be used.

103 *COMMENT*: THE POTENTIAL FOR SPREAD OF PHYTOPHTHORA LATERALIS IS GREATLY INCREASED BY THE ROAD ACROSS THE HEADWATERS OF THE NORTH FORK IT SHOULD BE GATED (CLOSED IN THE WET SEASON) AT POVERTY PASS AND AT THE SOUTH FORK

Response: The indicated road segment is part of a historical route which the public uses to travel between the Port Orford coastal area and the inland north-south arterial Agness Road. The spread of *Phytophthora lateralis* from roads presents a serious problem. Your suggestion that Collector Road 3353 be gated during the wet season to help slow the spread of the disease will be taken into consideration

104. *COMMENT*: PROHIBIT ENTRY INTO DRAINAGES WHERE PORT-ORFORD-CEDAR IS UNINFECTED UNLESS IT IS CONCLUSIVELY DETERMINED THERE WILL BE NO INCREASED RISK OF INFECTION.

Response: Port-Orford-cedar management will be integrated in environmental analysis and project planning for all areas containing the species. Management objectives are to reduce the spread or severity of Phytophthora root disease Control measures, including access management, will be prescribed on a site- or drainage-specific basis to meet these objectives (LRMP, Chapter IV, "Fire and Pest Management"). The analysis process for proposed projects with POC (Port-Orford-cedar) recognizes the importance of uninfected populations; the objective is to prevent the import of the disease into these populations in management activities.

105. *COMMENT*: IT SEEMS A LARGE NUMBER OF TREES ARE BEING LOST TO PINE BEETLES. ISN'T THERE A NEED TO FIGHT THIS VIGOROUSLY?

Response: Mountain Pine Beetles are endemic to the forest environment. The Pacific Northwest Regional Office and National Forests have ongoing pest monitoring programs. At this time, there are not significant Mountain Pine Beetle problems on the Siskiyou National Forest The LRMP, Chapter IV, provides direction for pest management practices

Herbicide/Pesticide Use

106. *COMMENT*: EVALUATE THE USE OF HERBICIDES.

Response: The issue of vegetation management practices is outside the scope of this Forest Planning analysis (see FEIS, Chapter II, "Alternatives Considered, but Eliminated from Detailed Study"). It is currently addressed in a Regional FEIS (1988) entitled "Managing Competing and Unwanted Vegetation." Environmental analysis and NEPA documentation for vegetation management proposals on the Siskiyou National Forest will be tiered to and in conformance with that document. All alternatives in this Forest Plan assume the availability of the full range of alternative treatment methods, including chemical. Stand condition and growth will be monitored during Forest Plan implementation, they could vary from plan projections because of changes from the assumptions used in Forest Plan analysis Adjustments to harvest levels would be based on monitoring results.

107. *COMMENT*· USE NO HERBICIDES OR PESTICIDES.

Response: Timber harvest outputs in the FEIS are based on the assumption that silvicultural techniques are available to be used. Chapter IV of the LRMP discusses the timber management practices that may apply on all lands selected for timber production However, before any cultural activities are undertaken, site-specific environmental analyses and silvicultural prescriptions will be prepared that will identify the most appropriate treatments The site-specific environmental analyses will be tiered to the Regional FEIS on vegetation management for silvicultural activities, such as release, that involve manipulation of

vegetation. Consideration of the use of herbicides will follow the requirements and guidance contained in the Regional FEIS.

Non-sensitive Plants

108. *COMMENT*: DO NOT INTRODUCE EXOTIC PLANTS.

Response: In regards to tree species, non-native species are not introduced and controls to prevent this from happening are provided in Standards and Guidelines (LRMP, Chapter IV). Recently there has been concern about the introduction of non-native species for erosion control and animal browse In response to this concern, a Standard and Guideline has been added to "plan for natural vegetation to stabilize cut and fill slopes" whenever possible (Standard and Guideline 7-5, Chapter IV, LRMP).

109. *COMMENT*. THE SISKIYOU NATIONAL FOREST SHOULD EMPLOY AT LEAST TWO FULL TIME BOTANISTS IF THE PUBLIC IS TO HAVE ANY FAITH IN THE RELIABILITY OF THE SENSITIVE PLANT PROGRAM, THE OVERALL CONSIDERATION TO BE AFFORDED TO THE PROPER MANAGEMENT OF NATIVE PLANTS, OR THE ADEQUACY OF YOUR PROPOSED GUIDELINES AND MONITORING PROGRAM

Response: The Siskiyou National Forest has had a Sensitive Plant Program since 1975. Volunteers, contractors, detailers, and various Forest personnel have worked to inventory and manage the Forest's botanical resources A shared botanical position (Rogue River and Siskiyou National Forests) was filled in September 1988.

110. *COMMENT*: SURVEY OF THE SILVER FIRE DAMAGE SHOULD INCLUDE A SURVEY OF WHAT SPRUCE TREES, IF ANY, WERE DAMAGED OR DESTROYED BY THE FIRE IN THE BIG CRAGGIES BOTANICAL AREA AND ALONG THE JOSEPHINE-CURRY COUNTY LINE BETWEEN TINCUP PASS AND DAILEY CREEK.

Response. Specific surveys in the burned areas to assess impacts of the Silver Fire on Brewer spruce have not been conducted at the time of this writing These areas will be added to our priority list of inventory sites for sensitive and rare plants

111. *COMMENT*. DEVELOP A SYSTEM TO IDENTIFY ALL PLANTS AND ANIMALS IN OUR NATIONAL FOREST AND PLACE A MORATORIUM ON CUTTING UNTIL THE FOREST SERVICE IS KNOWLEDGEABLE ABOUT THE IMPACTS THEY ARE HAVING IN THESE AREAS

Response: Knowledge is sufficient to harvest timber with minimum adverse impacts on native and desirable non-native plants and animals.

Concentration areas of rare plants will be inventoried as part of the Siskiyou's sensitive plant program Outside of RNA's and Botanical areas, sensitive plants would continue to be managed under Forest-wide Standards and Guidelines. As part of the Forest Plan, specific populations of sensitive plants would be monitored.

A bibliography of individual plants and propagational needs which is aimed at protection and enhancement of the ecosystem is being developed A product of the Pacific Northwest Regional Office Ecology Program is the publication, *Preliminary Plant Associations of the Siskiyou* (Atzet and Wheeler

1984), which addresses the ecology of most of the common plants found on the Siskiyou National Forest The RNA's and Botanical reserves (LRMP, Chapter IV) were designated to provide opportunities for research, observation and study of plant communities

OTHER FOREST PRODUCTS

112 *COMMENT*: INSTITUTE A PROTECTION POLICY FOR ALL PACIFIC YEW (TAXUS BREVIFOLIA) FOR ALL TREES FOUND ON THE NATIONAL FORESTS OF THE PACIFIC NORTHWEST. BARK FROM THE PACIFIC YEW HAS BEEN FOUND RECENTLY TO CONTAIN AN AGENT IN THE TREATMENT OF CANCER. RECOGNIZING THAT IT TAKES A SUBSTANTIAL AMOUNT OF TIME FOR A PACIFIC YEW TO GROW BARK OF ANY THICKNESS, THE FOREST SERVICE SHOULD MAKE IT A POLICY TO PROTECT AS MANY OF THE EXISTING YEW TREES AS POSSIBLE. THESE TREES MIGHT PROVE TO HAVE A VALUE THAT FAR EXCEEDS ANY OTHER RESOURCE FOUND IN THE SAME AREA.

Response: Although reports of the yew/cancer connection have appeared in various media in the last few years, there has not been any demand for harvesting of yew trees (or their bark) on this Forest. Yew is present in a variety of areas on the Forest, many of which are sites where timber harvest is prohibited or will not occur (FEIS, Chapter III, "Vegetation"). If the demand for harvest of yew becomes an issue on the Siskiyou, appropriate steps will be taken to protect and manage this valuable resource.

113. *COMMENT*: MUSHROOM PRODUCTION MAY EXCEED THAT OF TIMBER AND USES MAY CONFLICT. MANAGEMENT OBJECTIVES SHOULD BE TO PROVIDE FOR THE PRESERVATION OF PUBLIC ACCESS TO MUSHROOM PICKING AND PROVIDE FOR THE CONSERVATION OF THE RESOURCE.

Response: The Forest Plan will not prevent access to mushroom picking and is not expected to degrade the resource. One of the goals of the Forest Plan (LRMP, Chapter IV, "Forest Management Goals") is to maintain all seral stages of existing terrestrial, aquatic, and edaphic plant associations on the Forest. Site-specific conflicts could occur due to the harvest of timber and in some cases may cause local displacement of some mushroom species.

SOCIOECONOMICS

JOBS AND COMMUNITY STABILITY

114. *COMMENT*: SECOND-GROWTH CUTTING SHOULD LEAD TO THE MANUFACTURING OF FINISHED GOODS IN THE AREA INSTEAD OF SHIPPING THE RAW LOGS AND PULP ELSEWHERE TO BE CONVERTED TO FINISHED GOODS, HENCE DENYING THE AREA OF THE "VALUE ADDED" THAT MANUFACTURING JOBS BRING

Response: All logs from the Siskiyou National Forest except Port-Orford-cedar are required by Federal law to be processed within the United States The decision to allow log exports from federal, state, or private lands, and the decision to upgrade mills is not within the scope of this Forest Plan. Congress, the State Legislature, and individual mill owners make those decisions. The effects of these decisions on the local economy is reflected in the assessment of the local economies' reaction to changes in the quantity of products produced on the Forest (FEIS, Chapter IV, "Social and Economic Effects").

115. *COMMENT* PAYMENTS TO COUNTIES NEED TO BE MAINTAINED THROUGH O&C RECEIPTS EXPLORE ALTERNATIVE METHODS OF REVENUE.

Response: In addition to O&C monies, the Forest Service provides revenues for counties from the National Forest Fund consisting of 25 percent of timber sale receipts The Forest Service does not have the authority to change the distribution of timber receipts, raise property taxes, or initiate sales taxes. The U.S. Congress and local and state governments have that authority.

116. *COMMENT*: GOAL #2 (LRMP, CHAPTER IV) STATES THE FOREST WILL "PROVIDE A SUSTAINED YIELD OF RESOURCE OUTPUTS THAT WILL PROMOTE THE STABILITY OF LOCAL COMMUNITIES AND PROVIDE FOR REGIONAL AND NATIONAL NEEDS " YOU HAVE FALLEN SHORT OF THIS GOAL ALREADY WITH THE WITHDRAWALS MADE IN THE PAST FOR SUCH THINGS AS WILDERNESS, SUPPLEMENTAL RESOURCE, DESIGNATED WILDLIFE, AND RIPARIAN AREAS TO INCLUDE THE CUSTODIAL AREA (MANAGEMENT AREA 6) WOULD BE AN EVEN GREATER DEVIATION FROM THE GOALS.

Response· Promoting community stability entails consideration of economic factors, including income, employment, and payments to counties, as well as social structure and lifestyle. Local, regional, and National needs may be met in varying degrees by providing a mix of both quantitative and qualitative outputs from the Forest The alternatives described in the FEIS, Chapter II, were formulated to address local, regional, and National needs, concerns, and requirements

The total acreage allocated for each Management Area generally varies according to the resource objectives and emphasis of the alternatives. Consequently, each alternative would respond to each of the Forest Management Goals in varying degrees

117. *COMMENT*: THE ECONOMY OF THIS AREA IS MORE IMPORTANT THAN HABITAT CONSIDERATIONS. THE PREFERRED ALTERNATIVE IS IN CONFLICT WITH THE WISHES OF CONGRESS TO STABILIZE LOCAL COMMUNITIES

Response: The Forest's task is to balance the different uses (timber, wildlife and fisheries, recreation, range, and watershed) of the Forest. Congressional legislation states the National Forests will "ensure consideration of the economic and environmental aspects...to provide for outdoor recreation (including Wilderness), range, timber, watershed, wildlife, and fish" (NFMA, 1976) See LRMP, Chapter IV, "Forest Management Objectives."

118. *COMMENT*: HARVEST LEVELS SHOULD BE SET TO MAINTAIN COMMUNITY STABILITY TAKING INTO ACCOUNT THE VOLUMES AVAILABLE TO THE COMMUNITIES AFFECTED BY THE PLAN FROM ALL SOURCES: USFS, BLM, STATE, COUNTY, AND PRIVATE TIMBERLANDS.

Response: The economic and social section of Chapter III of the FEIS discusses the harvest levels which historically have occurred. Chapters II and IV of the FEIS display the relationship among alternatives and the historical and predicted harvest levels from different ownerships

119. *COMMENT*: WHEN DISCUSSING JOBS AND LOCAL ECONOMIES, THE PLAN SHOULD ADDRESS THE COMPARABLE WORTH OF LARGE NUMBERS OF RELATIVELY SHORT TERM JOBS TIED TO ONE HISTORICALLY DRAMATICALLY FLUCTUATING INDUSTRY VS. SMALLER NUMBERS OF PERMANENT JOBS IN A DIVERSIFIED ECONOMY.

Response· See the FEIS, Chapter II, "Economic Efficiency Analysis of Alternatives;" Chapter III, "Economic and Social;" and Appendix B, "Social and Economic Impact Analysis" for discussion of jobs and local economies and other socioeconomic considerations

120. *COMMENT*: THE LONG-RANGE GOAL OF ECONOMIC DIVERSITY NEEDS TO BE RECOGNIZED AS WELL AS THE SHORTSIGHTED GOAL OF TIMBER MANAGEMENT.

Response: See the LRMP, Chapter IV, for the long-range management direction and goals of the Forest. Timber management is one of several Forest activities contributing to both short- and long-range economic diversity.

121. *COMMENT*: STOP THIS DEPENDENCY ON FOREST TIMBER SALES FOR ECONOMIC STABILITY. EMPHASIZE INSTEAD TOURISM, FISHERIES, WILDLIFE, AND RECREATION.

Response Chapter IV of the LRMP contains "Forest Management Goals" addressing community stability and associated economic needs. Chapter III of the FEIS provides a discussion of the Forest's economic and social setting, while Chapter IV contains information on the social and economic interactions and effects of implementing the alternatives. Appendix B of the FEIS includes a social and economic impact analysis that examines the relationships among Forest activities and the communities and counties within the Forest's influence area.

The contribution of timber sales, recreation, tourism, fisheries, and wildlife to economic stability and the relative importance of each is a composite concern to which the Siskiyou National Forest strives to be responsive This responsiveness is reflected in the range of alternatives formulated and evaluated in the FEIS.

122 *COMMENT*: STOP THE PRACTICE OF GIVING TIMBER COMPANIES PURCHASER CREDITS FOR CONSTRUCTING LOGGING ROADS.

Response· Roads built with purchaser credits belong to the Federal government. This is but one tool established by Congress to accomplish needed road access. The use of Purchaser Credits allows the Forest Service to obtain the standard of road required for future management, and to control construction to minimize resource impacts

123 *COMMENT*: AFTER COMMERCIAL LOGGING IS DONE, LONG-TERM TOURIST APPEAL AND TOURIST MONEY IS LOST LOGGING THE SISKIYOU AREA SEEMS LIKE AN EXTREMELY SHORT-SIGHTED GOAL ECONOMICALLY

Response. Tourism and timber harvest can both be accommodated on the Forest. See the FEIS, Appendix B, "Social and Economic Impact Analysis" for discussions pertinent to tourism and timber and their respective socioeconomic roles and contributions to the Forest influence area

124. *COMMENT* YOU ARE TO BE COMMENDED FOR TAKING A STANCE TO FINALLY HALT THE RAPID DESTRUCTION OF THE FOREST TRAIL SYSTEM HOWEVER, MUCH MORE NEEDS TO BE DONE THE BUDGET IN THE PROPOSED PLAN FOR RECONSTRUCTION AND CONSTRUCTION IS INADEQUATE IN ALL ALTERNATIVES.

Response In response to public interest in trails, the LRMP, Appendix B, Table B-6 has been revised to increase capital investments in the Forest trail system.

125. *COMMENT*: THE DEIS COMPARES THE TIMBER HARVEST AND ECONOMIC EFFECTS OF THE ALTERNATIVES TO THE AVERAGE FOR 1975-84 AND TO ALTERNATIVE A (THE "CURRENT SITUATION"). IN ADDITION, THE HARVEST FOR THE LAST YEARS SHOULD SERVE AS A BENCHMARK. THE 1975-84 AVERAGES FOR TIMBER HARVEST, TIMBER SALES AND TIMBER-BASED EMPLOYMENT DO NOT REPRESENT WHAT THE SURROUNDING COUNTIES HAVE EXPERIENCED OVER THE LAST FEW YEARS THESE COUNTIES RECENTLY HAVE EXPERIENCED A MUCH HIGHER TIMBER-BASED EMPLOYMENT LEVEL THAN THE 10-YEAR AVERAGE AS COMPANIES CUT THEIR ACCUMULATED TIMBER-UNDER-CONTRACT WITH THE RETURN OF HIGH STUMPAGE PRICES.

Response: The 1975-84 average annual harvest was about 131 MMBF, while the 1978-87 average annual harvest was about 129 MMBF. Both ten-year periods reflect four phases of a business cycle. boom, peak, recession, and trough Using data for a shorter time period covering a selected phase of a business cycle as a benchmark would not provide as accurate an estimate of the timber-related employment in the local counties

126. *COMMENT*: THE ECONOMIC AND SOCIAL ANALYSIS DISPLAYED IN CHAPTER III AND ELSEWHERE IS INFORMATIVE BUT PERHAPS MISLEADING. THE BASE PERIOD SELECTED INCLUDES A HIGH PROPORTION OF TIME WHICH COULD HARDLY BE CONSIDERED TYPICAL IN RURAL, FOREST-BASED ECONOMIES. THE DEPRESSION IN THE TIMBER INDUSTRY IN THE EARLY 1980'S HAS SKEWED THE STATISTICS, INCLUDING CONSUMPTION PATTERNS AT A MINIMUM, CONSUMPTION EMPLOYMENT, STUMPAGE AND INCOME DATA SHOULD BE RECALCULATED FOR A TEN YEAR PERIOD FROM 1978 THROUGH 1987

Response: Employment by economic sector, including manufacturing of lumber and wood products, has been updated in Chapter III of the FEIS. Reported employment data in the four-county area is provided for in 1979, 1982, and 1986. The data are representative of business cycles encountered (over time) by the various economic sectors. See Table III-39 in the FEIS for reported employment data and its source

Personal income by major source and earnings by major industry for the four-county area have been updated in Chapter III of the FEIS. Reported income and earnings data is presented for 1980 and 1984 See Table III-40 in the FEIS for the data and its source.

Chapters II and IV, and Appendix B of the FEIS contain information pertinent to employment and income generated from timber harvest on the Forest The figures are presented for comparison purposes among the alternatives and should not be interpreted as absolute numbers of jobs and wages. See Appendix B, "Social and Economic Impact Analysis" for a more detailed discussion.

Stumpage values were developed from 1973-1982 data. The period contains years representing the four phases in a business cycle: boom, peak, recession, and trough. The suggested 1978-87 period includes five years of the selected period and also the four business cycle phases. Average annual volume harvested for 1973-82 was about 154 MMBF, while the 1978-87 period averaged about 129 MMBF per year.

127. *COMMENT*: THE BUDGET COSTS YOU USE FOR SILVICULTURAL PRACTICES SEEM TO BE ABOUT TWICE WHAT THE INDUSTRY CONTRACTS THIS WORK FOR THE BUDGET, FOR THE FINAL PLAN, NEEDS DIFFERENT TIMBER OUTPUT LEVELS GIVEN DIFFERENT BUDGET LEVELS. ALSO, THE FOREST SHOULD REQUEST THE BUDGET SHOWN IN THE FINAL PLAN. IT IS MOST

FRUSTRATING TO BUILD A MILL ANTICIPATING A TIMBER SUPPLY AND THEN FIND THE SUPPLY CONTINUALLY DECLINES BECAUSE THE FOREST DID NOT REQUEST THEIR BUDGET.

Response: The Siskiyou National Forest annually prepares an outyear budget request See the LRMP, Appendix B, Table B-1 for the requested budget for Fiscal Year 1991. It should be recognized that actual funding received in response to the submitted budget may not be the same as requested. Since Congress has the ultimate budget authority, the situation cannot be resolved through the Forest Planning process However, monitoring the level of timber outputs annually is provided for in the LRMP, Appendix D, to determine whether timber objectives are being met during Plan implementation

Silvicultural costs are discussed in the FEIS, Appendix B, "Benefits and Costs Used in the PNV Calculation," and have been extensively reviewed for accuracy.

128 *COMMENT*. REVISE YOUR ECONOMIC DATA TO UPDATE THE TIMBER JOBS MULTIPLIERS. THE CURRENT DATA USED IN THE PLAN IS BASED UPON 1977 INFORMATION AND OVERSTATES THE NUMBERS OF TIMBER-BASED JOBS THE FOREST PRODUCES BY 20-40%. USE CURRENT ECONOMIC DATA TO SHOW THE ACTUAL BALANCE OF ECONOMIC OUTPUTS TO LOCAL COMMUNITIES DON'T OVERSTATE THE TIMBER VALUES.

Response. The most current data available was used in the economic model (IMPLAN) Local economic indicators, including timber-related employment and income, were derived from generated changes in planned Forest outputs compared to the current direction Alternative A. The resulting figures are relative, not absolute, and are intended to provide a comparison among the alternatives and not absolute numbers for employment and income. See the FEIS, Appendix B, "Sources of Data" and "Information Generated From the Social and Economic Impact Analysis" for a more detailed discussion.

129. *COMMENT*: EMPLOYMENT AND INCOME INFORMATION NEEDS TO BE EXAMINED AT THE INDIVIDUAL COMMUNITY LEVEL IN ORDER TO ASCERTAIN THE TRUE IMPACTS ON THE PUBLIC THE LEVEL OF INFORMATION ON THIS TOPIC PROVIDED IN THE DEIS IS INADEQUATE.

Response: Employment and income information is presented at the county level See the Chapters III and IV, and Appendix B of the FEIS for discussions of social and economic considerations pertinent to communities, community types, and counties within the Forest influence area.

130. *COMMENT*: THE USE OF A HORIZONTAL DEMAND CURVE FOR TIMBER, WHILE MAKING COMPUTER MODELING EASIER, IS A SERIOUS MISREPRESENTATION OF OUR BUSINESS CLIMATE. IF YOU ULTIMATELY CHOOSE AN ALTERNATIVE THAT DROPS TIMBER SUPPLY, YOU WILL CAUSE STUMPAGE TO INCREASE AND WHILE MILL CAPACITY ADJUSTS TO AVAILABLE TIMBER SUPPLY, THE LOCAL OPERATING CONDITIONS FOR MILL OWNERS WILL BE MISERABLE.

Response. See Chapters III and IV, and Appendix B of the FEIS for detailed information regarding timber supply, demand, and other economic considerations. Appendix B also discusses timber demand curves.

131 *COMMENT*: IN ORDER TO COMPENSATE FOR SOME OF THE ECONOMIC DISLOCATION AND JOB LOSSES THAT WOULD OCCUR BY ADOPTING AN ALTERNATIVE THAT WOULD ALLOW LESS CUTTING THAN HAS OCCURRED DURING THE LAST TEN YEARS, THE SISKIYOU NATIONAL FOREST SHOULD SUBSTANTIALLY INCREASE THE RECREATION-ORIENTED RESOURCES.

Response In response to many people who want to see more recreation opportunities, the capital investment schedule for recreation has substantially increased the recreation-oriented investments (see LRMP, Appendix B). Also the Siskiyou National Forest will continue to seek partnership opportunities to enhance recreation and tourism (see LRMP, Chapter IV, "Forest Management Goals").

132. *COMMENT*: IS IT POSSIBLE FOR SOME OF THOSE MADE JOBLESS BY THE REDUCTION OF TIMBERING BY FIRE TO BE HIRED TO HELP IN REFORESTATION, MANUAL RELEASE, STREAM REHABILITATION, OR SLIDE STABILIZATION?

Response: All contracts for these types of projects on the Siskiyou National Forest are let by competitive bids Anyone can bid on these contracts, provided they meet bidder qualifications While the amount of work to be done will provide jobs, the Forest Service does not control to whom the jobs will go

133. *COMMENT*: THE FOREST SHOULD BE MANAGED PRIMARILY WITH THE GOAL OF MAXIMIZING ITS USEFULNESS TO THE PEOPLE THAT LIVE IN AND AROUND IT. IT IS IMPORTANT TO MAINTAIN A STABLE ECONOMIC ENVIRONMENT BY MAXIMIZING SUSTAINED YIELD FORESTRY, MAINTAINING AUM'S, AND PROMOTING MINERAL DEVELOPMENT.

Response: The Forest Service is required to be responsive to all people of the United States and the Nation's directives as provided by Congress. The Forest Service is required by Congress to "include coordination of outdoor recreation, range, timber, watershed, wildlife and fish, and wilderness" (NFMA, 1976). The various Management Areas are lands which provide for coordination of these different uses which include both commodity outputs and amenity values.

134. *COMMENT*: WHILE THE PROPOSED ALTERNATIVES INCLUDE NUMEROUS MEASURES TO MITIGATE THE EFFECTS OF THE ALTERNATIVES UPON FISH, WILDLIFE, AIR QUALITY, SEDIMENT, AND VISUAL RESOURCES, THERE ARE NO MEASURES DISCUSSED WHICH WOULD MITIGATE THE EFFECTS OF THE PROPOSED ALTERNATIVES UPON THE ECONOMIES OF THE FOUR-COUNTY AREA.

Response: Resource mitigation measures are part of the formulation of alternatives and are provided to lessen adverse environmental impacts which may result from certain management activities including road building and timber harvesting.

Local economic indicators, including jobs, income, and payments to counties, are primarily affected by changes in the allowable sale quantity (ASQ). Recreation, fisheries, and wildlife values are also significant to local economies. Appendix B of the FEIS contains a detailed social and economic impact analysis, while Chapter IV of the FEIS provides information on each alternative's social and economic effects.

Mitigation measures designed to provide the highest ASQ consistent with the resource objectives and emphasis of the alternatives include the following: use of the "maximize timber objective function" in the FORPLAN model; fertilization; hardwood conversions; commercial thinnings; and intensive management regimes including stocking control, planting and vegetative control, departures from nondeclining even flow, and short rotations.

The Siskiyou National Forest has no means available to directly compensate local economies for any reductions in jobs, income, or payments to counties that could occur as a result of implementing any of the alternatives

135. *COMMENT*. THE MAJOR REGIONAL PORT AT COOS BAY AND ITS ECONOMIC IMPACT ON THE REGION, AND THE STATE OF OREGON'S RECENT INVESTMENT IN THIS PORT, WAS NOT ADDRESSED IN THE PROPOSED SISKIYOU NATIONAL FOREST PLAN MORE FOREST PRODUCTS MOVE THROUGH THE PORT AT COOS BAY THAN THROUGH ANY OTHER PORT IN THE WORLD.

Response: The economic contributions of the Coos Bay port are reflected in the employment and income data presented for Coos County and are also factored into the economic model. See the FEIS, Appendix B, "Social and Economic Analysis "

136. *COMMENT*: LOCAL ECONOMIES SHOULD BE ACCOUNTED FOR ON A PERMANENT BASIS, AND NOT FOR JUST 10 OR 15 YEARS.

Response: Local indicators of economic and social stability, including employment, income, and payments to counties are provided as estimated effects resulting from implementing each of the alternatives described in the FEIS (Chapters II, IV, and Appendix B). These estimated effects are for the first decade of Plan implementation and should not be interpreted to mean local economies are not considered permanent Provisions of NFMA require Forest Plans to be revised every 10 to 15 years; Plans may be amended more often as conditions warrant.

137 *COMMENT*: ALTERNATIVE K BUDGETS $350,000 PER YEAR FOR FISH HABITAT ENHANCEMENT AND $230,000 PER YEAR FOR SOIL AND WATER RESOURCE IMPROVEMENTS. THESE AMOUNTS SHOULD BE THE ABSOLUTE MINIMUM AMOUNT BUDGETED. OUR CONCERNS ARE THAT IN PAST PRACTICES DURING BUDGET "CUT-BACKS" AND CONSTRAINTS, THESE ARE THE FIRST TO BE DROPPED AS THEY ARE USUALLY CONSIDERED A NON-PRODUCTIVE EXPENDITURE WHEN COMPARED TO FOREST HARVESTS.

Response· Should budget amounts received by the Forest be less than the amounts requested, certain reductions may be necessary in the various programs and activities. A portion of this budget is provided through timber sale returns, so these resource improvements are, in part, tied to a level of other resource activity.

Appendix D of the LRMP provides monitoring direction for all resource elements including fish habitat, soil and water. The purpose of monitoring is to determine whether or not the Management Direction in the Plan is being implemented and to what degree. If the fish habitat enhancements and watershed improvement objectives are not being attained as planned, then amendments may need to be made to the Forest Plan

138. *COMMENT:* CURRENT MANAGEMENT DIRECTION AND YOUR PREFERRED ALTERNATIVE ASSUME ECONOMIC PRODUCTION TO BE THE FOREST'S PRIMARY PURPOSE. ON WHAT IS THIS ASSUMPTION BASED AND WHERE IS IT LEADING US AND THE FOREST?

Response· The alternatives described in the FEIS, Chapter II, emphasize differing mixes of commodities and amenities in response to the public issues See the FEIS (Chapter II, "Alternative Development Process") and Tables II-5 and II-6 for both quantitative and qualitative comparisons among the alternatives.

139. *COMMENT*: IN LOOKING AT COMMUNITY STABILITY, THE DRAFT DID NOT INCLUDE THE EXPECTED REDUCTIONS IN LOCAL EMPLOYMENT IN THE WOOD PRODUCTS INDUSTRY DUE TO AUTOMATION. IN OTHER WORDS, THERE WAS NO COMPARATIVE OR SENSITIVITY ANALYSIS OF KEY FACTORS AFFECTING WOOD PRODUCTS EMPLOYMENT THAT WOULD

PROVIDE INFORMATION ON THE RELATIVE IMPORTANCE OF ALTERNATIVE FOREST MANAGEMENT PLANS ON THE SHORT-TERM ECONOMY. ABSENT SUCH ANALYSIS, THE DRAFT PLAN FIGURES ON POSSIBLE WOOD PRODUCTS EMPLOYMENT IMPACTS ARE MISLEADING BECAUSE THEY ARE INCOMPLETE AND TOO ABSTRACTED FROM REALITY. OF EVEN GREATER SIGNIFICANCE, HOWEVER, IS THE AVOIDANCE OF ANY TRULY LONG-TERM LOOK AT THE AREA'S ECONOMY. NOTABLY ABSENT, AGAIN, IS ANY EVALUATION OF A NATIONAL PARK ALTERNATIVE IN TERMS OF ITS LONG-TERM IMPACT.

Response: Changes in technology within the wood products industry that may result in few related jobs, such as increasing automation in wood processing facilities, are not within the scope of the Forest Plan These decisions are made within the industry.

The local economic indicators, including jobs and income related to timber harvest levels, are presented as estimates based upon the best available data. The figures are intended for comparisons among the alternatives and should not be interpreted as absolute numbers of jobs and income. Reduced employment due to increased automation would not affect the relative difference among the alternatives with respect to jobs and income related to timber harvest levels. Further discussions of the economic aspects are provided in the FEIS, Chapter II, "Economic Efficiency Analysis of Alternatives;" Chapter IV, "Economic and Social," and Appendix B, "Social and Economic Impact Analysis "

Alternatives proposing National Park designation were considered but eliminated from further study See the FEIS, Chapter II, "Alternatives Considered But Eliminated From Detailed Study," for additional information.

TOURISM AND RECREATION

Economic Values

140 *COMMENT*: THE OPTIMISM ABOUT IMPROVING TOURISM THROUGH WILDERNESS OR OTHER SINGLE USE DESIGNATION IS A FALLACY. WILDERNESS USE IS INSIGNIFICANT, WHEREAS OTHER RECREATION USER NUMBERS GROW CONSISTENT WITH ROAD ACCESS TO FISHING, CAMPING, HIKING, ETC. IN THAT VEIN, VISUAL MANAGEMENT PLANS ARE OVERDONE, TOO DETAILED, AND INAPPROPRIATE FOR THIS PLAN.

Response. Wilderness use is described throughout the FEIS as being very low relative to other areas in the Wilderness System. The level of actual and projected use does not project large or "inflated" figures or increases when viewed against existing recreation use data or local and regional trends.

The Forest Plan, however, does place increased emphasis on recreation and supports local governments in their goal of developing the recreation tourism industry. Toward this end, the capital investment program has been increased in the areas of developed site construction and trail construction (both Wilderness and in other areas of the Forest). Capital investments over the next five years are detailed in the Forest Plan (Appendix B, "Recreation Capital Investments" and "Trail Capital Investments"). Potential development projects are listed for each Ranger District at the end of each schedule.

The FEIS displays a range of alternatives, from Alternatives S, G, E, and M, that manage a high number of acres in Preservation, Retention, and Partial Retention, to Alternatives C, B, D, and D-1 which allow for most Modification (See FEIS, Chapter IV, "Visual Resources"). Management Area prescriptions (LRMP, Chapter IV) for Partial Retention Visuals and Retention Visuals are not intended to be detailed Visual Management Plans, but provide general guidelines for the area. More detailed Visual Management Plans

can be developed for site-specific areas through project development for specific areas like a certain road or river corridors (e g Rogue National Wild and Scenic River Management Plan)

141. *COMMENT*: YOUR PLANNING FOR RECREATIONAL USE OF THE FOREST IS BASED ON A GROWTH IN DEMAND OF ONLY 1/2 PERCENT PER YEAR. THIS ASSUMPTION IS INADEQUATE GIVEN NATIONWIDE TRENDS IDENTIFIED IN THE RECENT REPORT FROM THE PRESIDENT'S COMMISSION ON AMERICANS OUTDOORS, AND THE EMERGING LOCAL EMPHASIS ON DEVELOPING AND PROMOTING TOURISM TO STIMULATE THE ECONOMY. IN ADDITION YOU HAVE NOT ALLOWED FOR ANY INCREASE IN REAL PRICES DURING THE LIFE OF THE PLAN, NOR HAVE YOU MADE ANY ESTIMATE OF USAGE OF THE FOREST BY NON-LOCAL PERSONS. THIS, COUPLED WITH YOUR REDUCTION OF 37 PERCENT FROM THE 1985 RPA FIGURES, HAS GROSSLY UNDERVALUED RECREATION'S CONTRIBUTION TO THE NET PRESENT WORTH CALCULATIONS IN YOUR ECONOMIC ANALYSIS

Response: The projected growth rate of recreation demand is an estimate based upon the best available information and recreation use data for Forest visitors regardless of where visitors live. These recreation use figures are specific to the Siskiyou National Forest and provide a more accurate basis for projecting demand than broader National reports.

The dollar values displayed for recreation visitor days by recreation setting are slightly higher than the 1985 RPA Program figures for Region 6 See the FEIS, Appendix B, for additional discussions pertinent to recreation and economics.

Growing emphasis on recreation and related tourism and the importance to local economies is a major consideration reflected in managing the Forest. For example, the Siskiyou National Forest is involved in cooperative recreation projects and activities with four local counties, the State of Oregon, three neighboring National Forests, two Bureau of Land Management Districts, and private groups

Recreation Opportunities

142. *COMMENT*: ALL WILDERNESS WITHIN THE SISKIYOU NATIONAL FOREST SHOULD BE CLOSED TO HORSEBACK TRAVEL AND HUNTING AT ALL TIMES. HORSE TRAVEL IS HIGHLY DESTRUCTIVE TO TRAILS AND PLANT COMMUNITIES, AND HUNTING UPSETS THE NATURAL BALANCE OF PREDATOR/PREY WHICH MUST EXIST IN A STABLE ECOSYSTEM.

Response: Wilderness management is based on the direction contained in the Wilderness Act. The Act specifically excludes only motorized or mechanized equipment from use in the Wildernesses. Horse travel is considered an acceptable use within Wilderness However, horse usage in the Forest's five Wildernesses is very light at present, impacts of past usage have been negligible, at most. Changes in this type of use are not expected to be significant during this planning period

Current management provides that all trails be inspected annually to identify trail maintenance needs (LRMP, Chapter IV, Forest-wide Standards and Guidelines) and the management prescription for Wilderness (LRMP, Chapter IV, MA-1) includes Standards and Guidelines for corrective actions when monitoring indicates Wilderness use exceeds the degree of impact established through the Limits of Acceptable Change system. Corrective actions could include closing a zone to all recreation use until the area is restored to wilderness conditions, if necessary.

The Forest Service is responsible for the management of wildlife habitat (including Wilderness), and the State is responsible for the management of wildlife. The State is responsible for the administration and

development of hunting regulations on National Forest lands. Although the Forest Service may recommend changes in the hunting regulations to Oregon Department of Fish and Wildlife, hunting is considered an acceptable Wilderness activity.

143 *COMMENT*: THE LIMITATION ON GROUP SIZE GOING INTO THE WILDERNESS TOGETHER IS TOO RESTRICTIVE.

Response. Regional direction for management of groups within Wilderness is found in Forest Service Manual 2322.03 (R-6 Supplement 81). Under these Standards and Guidelines, group size limits range from 6 to 12, and could go to 18 including livestock depending on the number of encounters expected. Larger groups, particularly those using horses, must obtain a special use permit in order to avoid unnecessary impacts to Wilderness resources. The size of groups recreating within Wilderness is not further limited in the Forest's Standards and Guidelines (LRMP, Chapter IV) or in the Wilderness Management Plans (LRMP, Appendix A).

144. *COMMENT*· PRESERVE VARIED HABITAT FOR HUNTING, FISHING, AND MORE DEVELOPED RECREATIONAL OPPORTUNITIES.

Response: All alternatives provide habitat for hunting and fishing, and developed recreation opportunities. They vary in the amount of habitat in a "preserved state" (see FEIS, Chapter II, Table II-5). Developed recreation opportunities are similar for each alternative in the first several decades All alternatives can meet the demand for developed recreation until approximately the seventh decade of the planning horizon (see FEIS, Chapter II, "Recreation Settings").

145. *COMMENT*. THE SISKIYOU NATIONAL FOREST NEEDS TO TAKE A MORE ACTIVE ROLE IN INCREASING RECREATION OPPORTUNITIES AND TOURISM NEEDS INCLUDE: MORE DESIGNATED SITES, PARKING LOTS, AND TRAILS; AND DISPLAYS, MAPS, AND BROCHURES IN THE LOCAL RANGER HEADQUARTERS.

Response: In response to increased public interest in recreation, the Forest has implemented a strategy that includes partnerships with County, State, and other Federal agencies for the purpose of developing the recreation and tourism industry. The strategy includes the development of computer video displays illustrating the recreation sites in the area, the development of a Southern Oregon recreation map, computer-assisted trail information, and a variety of brochures, pamphlets, and other information which will be made available at District offices, information centers, and other locations throughout southern Oregon and the Pacific Northwest In addition, construction and rehabilitation of 17 developed recreation sites and construction or reconstruction of approximately 114 miles of trails, trailheads, and bridges are planned for the first half of the decade. These projects are part of the "Recreation Capital Investment Schedule" (LRMP, Appendix B).

Supporting recreation and tourism is, and will continue to be, an important part of implementing the National Recreation Strategy. The program involves aggressive marketing strategies which are designed to "advertise" the availability and the abundance of recreational opportunities available on National Forest lands. The concept of Backcountry Recreation was developed in the FEIS, and acres allocated to these areas were increased in the Preferred Alternative S to provide recreation opportunities in areas which will have no programmed timber harvest (LRMP, Chapter IV, "Management Prescriptions"). The objectives of the National Recreation Strategy have been incorporated into the Forest Plan and will continue to be an important part of the Recreation Program (LRMP, Chapter IV, "Forest Management")

146 *COMMENT*: WINTER SPORTS IN THE SISKIYOU NATIONAL FOREST ARE BECOMING INCREASINGLY MORE POPULAR. THERE WAS NO MENTION OF CROSS-COUNTRY SKIING, SLEDDING, ETC. IN THE DRAFT.

Response: In the past, there has been little interest in the development of facilities that would support these types of activities There are few areas on the Forest that would provide the quality experience that winter recreationists prefer Since the publication of the Draft, there has been active interest in the development of a winter sports facility in the vicinity of Page Mountain on the Illinois Valley Ranger District. In response to interest in this project, the Page Mountain Snopark is identified in the Recreation Capital Investment Schedule (LRMP, Appendix B). The facility is planned for segregated use by cross-country skiers and snowmobilers Plans are currently being developed and construction is anticipated in the near future due to the involvement of interested volunteer groups. Development of additional facilities would be encouraged in areas of the Forest with sufficient snow and public interest, however both have been rather limited to present

147. *COMMENT*: ALTERNATIVE K IN THE DRAFT STATED THAT IT INCREASES AVAILABLE PRIMITIVE AND SEMI-PRIMITIVE RECREATION OPPORTUNITIES. THIS IS NOT SO, BECAUSE THE GREATEST OPPORTUNITY FOR PRIMITIVE AND SEMI-PRIMITIVE RECREATION IS THE PRESENT MANAGEMENT SITUATION INCREASE THE AREA AVAILABLE FOR UNROADED PRIMITIVE AND SEMI-PRIMITIVE RECREATION.

Response Table II-5 (Monster Matrix) and Table II-57 (FEIS, Chapter II) show approximately 261,000 acres currently available (Alternative A) for Pristine, Primitive, and Semi-primitive Non-motorized recreation. Alternative K projected about 269,000 acres available for these recreation opportunities, a slight increase over current management. In response to public comments on the DEIS, development of the Preferred Alternative S in the FEIS included an increase in the area available for unroaded Primitive and Semi-primitive recreation opportunities to approximately 293,500 acres.

148. *COMMENT*: SPECIFIC SITES FOR CAMPGROUND OR PICNIC AREA DEVELOPMENT WERE SUGGESTED. NO NEW FACILITIES SHOULD BE CONSTRUCTED UNTIL ALL EXISTING CAMPGROUNDS ARE RESTORED TO FULL USE, AND BETTER MAINTENANCE OF CAMPGROUNDS IS NEEDED.

Response: Specific areas mentioned are already developed or have been scheduled for development (LRMP, Appendix B). The Forest Plan includes a programmed recreation budget that would allow a full level of maintenance for facilities (LRMP, Appendix B, "Projected Budget"). As new sites are constructed, the maintenance budget would be increased In addition, the Forest Plan includes a program of new construction which would emphasize facilities closer to local communities, as well as rehabilitation or reconstruction of existing facilities to modern standards (LRMP, Appendix B, "Recreation Capital Investments"). In the past, developed sites that received minimal use were closed or dropped from the maintenance schedule and operated for dispersed use. If monitoring determines that existing developed sites receive minimal use, the Forest would continue to close them or operate them for dispersed use

149. *COMMENT*· REDUCE THE NUMBER OF COMMERCIAL FLOATERS AND INCREASE THE NUMBER OF PRIVATE FLOATERS ON THE ROGUE RIVER

Response· Changes in river management for both the Rogue and Illinois wild and Scenic Rivers was not included in the scope of this Forest Planning effort The Forest Plan incorporates, unchanged, the Rogue National Wild and Scenic River Management Plan (LRMP, Chapter I, "Special Area Plans") However, the Forest does intend, in cooperation with the Bureau of Land Management, to re-evaluate the River

Management Plan over the next five years This evaluation will include capacity levels and permit allocation for guided and non-guided river users.

150 *COMMENT*: USE TRAILHEAD BOXES FOR MONITORING NUMBERS OF HIKERS IT COULD NOT BE DETERMINED FROM THE DEIS WHETHER FIELD MONITORING FOR EACH ACTIVITY WOULD BE AT LEAST PART OF THE BASIS FOR EVALUATION. IF NOT, IT SHOULD BE.

Response: Hiker registration boxes at all formal trailheads are being, and will continue to be, used The information provided is used as a reference for monitoring numbers of hikers. Information collected from trail registration boxes is normally compiled within the Recreation Information Management (RIM) inventory on a yearly basis. This information is basic to tracking the level and type of uses that are occurring on the various trail systems (LRMP, Chapter V, "Monitoring").

151. *COMMENT*. A VISITOR CENTER AT AGNESS IS NOT REALLY A SOUND INVESTMENT AS THIS IS SO FAR FROM POPULATION CENTERS ABOUT THE ONLY PEOPLE USING THIS WOULD BE PEOPLE AT THE END OF THEIR RIVER TRIPS, AND THIS WOULD BE SORT OF ONE WAY.

Response: There has been an increasing demand for visitor information services from people driving into the Rogue and Illinois Wild and Scenic River corridors via Gold Beach and the Coast. In many instances, visitors come to see the river and are unaware of the many recreation opportunities available. The Agness facility (located near the Illinois River Bridge) would provide valuable information as to the availability of camping facilities, trailheads, motels, private campgrounds, closures, fire restrictions, and more The development of this facility remains on the schedule in order to meet the increasing demand for this type of service (LRMP, Appendix B, "Future Recreation Capital Investments").

However, before this facility is approved for construction, the project will be subject to a project-level environmental analysis. At this point, both Forest Service personnel and the public will be given the opportunity to participate in identifying issues, proposing alternatives, and reviewing the documented analysis. Whether it is a sound investment or not would be a most appropriate concern to raise at that time.

152. *COMMENT*: THE SENIOR CITIZEN GROUP NEEDS TO BE CONSIDERED FOR RECREATION FACILITIES IN THE SISKIYOU NATIONAL FOREST. CAMPGROUNDS AND PICNIC AREAS ARE NEEDED FOR VIEWING.

Response· The FEIS (Chapter II, Table II-4) lists all of the developed recreation sites and potential developed sites that are currently available for use on the Forest. The Forest has proposed a "modest program" of recreation construction for the future, which appears to be in line with projected levels of use. The program can be expanded if warranted by unexpected levels of demand. Most of these sites would be compatible for use by Senior Citizens (either individuals or groups).

153. *COMMENT*: THE FOREST SERVICE SHOULD NOT BE IN THE RECREATION BUSINESS (THROUGH DEVELOPED SITES, CONCESSIONS, MUSEUMS, ETC.).

Response: Congress has directed that the National Forests "be administered for outdoor recreation" in addition to other resources (Multiple-Use, Sustained-Yield Act of 1960). An objective of the Forest Service is to provide recreation opportunities for the public The policy in the past has been, and will continue to be, not to develop recreation sites close to private campgrounds that would create a competitive situation. Fees are collected at some developed recreation sites on the Forest, however, these are collected in order to provide funds for the maintenance and repair of the sites.

The philosophy behind the concessionaire program is to provide a business opportunity and to reduce the cost to the government for the maintenance and repair of these sites The concessionaire concept has been explored on the Siskiyou National Forest and is not considered feasible at this time, though there may be concessions in the future

The Forest maintains displays of artifacts that have local historic significance. These are open to the public at the Supervisor's Office and Ranger District Offices during business hours free of charge.

154. *COMMENT*. SPECIFIC SUGGESTIONS WERE MADE ABOUT THE FOREST PROVIDING "WILDLIFE VIEWING CORRIDORS" ALONG THE ROGUE RIVER (IN WHICH NO HUNTING WOULD BE ALLOWED) AND OTHER MAJOR TRAVEL CORRIDORS.

Response: The Rogue River is valuable for recreation and wildlife resources, as well as fisheries and other resources. Wildlife viewing along the length of the River is encouraged, though no "official" designations for that activity exist

The Oregon Department of Fish and Wildlife regulates hunting along the River. Establishment of a no-hunting corridor would best be pursued through that agency. At present, all land within one mile of the Rogue River between Grave Creek and Lobster Creek is closed to bear hunting In addition, the discharge of firearms is prohibited on all land within 1/4 mile of the Rogue River in the "Wild" River section from Grave Creek downstream to Watson Creek, except during authorized hunting seasons. Beaver and otter trapping is prohibited along the entire length of the Rogue River from Grave Creek to the mouth at Gold Beach.

Nonconsumptive use of wildlife is believed to be as high or higher than consumptive use (USFWS 1976). The Siskiyou National Forest has begun doing these types of projects, but many more opportunities are available. The Galice Ranger District recently closed the road through Horse Creek to vehicle travel. This special wildlife site is open to foot traffic; a bird and butterfly list is available. Other sites lend themselves to wildlife viewing and education, and the Forest will develop their ideas and those of the public as time and funds permit. A number of projects are scheduled as capital investments during the first decade after plan implementation. Examples of the types of possible projects are· educational signs in osprey and bald eagle habitat areas; Foster Bar elk viewing area; Adams Prairie overlook and educational signs; Bearcamp overlook kiosk, Happy Camp Road old-growth site information display; Lobster Creek old-growth trail; Illinois River Falls interpretive signs for salmon runs; interpretive trails through Habitat Areas allocated to spotted owls, pileated woodpeckers, and pine marten (the Waters Creek SOHA is particularly appropriate); wildlife interpretive signs along the Coquille River; brochures featuring viewing areas such as Horse Creek; development of species lists and other educational brochures; bluebird trails, highlighting of special wildlife areas through interpretive signs and brochures; development of wildlife viewing trails (such as in the Burned Timber meadow area).

155. *COMMENT*· BABYFOOT LAKE APPEARS TO GET ALOT OF USE. THE FOREST SERVICE NEEDS TO DEVELOP A PLAN TO PROTECT IT FROM BEING OVERUSED AND TO PREVENT THE SENSITIVE VEGETATION SURROUNDING IT FROM BEING DAMAGED.

Response: Babyfoot Lake is a very popular recreation site and is moderately to heavily used. At present, camping is not permitted within 200 feet of the lake in order to allow some vegetation recovery and protect existing vegetative cover Babyfoot Lake is just within the boundary of the Kalmiopsis Wilderness. As such, it is managed under the concept of "Limits of Acceptable Change " As recreation use causes unacceptable impacts to the Wilderness, resource users would be channeled to other areas or prohibited altogether. Management prescriptions for Wilderness are described in the Forest-wide Standards and Guidelines (LRMP, Chapter IV).

Trails

156. *COMMENT*: THE TRAIL SYSTEM SHOULD BE A PRIORITY NO MORE TRAILS SHOULD BE LOST TO ROADS AND LOGGING. ABANDONED SEGMENTS SHOULD BE REOPENED. TRAIL SEGMENTS WHICH IN THE PAST HAVE BEEN SUPERSEDED BY ROADS AND CLEARCUTS SHOULD BE RELOCATED TO ALLOW NON-MOTORIZED TRAVEL THROUGHOUT THE FOREST.

Response: The Forest Trail System is a priority The Forest received substantial comment concerning the protection and expansion of the trail system after the publication of the DEIS. In response, the Forest has placed more emphasis on the protection and maintenance of the entire Forest trail system Forest-wide Standards and Guidelines (LRMP, Chapter IV, "Dispersed Recreation") have been strengthened so that trail systems are thoroughly analyzed before roads can be built over them. If displaced, new sections of trail will be constructed that would be designed to maintain the integrity of the system. Trail maintenance funding has been increased (LRMP, Appendix B) so that one half of the entire trail system would be maintained annually.

Additional funds have been programmed that would expand the trail system through a modest program of construction and reconstruction. Approximately 114 miles of trail, trailheads, and bridges are identified in the capital investment schedule (LRMP, Appendix B) to be built in the first five years New trail construction emphasizes the development of loop opportunities within or between existing trails. Some abandoned segments of trail (such as the South Bank of the Illinois River) will be reopened for public use. Interagency trail development is anticipated as the result of the recently formed partnership between three National Forests, the Bureau of Land Management, the State of Oregon, and Josephine, Douglas, Jackson, and Curry Counties. Backcountry Recreation allocations will provide additional trail systems for both motorized and non-motorized recreation opportunities. Day use systems are planned in several areas of the Forest that provide interpretive opportunities and access for specific user groups such as equestrian groups or mountain bike enthusiasts.

157. *COMMENT*. MORE PROTECTION OF THE TRAIL SYSTEMS IS NEEDED, SUCH AS THOSE ON THE ROGUE AND ILLINOIS RIVERS.

Response· The Upper Rogue River Trail (#1160) is 42 miles in length and all but 16 miles are administered by the Bureau of Land Management. The majority of the section administered by the Forest Service is located within the Wild Rogue Wilderness (15 miles) where timber harvest is precluded by law (Wilderness Act 1978) The remaining one mile is located in an area of the Forest that is considered "visually sensitive" due to the large amount of recreation use that occurs The area within view of this portion of the trail would be managed at a constrained level to achieve the Retention and Partial Retention visual objectives under all alternatives in order to retain the character of the forest landscape. In the Preferred Alternative S, the foreground area (roughly within 1/4 mile of the rivers edge) is managed under a Supplemental Resource allocation which provides for no programmed harvest.

The Illinois River Trail (#1161) is located in a "visually sensitive" area of the Forest as well. The first six miles of the trail (between the trailhead at Oak Flat and Silver Creek) is a designated National Recreation trail and is located either within or immediately adjacent to the Illinois Wild and Scenic River. The remainder of the trail is located within the Kalmiopsis Wilderness where timber harvest is precluded by law. The area within view of the trail (outside of the Wilderness) would be managed at minimum levels to achieve Partial Retention under several alternatives (B, C, D, and D1; reference Chapter IV, FEIS). The remaining alternatives would manage the same area as a Backcountry Recreation area of varying size. Viewshed protection is provided under all alternatives

158 *COMMENT*: A MAJOR TRAIL SYSTEM SHOULD BE ESTABLISHED THAT CONNECTS THE GRANTS PASS AREA TO THE OCEAN.

Response: There are several cross-Forest trail systems that very nearly accomplish the link to the ocean (#1160, #1166, #1162, #1102, and #1210) It is possible that these trail systems could be expanded and linked with State or County trail systems, however none of these trails are scheduled for expansion at this time. In addition, there is an All Oregon Trail proposal (also unscheduled) that would provide access to the ocean. If built, this trail would begin in the vicinity of Cape Blanco, pass through the Grassy Knob and Kalmiopsis Wildernesses, and eventually terminate in the Hells Canyon National Recreation Area in the northeastern corner of the State.

159 *COMMENT*: SO MANY ROADS RUIN OPPORTUNITIES FOR OFF-ROAD HUNTING AND HIKING.

Response: Off road or cross country travel on the Forest is limited by terrain and vegetation, and is considered by most to be difficult at best. In that sense, roads provide access to unroaded areas that would otherwise be inaccessible to all but the most rugged backcountry traveler. The Forest has recognized the importance of the trail system and the related recreation opportunities that these facilities provide. The Forest Plan (LRMP) places more emphasis on the protection and maintenance of the entire trail system in the Forest-wide Standards and Guidelines. Several alternatives were considered in the FEIS that provided Backcountry Recreation allocations where access is limited to trails or off-road vehicle "ways " Off-road recreation opportunities including hunting would remain available in these areas (LRMP, Chapter IV, Management Area 6, and Appendix E)

160. *COMMENT*: IMPROVE THE CONDITION OF MANY OF THE HIKING TRAILS AND THE INFORMATIVE SIGNS ALONG THEM

Response: The Forest Plan has programmed full maintenance through projected budgets (LRMP, Appendix B) for the entire trail system every other year (one-half the system fully maintained each year) and anticipates visible improvement to the entire system in the near future Signing varies over the Forest. In areas outside the Wildernesses, the objective is to provide an adequate level of signing that will provide clear guidance through the trail system being used. Informative signs in appropriate locations will receive greater emphasis in the future. A number of trail projects are being developed that feature interpretive signs for historical values, fire behavior, and salvage efforts (LRMP, Appendix B). Inside the Wildernesses, the objective is to provide only enough signing to ensure the safety of recreationists. Self reliance is a part of the Wilderness experience and users are expected to research their route prior to departure

161. *COMMENT*: INSTEAD OF SINGLE DESTINATION "IN AND OUT" TRAILS, ADOPT THE GOAL OF LINKING AREAS LIKE THE RED BUTTES WILDERNESS AND SISKIYOU WILDERNESS VIA THE BOUNDARY TRAIL EXTENSION. DEVELOP TRUNK TRAILS THAT HAVE FEEDER TRAILS OFF THEM TO HIKE LOOP SYSTEM TRAILS. DEVELOP MORE LINK TRAILS

Response: A primary objective in the development of additional trails is to provide links between, or loops within, existing systems. The trail capital investments include development of trails that create these opportunities both in the Wildernesses and in other areas of the Forest. For example, the Forest has added trail development projects such as the Eagle Gap Trail (#1221A) to the investment schedule that would provide a valuable link between the Kalmiopsis Wilderness and the Scenic section of the Illinois Wild and Scenic River corridor. The trail #1144 from Florence Saddle to Flattop Mountain is listed as a potential trail and will be developed as the need arises.

Other loop opportunities are anticipated in the vicinity of Briggs Valley on the Galice Ranger District, Game Lake on the Gold Beach District, and in the Silver Creek drainage. Interpretive trails such as the Osgood Ditch project on the Illinois Valley Ranger District will provide a link between existing trail systems Tentative trail locations have been identified in the Grassy Knob Wilderness and, based on the public response to the DEIS, have been added to the list of potential trail projects. The connection to the Rogue River Trail is being considered as well The Grassy Knob Trail and Rogue River tie have been proposed as part of an All Oregon Trail The tie to the Rogue River trail is being considered in several alternative locations. These trail developments are displayed in the Capital Investment Schedule (LRMP, Appendix B)

162. COMMENT: THE GRASSY KNOB RIDGETOP TRAIL SHOULD BE USEABLE FOR HORSE TRAVEL AS WELL AS FOOT TRAFFIC.

Response· The management objectives for the proposed trail have not been developed at this time. Prior to construction, objectives will be identified (including the feasibility of horse use) and, if considered appropriate, the trail would be constructed to accommodate travel by horse

163. *COMMENT*: TRAILHEADS TO SERVE THE KALMIOPSIS WILDERNESS WILL MAKE THAT AREA ACCESSIBLE TO MORE PEOPLE.

Response: Recreation is an activity that can occur in Wilderness, but is secondary to the primary goal of the maintenance of the natural condition for which the area was designated (LRMP, Chapter IV, "Management Prescriptions, Management Area 1-Wilderness"). At present there are 13 trailheads that provide access to the Kalmiopsis Wilderness. There are no plans for the development of additional trailheads at present, although potential trailheads have been identified (LRMP, Appendix B) which can be developed as the need arises.

Visual Resources

164. *COMMENT*. THE FOREST SERVICE NEEDS TO INCREASE ITS PROTECTION OF SCENIC VALUES ESPECIALLY ALONG ROAD AND RIVER CORRIDORS, AS WELL AS AREAS SEEN FROM COMMUNITIES AND FROM TRAILS.

Response· Visual management allocations were re-evaluated based on the public response. Lands allocated to Management Areas 12 and 13 (Retention and Partial Retention) reflect the most sensitive travel routes and recreation use areas (LRMP, Chapter IV, "Management Prescriptions"). While some management may be evident in some of these areas, they are managed under constrained levels of harvest so that views to a natural or near natural Forest setting are expected to prevail.

Visual allocations have been made in areas of the Forest visible from the communities of Grants Pass, Takilma, Cave Junction, Brookings, Agness, and Powers. Other areas allocated include the Rogue and Illinois River corridors, major travel routes including Highway 199, the Bear Camp Road, the Coquille River Road, and other areas of the Forest identified in this Plan (LRMP, Chapter IV, "Management Prescriptions, Retention Visual and Partial Retention Visual").

Major rivers are protected by one of two allocations unless specifically stated otherwise in this Forest Plan (LRMP, Chapter IV, "Management Prescriptions") The Supplemental Resource allocation restricts harvest within 1/8 mile of the bank on either side of the river. Designation as a Wild and Scenic River restricts or precludes timber harvest within 1/4 mile from the bank on either side of the river. Wild and Scenic designation is often accompanied by allocations to visual resource management which place varying levels of constraints on timber harvest and other activities from ridge to ridge in the river corridor

In the development of Alternative S, preservation of visual quality was increased by approximately 131,000 acres primarily through the Backcountry Recreation allocation (Management Area 6) Allocations to Retention (Management Area 13) and Partial Retention (Management Area 12) were increased in areas of the Forest such as the Chetco, Elk, and Winchuck River corridors, the Wilderness access route in the vicinity of Game Lake, and in areas of the Forest that are visible from the city of Grants Pass (reference Table II-3, Chapter II, FEIS) However, overall there is a reduction in the inventory of Retention and Partial Retention carried in current management direction (Alternative A). This reduction is accounted for in two ways. (1) There were, of necessity, trade-offs made in favor of other resource values Areas currently managed for Partial Retention such as Copper Mountain and Frog Lake would be managed for Modification These reductions occurred primarily in areas of the Forest receiving very low recreation use, or in areas that are not visible from the primary travel routes. (2) Management Areas with restrictions that limit or preclude timber harvest were made that override the inventoried visual objective. For instance, the allocation to Backcountry Recreation restricts timber harvest (allowing salvage only under catastrophic circumstances) and would be managed under the Preservation visual objective This allocation would constitute an upgrade of the existing inventory and account for a significant portion of the apparent reduction in area allocated to Retention or Partial Retention.

Some specific suggestions regarding viewsheds and rivers were considered in developing Alternative S. A variety of options were used to protect the viewsheds specified In some cases, land allocations were already considered to be enough protection, such as those views overlapped by the Supplemental Resource allocation where the only harvest allowed would be a result of catastrophes. Other viewsheds were protected with a Retention Visual or a Partial Retention Visual allocation. Harvest could occur in these areas, providing visual objectives are met In general, activities must be designed to blend with the surrounding landscape so that they are not readily apparent to "casual Forest visitors".

165. *COMMENT* VISUAL MANAGEMENT CLASSIFICATIONS SHOULD BE ELIMINATED FROM THE PLAN. INSTEAD, EDUCATE PEOPLE ABOUT ACTIVITIES, THE REASONS FOR PERFORMING THEM, AND THE SHORT-TERM NATURE OF THE "NEGATIVE" VISUAL IMPACT. VISUAL MANAGEMENT IS APPROPRIATE TO WILDERNESS AND NATIONAL PARKS, NOT MULTIPLE-USE FORESTS WHERE VISUAL MOSAICS EXIST FOREST-WIDE.

Response: The elimination of visual quality objectives would not meet the requirements of NFMA implementing regulations. The visual resource shall be inventoried and evaluated as an integrated part of evaluating alternatives in the Forest Plan Visual objectives are assigned based on the Agency's perception of viewer sensitivity. Visual Quality Objectives (VQO's) are assigned to every acre of National Forest land (FEIS, Chapter III, "Visual Resource"), including those managed as General Forest. Harvest coefficients have been developed for each objective The Retention and Partial Retention objectives constrain harvest and require longer harvest rotations in order to maintain the natural or near natural character of the landscapes (LRMP, Chapter IV, "Management Prescriptions"). These objectives require smaller harvest units, and greater spatial dispersion These harvest constraints have been utilized in sale planning and implementation over the course of the last six years and have resulted in the successful achievement of visual objectives.

Last, it is agreed that the public perception varies widely. Public education as to the reasons for a given activity and the short-term nature of the impact (in many cases) definately needs increased emphasis. It is with this intent that visitor centers, public contacts by Forest officers, ties with the news media, and other forms of information and involvement are built into the management operations.

166. *COMMENT*: CREATE A FEW VIEWSHEDS THROUGH THE HARVEST OF TIMBER FOR TOURISTS AND FOR SPORTSMEN.

Response. The visual resource system is an inventory of Visual Quality Objectives that are based on the Forest Service perception of viewer sensitivity. Visual Management is based on the positive manipulation of vegetation toward specific objectives Included in those objectives is the strategic location of harvest units that are correctly sized and shaped to open views on various travel routes throughout the Forest.

167. *COMMENT*: TREES SHOULD BE HARVESTED TO THE ROAD WITH NO BUFFER ZONES, SO IN THE NEXT 15 YEARS THE DEER AND ELK ARE VISIBLE GRAZING IN THE CUT OFF AREAS AND THE VIEW IS MUCH IMPROVED, LEAVING TREES AT ROADWAYS ONLY BLOCKS THE VIEW OF THE SCENERY AND THE WILDLIFE.

Response: The Forest has established visual management objectives along most of the main traveled roads. In some cases these visual management objectives call for the maintenance of natural or near natural conditions within the viewing area from the road In those cases, management would try to screen activities, in other areas timber harvest may occur next to the road. In addition, one of the management tools used is to cut viewing windows along roads where it is desirable to open vistas or wildlife viewing areas that offer good viewing opportunities.

168. *COMMENT*: STREAM STRUCTURES OFTEN LOOK ARTIFICIAL AND MAR THE SCENIC ASPECT OF STREAMS

Response: In the past, stream structures were constructed that only considered the functional aspects of the facility. As the Forest Plan is implemented, new structures provided for improvement of fish habitat are planned (LRMP, Appendix C, "Fish Capital Investments") and will be installed within the constraints of visual objectives considered appropriate for the area. Forest-wide Standards and Guidelines and Management Area prescriptions for Retention Visual, Partial Retention Visual, and General Forest (LRMP, Chapter IV) speak to this requirement. Structures will be designed and constructed utilizing materials that blend with the surrounding environment.

169. *COMMENT*: WHAT ABOUT VISUAL OBJECTIVES THAT CANNOT BE MET DUE TO PAST LOGGING? WILL THESE AREAS BE MITIGATED? MITIGATION CAN NEVER BE SUBSTITUTED FOR LOST VISUAL QUALITY. THE AGENCY SHOULD ERR ON THE SIDE OF THE VISUAL RESOURCE AND MITIGATE THE IMPACT ON HARVEST LEVELS.

Response: Rehabilitation is a recognized Visual Quality Objective that is used in situations where past management has exceeded inventoried or allocated visual objectives. In all alternatives, rehabilitation would be used to mitigate past harvest effects in areas allocated to visual resource management (USDA Handbook #462)

Off-Road Vehicle Use

170 *COMMENT*: MAKE MORE TRAILS OPEN TO THE PUBLIC FOR MOTORIZED USE. LOCAL GROUPS WANT RECREATIONAL OPPORTUNITIES FOR USING MOTORCYCLES AND ALL-TERRAIN VEHICLES.

Response: In response to public interest in motorized recreation, several changes were made since the DEIS. The Backcountry Recreation Management Area was expanded in the Preferred Alternative to include motorized use for the major acreage in this allocation (LRMP, Chapter IV, "Management Prescriptions"). Standards and Guidelines were changed to accommodate both motorized and non-motorized uses,

depending on location and Management Area goals (LRMP, Chapter IV) All trails have been re-assessed for use by off-road vehicles. Of approximately 233 miles of non-Wilderness trail on the Siskiyou, about 171 miles (73 percent) are unrestricted use. The updated list of trails and those closed to motorized uses are listed in the LRMP, Appendix E. Opportunities for trail system development in the motorized areas are identified for off-road vehicles, including jeep-type vehicles, also in Appendix E (LRMP).

171. *COMMENT*: THE FOREST PLAN SHOULD CONTAIN PROVISIONS TO ELIMINATE OFF-ROAD VEHICLE RECREATION ORV USERS SHOULD BE RESTRICTED TO PRIVATE LANDS OR, AT LEAST, TO SPECIFIC AREAS, TO LIMIT ENVIRONMENTAL DAMAGE AND TO SEPARATE THEM FROM OTHER FOREST USES THEY SHOULD NOT BE ALLOWED ON TRAILS BUILT ON SOFT GROUND OR ON STEEP GRADES.

Response: The National Forest System is managed under the concept of multiple uses, including providing an array of recreation opportunities that range from heavily developed sites to very primitive opportunities One of the uses that is acceptable is off-road vehicular use, although it is prohibited in areas where resources may be adversely affected (LRMP, Appendix E). The Forest recognizes the sensitivity of some areas and regulates their use. At present, the Forest has approximately 450 miles of trail Of these, approximately 217 miles of trail are located within the Wildernesses, and another 62 miles are closed to vehicular access for various reasons (LRMP, Appendix E). The remainder of the trails, about 171 miles, or 38 percent of the total trail system, are open to vehicular use.

All trail systems should be inspected annually to identify trail maintenance needs. Sufficient maintenance shall be provided to protect soil and water resources (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). If unacceptable resource damage is occurring and maintenance does not solve the problem, then the Forest could close that system until the damage is repaired, or close the trail to motorized uses permanently.

172. *COMMENT*: ORV USAGE AREAS SHOULD BE DESIGNATED SO THAT RESULTING NOISE WILL NOT CARRY INTO WILDERNESS OR OTHER RECREATIONAL AND WILDLIFE AREAS

Response: The Backcountry Recreation allocations (Management Area 6) made in several of the alternatives are designed to accomodate both non-motorized (includes mechanized but not motorized vehicles) and motorized (generally limited to ORV's) uses. In general, those areas located immediately adjacent to Wildernesses would be managed for non-motorized uses and the remainder for motorized uses This is expected to provide a range of opportunities at the same time maintaining the feeling of solitude in the Wildernesses In wildlife areas (Management Area 9), motorized activities "should be prohibited" except where such use is not detrimental to wildlife (LRMP, Chapter IV, "Management Prescriptions").

173. *COMMENT*. ALL TRAILS THAT LEAD TO WILDERNESS AREAS SHOULD BE CLOSED AT THE TRAILHEAD TO ORV'S AND ALL-TERRAIN BICYCLES TRAILS AUTHORIZED FOR MOTORCYCLE AND ALL-TERRAIN BICYCLE (ATB) USE SHOULD BE OF SUCH A STANDARD THAT A GROOVE WILL NOT RESULT IN THE TRAIL FROM THEIR USE.

Response: At present, trails located outside of Wilderness but accessing Wilderness trail systems are not closed to motorcycles and all-terrain bicycles. Trailheads are posted, notifying users that the Wilderness is closed to vehicular use (LRMP, Appendix E). In addition, the Forest is making the effort to educate the public prior to use, rather than allowing the issue to become an administrative problem Trails that are open to motorized use are maintained to a standard that is higher than that used for pedestrian trails to avoid such problems as grooves from vehicle use The Trail Management Objectives will identify the maintenance

level required for each of the Forest system trails (LRMP, Chapter IV, Forest-wide Standards and Guidelines).

174. *COMMENT*. ALLOW NO OFF ROAD VEHICLES IN ROADLESS AREAS.

Response: Areas inventoried as roadless were released to multiple-resource management as a result of the 1984 Wilderness Acts. An array of management prescriptions was considered for these areas in the different alternatives considered in the FEIS. Some of these roadless areas would be managed as Backcountry Recreation Management Areas that would not allow off-road vehicle use. Other alternatives allowed motorized use in some of the Backcountry areas (See FEIS, Chapter II, "Wilderness and Roadless Areas").

Historic use and public input were used in developing the Preferred Alternative S, including the Backcountry Recreation Management Area. In Alternative S, some roadless areas would be in a non-motorized Backcountry Recreation area Others, with historic four-wheel drive use and mining roads, such as the South Kalmiopsis, would be in a motorized Backcountry Recreation area (LRMP, Chapter IV, "Management Prescriptions").

175. *COMMENT*: YOU SHOULD ADD A STRATEGY TO CONSIDER THE SUCCESSES OF USER-COOPERATIVE PROGRAMS, SUCH AS ADOPT-A-TRAIL/ROAD, WHICH HAVE BEEN A HIGHLY SUCCESSFUL MANAGEMENT TOOL IN MANY FORESTS. WE REQUEST THAT YOU REVERSE THE INCREASING CLOSURE TO 4WD VEHICULAR USE THROUGH SHARING MANAGEMENT RESPONSIBILITIES WITH INVOLVED USER GROUPS.

Response: Motorized recreation opportunities are provided on the Forest, including use by ORV's and four-wheel drive vehicles (LRMP, Chapter IV, "Management Prescriptions"). While this program exists, should additional user groups desire cooperative involvement in an adopt-a-trail/road project, the Forest would welcome that participation.

EDUCATIONAL VALUES

176 *COMMENT*: MORE INTENSIVE FOREST SERVICE OUTREACH EDUCATIONAL PROGRAMS ARE NEEDED TO PROVIDE AN UNDERSTANDING OF FOREST MANAGEMENT AND GOALS. PERHAPS TOURS OF LOGGING OPERATIONS COULD BE ARRANGED, OR COURSES PRESENTED WHICH DISCUSS THE ECOSYSTEM AND FOREST RELATIONSHIPS.

Response: The Siskiyou National Forest does, and will continue to, provide educational material and presentations to any group that requests such information. This is generally accomplished on an individual request basis by Ranger District or Forest Supervisor's office personnel. Interpretation programs can be initiated by the Forest, for example, for cultural resource sites (LRMP, Chapter IV, "Standards and Guidelines") As the demand for more educational programs increases, there are opportunities to increase the interpretation program. It would certainly be one method to support recreation and tourism in the area (LRMP, Chapter IV, "Forest Management Goals").

177. *COMMENT*: THE SISKIYOU NATIONAL FOREST SHOULD DEVELOP SEVERAL INTERPRETIVE AREAS FOR EXAMPLE, A DARLINGTONIA BOG, A KALMIOPSIS PATCH, THE AREA CONTAINING THE BIGGEST OLD-GROWTH TREES ON THE FOREST, AND GEOLOGICAL ATTRACTIONS - TOURIST TYPE THINGS WITH EASY ACCESS

Response: The Forest has long recognized the uniqueness of the biological, historical, and geological diversity of the Siskiyou Recreation use is encouraged in areas offering high educational value, though development and access may be limited to trails due to the sensitivity of the areas These suggestions for interpretive areas are excellent, and the Forest will try to incorporate these in site-specific proposals, as well as enlist the support of the local community through partnership and cooperative efforts to accomplish the projects.

178 *COMMENT*: MORE INTERPRETIVE SIGNS ARE NEEDED AT RESOURCE SITES SO THE PUBLIC KNOWS WHAT SPECIFIC SITES ARE BEING MANAGED FOR.

Response: Interpretive signing will receive greater emphasis in all resource areas in the future. Capital investment projects are scheduled that incorporate interpretive signing such as at the Bear Camp and Shasta Costa Overlooks (LRMP, Appendix B) Signing at these locations will address historical values and a variety of other resources, including visual resource management, vegetative diversity, and geological interests A number of trail projects are being developed that feature interpretive signing for historical values, and for fire behavior and salvage efforts

INVESTMENTS AND TIMBER VALUES

179. *COMMENT*: NATIONAL SUPPLY AND DEMAND PROJECTIONS ARE FACTORS WHICH NEED TO BE CONSIDERED WHEN EVALUATING THE AMOUNT OF TIMBER OFFERED FROM NATIONAL FOREST LAND

Response: The effect of the National consumption of softwood forest products, the future economic markets, and the cumulative effects of different ownerships for timber production are discussed in the FEIS, Chapters II, III, and IV, "Timber "

180. *COMMENT*: INDIVIDUAL TIMBER SALES HAVE BEEN SOLD AT AN ECONOMIC LOSS AND THESE LOSSES SHOULD BE AVOIDED, EITHER BY SETTING MINIMUM BID PRICES FOR TIMBER TO ASSURE COSTS WILL BE COVERED, OR BY REMOVING ECONOMICALLY UNSUITABLE LAND FROM THE TIMBER BASE. THE ILLINOIS VALLEY RANGER DISTRICT HAS BEEN IDENTIFIED BY THE COMMENTS AS HAVING DIFFERENT CONDITIONS WHICH CAUSE IT TO HAVE MANY "BELOW COST" SALES. IT WAS SUGGESTED THAT THESE DIFFERENCES SHOULD BE MODELED BY HAVING DIFFERENT STAND DENSITY INDEXES FOR EACH DISTRICT.

Response: The Forest Service does not consider the cash flow from an individual sale as the indicator of the economic suitability of the land base. Such cash flow includes the costs of capital investments such as road construction and tree improvement, and maintenance of investments such as road reconstruction. These investments have a longer life span than the timber sale and need to be amortized over the life span of the road. The cash flow from an individual sale does not account for the Forest-wide effects over time in the timber program Such effects have been taken into account by the FORPLAN model. It is a tool designed to screen lands in the General Forest, Partial Retention Visual, Retention Visual, and Riparian Management Areas for timber management if (1) that selection of land groupings is economically efficient, and (2) it accounts for the Forest-wide effects on allowable sale quantity for a period of 150 years.

The Forest Service also compares costs which occur in different time frames by discounting the costs and values to the present. To simply add costs and values from different years does not account for the value or cost of money over time.

In 1988, the Timber Sale Program Information Reporting System (TSPIRS) analysis for the annual timber program on the Siskiyou National Forest indicates a large positive value for the timber sale program.

The Forest Service does not include payments to counties as a cost when making a Forest Planning decision. The transfer of funds from the Federal government to the local government, whether it is for welfare payments, revenue sharing, or payments to counties from timber revenue, is subject to Congressional legislation and is not within the scope of the Forest Service planning decisions or analysis If the Forest Service chose to include a macro-economic analysis, which includes the Federal payments to local governments, then such analysis would also include Federal and state income tax generated from Forest Service activities, social security payments, and welfare transfer payments such as food stamps. However, all of those items are not decision variables for the Siskiyou National Forest and, consequently, are not included in the Forest analysis.

The timber inventory, as documented in the FEIS, Appendix B, is divided into high, moderate, and low site classes. Each Ranger District has differing percentages of high, moderate, and low site classes depending on the local growing conditions. Consequently, the analysis has resolution reflected to site classes which represent productivity for each District. Forest-wide average costs, which include such items as precommercial thinning (which may not occur on low site lands), are appropriate for use when examining one District's timber program.

181. *COMMENT*: TIMBER PRICES USED IN THE FORPLAN MODEL ARE TOO HIGH AND THE TIMBER PRICE TREND IS UNREALISTIC, RESULTING IN UNREALISTIC TIMBER REVENUES

Response. The timber market has been a cyclic market with periodic robust times and hard times. Timber prices in the FORPLAN model reflect cut values for timber sales sold between 1973 and 1982. This period includes both the high and low markets for timber More recently, in 1988 several sales have sold at rates over $500/MBF (which is higher than the rate used in FORPLAN). Even the salvage sales with the fire-killed timber from the 1987 fire seasons have had substantial overbids. Conversely, during the depressed market of the early 1980's, bids were low with very little overbid The figures used in FORPLAN represent an average over a decade for stumpage harvested from the Siskiyou.

The Forest Service tested the sensitivity of the Siskiyou FORPLAN model to lower stumpage prices (an average of $167/MBF as suggested by Randall O'Toole). The results did not reflect any change in allowable sale quantities for Alternative K from the higher stumpage rates used in the DEIS. Consequently, no change in outputs would be predicted for Alternative K even if lower stumpage values were used. However, the PNV of the alternative changes substantially with the lower stumpage rates. Alternative K uses the maximum timber objective function which masks the effect of the lower stumpage rate

When a lower stumpage rate is used for the max-PNV Benchmark ($167/MBF), a seven percent reduction occurs in the first decade allowable sell quantity. However, the amount of suitable lands managed for timber only decreases by 8,000 acres (one percent decrease). The lower stumpage rates change the management intensity regimes and options which are economically efficient. It does not drop many acres of suitable land due to economics. With lower stumpage rates, extensive regimes are more economically efficient for timber management.

Using the results from the PNV Benchmark run and discounting the effects of the timber price trend, the first 10 decades of timber management would have total timber revenues exceeding total timber costs. However, the next five decades would have a negative cash flow. The effects of the price trend with the stumpage rates used in the FEIS are documented in Appendix B.

182. *COMMENT*: THE PROPOSED PLAN MAY CAUSE RISING STUMPAGE PRICES THROUGH SPECULATIVE BIDDING BY MILLS PRESSED TO MEET DEMAND.

Response: Speculative bidding is not controlled by the Forest Planning process, and is outside the scope of the Forest Plan. Available timber supplies from all ownerships interact with the aggregate demand for wood products to determine bid prices (FEIS, Chapter III, "Economic and Social").

183. *COMMENT*: CROSS SUBSIDY OF LOW VALUED STANDS WITH HIGH VALUED STANDS VIOLATES THE FOREST SERVICE TRACT VALUE POLICY.

Response: The Forest Service Manual, Section 2403.25--1 reads, "Offerings of timber will not be made under conditions which permit leaving usable portions of trees Offerings will not ordinarily be made which provide for removing only certain more valuable species from mixed stands . As a general rule, the *total* appraised value of a tract of timber will not be reduced to obtain utilization of a species, size, or class material. Average appraised stumpage prices may, however, be reduced in order to obtain more complete utilization, provided that the additional volume included as a result of the reduction is sufficient to obtain a return of at least the same total appraised value."

184. *COMMENT*: INVESTMENTS FOR SECOND-GROWTH MANAGEMENT ARE UNECONOMICAL.

Response The Forest Service is required by law to reforest harvested lands. Consequently, if a stand is harvested, then second-growth management will occur. The question to be answered, then, is, "Should the lands be harvested?" Such an economic question will compare the costs and benefits of harvest activity, reforestation costs, and timber stand improvements. To exclude the stumpage values and harvest costs of existing stands when analyzing second growth management would only be meaningful if the Forest Service could consider harvest without management of second growth.

The analysis for second growth management should also include the Forest-wide effects of different silvicultural practices. A silvicultural practice may not pay for itself on a per acre basis, but may allow the harvest of more acres due to faster tree growth This allowable cut effect is appropriate to consider when evaluating second growth management

The FORPLAN model for the Siskiyou National Forest has been used to consider the harvest questions and allowable cut effect for different management intensities of second growth It incorporates the harvest values and costs of existing stands, the allowable cut effects, and the costs and benefits of second growth management (FEIS, Appendix B)

185. *COMMENT*: FUTURE TIMBER VALUES SHOULD BE LOWER THAN PRESENT BECAUSE MORE LOWER GRADE WOOD WILL BE REMOVED VIA LOGGING EFFICIENCY.

Response· Future timber values are modeled as a function of the average diameter of the harvested material. The function accounts for the differences in grade between old-growth and second-growth timber (FEIS, Appendix B).

186. *COMMENT*: $40 MILLION IS PLANNED FOR ROAD CONSTRUCTION IN THE FIRST DECADE THE NEED FOR THIS AMOUNT OF MONEY TO BE SPENT ON ROADS, WHICH ARE FOR THE VAST MAJORITY ALREADY BUILT (DEIS, III-2), IS NOT JUSTIFIED IN THE PLAN OR DEIS

Response: Alternatives vary from low roading projections (and costs) in Alternatives M, G, and E, to higher amounts of road (and associated costs) to be built in Alternatives B, C, D, and D-1. The other alternatives (NC, K, and S) are in between (FEIS, Chapter IV, "Improvements"). Projected roads are ones that have not yet been built. The Siskiyou National Forest has many areas which are yet unroaded. Much of the terrain requires expensive road construction to avoid adverse environmental impact. The expensive roads are offset by the relatively high stumpage values of the timber located on the Forest

PLANNING

ADEQUACY OF THE DOCUMENT

Adequacy/Accuracy of Data

187. *COMMENT*: THE DRAFT ENVIRONMENTAL IMPACT STATEMENT IS NOT WRITTEN IN LANGUAGE WHICH MAKES THE PLANNING PROCESS UNDERSTANDABLE BY THE GENERAL PUBLIC. UNLESS A REVIEWER HAS A SUBSTANTIAL PRIOR UNDERSTANDING OF THE PLANNING PROCESS, ORGANIZATION, MODELS, ANALYTICAL TOOLS, AND IMPLICATIONS OF THE ALTERNATIVES, IT IS IMPOSSIBLE TO GLEAN THE NECESSARY INFORMATION FROM THE DEIS TO COMMENT MEANINGFULLY

Response. Part of the analysis, by its requirements and inherent nature, is difficult for ease in understanding. In the Final Environmental Impact Statement, we have attempted to explain the analytical details in a simplified, comprehensible fashion. However, some technical concepts simply do not translate to clean and simple language For that reason, much of the discussion regarding analytical processes (i e , "models and tools") is found in an appendix (B) to the FEIS rather than in the main body.

Members of the Interdisciplinary Team have given considerable time explaining and interpreting the technical aspects and resource interrelationships to any and all people who have requested assistance. This assistance and continuing dialogue has persisted since issuance of the Draft Environmental Impact Statement. Many "white papers" were prepared and distributed in response to requests for additional discussion and clarification. Only a limited few have delved into the documents in great detail, these analysts have been provided the time and explanation necessary to comment meaningfully

Last, by the very nature and complexity of Forest Planning and accompanying environmental documents, light reading and simplicity are not their virtue. The Interdisciplinary Team and writer-editors have attempted to reduce technical jargon and the extemely interwoven issues to an understandable level This effort has occasionally backfired in cases where the more technically-minded reviewer sharply critiqued the discussions as being too basic or incomplete. For most, the table of contents, detailed index, and tracking of issues by Planning Problems helps immensely. And, as noted, members of the Interdisciplinary Team and Forest staff are always willing lend assistance where clarity is not apparent

188. *COMMENT*: INVENTORY NUMBERS AND ASSOCIATED STATISTICS ARE INADEQUATE (DUE TO INADEQUATE SAMPLE OR FIRE EFFECTS)

Response: The Siskiyou National Forest was mapped and inventoried in 1978-79 The statistical accuracy has been validated for the degree of precision and reliability needed at the Forest Plan level of resolution. The Forest-wide volume estimates are within 10 percent at the 67 percent confidence interval.

The effects of the 1987 fires have been evaluated and are described in FEIS Chapter III, "1987 Fires." This relationship with the alternatives is described in the FEIS Chapter II, "Implications of the 1987 Fires."

The Siskiyou National Forest is scheduled to be reinventoried in the next two to three years FORPLAN outputs for the Forest Plan will be reanalyzed with these new data as part of the Monitoring Plan The need for adjustments to ASQ and other projections will be studied in light of this analysis (LRMP, Chapter V, "Table V-1: Monitoring and Evaluation Program").

189. *COMMENT*: THE INVENTORY FOR, OR DEFINITION OF, LAND SUITABLE FOR TIMBER PRODUCTION IS INACCURATE OR TOO BROAD A LARGE PROPORTION OF ROADLESS AREAS WOULD BE ELIMINATED FROM SUITABLE LANDS, AND ASQ REDUCED, IF MORE ACCURATE INFORMATION WAS USED

Response: Land suitability is defined by the physical capability of the lands to comply with legal requirements if managed for timber production. These requirements are described in FEIS, Appendix B, "Suitability Analysis." All available data sources were compiled and evaluated by knowledgeable, qualified Ranger District personnel (silviculturists, soil scientists, and geologists) to determine and map suitable lands on a site-by-site basis The latest reforestation technology, including applicable results from Forest Intensive Research (FIR), was considered when determining the potential of various sites for prompt reforestation without irreversible resource damage.

Two potential circumstances could modify the suitable land base in the future. Further field examination of sites may refine the existing information base and indicate that changes in suitability classification are necessary on a site-specific basis Changes in reforestation, soil erosion control technology, or special harvest systems and site prescriptions may permit some additional lands to be promptly reforested without irreversible resource damage These changes will be monitored for significance of their aggregate effect on Forest Plan projections as described in LRMP, Appendix D, "Monitoring and Evaluation Program Background."

190. *COMMENT*: IT IS NOT CLEAR WHY BASIN HARVEST CONSTRAINTS ARE SET AT THE SPECIFIC PERCENTAGES OF THE GENERAL FOREST AND ALSO THE BENEFITS AND COSTS OF LEVELS DIFFERING FROM THE ONES CHOSEN.

Appendix B of the FEIS describes how the Planning Basin harvest dispersion constraints were developed for the alternatives. In response to public input, the timber harvest dispersion constraints were re-evaluated as used in the original model, FORPLAN Version I, compared with Version II. Changes were made as described in Appendix B and Chapter II of the FEIS. The benefits and costs of levels are also briefly described in Appendix B.

191. *COMMENT*: WHY WAS THE 150-YEAR HARVEST SCHEDULE USED INSTEAD OF THE RPA 50-YEAR PLANNING HORIZON? OR 200 YEARS?

Response: The alternatives presented in the FEIS contain management direction for the Plan period The Plan period covers the next 10 to 15 years. The NFMA regulations define the Plan period as one decade (36 CFR 219.3 (1982)), while the law permits a 15-year maximum (16 USC 1604 (f)(5)). the Forest Plan analysis considers a 150-year planning horizon to ensure that management plans can be implemented over the long term, and to disclose and evaluate long-term environmental consequences (FEIS, Chapter I, "National, Regional, and Forest Planning")

192 *COMMENT*: BOARD FOOT/CUBIC FOOT RATIOS ARE INACCURATE (OR NOT DISPLAYED) AND SHOULD VARY ACCORDING TO THE MATERIALS BEING PRODUCED IN THE FIRST DECADE

Response: The BF/CF ratio used for display of the board foot volume ASQ for the first decade has been revised to more closely reflect the actual volume expected to be harvested. This revision better reflects the conversion ratio for the average product size that will be produced in the first decade. This change is mentioned in several places in the FEIS and discussed in Appendix B, "Forest Planning Model Development of Yield Coefficients."

193. *COMMENT*: A TIMBER PRODUCT DEMAND FORECAST COULD NOT BE FOUND IN THE DOCUMENT.

Response. The timber product demand forecast can be found in the following tables: "Projected Consumption of National Forest Timber-Coos and Curry Counties," and "Projected Consumption of National Forest Timber-Jackson and Josephine Counties" (FEIS, Chapter III, "Economic and Social").

194. *COMMENT*. THE ANALYSIS UNDERESTIMATES TRUE DEMAND FOR WOOD PRODUCTS, CURRENT AND PROJECTED.

Response: Demand has been re-analyzed in the FEIS (Chapter III, "Economic and Social") Region Six/Pacific Northwest Experiment Station projections were used and greater demand was projected than in the DEIS

195. *COMMENT*: INCLUDE THE PROJECTED INVENTORY OF WOOD VOLUME IN THE CHART OF PROJECTED SUPPLY AND DEMAND.

Response: Projected wood volume inventories have been modeled in the references cited in the FEIS, Chapter III, "Economic and Social." These inventories were used to project future harvests from different ownerships that are displayed in tables in that section

196. *COMMENT*: JUSTIFY THE USE OF SELL RATHER THAN CUT DATA FOR HISTORIC HARVEST LEVELS.

Response: Both the Forest Plan comparison of projected outputs by alternative (FEIS, Chapter II) and estimates of economic effects (FEIS, Chapter IV) assume that all National Forest timber offered for sale in the future will be sold and harvested This assumption is necessary to provide a common point for comparison of alternatives and analysis of effects. If all timber offered is not sold and harvested, then effects and comparisons may be different than estimated. Also displayed in Chapter II for comparison purposes is the historic cut data from 1963 through 1987.

197. *COMMENT*: PROJECTIONS OF FUTURE TIMBER SUPPLY FROM OTHER PUBLIC AND/OR PRIVATE LANDS ARE WRONG (TOO LOW); REFER TO PNW PAPER.

Response: Timber supply projections have been revised in the FEIS based on Region Six/Pacific Northwest Experiment Station projections (FEIS, Chapter III, "Economic and Social").

198 *COMMENT*. THERE ARE NO PROVISIONS FOR POPULATION GROWTHS AT VARIOUS LEVELS. THERE COULD BE MORE PRESSURE FOR. TIMBER CUTTING, PERMITS ON THE ROGUE RIVER, LOCATIONS FOR HOMES, HUNTING, FISHING, AND RECREATION.

Response. Projected demand for hunting, fishing, and recreation are based on the projected population growth over the next 50 years. Timber demand is influenced by markets over wider areas (National and international); studies of timber demand include projections of needs for housing and other factors The Forest monitoring program has demand and consumption trends as a monitoring item for tracking increased pressure on the Forest resources (LRMP, Chapter V) Changes will be made in the future as trends become more evident. Sensitivity analysis has been done for timber prices and recreation trade-offs (FEIS, Appendix B)

199. *COMMENT* CONCERN WAS EXPRESSED THAT THERE ARE MORE LANDS UNSUITABLE FOR TIMBER HARVESTING THAN HAS BEEN ESTIMATED IN THE CURRENT INVENTORY

Response: An inventory of lands suitable for timber production was made by use of aerial photos and field verification. Whereas this provides a good approximation, this process was not designed to identify all unsuitable areas (FEIS, Appendix B). Following the initial inventory, data is collected annually through project-level field analysis and inventory, with an update of the suitability lands map made each decade That ten-year update would include changes of unsuitable and suitable lands identified during the course of the decade, as well as a review of current suitability maps. Suitability maps are located at Forest Supervisor and Ranger District offices. The monitoring plan provides for re-evaluation if the acreage adjustments indicated during the Planning period reaches a significant level (LRMP, Chapter V, Appendix D).

200. *COMMENT*: AS STATED BY THE FOREST SERVICE ITSELF IN ITS SOIL INVENTORY, 1/3 OF THE 624,240 ACRES TENTATIVELY SUITABLE FOR LOGGING AND ROAD BUILDING IS RATED AS "HIGH EROSION HAZARD" (DEIS III-65). THE PREFERRED ALTERNATIVE DESIGNATES ONLY 22,206 ACRES AS UNSUITABLE DUE TO IRREVERSIBLE SOIL DAMAGE, WHERE, ACTUALLY, GREATER THAN 200,000 ACRES SHOULD BE DESIGNATED AS UNSUITABLE. THIS IS ONE INSTANCE OF MISREPRESENTING THE FACTS, OR, MORE ACCURATELY, IGNORING THE AGENCY'S OWN RESEARCH.

Response: Soils rated as high erosion hazard are not equivalent to lands classified as unsuitable for timber production (FEIS, Appendix B). Many highly productive and reforestable soils have a high potential for erosion, but would incur little soil loss with a minimum of ground disturbance "High erosion hazard" as discussed in the Soil Resource Inventory represents the potential, and is not evaluated in light of applying mitigation measures provided in the Standards and Guidelines and associated Best Management Practices (LRMP, Chapter IV and Appendix F). Classification of lands unsuitable for timber harvest, on the other hand, is based on several criteria, including potential mass wasting and potential surface erosion. As a result, there is much less unsuitable land than high erosion hazard land.

201. *COMMENT*· A SHORT, CONCISE PLAN SHOULD HAVE BEEN PREPARED WHICH WOULD PROVIDE CONGRESS AND "WE THE PEOPLE" YOUR BEST ESTIMATE OF PRESENT VALUE OF THE OLD-GROWTH TIMBER ON YOUR ENTIRE FOREST, THE POSSIBLE ANNUAL INCOME THAT THE FEDERAL AND OTHER GOVERNMENT BODIES COULD EXPECT BY UTILIZING ALL TIMBER RESOURCES (EXCEPT FOR A FEW SMALL AREAS RESERVED FOR PUBLIC ACTIVITIES), AND THE PRESENT INCOME AND EXPENDITURES FOR YOUR ENTIRE FOREST.

Response· The present value of the timber program on the Forest is presented in Chapter II of the FEIS The average net receipts to the Federal Government are displayed in Table II-62, "Indicators of

Responsiveness to Planning Problems". The present income and expenditures for the Forest are estimated for the No Change Alternative in Chapter II Tables.

202. *COMMENT*: DEVELOP A LARGE-SCALE MAP SHOWING DETAILS OF THE EXISTING STATE OF THE FOREST AND PROPOSED HARVESTS.

Response. Because of limited demand and high cost, large-scale maps have not been produced for distribution on a regular basis. Maps of the many of the individual layers used in the Forest Plan analysis have been produced at a 3/8-inch to one-mile scale. These have been made available for inspection by various people wishing to see them, and at numerous public meetings. They are in the Process File in the Forest Supervisor's Office Others could be produced if needed. These maps provide the same resolution and detail used in Forest planning at the programmatic level Large scale maps of proposed timber sale analysis areas for the first decade of the Forest Plan are available for inspection at the Ranger District offices. However, individual harvest units will be identified in the project environmental analysis and are outside the scope of the Forest Plan programmatic analysis.

203. *COMMENT*: PROJECTIONS OF RECREATION USE SHOULD BE BASED ON HISTORICAL USE TRENDS ON THE FOREST AND DEMOGRAPHIC TRENDS FROM LOCATIONS THAT PROVIDE A MAJORITY OF THE USE.

Response: The Siskiyou National Forest is not considered a heavily used recreation Forest when compared with other Forests in California or the Pacific Northwest. Rates of increase based on demographic trends from surrounding communities were considered, but the results did not seem consistent when compared to historic rates of growth. A growth rate of one-half percent per year over the life of the Plan was taken from research sources (Oregon State University Research Bulletin #28, 1979) and used in making projections (FEIS, Appendix B, "Development of Yield Coefficients"). When projected over time, this rate of increased use was found to be consistent with historic trends. Since initiating the Forest Planning process, annual recreation use figures do not indicate a major shift from this projection. For more information on this analysis, see the Planning Records at the Siskiyou National Forest Supervisor's Office

204. *COMMENT*: A SERIOUS DEFICIENCY OF BACKGROUND RESEARCH AND INFORMATION, ESPECIALLY ON WILDLIFE, DISQUALIFIES THE FOREST PLAN AS LEGALLY VALID OR COMPLETE UNDER THE PROVISIONS OF NFMA. ADDITIONALLY, THIS INADEQUATE INVENTORY AND RESEARCH BASE RENDERS THE MONITORING PROGRAM ILLEGAL AND INEFFECTIVE UNDER THE TERMS OF THE ACT.

Response: It was necessary to proceed with the Forest Plan with the best information currently available. We agree that there are deficiencies in available information in many areas, including on many species of wildlife. Incomplete or unavailable information needed for better Forest planning and management are identified in the Forest Plan (LRMP, Chapter II, "Information Needs"). Research is ongoing, and the Plan can be modified if new research findings indicate the need. The Plan could also be modified if monitoring indicates problems with implementation (LRMP, Chapter V, "Monitoring and Evaluation" and "Amendment and Revision").

205. *COMMENT*. A MODIFICATION OF TABLE IV-5 IN THE DEIS USING PERCENTAGES RATHER THAN ACREAGES IS NEEDED. IT MAY BE EASIER TO ENVISION THE COMPARISON AND COMPREHEND THE EFFECTS EACH ALTERNATIVE MAY HAVE ON MINERAL RESOURCES.

Response: Figure II-19 in the FEIS is a bar graph designed to illustrate the differences among the alternatives with respect to access restrictions. The figure is intended to complement Table IV-5 and the accompanying text addressing effects of alternatives related to minerals development.

206. *COMMENT*: THE DRAFT DOCUMENTS FAIL TO MEET THE BEDROCK STANDARDS OF THE NEPA AND NFMA. WHERE IS THE DATA TO SHOW WHICH AREAS ARE UNSUITABLE FOR LOGGING BECAUSE FINANCIAL COSTS WOULD BE LARGER THAN THE VALUE OF THE WOOD? HOW MANY BELOW-COST OR CROSS-SUBSIDIZED TIMBER SALES CAN WE EXPECT?

Response: Discussions regarding the suitability of forest lands for timber production are found in the FEIS, Chapter III, "Suitability," and Appendix B, "Suitability Analysis." Additionally, see the LRMP, Chapter II, "Resource Supply Conditions," and Chapter III, "Response to Planning Problems."

Essentially none of the lands that were determined to be tentatively suitable for timber production were subsequently determined to be inappropriate for timber production solely on the basis of cost efficiency.

See the FEIS, Chapter IV, Tables IV-16 through IV-27 for the relative difference among alternatives pertinent to their respective potential for below-cost sales. Alternatives B, C, D, and D1 are projected to have the largest number of sales where the immediate cash flow could be negative These alternatives would harvest large amounts of hardwood stands which have low product values and consequently a high potential for some individual timber sales to have costs exceeding revenues However, timber program benefits exceed timber program costs in all alternatives.

207. *COMMENT*: THE CHANGES IN TIMBER SUPPLY FROM THE NATIONAL FOREST WHICH RESULTED FROM THE MAJOR FOREST FIRES BEGINNING ON AUGUST 30, 1987 (AFTER THE PLAN WAS PUBLISHED), ARE NOT ADDRESSED IN THE PLAN

Response: The FEIS for the Silver Fire Recovery Project has been incorporated by reference in the FEIS for the Forest Plan A discussion regarding changes in timber supply and the 1987 fires has now been included (FEIS, Chapters II, III, and IV, "1987 Fires").

208. *COMMENT*: FUNDAMENTAL TO YOUR ANALYSIS IS THE DIVISION OF THE FOREST INTO 19 PLANNING UNITS WHICH ROUGHLY FOLLOW WATERSHED BOUNDARIES. YOU SHOULD INDICATE THE LOCATION OF THESE PLANNING UNITS ON YOUR ALTERNATIVE MAPS, THUS MAKING THEM EVEN MORE VISIBLE.

Response: A comparison of the Planning Basin Map (FEIS, Chapter III) to the alternative maps will provide a general idea of activities by Planning Basin For more detail, planning records are available for public review at the Forest Supervisor's Office.

Individual projects implemented under the Forest Plan will provide site-specific information with respect to the individual Planning Basins A detailed discussion of watershed and fishery effects is provided in the FEIS, Chapter IV, "Environmental Consequences by Planning Basin."

209 210 *COMMENT*: BENCHMARK OUTPUTS (TABLE II-2, LRMP) INDICATE THAT NONWILDERNESS AND WILDERNESS RECREATION AND RANGE VALUES DO NOT VARY. WHY, IF VARIATIONS IN SUPPLY ARE AVAILABLE?

Response· The outputs for recreation and range are dependent on the demand for these resources. The Forest has excess capacity in both of these areas None of the benchmarks would reduce capacities below the projected demand in these areas, so the use does not vary

Modeling (e.g. FORPLAN)

211. *COMMENT*· WHAT MODEL WAS USED FOR TIMBER INVENTORY AND ASQ PROJECTIONS?

Response: ASQ calculations were based on yield tables developed by one of two different methods, depending on whether the stand is unmanaged or is a plantation resulting from timber harvest Then the FORPLAN linear programming model was used to determine optimal prescriptions and scheduling to produce the highest Present Net Worth (PNV) for each land allocation alternative (FEIS, Appendix B, "Lost Efficiency and Net Public Benefit").

Yield tables for unmanaged immature stands of natural origin were developed through statistical analysis of Forest inventory data. Stand volume and growth were projected for each combination of Productivity Class and Condition Class Empirical yield tables were developed using a statistical regression analysis correlating stand volume with age for each model class. These projections, and supporting data and development processes, are part of the Plan process records (FEIS, Appendix B, "Development of Yield Coefficients")

Yield tables for existing plantations and future managed stands were developed using the stand simulation model for Douglas-fir, DFSIM Yield projections were made for the various combinations of Productivity Class, Prescription Emphasis, and Management Intensity. An adjunct dynamic programming model (DP-DFSIM) identified optimum variations of rotation and thinning regimes to maximize timber yield on a Forest-wide basis. Local tree height/age relationships were used in growth functions and output was modified for stockability limitations of low productivity sites. The yield tables and supporting information are found in *Managed Yield Tables for the Siskiyou National Forest* (Craig, 1984).

These yield tables, current Forest inventory data, and predictions for the production of other Forest resources were combined, and economic values were developed for selected resource outputs. These data and projections were used by the FORPLAN linear programming model to determine the optimal combination of management prescriptions for maximum PNV for each alternative. The ASQ is calculated by FORPLAN and presented for each of the alternatives considered in detail This process is described in detail in FEIS, Appendix B, "Forest Planning Model."

212. *COMMENT*: PROJECTIONS OF NET GROWTH OF IMMATURE TIMBER ARE NEEDED IN THE DOCUMENTS.

Response: Growth for existing immature stands was estimated by one of two different methods, depending on whether the stand is unmanaged or a plantation resulting from timber harvest. Yield tables for unmanaged immature stands of natural origin were developed through statistical analysis of Forest inventory data Stand volume and growth were projected for each combination of Productivity Class and Condition Class. These projections, and supporting data and development processes, are part of the Plan process records (FEIS, Appendix B, "Development of Yield Coefficients") Yield tables for existing plantations (stands resulting from regeneration harvest) were developed using the stand simulation model for Douglas-fir, DFSIM Yield projections were made for the various combinations of Productivity Class, Prescription Emphasis, and Management Intensity These tables and supporting information are found in the Process File in a separate document prepared for the planning record, *Managed Yield Tables for the Siskiyou National Forest* (Craig, 1984), available in the Siskiyou National Forest Supervisor's Office.

213 *COMMENT.* FORPLAN IS INCAPABLE OF MODELING SPATIAL PATTERNS, ECOLOGICAL DIVERSITY, AND NON-MARKET VALUES. BECAUSE OF THESE DEFICIENCIES, ITS USE CONFUSES AND OBSCURES REAL ISSUES AND TRADEOFFS.

Response: The capability of the model is relative to the degree of resolution needed to address the planning question The FORPLAN model does represent spatial patterns at the Forest level The Identifiers in the model include. Planning Basin, Roaded versus Unroaded, Vegetation Condition, and Productivity Class (FEIS, Appendix B, Forest Planning Model). This provides the resolution needed for the Interdisciplinary Team to assess the implications of program level decisions on spatial patterns and ecological diversity. The model does not have the resolution to identify individual stands or units that could be treated; however, this level of specific detail is more appropriate at the project planning level where site-specific analysis is conducted

Many non-market values, such as recreation visitor days or wildlife viewing, are represented economically in the model (FEIS, Appendix B, Determination of Economic Values) The Forest Service recognizes that many values are not "priced" and do not have economic representations in the model. The definition of Net Public Benefit includes consideration of nonpriced values or outputs (FEIS, Appendix B, Cost Efficiency and Net Public Benefit). In view of the limitations of the model to represent the total picture of Net Public Benefits, the Forest Service has developed a wide range of alternatives and described the costs and benefits, both economic and environmental, in Chapter IV of the FEIS and compared the alternatives in Chapter II. These descriptions of effects and comparisons include discussions of many nonpriced elements such as visual quality and old-growth habitat and effectively analyze tradeoffs.

214 *COMMENT* FORPLAN MODEL MAY NOT BE CAPABLE OF MODELING THE STANDARDS AND GUIDELINES OF THE LRMP. THESE GUIDELINES APPEAR TO BE CONSTRAINTS THAT MAY BE VULNERABLE TO LEGAL APPEAL.

Response: The Standards and Guidelines are part of each alternative (FEIS, Appendix D, and LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). The FORPLAN model is designed to represent those having a measurable effect on Forest-wide activities and outputs or environmental conditions. It is not intended that the model would be a perfect representation of the total Forest and all the actions that could take place. Restrictions imposed by Standards and Guidelines are represented in several ways. In some cases, the resource yields or economic values are adjusted to allow for specific actions that may be required on each acre. The model may be constrained to assure that a particular condition will be achieved, or that a condition can be avoided. In other cases, acres may be constrained to a specific prescription designed to accomplish the desired effect. The representations in FORPLAN are adequate to project the outputs and environmental conditions that may be expected under each alternative with its complement of Standards and Guidelines.

215. *COMMENT.* DO NOT "HARDWIRE" PRESCRIPTION CONTROLS IN FORPLAN; ALLOW MORE MANEUVERING ROOM TO OPTIMIZE A SOLUTION

Response· Sensitivity testing with the FORPLAN model indicated that when given a choice, the model tends to opt for the prescription with the highest timber output in all cases. To develop a range of alternatives and represent allocations of some specific land areas to groups of prescriptions designed to *emphasize other resource values (many of which are nonpriced), it is necessary* to "force" FORPLAN through prescription controls or coordinated allocation choices. The Siskiyou elected to use controls on prescriptions to simulate the land allocations for alternatives designed by the Interdisciplinary Team rather than trying to build the linkages in the model to get logical allocations of contiguous acres to Management Areas that would provide the desired benefits Given the land allocation and the prescription intensities and timing choices, the FORPLAN model solves for the most efficient (optimum) set of prescriptions and

schedule of activities for each alternative. The analysis process is described in Appendix B (FEIS), and summarized in the FEIS, Chapter II "Description of the Analysis Process "

216. *COMMENT*: USE THE ORGANON MODEL FOR FEIS TIMBER PROJECTIONS BECAUSE IT USES LOCAL GROWTH DATA IN ITS PROJECTIONS.

Response. While the ORGANON model was developed in southwest Oregon, the data used in its development does not cover the geographic area of the Siskiyou National Forest. This model was not available when the yield projections were made for the Forest Planning analysis. The Forest Service considered use of ORGANON to examine the yield projections between the Draft and Final EIS, but rejected this idea for the several reasons The ORGANON model begins simulation at age 20; some method of estimating stand conditions at age 20 for each combination of productivity class and management intensity would need to be developed. Data would also have to be developed to calibrate the model to represent stand development under Siskiyou National Forest growing conditions The work needed for ORGANON to be operational for the Siskiyou will be on-going and much of the data needed will be collected in the upcoming inventory for young stands. In addition to these considerations for the orderly progression of implementation of this new model, no evidence has been offered that the DFSIM model used for this analysis is less than adequate.

217. *COMMENT*: TIMBER MANAGEMENT AFFECTS WILDLIFE POPULATIONS BUT THE MODEL IS RELATIVELY INSENSITIVE TO CHANGES IN WILDLIFE POPULATION LEVELS WITH CHANGES IN HARVEST LEVEL. DURING THE NEXT DECADE, THE WILDLIFE POPULATION PORTION OF THE MODEL NEEDS A THOROUGH REVIEW, OR THE FOREST NEEDS TO QUIT RESERVING TIMBER TO PROTECT WILDLIFE POPULATIONS.

Response: The Forest Plan represents the best possible effort to manage all the Forest's resources, including wildlife The Forest Plan attempts to balance the needs of all wildlife species. For example, to accommodate species which use mature and old-growth forest, Management Area # 8 (Designated Habitat) was created (LRMP, Chapter IV, "Management Prescriptions")

The Forest is continually gathering more information. At the next revision of the Forest Plan in ten to fifteen years, wildlife data will be considerably improved and refined. (One would not expect timber management to cause wildlife populations to fluctuate drastically over the short term.) The Forest normally harvests 5,000 acres per year (50,000 per decade) out of a total land base of 1.1 million. This is less than one-half of one percent (0.5) of the Forest land base per year, and less than five percent per decade. In addition, in the various FEIS alternatives, timber harvest levels fluctuate only 54 percent below or 18 percent above the current level (Alternative M not included). Given those bounds, wildlife population figures are not going to fluctuate wildly over the short term. Over the long term (an entire rotation), some wildlife populations, such as those dependent on mature or old-growth forest, could drop to less than viable levels if measures (such as creation of Management Area 8) are not taken now to provide adequate quality habitat.

218. *COMMENT*: USE ALL ALLOCATIONS AND MANAGEMENT ASSUMPTIONS FROM THE CURRENT PLAN TO PRODUCE THE BENCHMARK FORPLAN OUTPUTS.

Response. The Current Direction Benchmark is based on the land allocations and management direction established prior to the Forest Plan, however, it does use state-of-the-art techniques for modeling and for projecting yields. It also includes the requirements of law and regulation that are not a part of "current plans" (meaning those plans approved prior to this Forest Plan). The No Change Alternative in the FEIS represents carrying forward the current plans with the allocations and assumptions of those plans Since the purpose of the benchmark analysis is to define the decision space and provide a framework for the

development of alternatives, state-of-the-art modeling techniques and requirements of law and regulation are incorporated in all benchmarks (FEIS, Appendix B, "Benchmark and Constraint Analysis")

219. *COMMENT*. YOUR TABLES OF ROAD CONSTRUCTION SHOULD HAVE INCLUDED ALL POTENTIAL ROADS PERMANENT OR TEMPORARY. TEMPORARY ROADS LEAVE SCARS PLUS DISTURB DRAINAGE PATTERNS. THROUGH THIS DATA ONLY CAN WE JUDGE THE IMPACT OF ROAD BUILDING FORPLAN SHOULD BE ON THE HIGH SIDE OF ROAD BUILDING AND NOT ON THE LOW SIDE

Response· Estimates of potential temporary road construction, and any associated environmental effects, were not included in the FORPLAN model calculations. The estimates of costs and effects would be relatively insignificant when compared to those of Forest Development Roads as they are limited in number, extent of construction, and life. These temporary roads are generally closed (i.e., "put to bed") upon termination of the project and post-treatment activities; drainage is reinstalled to original contour and revegetation is attained by either mitigative treatments and/or natural means.

Methods used, timing, and site-specific mitigation for temporary roads will be made in accordance with site-specific project planning (LRMP, Chapter IV, "Forest-wide Standards and Guidelines")

220. *COMMENT* BECAUSE FORPLAN WAS DEVELOPED AS A TIMBER MANAGEMENT MODEL, MOST OTHER RESOURCES ARE DEALT WITH MERELY AS "CONSTRAINTS" LIMITING THE PRINCIPAL MANAGEMENT OBJECTIVE OF MAXIMIZING PRICED OUTPUTS. RATHER THAN *ACCORDING EQUAL TO EACH OF THE FOREST PLANNING CONSIDERATIONS SPECIFIED IN* NFMA REGULATIONS (SEE 36 CFR 219), THE PLAN TREATS THE MAXIMIZATIONS OF PNV AS THE BASE LINE TO WHICH OTHER POSSIBILITIES AND TRADEOFFS MUST BE COMPARED. THIS APPROACH INEVITABLY FAVORS FOREST USES THAT PRODUCE EASILY QUANTIFIABLE ECONOMIC BENEFITS OVER USES FOR WHICH ECONOMIC BENEFITS HAVE NOT YET BEEN DETERMINED

Response: FORPLAN Version 2 provides both an analysis and accounting system for long-range National Forest planning. The model's primary analysis function is to assist in: (1) analysis of the management situation; (2) formulation of alternatives; (3) estimation of effects of alternatives; and (4) evaluation of alternatives. These four steps are integral in development of the Forest Plan and are described in the NFMA regulations, Title 36 CFR, Section 219.12 e-h.

While many Forest values do not have a price, many of these nonmarket values such as recreation visitor days, sport fishing, and wildlife viewing are represented economically in FORPLAN (FEIS, Appendix B, "Determination of Economic Values").

Alternatives

221. *COMMENT* THE DEIS FAILS TO EXPLAIN WHY THE PREFERRED ALTERNATIVE WAS SELECTED THERE IS NO EVIDENCE THROUGHOUT THE DEIS THAT THE SISKIYOU CONSIDERED THE STATUTORY DIRECTIVES (ORGANIC ACT AND OTHERS) IN ITS SELECTION OF THE PREFERRED THE SISKIYOU MUST SPECIFICALLY ADDRESS THESE DIRECTIVES AND EXPLAIN HOW THE PREFERRED ALTERNATIVE SATISFIES SPECIFIC CRITERIA BETTER THAN OTHER ALTERNATIVES. THE FOREST SERVICE NEVER PROVIDES ANY INDICATION OF THE WEIGHT IT GIVES ANY OF THE FACTORS CONSIDERED.

Response The purpose of the FEIS is environmental disclosure, the purpose of the Record of Decision (ROD) is to provide the rationale for selection The Agency decisionmaking procedures and disclosure of the decision are directed by CEQ Regulations (40 CFR 1505) and subsequent Forest Service policies and procedures.

The Draft Environmental Impact Statement (DEIS) is designed to inform the public of the Agency's intent to plan actions and make decisions The DEIS provides disclosure and discussion of the major environmental impacts associated with the alternatives. It is prepared in accordance with the range of actions, alternatives, and impacts decided upon in the scoping process Issuance of the DEIS insures that the public and other agencies are made aware of the proposed action and information as to its potential environmental effects. Public scrutiny of the issues that are truly significant to the action is essential to implementing NEPA.

The "Preferred Alternative" in the DEIS is a NEPA requirement, the purpose is simply to identify the Agency's preference or proposed action in seeking more focused public and other agency comments.

222. *COMMENT* THE RANGE OF ALTERNATIVES CONSIDERED FOR TIMBER PRODUCTION IS INADEQUATE. THE ALTERNATIVES IN THE DEIS HARDLY DISTRIBUTE TIMBER PRODUCTION BETWEEN THE "MINIMUM" AND "MAXIMUM" RESOURCE POTENTIAL AS REQUIRED BY 36 CRF 219 12 (f)(1). THE FOREST PLAN, THEREBY, FAILS TO REFLECT THE FULL RANGE OF MAJOR COMMODITY USES AND VALUES THAT CAN BE PRODUCED ON THE FOREST IN THE MAXIMUM TIMBER ALTERNATIVES.

Response: The cited NFMA regulations also state that alternatives shall be distributed *between* the minimum and maximum resource potential to *reflect, to the extent practical*, the full range of major commodity and environmental resource uses and values that could be produced. The alternatives in the FEIS provide, in comparative form, a strong range of options. These allow the issues to be sharply defined and provide the Regional Forester and public a clear basis for choice among them

The possible number of reasonable alternatives suggested by numerous individuals and organizations was very large. The possible permutations of alternatives was infinite. For each major issue identified, an attempt was made provide either the maximum range or some reasonable facsimile thereof Many of the alternatives included in this analysis were developed directly from public input during the scoping process. Those alternatives developed in detail and analyzed in the FEIS, the Preferred Alternative in the FEIS, the Benchmarks, and other alternatives considered but not studied in detail, all contribute to a wealth of variations in theme and range within and among the major issues addressed (FEIS, Chapter II).

223. *COMMENT*: THERE SHOULD BE A CHOICE OF ALTERNATIVES DESIGNED AROUND SPECIFIC LAND ALLOCATIONS WITHIN AN "ACCEPTABLE" RANGE OF ASQ (140-160 MMBF), PARTICULARLY REFLECTING VARIATION IN MANAGEMENT AREAS AFFECTING THE RECREATION, EDUCATION, AND BIOLOGIC NEEDS OF THE FOREST.

Response: Because there could be a infinite number of possible alternatives, the Forest attempted to develop an array that reflects most concerns expressed by the general public. The Forest Plan and Environmental Statement accomplishes this objective. Alternatives K and S are within the range suggested for Allowable Sale Quantity (FEIS, Chapter II, "Alternative Descriptions".

224. *COMMENT*· A RANGE OF PARTIAL-WILDERNESS ALTERNATIVES SHOULD HAVE BEEN DISCUSSED, AT LEAST IN APPENDIX C. THE ALL-OR-NOTHING TREATMENT ALLOWS THE

WRITERS TO DISMISS WHOLE AREAS AS UNMANAGEABLE WHEN A LITTLE TRIMMING WOULD PRODUCE OBVIOUSLY LOGICAL UNITS.

Response. The FEIS Appendix C provides a site-specific analysis of each unroaded area to evaluate its allocation to either continued unroaded status, development, or an intermediate level of development. Each unroaded area was evaluated for its Wilderness potential. How all or portions of each unroaded area have been allocated varies among the alternatives Chapter III and IV of the FEIS offers additional discussion and analysis of the specific roadless areas, or portions thereof, that currently retain substantive characteristics and potential for Wilderness.

225 *COMMENT*: USE OF THE EXISTING PLAN (NO CHANGE ALTERNATIVE) IN MEASURING IMPACTS OF THE PREFERRED ALTERNATIVE IS INADEQUATE.

Response. The Current Direction Alternative (Alternative A) is the No Action Alternative for comparison purposes among the alternatives, including the Preferred Alternative. See the FEIS, Chapter II, "Background on the No Change and No Action Alternatives," for a more detailed discussion.

Standards and Guidelines

226. *COMMENT*: THE FOREST HAS NOT DISPLAYED STANDARDS OR METHODS FOR PROTECTING DEAD AND DOWN WOODY HABITATS FROM SUCH ACTIVITIES AS FIREWOOD CUTTING AND PRESCRIBED BURNING DURING SITE PREPARATION.

Response: The Standards and Guidelines in the LRMP call for the retention of dead and down coarse woody material The Standards and Guidelines for dead and down woody material apply to all activities including fuel treatment and firewood cutting (LRMP, Chapter IV). Detailed plans for the protection of this material would be developed as part of the site-specific fuels treatment plan and prescribed fire plan for each activity site.

227. *COMMENT*. IN THE STANDARDS AND GUIDELINES, THE FOREST HAS DEFINED "LARGE WOODY DEBRIS" AS MATERIAL OVER 12 INCHES IN DIAMETER AND 15 FEET LONG. BROWN (1985) STATES THAT LARGE WOODY DEBRIS SHOULD BE OVER 18 INCHES IN DIAMETER. WE RECOMMEND THAT THE MINIMUM STANDARD FOR LARGE WOODY DEBRIS BE 18 INCHES IN DIAMETER WITH AN AVERAGE DIAMETER OF 22 INCHES

Response. Large woody material for site productivity is defined in the Standards and Guidelines as log pieces, "at least 20 inches in diameter at the large end, and at least 40 cubic feet volume in a range of decomposition classes " For wildlife use, "the logs should be at least 12 to 17 inches in diameter at the large end, and 20 or more feet in length." Most logs reserved as large woody material are cull, and in decomposition classes 1 and 2. All decomposition class 3, 4, and 5 logs are reserved (LRMP, Chapter IV, "Forest-wide Standards and Guidelines")

228. *COMMENT*· THE STANDARDS AND GUIDELINES FOR WATER NEED TO BE MORE FULLY DEVELOPED IN THE FINAL EIS/PLAN.

Response· The Standards and Guidelines for soil and water have been revised based on public comments on the Forest Plan DEIS In particular, the Standard and Guideline for Best Management

Practices (BMP's) was more fully developed, and Appendix F of the Forest Plan added to describe the process for implementing BMP's

229. *COMMENT*: THE LANGUAGE IN STANDARDS AND GUIDELINES NEED TO BE STRENGTHENED. USE THE MANDATORY WORD, "SHALL;" WORDS LIKE "SHOULD," "WHERE PRACTICAL" AND "MAY" DO NOT PROVIDE ADEQUATE PROTECTION FOR RESOURCES THEY ALLOW THE DECISIONMAKER TO IGNORE THE STANDARDS AND GUIDELINES WHILE ALLOWING TIMBER ACTIVITIES.

Response: No timber management activity occurs on much of the total Forest acreage in all alternatives. Forest-wide Standards and Guidelines govern activities on Management Areas which have a programmed harvest (LRMP, Chapter IV) The Standards and Guidelines have been revised, based on comments received from the public and government agencies (LRMP, Chapter IV). Direction statements have been changed to "shall" where appropriate. The direction terms are defined in the introduction to the Standards and Guidelines; they each have very specific uses. The use of the word "should" will not allow the decisionmakers to "ignore" specific direction. Also, a monitoring element is specifically designed to evaluate Standards and Guidelines related to all resource elements (LRMP, Chapter V and Appendix D).

230 *COMMENT*: THE PLAN'S MANAGEMENT STANDARDS AND GUIDELINES ARE INADEQUATE IN PREVENTING LANDSLIDES AND EROSION ON THE FRAGILE LANDS THAT REMAIN IN THE SUITABLE TIMBER BASE

Response The Standards and Guidelines addressing "mass-movement" require qualitative landslide hazard maps and risk assessment for timber harvest activities, including road construction (LRMP, Chapter IV). These, and many other mitigation measures associated with the Best Management Practices (LRMP, Appendix F), are designed to prevent and/or minimize landslides and erosion on lands determined to be suitable for timber production. This suitability determination, in itself, is an initial step in separating the low to higher risk areas from those where management practices would be unacceptable. Landslide monitoring will also provide inventory information about landslide frequency under natural, roaded, and harvested conditions (LRMP, Chapter V and Appendix D) in order to better differentiate risks and track practices which were designed to avoid or reduce soil and water impacts.

231. *COMMENT*: REGARDING SOIL AND WATER STANDARDS AND GUIDELINES: THE STANDARD THAT 85 PERCENT OF AFFECTED (TIMBER HARVEST) AREAS SHOULD BE IN A NON-COMPACTED AND NON-PUDDLED CONDITION IS SOMEWHAT CONFUSING. THE 85 PERCENT STANDARD NEEDS MORE EXPLANATION. IT IS UNCLEAR WHY OR FOR WHAT PURPOSE ONE WOULD USE THE 85 PERCENT WITHOUT USING THE PERCENTAGE COMPACTED IN ROADS

Response: The total acreage within an activity includes roads and landings (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Eighty-five percent of an affected area in a non-compacted and non-puddled condition following timber harvest includes roads and landings. That is, with roads and landings, 15 percent would be a maximum tolerable limit for soil and water impacts resulting from compaction and puddling For skyline yarding systems which comprise over 90 percent of all yarding on the Forest, soil disturbance rarely exceeds five percent of an activity area. However, with ground-based (tractor) yarding of timber, it is sometimes possible to disturb 15 percent or more of an activity area. This mitigation measure is purposefully designed to place impact restraints on the degree of ground disturbance, thereby protecting both site productivity and watershed functioning

232. *COMMENT*: IT IS STATED IN THE FOREST-WIDE GUIDELINES THAT ANY PROPOSED PROJECTS TO ALTER HABITAT OF PLANT SPECIES WILL BE EVALUATED TO DETERMINE IF SENSITIVE SPECIES ARE PRESENT. FIRST, THE TERM "EVALUATED" SHOULD BE BETTER DEFINED AS TO INCLUDE ON THE GROUND INVENTORIES AND REFERRAL TO PROFESSIONAL BOTANISTS FOR MANAGEMENT ADVICE SECONDLY, IT SHOULD BE NOTED THAT LITTLE INFORMATION ON RARE OR SENSITIVE PLANT SPECIES HABITAT HAS BEEN COLLECTED TO DATE WHICH MAKES IT DIFFICULT TO PREDICT THE EFFECTS OF MANAGEMENT ACTIVITIES ON HABITAT.

Response The term "evaluated" has been better defined in the FEIS, Appendix F, and the LRMP, Chapter IV, "Forest-wide Standards and Guidelines." The need for more information on rare or sensitive plant habitat has been addressed in the FEIS, Appendix F, and the LRMP, Chapter II, "Research and Information Needs "

233. *COMMENT*. WITHIN THE LRMP, UNDER FOREST-WIDE STANDARDS AND GUIDELINES, IT APPEARS THAT PRECOMMERCIAL THINNING SHOULD BE INCLUDED AS PART OF 6-1 TIMBER MANAGEMENT (IV-29).

Response. Precommerical thinning was inadvertently omitted during editing processes This has been corrected.

234 *COMMENT*: THE STANDARDS AND GUIDELINES ARE WEAK AND NOT SPECIFIC ENOUGH.

Response: The Forest-wide Standards and Guidelines (LRMP, Chapter IV) are specific to the degree possible without taking away the flexibility needed for individual planning of activity at the project level. Specific management requirements, constraints, and mitigation is developed during the project analysis and recorded in the environmental document and/or implementing instrument (e g , contracts, special use permits, cooperative agreements).

Monitoring

235. *COMMENT*. FOREST SHOULD DEVELOP AN ACTIVE AND ONGOING MONITORING PROGRAM FOR ALL MANAGEMENT ACTIVITIES THAT HAVE AN ENVIRONMENTAL IMPACT. SPECIFIC SUGGESTS FOR IMPROVING THE MONITORING PROGRAM ARE GIVEN.

Response: In response to many suggestions, the Monitoring and Evaluation Program in the Siskiyou National Forest Plan has been changed (LRMP, Appendix D). The Monitoring program is designed to identify acceptable levels of any ground-disturbing activity and provide a basis to measure the effect of this disturbance so that corrective action can be taken if threshold levels are exceeded.

236 *COMMENT*. A NUMBER OF INDIVIDUALS AND AGENCIES EXPRESSED THE DESIRE FOR FOREST-WIDE MONITORING OF FISH HABITATS. MAJOR ITEMS THAT NEED TO BE ADDRESSED INCLUDE DETERMINING THE EFFECTS OF LAND MANAGEMENT ACTIVITIES ON SALMONIDS, AND THE EFFECTIVENESS OF FISH CAPITAL INVESTMENTS IN ENHANCING SALMONID POPULATIONS.

Response· Appendix D of the LRMP describes the proposed fisheries monitoring program. This program was developed from specific concerns raised by individual and agency responses to the DEIS and Draft Plan Monitoring is an essential part of any management program The Region recognizes the importance and has allocated more funds to the Forest fisheries program to accomplish this objective.

237 *COMMENT*: THE DRAFT PLAN AND DEIS DO NOT MAKE CLEAR THE EXTENT OF PAST MONITORING THAT HAS TAKEN PLACE ON THE FOREST WITH REGARDS TO CRITICAL FACTORS AFFECTING THE FISHERIES

Response The *FISH* and *SOIL AND WATER* elements Chapter III of the FEIS now include a brief summary of past fish, soil, and water monitoring that has been done on the Forest

238 *COMMENT* IMPROPER ROAD AND SKID TRAIL CONSTRUCTION AND MAINTENANCE IS PROBABLY THE GREATEST CONTRIBUTOR OF SEDIMENT TO STREAMS. A BETTER SYSTEM OF MONITORING THE ENTIRE ROAD AND SKID TRAIL NETWORK NEEDS TO BE DEVELOPED SO THAT PROBLEMS CAN BE IDENTIFIED AND CORRECTED.

Response Annual maintenance work planning is used as a monitoring tool by road system managers to identify and to fit work needed to correct problems into the maintenance program The level of maintenance is identified in the Road Management Objective for an individual road (See LRMP, Chapter IV, Forest-wide Standard and Guideline 11-5).

239. *COMMENT*. IMPLEMENTATION OF "BEST MANAGEMENT PRACTICES" IS NOT AN ACCEPTABLE SUBSTITUTE FOR WATER QUALITY MONITORING. IT'S NOT CLEAR IN THE DRAFT PLAN HOW SEDIMENT YIELDS AND THEIR IMPACTS WILL BE MONITORED. IN FACT, IT APPEARS NO PROGRAM IS ESTABLISHED AND NO FUNDS WILL BE COMMITTED TO DIRECTLY MONITOR WATER QUALITY STANDARDS SUCH AS TURBIDITY. A WELL-PLANNED AND ADEQUATELY FUNDED MONITORING PROGRAM IS NEEDED

Response· In response to public input, the soil and water monitoring program has been more fully developed and described in Chapter V and Appendix D of the Forest Plan. Water temperature and turbidity monitoring are included as part of the monitoring plan. The on-going project-level soil and water monitoring activity was not displayed in the Forest Plan monitoring summary. Considerable information gathered at the project level can be used to complement the Forest Plan monitoring effort; this is particularly true relative to assessing implementation and effectiveness of Best Management Practices.

240. *COMMENT*: MONITORING OF SNAG LEVELS SHOULD BE INCLUDED IN THE PLAN.

Response: Monitoring of wildlife trees is included in element CW121(d) of the wildlife monitoring plan (LRMP, Chapter V and Appendix D). Details for other monitoring elements, including habitat diversity, are included in these documents.

241. *COMMENT*: THE MONITORING AND EVALUATION PROGRAM IS BIASED, EITHER IN ONE DIRECTION OR ANOTHER. ITEMS NEED TO BE TRACKED FOR BOTH DECREASES AND INCREASES (NOT JUST DECREASES).

Response· The Forest Service Regulations for National Forest System Land and Resource Management Planning (36 CFR 219.12 (k)) describe the goals of monitoring and evaluation. The Forest Service Manual, Section 1920, Land and Resource Management Planning, 1922.7, and the Forest Service Handbook 1909.12, and Land and Resource Management Planning, Chapter 6, stress that the objective of monitoring and evaluation is to determine whether programs and projects are *meeting* direction. In many cases, the monitoring will result in identification of actual levels of outputs or conditions, thus showing the extent that direction is exceeded. In some cases, while it would be of interest to know if objectives are exceeded, the monitoring needed to determine compliance will not supply that information. Collection of such information

would more appropriately be done as research or resource inventory work, and would be subject to the objectives and financing in those areas.

242. *COMMENT*: THE SISKIYOU EIS ERRONEOUSLY SHOWS THAT NO ACRES WILL REMAIN ROADLESS IN TEN YEARS, DEIS II-168. HOWEVER, IT IS ALMOST IMPOSSIBLE TO HARVEST 31,400 ACRES PER YEAR TO DEVELOP ALL THE ROADLESS ACREAGE. THE SISKIYOU SHOULD FOLLOW THE LEAD OF OTHER FORESTS AND SHOULD DISPLAY HOW MANY ACRES WILL REMAIN ROADLESS, IRRESPECTIVE OF THE LAND ALLOCATION.

Response. "Roadless" refers to the inventoried areas identified in Appendix C of the DEIS and FEIS. The observation that it **may** be "impossible to harvest 31,400 acres per year" is accurate However, not all acres must be harvested to change the character of an area from roadless to roaded (or developed). A review of the Ten-Year Timber Sale Action Plan (LRMP, Appendix C) reveals harvest and, more specifically, roading in most areas prescribed for "Roaded Management" during the first decade to a point that will leave many areas (acres) no longer meeting the criteria that created their roadless identity. A display of the acres expected to remain roadless at the end of the first, second, and fifth decades by alternative has been added to Chapter II of the FEIS (Table II-24) and in the Introduction section of Appendix C, FEIS.

243. *COMMENT* IT MAY BE THAT RECREATION USE INCREASES WITH INCREASING TIMBER HARVEST BECAUSE TIMBER HARVEST CREATES JOBS WHICH ATTRACTS PEOPLE TO USE THE FOREST ON THEIR FREE TIME. THESE TRENDS SHOULD BE CAREFULLY MONITORED OVER THE NEXT PLANNING CYCLE.

Response· Monitoring recreation use is included in the LRMP, Appendix D. Access development associated with timber harvest generally increases opportunities for developed recreation, while it generally decreases opportunities for undeveloped recreation such as Primitive and Semi-primitive Non-motorized uses

244. *COMMENT* THE SOIL AND SOIL PRODUCTIVITY MONITORING PROCESS IS WEAK AND NOT SPECIFIC ENOUGH.

Response: Soil (and site) productivity monitoring is currently evolving in the research community. Important to site productivity is the total organic matter, including above ground, surface, and below ground components, provided in several Standards and Guidelines. Monitoring of site productivity will focus on biochemical and physical values of large woody material (LRMP, Chapter V, "Implementation of the Forest Plan"). Monitoring and evaluation of soil conditions will take advantage of the close ties that have been developed with the research communities of Oregon State University and the Pacific Northwest Experiment Station Monitoring projects will be as specific and as current as the scientific community's research. See Appendix D (LRMP) for the monitoring plan pertinent to soils and the soils relationship with water resources.

245. *COMMENT* AN ANNUAL REPORT IS NEEDED FOR THE PUBLIC TO SHOW RESULTS OF MONITORING, INCLUDING THOSE ACTIVITIES THAT EXCEED THE LEVEL OF CONCERN, WHAT ACTIONS WILL BE TAKEN, A COMPARISON OF ALL RESOURCE OUTPUTS AS PROGRAMMED AND ACCOMPLISHED, AND THE FISCAL BUDGET AS PLANNED AND REALIZED.

Response: Table V-1, "Monitoring and Evaluation Program," in the Forest Plan has been changed to clarify that the "frequency" of monitoring means "Reporting Frequency." Most of the actions to be monitored are evaluated annually, an annual report will be available to the public A monitoring element has been

expanded in the Monitoring Plan which will compare actual and planned implementation costs and value which includes monitoring costs (LRMP, Chapter V, Table V-1 and Appendix D)

246. *COMMENT*: THE BUDGET FOR THE FOREST SHOULD CONTAIN ADEQUATE FUNDING TO MONITOR THE ENTIRE ROAD AND SKID TRAIL NETWORK AND ITS STREAM SEDIMENTATION EFFECTS

Response. Appendix D of the LRMP contains monitoring information including estimated annual costs for inclusion in the Forest budget. Stream sedimentation is addressed under the following resource elements in the monitoring plan: fish habitat, water resource, and soil productivity. In addition, project-level monitoring will provide additional and complementary information to Forest Plan monitoring of these elements.

MANAGEMENT REQUIREMENTS

247. *COMMENT*: ESTABLISH AN MMR AND LEGAL REQUIREMENT FOR TIMBER PRODUCTION (EQUAL TO CURRENT PRODUCTION WITHOUT INCLUDING ANY EFFECTS FROM INTENSIVE MANAGEMENT PRACTICES).

Response. There is no requirement or authorization in applicable law or Forest Service policy to establish a Management Requirement (MR) for ASQ The Forest Service is required to constrain timber outputs over time to meet sustained yield principles. The application of an MR for timber outputs could violate sustained yield principles, or could prevent the selection of the alternative which best maximizes net public benefits. The benchmark levels provide a basis for the comparison of tradeoffs for alternatives against the maximum legal potential production of various resources including timber output (FEIS, Appendix B, "Development of Management Requirements").

248 *COMMENT*. MINIMUM MANAGEMENT REQUIREMENTS WERE DONE WITHOUT PUBLIC INVOLVEMENT, INTERDISCIPLINARY ANALYSIS, AND INTEGRATED PLANNING MANDATES OF THE NATIONAL FOREST MANAGEMENT ACT. THE "SENSITIVITY ANALYSIS FOR MINIMUM MANAGEMENT REQUIREMENTS (APPENDIX J) IS A MAJOR STEP TOWARD ALLEVIATING THIS CRITICISM. HOWEVER, IT SHOULD GO FURTHER; SPECIFICALLY, DEMONSTRATE THAT AN EFFICIENT METHOD OF SELECTING MINIMUM MANAGEMENT REQUIREMENTS WAS USED, GIVEN THE OBJECTIVES AND CONSTRAINTS OF THE PREFERRED ALTERNATIVE

Response: The National Forest Management Act (NFMA) set legal guidelines for management of the National Forests The guidelines were interpreted by the Secretary of Agriculture, in cooperation with a Committee of Scientists and with public and professional involvement, to develop regulations Direction from the Chief of the Forest Service and Region 6 resulted in MR's which reflect the requirements of the laws and regulations in NFMA. The MR direction ensures that minimum legal requirements are applied to all alternatives in Forest plans consistently across all National Forests MR's exist for dispersal of created openings, water quality, riparian and wildlife habitat as required by NFMA

The Management Requirements were developed with public involvement. Siskiyou National Forest personnel displayed the preliminary analysis at several public meetings held around the Forest, attempting to involve local people in the development of yield coefficients, planning assumptions, and formulation of alternatives. These meetings are documented in the planning records. The documentation in Appendix B and Appendix J of the DEIS, as well as the discussion in Chapter II, explains how MR's were developed for the Siskiyou These documents provided reviewers with the information needed to comment on the development of the Management Requirements Appendix J has been revised in the FEIS and now

includes some of the information from Appendix B related to the selection of the most efficient methods of meeting the necessary requirements

Designation of MR areas was an interdisciplinary effort. The Interdisciplinary Team has designed the Management Requirements to take advantage of overlaps in resource benefits and minimize tradeoffs to the extent practical This is particularly the case where designated wildlife habitat would preclude timber management These areas are mapped using a priority system which locates them first in dedicated areas (e.g., Wilderness, Wild River), then in areas unsuitable for timber management, then in areas that are potential areas for allocation to Management Areas that would restrict timber management, and finally in area suitable for timber production if the above did not fill the required need. This results in the lowest tradeoffs not only in the Preferred Alternative, but in any alternative formulation considered.

249. *COMMENT* NON-OWL MMR'S SHOULD ONLY INCLUDE THOSE AREAS NEEDED TO MEET MMR'S, AND THAT THE ADDITIONAL ACRES BEING CONSIDERED HERE BE PLACED IN OTHER LESS RESTRICTIVE CATEGORIES.

Response· Management Area 8 (Designated Wildlife Habitat) includes habitat areas for spotted owl, pileated woodpecker, and pine marten (LRMP, Chapter IV, "Management Prescriptions") Management Requirements for all three species are met through an integrated network of habitat areas Appendix J of the FEIS describes the legal foundation and background analysis supporting these Management Requirements.

250 *COMMENT*: THROUGHOUT THE DOCUMENT, THE FOREST SERVICE ASSUMES THAT THE MMR'S WILL INSURE VIABLE POPULATIONS OF OLD-GROWTH DEPENDENT SPECIES. THIS ASSUMPTION IS UNWARRANTED AND, PARTICULARLY IN THE CASE OF THE SPOTTED OWL, IS A MATTER OF CONSIDERABLE CONTROVERSY WITHIN THE SCIENTIFIC COMMUNITY.

Response Although more data remains to be collected, enough information is available to begin to allocate habitat for wildlife species dependent on mature and old-growth forest. Refer to the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines) for details on habitat allocations for spotted owls in the National Forests of Oregon and Washington. For indicator species representing mature and old-growth habitat, habitat networks have been established according to Regional direction (FEIS, Chapter III and IV, "Wildlife", LRMP, Chapter IV, "Management Prescriptions")

251. *COMMENT*: THE MINIMUM MANAGEMENT REQUIREMENT (MMR) FOR MAINTENANCE OF SPECIES FREQUENTING MATURE OR OLD-GROWTH FOREST IS ONLY 20%, WHEREAS 60% WOULD BE REQUIRED TO PROVIDE FOR "HIGHLY VISIBLE POPULATIONS." THE ESTABLISHMENT OF SO LOW AN MMR APPEARS VERY UNWISE

Response: The MR for Primary Cavity Excavators is maintenance of 20 percent habitat capability (The MR's for marten, pileated woodpecker, and northern spotted owl are not described in terms of population percent.) Regional Management Requirements for woodpeckers (primary cavity excavators) are set at 20 percent based on the pioneering work done by Thomas in 1979 (FEIS, "Literature Cited") Thomas points out that populations below 20 percent are considered non-viable; populations between 20 and 39 percent are defined as marginal Thus, Regional Policy is 40 percent (FSM 2630.3 8/87 R-6 Supp 45) Thomas also states that snag habitats maintained at 40-59 percent "will probably maintain viable populations," and that population levels at 60 percent or above "will almost certainly support highly viable populations .." The Siskiyou has maintained a snag policy of 60 percent since 1976, several alternatives in the FEIS, including the Preferred, would reaffirm the 60 percent policy.

252. *COMMENT*: MINIMUM MANAGEMENT REQUIREMENTS FOR OLD-GROWTH DEPENDENT SPECIES ARE BASED ON INADEQUATE DATA.

Response: Preliminary research does indicate dependence of certain wildlife species on mature and old-growth habitats (FEIS, Appendix J). We agree that more research and monitoring is needed. Research needs have been identified (LRMP, Chapter II, "Information Needs") and monitoring efforts of old-growth dependent species will continue during the planning cycle (LRMP, Chapter V and Appendix D) The objective of current Management Requirement allocations is to balance considerations for old-growth dependent species and economic concerns, while maintaining options for managing old-growth ecosystems in the future. Allocations must be made now, based on current knowledge, in some areas of the Siskiyou adequate mature and old-growth habitat will simply not be available at the next revision of the Forest Plan. If more area has been set aside than necessary, habitat can be rededicated to timber management at the beginning of the next planning cycle, if the converse is true, options will already be forgone, i e., cutover areas will not produce mature and old-growth habitat again for many decades

253. *COMMENT*: THE MINIMUM REQUIREMENT STANDARDS ARE FLAWED BECAUSE THEY ARE DIRECTED TOWARDS MAINTAINING WHAT THE USFS CALLS "VIABLE POPULATIONS." THERE IS NO DEFINITION OF WHAT CONSTITUTES A MINIMUM "VIABLE POPULATION" FOR THE MORE THAN 270 SPECIES FOUND IN THE SISKIYOU NATIONAL FOREST. IN FACT, THERE IS NO BIOLOGICAL BASIS TO SUPPORT THE USE OF THE CONCEPT OF MINIMUM VIABLE POPULATIONS IN THIS MANNER.

Response: Although current thinking in the scientific community has been moving away from the concept of indicator species as appropriate measures of habitat capability for entire groups of species, NFMA implementing regulations still require the identification and monitoring of such species. They are thus still identified and provided for in Forest Planning. It is recognized that no single species can be a perfect indicator of habitat for another species. There are many data gaps in our knowledge of habitat requirements, as identified in the Forest Plan (Chapter II, "Information Needs").

The next plan will be founded on better data. In the meantime, only half of the forest is open to timber management During the first decade timber would be harvested on no more than six percent of the Forest under any alternative. Through the Standards and Guidelines, this Forest has tried to accommodate the habitat needs of all wildlife Land allocations and Standards and Guidelines will maintain viable populations of all species inhabiting the Siskiyou The only exceptions will be uncommon species which find scant habitat on the Siskiyou For instance, it would be unrealistic to assume that the Forest could support viable populations of species such as the water pipit (which finds only marginal habitat on the Siskiyou), or occasional visitors such as Clark's nutcracker.

RESEARCH

254. *COMMENT*: A COMPREHENSIVE AND COMPLETE INVENTORY OF THE PLANTS AND ANIMALS OF OUR NATIONAL FORESTS SHOULD BE COMPILED SO THAT OUR UNDERSTANDING OF THEIR COMPLEX INTERRELATIONSHIPS CAN ASSIST US IN OUR STEWARDSHIP OF THE WILDERNESS.

Response: The long-range goal is to have a complete inventory of the Siskiyou's plants and animals and their habitat, and a better understanding of how the entire ecosystem functions (LRMP, Chapter IV, "(Forest Management Goals," and Chapter II, "Information Needs") The Forest Service is committed to learning as much about sensitive plants and their role in ecosystems as is possible. In 1988, a botanist was hired to oversee the sensitive plant program on the Rogue River and Siskiyou National Forests. Also, inventory and

monitoring of sensitive plants is an important part of implementing the Forest Plan Specific inventories are identified in the "Threatened, Endangered, and Sensitive Wildlife and Plant Capital Investment" Schedule in the LRMP, Appendix B. Also, ongoing monitoring is identified in Chapter V and Appendix D of the LRMP.

255. *COMMENT*: BUILDINGS CAN BE MADE OF EARTHQUAKE-PROOF, MOLDED MATERIALS, ESPECIALLY SHOPS AND SMALLER DWELLINGS. RESEARCH MONIES SHOULD BE SET ASIDE FROM ALL TIMBER COMPANIES AND WOODS OPERATIONS IN 1988 AND BEYOND FOR THIS TYPE OF RESEARCH CONSTRUCTION.

    WE SHOULD NOT BE "LOCKING UP" OUR FOREST, BUT SHOULD BE SPENDING MORE MONEY ON RESEARCH TO FIND MORE USES FOR WOOD AND WOOD FIBER TO REPLACE DEPLETED RESOURCES LIKE COAL, STEEL, AND PETROLEUM. TREES ARE OUR ONLY RENEWABLE RESOURCE

Response: Both private and government agencies are conducting basic research into wood technology and forest management Two examples of such agencies are the Pacific Northwest Experiment Station, and the Wood Products Laboratory in Wisconsin The Siskiyou National Forest, on occasion, cooperates with research organizations. Based on public input, this research need is now identified in "Information Needs" in Chapter II of the Forest Plan.

256. *COMMENT*: CONDUCT MORE BASIC RESEARCH ON THE IMPACTS OF TURNING THE OLD-GROWTH FORESTS OF THE PACIFIC NORTHWEST INTO TREE FARM PLANTATIONS.

Response: "Better understanding the importance of old-growth ecosystems" is identified as among "Regional Needs" in the Forest Plan (Chapter II, "Information Needs").

257. *COMMENT*: ESTABLISH AND FUND LONG-TERM RESEARCH PROGRAMS EMPHASIZING NON-TIMBER PRODUCTION ISSUES.

Response: The Pacific Northwest Experiment Station is responsible for doing basic forest management research Basic research is beyond the scope of the Siskiyou National Forest mission. However, the LRMP (Chapter V, "Implementation") provides a Monitoring and Evaluation Program for all Forest activities Some of the non-timber resources that will be monitored include smolt production, sensitive plants, Roosevelt Elk populations, osprey, and recreation (LRMP, Chapter V and Appendix D). A number of research needs for non-timber-production issues are identified in "Information Needs" in the LRMP (Chapter II).

MANAGEMENT OF THE FOREST

258 *COMMENT*: MANAGEMENT PLANS MUST LOOK CENTURIES INTO THE FUTURE. INCREASING POPULATIONS OF FUTURE GENERATIONS WILL HAVE NEEDS REQUIRING THE INCREASE OF PRODUCTIVITY AND OUTPUT OVER TIME. NATURAL RESOURCES CANNOT BE MANAGED OR EXPLOITED JUST TO SATISFY THE NEEDS OR DESIRES OF THE PRESENT GENERATION OR OF LOCAL INTERESTS.

Response: Yes, management plans must look to the future, and demands for goods and services provided by the Forest will increase with time A 150-year time span (or "planning horizon") is used to display effects of alternatives and the nondeclining flow of timber. Re-examination of the LRMP will occur at least every 10 to 15 years to ensure changing conditions and demands can be incorporated into the analysis (LRMP, Chapter I).

259. *COMMENT*. THE FOREST, UNDER YOUR MANAGEMENT, IS NOT A "RENEWABLE RESOURCE." ONCE ROADED AND LOGGED, THE FOREST PRIMEVAL IS GONE, HUMANLY SPEAKING, FOREVER AND THOUGH MUCH OF IT COULD HEAL (IF YOU COULD FIND IT IN YOURSELVES TO LET IT BE FOR A FEW HUNDRED YEARS), THERE IS NO WAY - IF YOU CONTINUE YOUR PRESENT COURSE - THAT YOU WILL EVER BE ABLE TO RECREATE THE FISHER, SPOTTED OWL, WILD FISH RUNS, AND PORT-ORFORD-CEDAR, TO NAME A FEW CREATURES YOUR PRESENT MANAGEMENT DIRECTION HAS PUT IN JEOPARDY.

Response: We have endeavored to create a choice of alternatives in the FEIS that will preserve viable populations of all native and desirable non-native plants and animals. For instance, we have incorporated Standards and Guidelines listed in the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines), and taken actions to insure that minimum requirements for insuring viable populations and habitat are met. Most land management options available today will still be available at the end of this planning period It would not be possible, or wise, to make land allocation decisions now which would forever govern future actions

OTHER PLANNING COMMENTS

260. *COMMENT*· A FOREST PLAN REVISION AND AMENDMENT PROCESS SHOULD BE DEVELOPED TO GUIDE THE AMENDMENT AND REVISION PROCESS.

Response: Forest Service Regulations, National Forest System Land and Resource Management Planning (36 CFR 219.10 (f),(g)), provide for Amendments and Revisions under certain situations. This process is described in Chapter V of the Forest Plan ("Amendment and Revision").

261. *COMMENT*· A DEFINITION OF "SIGNIFICANT" SHOULD BE DEVELOPED TO GUIDE THE AMENDMENT AND REVISION PROCESS

Response. In determining "significance," factors are described in the Forest Service Handbook, 1909.12, Land and Resource Management Planning. The Handbook lists those factors that are to be used when determining whether a proposed change to a forest plan is significant or not. These include (1) timing; (2) location and size; (3) goals, objectives, and outputs, and (4) Management Prescriptions. More description of these factors is available from the Forest Supervisor's Office. The process for change is generally described in the Forest Plan, Chapter II, "Amendment and Revision."

262. *COMMENT*: A CLEAR DISCUSSION OF THE FOREST'S ABILITY TO IMPLEMENT THE PLAN AT EXPECTED LEVELS SHOULD BE INCLUDED IN THE EVENT OF FUTURE BUDGET REDUCTIONS, THE SISKIYOU PLAN SHOULD CLEARLY INDICATE WHAT PRIORITIES WILL BE ESTABLISHED (WITH CRITERIA FOR SAME) AND WHAT ACTIVITIES WILL BE CURTAILED.

Response· Implementation of the Forest Plan is discussed in the LRMP, Chapter V, while Appendix D of the LRMP contains monitoring information associated with Plan implementation. Budget information is provided in Appendix B of the LRMP for Fiscal Year 1991

Amendments to the Forest Plan may be triggered by changes in funding received as opposed to funding requested through the budgeting process The amounts received could be more than, the same as, or less than the amounts requested For instance, the Fiscal Year 1991 budget request identifies and prioritizes activities at both 30 percent reduction and 10 percent increase levels Major program areas identified at the reduced funding level include facilities, timber, and lands.

263. *COMMENT*: AT A MINIMUM, MONITORING SHOULD INCLUDE: NUTRIENT LOSS, EFFECTS FROM BURNING, COMPACTION, EROSION LOSS AND DISPLACEMENT, AND REDUCTION IN SOIL PRODUCTIVITY THE PLAN SHOULD DESIGNATE WHO IS RESPONSIBLE FOR MONITORING AND ENFORCEMENT AND WHAT COURSE OF ACTION THE FOREST SERVICE WILL TAKE TO PROTECT AGAINST LOSSES.

Response: Monitoring of soil productivity has been added to the Monitoring Plan (LRMP, Appendix D)

264. *COMMENT*: UNLESS SCIENTIFICALLY JUSTIFIED AND WITH FULL PUBLIC PARTICIPATION, NO NEW CONSTRAINTS SHOULD BE APPLIED IN THE INTERIM TO EXISTING PLANS IN CONTEMPLATION OF THE NEW PLAN

Response: The Forest is currently managed through direction provided within the Chetco-Grayback, Rogue-Illinois, Rogue, and Mt. Butler-Dry Creek Land Management Plans, portions of the Powers and Illinois Valley District Multiple Use Plans, the Timber Management Plan, and other sources, including the Forest Service Manual, Regional Guide, and numerous environmental documents, laws, regulations, and Executive Orders.

The Forest Plan supersedes or incorporates all previous land and resource management plans prepared for the Siskiyou National Forest (FEIS, Chapter I, "National, Regional, and Forest Planning"). Upon implementation of the Forest Plan, Forest management activities will be brought into compliance with the Forest Plan. Until implementation, the Forest continues to be managed through the existing plans as provided for in NFMA.

265 *COMMENT*: A FINAL PLAN SHOULD NOT BE ADOPTED UNTIL THE CUMULATIVE EFFECTS OF ALL DRAFT, REVISED DRAFT, AND SUPPLEMENTAL NATIONAL FOREST PLANS ARE KNOWN BY THE PUBLIC MOREOVER, PLANS DRAFTED BEFORE THE FINAL EIS FOR THE SPOTTED OWL, FINAL EIS FOR VEGETATION MANAGEMENT AND THE MMR POLICY PAPER, SUCH AS THE SISKIYOU, MUST TAKE A "HARD LOOK" AT THE EFFECTS OF EACH OF THESE AGENCY POLICY DOCUMENTS BEFORE A FINAL FOREST PLAN IS TO BE SERIOUSLY ADOPTED.

Response: The FEIS's for the spotted owl and vegetation management have been released. The Forest is consistent with this direction as well as that for Management Requirements. See the FEIS, Chapter I, "National, Regional, and Forest Planning" for information on the relationship between the Forest Plan and other pertinent documents

266. *COMMENT*: THE LENGTHY APPEALS PROCESS ALLOWS ENVIRONMENTALISTS TO TIE UP TIMBER SALES. THERE SHOULD BE A SHORTER APPEAL PROCESS.

Response: Recent changes (February 1989) have been made to the appeals process; however, these are not addressed as part of the planning efforts for the Siskiyou National Forest LRMP. Revising the appeals process is not within the scope of the FEIS for the Forest Plan.

267. *COMMENT*: THE NATIONAL FORESTS IN THE KLAMATH-SISKIYOU REGION OF CALIFORNIA AND OREGON SHOULD COOPERATE AND PRODUCE A REGIONAL PLAN FOR PROTECTING THE INTEGRITY OF THE VIEW, ITS BIOLOGICAL FUNCTION AND RECREATIONAL AMENITIES FOR THE LONG TERM THEN, AND ONLY THEN, WILL WE BE ABLE TO DETERMINE WHAT LEVEL OF LOGGING CAN BE SUSTAINED.

Response: NFMA requires each National Forest to prepare a Forest Plan and for each Forest Service Region to prepare a Regional Guide. See the LRMP, Chapter I, "Relationship of the Forest Plan to Other Documents" for more information Cooperation and coordination between adjacent Forests and Regions is on-going.

268. *COMMENT*: AN EXPLICIT STRATEGY IS NEEDED FOR BETTER INTEGRATING RECENT AND FUTURE RESEARCH KNOWLEDGE INTO FOREST PLANNING, OPERATIONAL GUIDELINES, AND ON-THE-GROUND IMPLEMENTATION AND MONITORING.

Response: The Forest Service, through its network of Experiment Stations and contacts with the academic community, strives to keep abreast of substantive research applicable to its management activities. Additionally, Forest Service employees are involved in training sessions, conferences, seminars, workshops and other situations where information is exchanged that is intended to provide employees with current knowledge in their various resource disciplines and specialties (LRMP, Chapter II, "Information Needs")

269. *COMMENT*: THE PUBLIC COMMENT SYSTEM TO INSURE PUBLIC INFLUENCE ON THE PLAN IS DESIGNED TO FAVOR THE TIMBER INDUSTRY. NATIONAL OPINION POLLS GENERALLY SHOW THAT THE PUBLIC FAVORS GREATLY INCREASED PROTECTION FOR OLD GROWTH AND ROADLESS AREAS. YET THIS IS NOT ADDRESSED IN THE PLAN. RESULTS OF BOTH NATIONAL AND STATE OPINION POLLS BY REPUTABLE ORGANIZATIONS SHOULD BE USED AS A MAJOR PART OF THE PUBLIC PARTICIPATION PROCESS.

Response: The public comment process is designed to insure that all responses from all people who responded to the Draft Forest Plan will be read, considered and recorded. Public opinion polls, while read by Forest managers, were not incorporated into the planning process. While opinions may definitely play a role in forming policy and aiding in decision making, the responsibility for management of National Forests resides with the Agency and professionals retained by the public to manage these public lands. NEPA procedures must insure that environmental information made available to the public and decisionmaker is measured against standards of quality and accuracy of scientific analysis. It is with this requirement that a systematic, interdisciplinary approach be used to insure the integrated use of the sciences and environmental design arts in planning provide as reasonable and non-opinionated analysis as possible.

For information relative to public participation and comments to the DEIS and Proposed Forest Plan, see the FEIS, Summary, "Public Response to the DEIS," "Changes Between DEIS and FEIS," and "Issues, Concerns and Opportunities."

RESOURCE PROTECTION

ROADLESS AREAS

270 *COMMENT*: MORE ROADLESS AREA SHOULD BE PROTECTED. NO LOGGING, MINING, HUNTING, LIVESTOCK GRAZING, OFF-ROAD VEHICLES, AIRCRAFT, INTERNAL COMBUSTION ENGINES, ROAD CONSTRUCTION, OR DEVELOPMENT OF ANY KIND SHOULD BE PERMITTED WITHIN EXISTING ROADLESS AREAS

Response: The FEIS contains a wide range of alternatives concerning the inventoried roadless areas on the Siskiyou. These alternatives range from little development of the roadless areas to nearly full development. Alternatives M, E, and G provide for maximum protection of the remaining roadless areas through management as "Backcountry Recreation" (see FEIS, Chapter II). Based on public input to the DEIS and consideration of need for this type of recreation opportunity over the next decade, this issue was seriously considered in developing Alternative S Standards and Guidelines (LRMP, Chapter IV) provide for restraints on nonconforming uses in Backcountry Recreation areas. No logging or road construction is programmed for the area Mining and hunting would continue much as it has in the past. Some areas have historic ORV use; the demand for this kind of recreation was considered in providing for both motorized and non-motorized recreation opportunities.

271. *COMMENT* ALLOW ROADS INTO THE NORTH KALMIOPSIS ROADLESS AREA ONLY IF IT IS WORTH THE HARVEST THAT WILL BE GAINED AND/OR WORTH IT TO KEEP WILDERNESS BUG-FREE, ETC.

Response· Benefits to the public must occur before a decision is made to construct a road The determination of whether the costs and impacts are acceptable is made in the site-specific project analysis stages, which is done based on NEPA and the Standards and Guidelines found in the Forest Plan (LRMP, Chapter IV). The Forest Plan FEIS established that portions of this inventoried roadless area should be placed in allocations which permit timber harvest and other activity.

272. *COMMENT*: FISH HABITAT STRUCTURES ARE INCONSISTENT WITH WILDERNESS MANAGEMENT GOALS, AND CANNOT BE ALLOWED IN WILDERNESS OR RESEARCH NATURAL AREAS.

Response: The Standards and Guidelines for Wilderness have been changed (LRMP, Chapter IV). Fish habitat structures will not be planned in designated Wilderness or RNA's.

273. *COMMENT*: ALL PRIMITIVE ROADS NOT ACTIVELY IN USE FOR MINING CLAIMS IN THE SOUTH KALMIOPSIS SHOULD BE CLOSED AND REVEGETATED.

Response· It is the intent of the Forest Service to either eliminate or minimize any adverse impacts on all areas of the Forest resulting from previous or current commercial operations. Primitive roads that can be closed will be barricaded to exclude any travel. In most cases, natural revegetation processes will be allowed to take place; however, if needed for erosion prevention reasons, revegetation and other restoration treatments may be implemented.

274. *COMMENT*: OPEN UP SOME OF THE WILDERNESS TO THE PUBLIC SO WE AND OUR CHILDREN CAN SEE THE BEAUTY THAT IS HIDDEN WITHIN THESE BOUNDARIES, AND MAKE AVAILABLE AREAS FOR CAMPING, PICNICKING, RECREATION, AND HIKING

Response: Designated Wilderness is open for use by the public. Trail systems designed to provide opportunities are routinely planned and constructed in Wildernesses. All alternatives provide for increased trail construction ranging 86 miles (Alternative S) to 24 miles (current direction) Table II-4, FEIS, displays all trails planned for construction in the Wildernesses over the course of the Plan. Motorized access and the construction of developed campsites are precluded by the Wilderness Act, but camping, picnicking, and hiking are part of the Primitive and Semi-primitive recreation experience for which Wilderness is valued

275. *COMMENT*: THE WILDERNESS SHOULD BE RESPONSIBLY DEVELOPED TO PROVIDE TIMBER HARVEST, PROTECT WILDLIFE, AND PROVIDE A SAFE ENVIRONMENT FOR FAMILIES TO ENJOY OUR STATE

Response. Wildernesses were designated by Congress An Act of Congress would be required to remove them from Wilderness or develop them in any way other than for their designated purposes. Wilderness management is limited to those activities that would not degrade the area's character (See LRMP, Chapter IV, "Standards and Guidelines") Timber harvest and other activities that require significant ground disturbance are precluded by law.

276. *COMMENT*. THE FOREST SERVICE DOES NOT MENTION HOW INCREASED VISITATION WILL AFFECT WILDERNESS MANAGEMENT INCREASING RECREATION VISITOR DAYS WITHOUT A CONCOMITANT CHANGE IN FOREST SERVICE MANAGEMENT, SUCH AS AN INCREASE IN THE ACREAGE DEVOTED TO WILDERNESS, MAY VIOLATE 36 CFR 293.2, BECAUSE THE WILDERNESS RESOURCES THAT ARE PRESENTLY AVAILABLE MAY NOT BE ABLE TO SUSTAIN ALL OF THEIR WILDERNESS CHARACTER WITH THE ANTICIPATED INCREASE IN VISITATION.

Response: Wilderness use on the Forest is low, and recreationists are encouraged to visit these areas The levels of use projected may or may not occur (see FEIS, Chapter III, "Wilderness"). It is important to understand that they are projections made for planning purposes.

Wildernesses are managed under the "Limits of Acceptable Change" concept (LRMP, Appendix A). Under this concept, the effects of recreation use within the Wildernesses are monitored on a more or less constant basis. If impacts reach unacceptable levels, the Forest will ask visitors to utilize other areas of the Wilderness, restrict use, or close an area to use so that sufficient time is allowed for recovery. The Forest has estimated "carrying capacities" for each of the Wilderness Recreation Opportunity Classes (refer to the Wilderness Rating System described in Chapter IV, FEIS). These are estimates of the amount of visitor use the Wilderness can sustain and still provide Primitive or Semi-Primitive Wilderness recreation experiences. As use approaches these levels, the Forest has the option to institute a permit system or some other means of limiting recreation use. In all cases, the Wilderness resource is primary; recreation is merely an activity that may occur provided the character of the Wilderness is not degraded.

277. *COMMENT*: THE PROPOSED EXTENSION OF ROADS INTO THE KALMIOPSIS WILDERNESS FOR THE PURPOSE OF LOGGING OPERATIONS IS UNACCEPTABLE.

Response: The Wilderness Act of 1964 and later legislation designating Wilderness preclude logging and associated roading in Wilderness. No roads are proposed in any Wildernesses.

278. *COMMENT*: THE DESIGNATION OF CUSTODIAL (ROADLESS) MANAGEMENT AREAS VIOLATES THE WILDERNESS ACT OF 1964 AND THE OREGON AND WASHINGTON STATE WILDERNESS ACTS. THE SISKIYOU DOES NOT HAVE THE AUTHORITY TO CREATE WILDERNESS THROUGH ADMINISTRATIVE FIAT.

Response: Public comments to the DEIS strongly noted that the objectives and prescriptions of the Custodial (Roadless) Management Area closely approximated that for Wilderness. The original intent of this allocation was to provide a recreation opportunity somewhere between that found in the Wilderness and those provides under General Forest As a result, the area was renamed to Backcountry Recreation and the objectives better clarified The Backcountry Recreation (Management Area 6) prescription was rewritten to represent an area where motorized and non-motorized recreation could occur in a largely

unroaded environment, but without the constraints of Wilderness. While no timber harvest is programmed in these areas, mineral access and other activities are not heavily constrained.

The Oregon and California Wilderness Acts of 1984 provided release/sufficiency language which precluded these areas from consideration as Wilderness for the planning period (next 10 to 15 years). Recognizing this law and the potential of these areas, a full range of alternatives was explored during the analysis to examine the other issues of roaded and unroaded management with and without harvesting activities (FEIS, Chapter IV and Appendix C) A discussion and comparison of alternatives is documented in Chapter II of the FEIS The comparisons are based on the environmental effects displayed in Chapter IV.

279. *COMMENT.* THE 10-YEAR PLAN PRESCRIBES ENTRY INTO APPROXIMATELY 85 PER CENT OF WHAT IS NOW ROADLESS AREA THIS MUST NOT OCCUR UNTIL AFTER A BETTER INVENTORY OF POTENTIAL LOSSES HAS BEEN PRESENTED.

Response. An inventory of these areas was completed and identifies the fact that these areas have numerous attributes with many opportunites for various uses These attributes were considered and trade-offs discussed in the FEIS and Appendix C of the FEIS In the development and analysis of the alternatives, the attributes of all areas of the Forest in various combinations and amounts to meet the demands were considered, and identified in the Summary of the Analysis of the Management Situation, Chapter II of the Forest Plan, and in Appendix B of the FEIS

The impacts or environmental consequences of each alternative are discussed and displayed in Chapter IV of the FEIS Chapter II of the Forest Plan also compares the identified demands with the ability of the Forest Plan to meet those demands

280 *COMMENT*: THE ACREAGES ALLOCATED TO ROADLESS MANAGEMENT SHOULD BE LISTED FOR EACH ALTERNATIVE MENTIONED IN THE FINAL DOCUMENT.

Response: These figures have been displayed in the FEIS, Chapter II (Table II-2, "Acreages in Management Areas by Alternative"). These are generally summarized by combining Management Areas 1 through 9 which have no programmed harvest and roading Appendix C provides the same information, but specific for each inventoried roadless area. In addition, the inventoried roadless area remaining unroaded in blocks greater than 5,000 acres, or smaller areas contiguous to Wilderness, is provided in Chapter II (Table II-24) and Appendix C of the FEIS. These tables provide a summary of the acres remaining unroaded on the Forest at the end of the first, second, and fifth decades

281. *COMMENT.* THE CABIN AND GENERAL AREA OF THE BIG JUMBO MINE ON JOSEPHINE CREEK SHOULD BE DESIGNATED AS SPECIAL INTEREST AND PROTECTED FROM FURTHER DESTRUCTION THIS OLD MINING CABIN HAS LOCAL HISTORICAL SIGNIFICANCE AS DOES THE AREA

Response As the LRMP indicates (Appendix B), a cultural resource survey and evaluation of the historic mining areas on the Illinois Valley Ranger District have been scheduled. The Big Jumbo Mine (or "Cutler Mine") and its vicinity will be covered by this project Until that evaluation is completed, historic sites will continue to be evaluated on a case-by-case basis All significant cultural resources will be protected from disturbance

282. *COMMENT:* THERE IS A QUESTION WHETHER PUBLIC INTEREST IN THE SOUTH KALMIOPSIS PORTION IS IN FACT ONLY "MODERATE" AS STATED IN THE TABLE ON PAGE 6 IN THE DEIS, APPENDIX C. THERE IS ALSO DOUBT WHETHER PUBLIC PREFERENCE FOR NONWILDERNESS FOR THE SOUTHERN AREA WAS MOSTLY UNANIMOUS IN RARE II.

Response: See the FEIS, Appendix C ("Table C-4 Key to Attribute Ratings") for the definitions of high, moderate, low, and none or negligible public interest pertaining to roadless areas Public preference data provided in the FEIS for RARE II, Appendix U, indicates 5,008 respondents (63 percent) favoring non-Wilderness status for the South Kalmiopsis area. With Forest Planning continuing since the RARE II decision in 1979, public interest relative to the South Kalmiopsis area (as separate from the Illinois River corridor) has been moderate, at best. Additionally, the input has remained more development oriented or "leave as is" (i.e , allow mining, motorized use, some timber harvest) than otherwise. See the FEIS, Appendix C, "South Kalmiopsis No 6709," for a complete discussion of that roadless area

283. *COMMENT.* DEVELOPMENT OF ROADLESS AREAS IS A CONCERN BECAUSE OF DEVELOPMENT AND USE OF NEW ROAD SYSTEMS VEHICLE USE OF ROADS REDUCES HABITAT EFFECTIVENESS FOR DEER AND ELK AND DIMINISHES THE QUALITY OF THE HUNTING EXPERIENCE FOR THOSE PREFERRING TO HUNT IN AREAS OF SOLITUDE.

Response: For the FEIS, Standards and Guidelines have been revised. Vehicle entry will either be limited or closed in areas where there is conflict with deer, elk, and other sensitive species. Much of the area will not be developed due to lands allocated to Backcountry Recreation and similar Management Areas which have no programmed harvest Some of the Backcountry Recreation areas may or may not be closed to motorized use, decisions will be made as part of site specific analyses, or as part of the scheduled Forest-wide deer and elk management plan (LRMP, Chapter IV, "Forest-wide Standards and Guidelines")

284. *COMMENT* THERE IS A PRESSING NEED FOR A REALISTIC DEFINITION OF "ROADLESS" WHEN IT COMES TO DEFINITION OF LAND AND DESIGNATION FOR WILDERNESS AND "ROADLESS." AREAS WITH IMPROVED GRAVEL ROADS HAVE BEEN DESIGNATED WILDERNESS BY BUREAUCRATIC FIAT BY MERELY GATING THE ROAD IN QUESTION, THEN IMAGINING IT NO LONGER EXISTS THE CLASSIFICATION OF "ROADLESS AREAS" MUST BE MADE CONSISTENT WITH FS POLICY OF CLASSING ANY PRIMITIVE TRAVELWAY (OVER 40 INCHES WIDE) AS A ROAD, AND NOT DISREGARDING THEM OUT OF CONVENIENCE JUST BECAUSE THEY ARE CLOSED. "ROADLESS AREAS" SHOULD BE EVALUATED SOLELY ON WHETHER ANY ROADS, PRIMITIVE OR OTHERWISE, EXIST.

Response: Roadless areas are characterized as areas 5,000 acres or larger, or contiguous to Wilderness, that are "essentially unroaded " Roadless evaluations were done during the RARE and RARE II planning in the 1970's. That inventory has been modified over time and updated during the Forest Planning process. Adjustments in the inventoried roadless areas for nonconforming uses, such as roads and harvest units, have occurred twice (the latest being the 1988 update) since the original RARE II inventory. Further addition unroaded areas is not anticipated as no other area meets the current criteria. Complete descriptions of all roadless areas are located in the FEIS, Appendix C

SOILS/WATER QUALITY/FISHERIES

Soil

285 *COMMENT.* HOW WILL LARGE WOODY DEBRIS BE MANAGED TO HELP PROTECT THE LONG TERM PRODUCTIVITY OF THE SOIL?

Response: The Forest has an increased awareness of the value of organic residues, as a result, emphasis has been placed on retention of large and small woody material following timber harvest. This is reflected in the Forest Plan by reservation of large woody material at levels compatible with the needs of the site. Research currently indicates this level may be on the order of 5 to 20 pieces, each of 40 cubic feet or more, per acre. Other woody materials will also be preserved by short duration site preparation burns made in the spring and by reservation of wildlife trees (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Current evidence suggests that small woody material and needles are most important for mitigating against soil fertility loss. Soil productivity will be monitored to insure long-term Forest productivity (LRMP, Chapter V and Appendix D).

286 *COMMENT* DISPERSION OF LOGGING ACTIVITY NEEDS TO BE CLEARLY ADDRESSED IN STANDARDS AND GUIDELINES. WHAT SPECIFICS OF THE STANDARDS AND GUIDELINES WILL BE USED TO SEE THAT LAWS PROTECTING SOIL AND WATER WILL BE MET?

Response. Dispersion of timber harvesting is addressed in a number of ways. The FORPLAN model uses timber harvest dispersion constraints in projecting outputs (FEIS, Appendix B). Forest-wide, not more than 20 percent of each Planning Basin is scheduled for harvest activities per decade. The Preferred Alternative was modeled using slightly more restrictive Planning Basin constraints which will be monitored as part of overall cumulative watershed effects (LRMP, Chapter V and Appendix D).

At the project level, dispersion constraints are addressed in Forest-wide Standards and Guidelines by limiting harvesting in smaller watersheds (500-2500 acres) to 20 percent of the area in a single decade (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Riparian Management Prescriptions limit harvest entry to 11 percent of the Riparian acreage within each Planning Basin per decade.

A number of Forest-wide Standards and Guidelines (LRMP, Chapter IV) describe practices that are directed toward meeting laws and regulations. Among them are 7-2, Soil Compaction and Puddling; 7-3, Rehabilitation of Roads; 7-4, Soil Erosion; and 7-9, Soil and Water Resource Improvements. Standard and Guideline 7-2 has been revised to include roads and landings in the affected area Also 7-5 through 7-15 address soil and water protection. The Monitoring Plan of the LRMP is designed to ensure that Standards and Guidelines are carried out. The Best Management Practices Appendix (LRMP, Appendix F) and General Water Quality Best Management Practices (Pacific Northwest Region, 1988), describe methods used to protect soil and water

287. *COMMENT*: A SLOPE STABILITY OR LANDSLIDE PROPENSITY MAP SHOULD BE INCLUDED TO FULLY DESCRIBE THIS PROCESS AND ITS IMPACT ON EACH LAND USE ALTERNATIVE.

Response· Detailed maps showing landslide potential are outside the scope of this Forest Plan, but are prepared either during area geologic inventories or in site-specific project-level planning. Potential for mass movement is evaluated before timber harvest, road building, or other vegetation or land disturbing activity (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Forest management activities, such as timber harvest and road construction, are not normally done in terrain with high potential for landslides or with active landslides. Additionally, the Forest has been initially screened for areas suitable for timber production Large areas of land unsuitable for management activities has been withdrawn from the land base Sediment tables in the FEIS (Chapter IV, "Soil and Water") include estimates of increased sedimentation from landslides for each alternative. Landslide mapping for activity monitoring and cumulative effects analysis is scheduled for most of the Planning Basins during the next four or five years

288 *COMMENT*· FOREST SOILS MUST BE TREATED AS GEOLOGIC MATERIAL AND AGRONOMIC MANAGEMENT PRACTICES GENERALLY ARE NOT APPROPRIATE IN A FOREST SETTING THE

DOCUMENT UNDER REVIEW TENDS TO LOOK AT SOILS AS BEING MUCH MORE COMPLEX AS TO DISTRIBUTION AND ATTRIBUTES THAN IS WARRANTED WHEN THEY ARE VIEWED THROUGH A PEDOLOGISTS EYES.

Response: As described in Chapter III of the FEIS, soil (as a product of climate, parent material, topography, plants, and time) is much more than a geologic material. Some soil chemical and physical properties closely reflect the parent rock, but the biochemical, climatic, and physical weathering processes tend to dominate. Experience in managing these soils suggests the soils are complex. It is important to understand how soils behave under a variety of management practices that may affect nutrient status and cycles, water transmission rates and plant growth. Forestry, while less intensive than agronomy, strives to avoid detrimental impacts and to maintain productivity as discussed in Chapters III and IV of the FEIS

289. *COMMENT*: THE PLAN DOES NOT ADEQUATELY RESTRICT TIMBER HARVESTING IN LANDS IDENTIFIED AS HIGH EROSION HAZARD. THE PLAN WILL NEED TO EXCLUDE ALL SOIL-DISTURBING ACTIVITIES FROM HIGHLY FRAGILE AREAS (AS REQUIRED BY NFMA).

Response: Lands with high potential for erosion and mass wasting have been classified as unsuitable for timber production where these are "lands where the technology is not available to prevent irreversible resource damage." As a result, they are not included in "tentatively suitable land for timber production" (FEIS, Appendix B).

Roads and timber harvest are not planned on unstable slopes or where soil erosion (loss of cohesion) and mass wasting would be excessively increased if the effects of these actions cannot be mitigated (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). It is recognized that any land or vegetative disturbance will likely cause some change and potential increase in erosion. However, what is tolerable will be evaluated against water quality standards and likelihood of an irreversible loss of the soil resource This evaluation by specialists and public disclosure of the potential impacts are accomplished within project-level analyses and accompanying environmental documents. All proposed timber harvest units and roads are located and designed with direct involvement of engineering geologists, hydrologists, engineers, and soil scientists to minimize impacts on any resources

Sedimentation

290. *COMMENT*: MINIMIZE SEDIMENTATION AND EROSION BY REDUCING DISTURBANCES, I.E. ROADBUILDING, LOGGING AND MINING. SEDIMENTATION AND ITS EFFECTS ON FISHERIES (SUCH AS CHINOOK SALMON) HAS NOT BEEN ADEQUATELY ADDRESSED. THE MEASURES TO REDUCE SEDIMENTATION NEED TO BE DESCRIBED. MORE RESEARCH AND MONITORING NEEDS TO BE CONDUCTED TO DETERMINE THE ACTUAL EFFECTS.

Response: Sedimentation and erosion will be minimized through land allocations, watershed improvement activities, and Standards and Guidelines and associated Best Management Practices (BMP's). Project-level analysis and implementation will evaluate the need and provide appropriate levels of mitigation to prevent or minimize potential sediment impacts. In addition under the Preferred Alternative S, approximately 50 percent of the total Forest would be managed with no programmed timber harvest and associated roadbuilding. (See discussions in FEIS, Chapter II and IV.)

Standards and Guidelines have been designed to protect soil, water and fisheries. Experience on the Siskiyou National Forest shows that by incorporating Standards and Guidelines (LRMP, Chapter IV) and BMP's (LRMP, Appendix F), water quality and fisheries are protected. BMP's for all resource management activities are implemented on the Forest to prevent nonpoint source pollution. Appendix F describes the

process for implementing BMP's on the Forest General Best Management Practices for the Pacific Northwest Region are described in General Water Quality Best Management Practices, Pacific Northwest Region, 11/88 The Forest-wide Standards and Guidelines (LRMP, Chapter IV) provide further guidelines and criteria for minimizing sediment production.

Sediment, coarse or fine, affects salmonid fishes when excessive amounts enter streams and rivers The early intergravel life stages of chinook salmon have been identified as being especially vulnerable to impacts from both fine and coarse sediments (FEIS, Chapter III, "Fish, Bedload Sediment"). The dynamics of coarse sediment transport in streams are extremely complex and are still being evaluated by scientists The Preferred Alternative S shows a decrease in sediment from levels under current management (FEIS, Chapter IV, "Fish" and "Soil and Water"). Riparian areas in basins that are used most extensively by chinook salmon have special allocations and prescriptions under the Preferred Alternative (FEIS, Chapters III and IV) These will minimize or reduce the potential risks of adverse impacts from increased sediments (in comparison to current conditions)

A wealth of information is available as to sediment and fish interrelationships However, additional research is necessary to fully specify how excessive sediments adversely affect salmonids, particularly within a given stream system This research need is identified in "Information Needs" (LRMP, Chapter II) Monitoring plans for water quality and fish habitat have been improved to incorporate many suggestions by the public (LRMP, Chapter V, and Appendix D). Recognizing that excess sediment above the natural variation can affect salmonid habitat capability, Forest management practices will be designed to prevent or minimize adverse impacts.

291 *COMMENT*. HOW DO YOU SELECT THE ROAD BUILDING AND LOGGING METHODS TO CONSIDER FOR EACH TYPE OF GROUND? WHAT TYPE OF ENVIRONMENTAL ASSESSMENT IS DONE PRIOR TO ROAD CONSTRUCTION? EROSION RESULTING FROM POOR ROAD LOCATION AND CONSTRUCTION IS ONE OF THE BIGGEST THREATS TO OUR RIVERS AND STREAMS

Response: All road proposals are evaluated by an interdisciplinary team during the environmental analysis to assure that erosion, mass wasting, and stream sedimentation are avoided or minimized (LRMP, Appendix F and Chapter IV, "Forest-wide Standards and Guidelines"). Engineers, hydrologists, foresters, soil scientists, geologists, and biologists who are trained to identify and understand erosion and mass wasting processes perform these evaluations. Specific mitigation measures and BMP's are designed for each project by the interdisciplinary team

Following the project analysis and public involvement phase, and before any construction, a "plan-in-hand" field review of the proposed road is made to identify and eliminate potential problems During construction, project administration and reviews continue which occasionally find items needing correction. After the road is in place, maintenance inspections, annual maintenance work, and reconstruction, if necessary, occurs. The post-construction phase also includes resource and facility monitoring and surveillance All actions contribute to the reducing actual and potential impacts of the road system on the soil and water resources.

292 *COMMENT* WHAT FACTORS WERE CONSIDERED IN THE DEVELOPMENT OF THE SEDIMENT YIELD MODEL? THE SEDIMENT YIELD MODEL APPEARS TO UNDERESTIMATE: (1) CUMULATIVE LOADING TO STREAM CHANNELS, AND (2) LONG-TERM INCREASES IN LANDSLIDE OCCURRENCE ON ROADED AND SECOND-GROWTH FOREST SLOPES AND DOWNSTREAM RIPARIAN AREAS.

Response: The sediment yield model was developed to include both natural and resource management-related surface, channel, and mass erosion The values generated by the sediment yield

model are an index of sediment production, and are not absolute amounts. They provide a basis for comparing trends between alternatives and estimating effects. Appendix B of the FEIS contains a more detailed description of how the sediment yield model was developed.

The graphs in Figures IV-1 to IV-12 of the FEIS (Chapter IV) show the average index of sediment yield per decade for the next five decades. The analysis of potential risk to beneficial uses took into account the long-term sediment yield for each alternative. The estimate of risk is based on the current condition of water quality and beneficial uses On a Forest-wide basis (FEIS, Table II-43), Alternative S is expected to have a negligible effect on current levels of water quality and the beneficial uses of water over the next five decades No decline in current fish habitat capability is expected for the Preferred Alternative.

Considering that two major floods (the 1964 flood being rated as a 100-year runoff event) occurred during the 1956 to 1976 period used for the aerial photograph inventory of natural and management-related landslides. Sediment yield due to mass erosion (landslides), therefore, is probably slightly over-estimated rather than under-estimated in the sediment yield model. In this same time frame, harvest and road construction activities were considerably different. From the late 1970's to present, major changes and shifts in logging systems, road locations, design, and construction practices, and input to all phases of an activity by a wide range of disciplines has greatly reduced the actual and potential erosion, slope failure, and stream channel impacts. The model attempts to build in the new practices (evidence indicates success), however measurements of this effort are still occurring.

293. *COMMENT* THE RELATIONSHIP BETWEEN STREAM SHADING AND SEDIMENTATION WAS NOT ANALYZED IN A HOLISTIC MANNER. THERE IS INCREASING EVIDENCE THAT ONE MAJOR EFFECT OF INCREASED SEDIMENT YIELDS IS CHANNEL WIDENING, LATERAL SHIFTING, AND THE DESTRUCTION OF RIPARIAN VEGETATION.

Response: Since the sediment yield index value for the activities proposed under Alternative S is projected to be 12 percent less than for Alternative A (Current Direction), no overall-increased channel widening, lateral shifting, and loss of riparian vegetation and stream shading is expected as a result of resource management activities on Forest-administered lands. The Riparian Prescriptions are expected to be the main variable controlling the amount of stream shading following timber harvest. Catastrophic flooding, if and when it occurs, has the greatest potential to result in the loss riparian vegetation The 1964 flood resulted in a substantial loss of riparian vegetation and major channel changes in many watersheds on the Forest. An example is the East Fork Illinois River, where stream temperatures increased several degrees Fahrenheit following the 1964 flood

However, observations of practices within the last decade do not support the hypothesis that major channel changes are occurring. The trend appears to be just the opposite, i.e., that many of the streams adversely impacted in the 1950's through mid-1970's are in a state of recovery. Nearly all channels subjected to the more current prescribed activities remain in a healthy and productive condition; adverse changes are not anticipated. In the 1980's, there has been no long-term (sustained) or major water quality problem encountered The worst cases are those associated with isolated landslides, some natural and others man-caused; even these have not been significant relative to magnitude or duration.

294 *COMMENT*. IS THERE ANY DIFFERENCE BETWEEN RIPARIAN PRESCRIPTIONS B, C, AND THE MINIMUM LEVEL IN TERMS OF REDUCING SEDIMENTATION TO STREAMS?

Response. The major difference between Riparian Prescriptions B, C, and Minimum Level in terms of sediment delivery to streams is primarily a matter of risk reduction because of varying degrees of vegetation removal (FEIS, Chapter III, "Fish"). Sediment delivery differences are not likely measurable as

the risk difference is negligible; all Prescriptions maintain a strong vegetative cover for erosion and healthy root mass for slope stability.

295. *COMMENT*: ERRONEOUS ASSUMPTIONS THAT STREAM POWER IS SUFFICIENT TO TRANSPORT SEDIMENT OUT OF MOST FOREST STREAMS (I.E. VIRTUALLY INSTANTANEOUSLY) LEAD TO GROSS UNDER-ESTIMATION OF SEDIMENTATION IMPACTS ON FISH HABITAT.

Response: Stream power on the Forest is not assumed to be sufficient to instantaneously transport sediment out of stream systems. Rather, based on the experience of Forest watershed and fish scientists, stream power in a combination of average winters and larger storm events has been sufficient to transport sediment downstream, yet maintain quality fish habitat. Forest personnel are well aware of the critical nature of lower gradient stream reaches, and the sensitivity of these to changes in sediment and water yield fluxes. The amount of sedimentation to streams is minimized by implementing Best Management Practices and Standards and Guidelines to protect water quality during all resource management activities (LRMP, Appendix F and Chapter IV). The monitoring program for fish, soil, and water outlined in Chapter V and Appendix D of the Forest Plan is designed to monitor water quality and fish habitat trends, as well as the projections made in the FEIS

296. *COMMENT*. THE RELATIONSHIP BETWEEN "AVERAGE" SEDIMENT YIELD AND INSTANTANEOUS PEAK SEDIMENT LOADING TO INDIVIDUAL STREAMS IS NOT EVALUATED PEAK SEDIMENT LOADS MAY EXERT AS SEVERE IMPACTS AS CHRONIC SEDIMENT LOADS.

Response· The estimated "average" and "peak" decade sediment yield indices shown in Figures IV-1 to IV-12 (FEIS, Chapter IV) was considered as part of the analysis of potential risk to beneficial uses Also considered were land allocations, beneficial uses of water, watershed condition, and past, present and future (anticipated) levels of management activity on National Forest lands and other ownerships.

297. *COMMENT*· A LIST NEEDS TO BE DEVELOPED THAT INCLUDES ALL AREAS THAT ARE SUBJECT TO EROSION OR ARE ALREADY ERODED. THE LIST SHOULD IDENTIFY THE LOCATION, NATURE OF THE PROBLEM, CAUSE, ESTIMATED REPAIR COSTS, AND COULD BE USED TO BUDGET AND SCHEDULE THE REPAIR AND MAINTENANCE OF THE SITES

The Forest maintains a Watershed Improvement Needs Inventory. The inventory contains a list of areas where watershed restoration work is needed. Annual programming identifies new areas requiring treatment, priorities projects, and schedules projects for accomplishment. In addition, the on-going Sale Area Improvement plans include projects identified for fish and watershed improvement or enhancement during project assessments. In extraordinary cases, such as the severely burned areas needing emergency treatment following the 1987 wildfires, special funding is requested if erosion threatens onsite and downstream soil and water resources, beneficial uses of the water, and facilities

298 *COMMENT* ARE NATURAL SEDIMENT GENERATION RATES KNOWN FOR THE FOREST, OR SPECIFIC PLANNING BASINS, SUCH THAT ALTERNATIVES COULD BE COMPARED TO THESE RATES AS WELL AS THAT OF THE CURRENT DIRECTION (A)? THIS COULD BE IMPORTANT IF SEDIMENT GENERATION IS CURRENTLY VERY HIGH RELATIVE TO NATURAL RATES IN THE REGION. IF KNOWN, THIS SHOULD BE INCLUDED IN THE FEIS

Response The natural rates (index values) of sediment yield have been provided for each Planning Basin (Chapter IV, FEIS) They are included along with sedimentation from existing roads as part of the

background sediment production of 623,000 tons/year for the Forest. This background value is an index, and represents an estimate of the amount of sediment yield from the Forest assuming no further timber harvest or road construction. It provides a basis for comparing trends between alternatives and estimating effects. Figures IV-1 to IV-12 in the FEIS show the mean (five decades) and peak decade percentage increase in accelerated sediment for each Planning Basin, by alternative. The percentages are calculated based on the background sediment yield index value for each Planning Basin, and are an index of the relative increase in sediment production over natural conditions.

Stream and River Protection

299 *COMMENT*: MANY STREAMS AND RIVERS ON THE FOREST NEED MORE PROTECTION.

Response. Responding to concerns expressed by individuals, groups, and agencies regarding values of streams and rivers, the Preferred Alternative S was developed to give more protection to fish, soil, and water quality Many suggestions made by the public were incorporated in the design of the Preferred Alternative. Under Alternative S, the total Forest area which would be managed under Management Areas 1-9 (with no programmed timber harvest) is higher than under the DEIS Preferred Alternative K (FEIS, Chapter II, "Alternative Descriptions"). Timber harvest dispersion constraints would be adjusted to include effects of adjacent landowners and the 1987 fires. Seven of the high fish-value basins would be managed under the more restrictive Riparian Prescription C, compared to one in Alternative K. Increased area would be managed as Supplemental Resource (FEIS, Chapter II, "Preferred Alternative") Standards and Guidelines and Monitoring Plans for water quality, soil protection and fish habitat have been improved to include public input (LRMP, Chapter IV, "Forest-wide Standards and Guidelines," and Appendix D). The Best Management Practices have been described in more detail to show how water quality, soil and fisheries are protected through the Forest Service's processes, procedures, activity location, design, construction, and maintenance practices, and monitoring and surveillance actions (LRMP, Appendix F).

300. *COMMENT*. PROTECTION OF WATER QUALITY THROUGH MMR'S AND STREAMSIDE MANAGEMENT UNITS (SMU's) GO FAR BEYOND THE OREGON FOREST PRACTICES ACT REQUIREMENTS. THE SISKIYOU STAFF SHOULD EXAMINE WHETHER SUCH LARGE BUFFERS ARE NEEDED FOR THE CLASS III STREAMS, IN PARTICULAR.

Response: The Forest Practices Act was not developed for application to lands with a multiple-use mandate. Neither the Forest Service Memoranda of Understanding with the States of Oregon and California or the definition of Best Management Practices prevents the Forest Service from prescribing land treatment which is more restrictive than the Forest Practices Act or minimum requirements for the protection of water quality. The specific BMP's selected by the Forest Service may be more restrictive where the objective is to improve water quality or minimize risk. Basic to the Memoranda of Understanding, the Forest Service has agreed to meet or *exceed* (emphasis added) those requirements imposed by the Forest Practices Act. In keeping with the principles and guidelines contained in the NFMA and implementing regulations, to provide greater protection for a multitude of benefits other than just achieving water quality standards is well within the Agency's mission to best manage public lands for all.

The Riparian Area prescriptions for Class III streams subject to management (termed Streamside Management Units, or SMU's) have been established as a result of recent project activity, SMU inventory, and monitoring. Monitoring will continue during implementation of the Forest Plan to better define the actual SMU widths, degree of harvest (basal area removal), and streamside vegetative cover within the Riparian area (LRMP, Chapter V, "Monitoring and Evaluation Program"). Field measurements will be evaluated against the management objectives for the Riparian ecosystem to determine whether they have been achieved or not. If the objectives have been met, the data will then be used to adjust or modify the

modeling assumptions and Standards and Guidelines (LRMP, Chapter IV). SMU width, effective canopy cover (stream shade), basal area removed, and other land, fish, and water parameters will be specifically tracked

301. *COMMENT.* CONSTRUCTION OF ROADS AND BRIDGES WHICH CROSS RIPARIAN ZONES SHOULD BE ACCOMPLISHED IN A WAY THAT WILL NOT HARM FISHERIES, WATER QUALITY OR STREAM CHARACTER. BIOLOGISTS NEED TO BE DIRECTLY INVOLVED TO INSURE PROTECTION OF INDIGENOUS SPECIES

Response: Biologists have for some time determined the periods in which construction can be permitted in fish-bearing streams Several specialists, such as geologists, hydrologists, and biologists provide input into the location, design, construction, and maintenance of stream-crossing structures during project planning and where existing structures pose problems. To minimize potential adverse impacts, inspectors at the site can shut down a project in which the work activity causes unacceptable turbidity in the stream or improperly changes the character of the stream These actions are supported by Riparian Management Area Standards and Guidelines MA11-3, MA11-6, and MA11-9, and supported by Forest-wide Standards and Guidelines 7-10 and 11-2 (LRMP, Chapter IV, "Management Prescriptions").

302. *COMMENT*: THE PRACTICE OF INTENSE MANAGEMENT FOR A SHORT DISTANCE THAT MIGHT CROSS THROUGH A CLEAR CUT UNIT IS A VERY NARROW APPROACH TO STREAM MANAGEMENT INCLUDE THE TOTAL STREAM IN POLICIES. THE FOREST SERVICE, IN CONJUNCTION WITH THE FISH AND GAME DEPARTMENT, SHOULD TARGET PROBLEM AREAS THAT ARE DETRIMENTAL TO A HEALTHY AQUATIC COMMUNITY

Response. Under the Preferred Alternative, management of Forest streams is designed to maintain or enhance aquatic habitats (FEIS, Chapter II, "Preferred Alternative"). Specific management of streams that are adjacent to harvest areas follow guidelines set forth in the Standards and Guidelines (LRMP, Chapter IV). Basin-wide Riparian Prescriptions B and C consider net impacts to the entire basin Streamside Management Unit Prescriptions (SMU'S) that are written for every harvest unit and other activity near Class 1, 2, 3, and 4 streams take into account the possible effects on stream habitats, including on-site, upstream and throughout the system below, that could occur. Prescriptions are designed to minimize effects not only in areas immediately adjacent to the harvest unit, but both down and upstream as well

Throughout the planning process, the Siskiyou National Forest has worked with the public and the Oregon Department of Fish and Wildlife biologists to help identify key stream areas that are important for salmonids. As a result of this process, we have included nearly all of the more productive salmonid fish sites in specially-designated areas under the Preferred Alternative (FEIS, Chapter II, "Preferred Alternative") In locations where there have been problems associated with past activities, these streams have management designations that are anticipated to improve current conditions. In more critical situations or where water quality problems are more pronounced, the Environmental Protection Agency and State Department of Environmental Quality have aided in interpretation and analysis of effects, and suggested measures to mitigate potential impacts.

303 *COMMENT* FROM THE MAP, ONLY ABOUT 100 FEET OF PROTECTION APPEARS TO HAVE BEEN GIVEN TO SOME AREAS, E G , THE WEST BANK OF THE NORTH FORK SMITH RIVER AS A SUPPLEMENTAL RESOURCE AREA A WIDER AREA OF PROTECTION SEEMS MORE APPROPRIATE.

Response· The Supplemental Resource area along the west bank of the North Fork Smith River may appear narrow on the map, but actually extends for approximately 1/8 mile (660 feet) from the water's edge,

as do other areas managed as Supplement Resource Areas (LRMP, Chapter IV, "Management Prescriptions"). Larger Class I and II streams and rivers, if they do not have other special Management Area allocations, are provided protection through the Riparian Prescription. The width of protection in these cases extends on the average 150-feet horizontal distance from the stream bank.

304. *COMMENT*: THE FOREST SERVICE MAY NOT BE ABLE TO MEET STATE WATER QUALITY STANDARDS. OF PARTICULAR CONCERN WAS THE STATE'S ANTIDEGRADATION POLICY FOR HIGH QUALITY WATERS. MANY OF THE RIVERS IN THE FOREST ARE HIGH QUALITY WATERS THE FEIS SHOULD ADDRESS IN DETAIL COMPLIANCE WITH THE STATE'S ANTIDEGRADATION POLICY. FOR WILD AND SCENIC RIVERS, THE ANTIDEGRADATION POLICY OF THE WATER QUALITY STANDARDS REGULATIONS EXPLICITLY PROHIBITS ANY LOWERING OF WATER (40 CFR SECTION 130.12).

Response. Standard and Guideline 7-14 in Chapter IV of the Forest Plan requires compliance with State requirements in accordance with the Clean Water Act for protection of waters of the State of Oregon and California through planning, application, and monitoring of Best Management Practices (BMP's) This includes compliance with the requirements of the State's Anti-degradation policy. The process for implementing Best Management Practices (BMPs) contained in Appendix F of the Forest Plan and the General BMP's listed and described in *General Water Quality Best Management Practices*, Pacific Northwest Region, 11/88, are designed to maintain water quality and the associated beneficial uses of the water. The water quality and fish habitat monitoring program described in Chapter V and Appendix D of the Forest Plan will be used to evaluate both the implementation and effectiveness of the BMP's, as well as compliance with State requirements in accordance with the Clean Water Act.

Proposed activities that cannot be appropriately mitigated to meet the established water quality standards will have to be either reanalyzed with new recommendations, deferred, or dropped from consideration Active projects, if they are not meeting either requirements imposed by the BMP's or as measured against the water quality standard(s), will likewise be halted or corrected

Wild and Scenic Rivers

305 *COMMENT*: THE NORTH FORK SMITH, CHETCO AND ELK RIVERS SHOULD/SHOULD NOT MERIT MORE PROTECTION AND BE DESIGNATED AS WILD AND SCENIC RIVERS.

Response: The Omnibus Oregon Wild and Scenic Act of 1988 was passed by Congress and signed by the President The Act includes designation of the Elk, Chetco and North Fork Smith Rivers.

306. *COMMENT*: DETAILED SUITABILITY STUDIES SHOULD BE CONDUCTED FOR ALL ELIGIBLE RIVER SEGMENTS. THOSE ALREADY IDENTIFIED IN THE PLAN AND THOSE WHICH MAY BE IDENTIFIED THROUGH ANALYSIS OF SUCH OTHER STUDIES AND INVENTORIES AS THE PACIFIC NORTHWEST RIVERS INVENTORY.

Response: The DEIS did provide an evaluation (Appendix E) of the "suitability" of the rivers inventoried in the National Park Service's Northwest Rivers Study. As a result of changes in criteria and public input into the DEIS, several other rivers not included in the rivers study were also examined for "eligibility" during the summer of 1988. A summary of this evaluation is discussed in the FEIS, Chapter III, "Wild and Scenic Rivers " The study is in the Planning Records, Forest Supervisor's Office. Of the potential rivers, Elk River was determined to be eligible and received an interim classification.

307. *COMMENT*. THE CORRIDOR OF THE ILLINOIS RIVER SHOULD BE LEFT ALONE, BUT THE RIVER SHOULD NOT BE DESIGNATED AS A WILD RIVER. THE ILLINOIS RIVER HAS ALMOST NO WATER IN IT DURING THE SUMMER MONTHS, PROBABLY DUE TO CLEAR CUTTING LARGE AREAS OF THE DRAINAGE WATER IMPOUNDMENT PROJECTS WOULD DO MORE FOR OUR AREA THAN THE PRESENT DESIGNATION ALLOWS. IT COULD KEEP THE WATER LEVELS UP FOR FISH, RAFTS, IRRIGATION, AND MAYBE A FEW BOATS AND PEOPLE ON THE LAKES THAT WOULD THEN EXIST.

Response· The Illinois River was designated by Congress as Wild and Scenic in 1984. The implementation of the LRMP will have no effect on the designation or classification.

The Forest has recognized that the Wild section of the Illinois River is perhaps the most pristine in the western United States (FEIS, Chapter III, "Wild & Scenic Rivers"), and for that reason the river is unique. There are virtually no human caused intrusions to the river corridor from Pine Flat to Nancy Creek The focus of management is to retain the undisturbed character of the lands within and adjacent to the Wild section of the Illinois, including the area outside of the Wilderness between Silver and Nancy Creeks (LRMP, Chapter IV, "Management Prescriptions").

Low water in the summer months is attributed to the lack of rainfall and to private landowners in the Illinois Valley who draw water off the River for irrigation and domestic purposes. Impoundment of any section of a designated river, Wild, Scenic, or Recreation, is prohibited by law (Wild and Scenic Rivers Act, 1984). However, the Forest, State, and other Federal agencies recognize several potential reservoir sites in principal tributaries of the Illinois River above Illinois Valley. If developed, these reservoirs could substantially benefit fishery, wildlife, recreation, and other uses affected by the severe dewatered conditions experienced downstream in both the Illinois Valley and River.

Water Quality/Quantity

308 *COMMENT*: DOMESTIC WATER RESOURCES MUST BE IDENTIFIED AND PROTECTED, E G , CITY OF BROOKINGS.

Response: The Forest goal identified in Chapter IV of the Forest Plan is to meet or exceed State and Federal requirements which provide protection to the water resources on the Forest Table III-9 in the FEIS identifies the key municipal water supplies on the Forest The numerous individual domestic water uses are taken into account through the the Forest's stream classifications and during project planning The stream classification system is briefly described in Chapter III ("Soil and Water") of the FEIS. Each Ranger District is familiar with local domestic water use, and can work with County agencies to identify downstream users in case of an emergency.

Under Alternative S, the current level of water quality and beneficial uses will be maintained or improved. The process for implementing Best Management Practices (described in Appendix F, and the Monitoring Plan in Chapter V and Appendix D of the Forest Plan) will ensure protection of domestic water supplies, including the City of Brookings and Harbor water supply taken from the lower reach of Chetco River.

309. *COMMENT*: THERE ARE SEVERAL MUNICIPAL WATERSHEDS IN THE SISKIYOU NATIONAL FOREST. ARE THESE UNFILTERED SURFACE WATER SUPPLIES? UNDER AN EPA PROPOSED RULE AS REQUIRED BY THE 1986 AMENDMENTS TO THE SAFE DRINKING WATER ACT, AN AGREEMENT MUST BE REACHED WITH THE FOREST SERVICE THAT WOULD ALLOW THE MUNICIPALITIES TO HAVE WATERSHED CONTROL IN ORDER FOR THEM TO CONTINUE TO USE THESE SOURCES WITHOUT FILTRATION.

Response: The municipal supply watersheds listed in Table III-9 of the *Soil and Water* element of the FEIS are either filtered or are indirect gravel-filtered water supplies drawn from stream alluvium. The season of use is also shown in the table. Intakes for the Brookings, Powers, and Cave Junction water supplies are downstream from the Forest boundary. The winter supply for Powers, however, comes from sources other than the National Forest

310. *COMMENT*: THE PROCESS FOR MANAGING FOREST ACTIVITIES IS NOT SUFFICIENTLY EXPLAINED TO ASSURE THAT ADVERSE ENVIRONMENTAL EFFECTS, PARTICULARLY TO WATER QUALITY, WILL BE PREVENTED. MORE FULLY DESCRIBE THE MANAGEMENT PROCESS OF THE SISKIYOU NATIONAL FOREST.

Response: In response to public input, Appendix F has been added to the Forest Plan to describe the process to be used for implementing Best Management Practices (BMPs) for all resource management activities on the Forest. The BMPs are designed to maintain the downstream beneficial uses of the water. Each General BMP is described in *General Water Quality Best Management Practices*, Pacific Northwest Region (1988). Each General BMP consists of a title, objectives, explanation, implementation and responsibility, and monitoring. The Siskiyou National Forest BMP's are evaluated for their Forest-wide effectiveness which covers a narrowed range of conditions and practices The ability to implement, effectiveness, and more specific monitoring for each BMP is most appropriately identified at the project level.

311. *COMMENT*: BEST MANAGEMENT PRACTICES MUST BE PART OF THE FOREST PLAN FAILING TO INCLUDE THESE DIRECTIONS WOULD BE A VIOLATION OF NFMA AND NEPA.

Response: A new appendix has been added to the Forest Plan to describe Best Management Practices (LRMP, Appendix F) in addition to the reference to and application of the existing set of Standards and Guidelines (LRMP, Chapter IV).

312. *COMMENT*: THE PLAN SHOULD SPECIFY AT WHAT STEP IN THE PROCESS THE BMP'S FOR INDIVIDUAL TIMBER SALE UNITS WILL BE IDENTIFIED AND SPECIFIED. IT HAS BEEN STAFF EXPERIENCE THAT THIS NEEDS TO OCCUR IN THE PROJECT LEVEL ENVIRONMENTAL ASSESSMENTS TO HELP ENSURE ADEQUATE FIELD IMPLEMENTATION.

Response: Appendix F (Best Management Practices) of the Forest Plan and General Water Quality Best Management Practices (Pacific Northwest Region, 11/88) describe the process for project-level implementation of BMP's.

313 *COMMENT*: THE DEIS RECOGNIZES APPROVED BEST MANAGEMENT PRACTICES AS A MEANS TO ACHIEVE AND MAINTAIN WATER QUALITY GOALS. THE PLAN SHOULD ALSO RECOGNIZE THAT THE STATE OF CALIFORNIA AND FEDERAL WATER QUALITY STANDARDS ARE THE NORTH COAST BOARD'S BASIN PLAN WATER QUALITY OBJECTIVES AND WASTE DISCHARGE PROHIBITIONS.

Response: The State of California's Porter-Cologne Water Quality Control Act and North Coast Board's Basin Plan are now referenced in Chapter IV ("Forest-wide Standards and Guidelines") and Appendix F (Best Management Practices) of the Forest Plan.

314 *COMMENT* NEEDED INFORMATION IS LACKING IN THE DEIS ON BASELINE WATER QUALITY CONDITIONS FOR INDIVIDUAL STREAMS AND THE EFFECTS OF PLANNED FOREST ACTIVITIES ON THOSE STREAMS

Response: Tables III-12 and III-21 of the FEIS show the baseline water quality conditions related to the beneficial uses of water for each Planning Basin. The potential risk of planned Forest activities on the current level of water quality and beneficial uses for each Planning Basin and alternative is described under "Soil and Water" and "Fish" in Chapter IV of the FEIS.

315. *COMMENT*: THE DEIS RECOGNIZES THAT THE FOREST LANDS PROVIDE A MAJORITY OF WATER FOR DOWNSTREAM USERS, BUT FAILS TO MENTION THAT MINIMUM STREAMFLOWS HAVE BEEN ESTABLISHED ON MANY STREAMS IN THE AREA. ALL AREAS WITH MINIMUM STREAMFLOWS SHOULD BE PROTECTED. ANY FOREST ACTIVITY THAT WOULD PRODUCE ADVERSE EFFECTS TO THE WATERSHED SHOULD BE AVOIDED AND OR MITIGATED.

Response: Chapter III ("Soil and Water") of the FEIS states that minimum streamflows have been established in the State of Oregon Water Resources Department's Rogue River and South Coast Basin Study/Plans. The Forest has been a cooperator in the evaluation and selection of the numerous streams on or affected by National Forest System lands. The Standards and Guidelines and Best Management Practices are designed to ensure that the beneficial uses of water on the Forest are protected

316 *COMMENT*: HARVESTING TIMBER COULD REDUCE WATER YIELD IN PROPORTION TO THE AMOUNT OF TIMBER HARVESTED

Response The Environmental Effects Unchanged by Alternatives, Chapter IV of the FEIS, describes why there is normally a small increase in water yield expected following timber harvest. The additional water produced by timber harvest is very small, and declines with time as the harvested areas reforest. Research is not as clear as to specifics of long-term water yield changes resulting from timber harvest, or whether 20 to 100-year-old conifer trees transpire more water than slower growing mature trees.

The dispersion of timber harvest across the Planning Basins should help to ensure that timber harvest is not concentrated in any watershed, thereby reducing the potential for any measurable changes in low or peak flows. Table II-5 indicates that no significant difference occurs in water yield changes between alternatives, and especially when compared to the current situation represented in Alternative A.

317. *COMMENT*: THE PLAN DOES NOT ACCOUNT FOR THE EFFECTS OF POSSIBLE INCREASES IN WINTER PEAK FLOWS AND DECREASES IN SUMMER LOW FLOWS ON STREAM HABITAT, FISH PRODUCTION, AND DOWNSTREAM RIPARIAN LANDS.

Response The section of Chapter IV of the FEIS, Environmental Effects Unchanged by Alternatives, describes why there is no expected increase in winter peak flows or decrease in summer flows for the resource management activities proposed under the Preferred Alternative.

318 *COMMENT*: NO DISCUSSION ON GROUNDWATER WAS FOUND IN THE DEIS. SINCE THIS IS AN IMPORTANT RESOURCE IN THE AREA, THE FOREST SERVICE SHOULD INFORM THE WATER RESOURCES DEPARTMENT OF ANY POTENTIAL GROUNDWATER PROBLEMS ENCOUNTERED

Response: A brief discussion of groundwater has been included under the "Soil and Water" section of Chapter III of the FEIS. Research on effects of Forest Management on water quality does not indicate

ground water problems are likely to result. Further, except for extremely localized problems of developing water sources for National Forest System purposes, few people or other agencies have addressed the subject as either a concern or problem. Little input exists to suggest that further discussion is necessary

319. *COMMENT*: CLEARCUTTING DESTROYS THE LITTLE AQUIFERS THAT LET THE RAIN SEEP INTO SUBTERRANEAN AQUIFERS. THIS RESULTS IN HEAVIER RUNOFF WHEN IT RAINS WITH A HIGHER RATE OF FLOODING IN THE WINTER.

Response: The Standards and Guidelines for Soil and Water described in Chapter IV of the Forest Plan and the General Best Management Practices (Pacific Northwest Region, 11/88) are designed to ensure that the hydrologic function of the watershed is maintained. Protecting soil cover and structure will maintain the high natural infiltration rates of forest soils on the Forest. Peak winter flows are not expected to be increased as a result of the resource management activities proposed under Alternative S. The scenario, as described, is not supported by research, administrative studies, or hydrologic principals. Only where the hydrologic cycle and soil functioning has been severely damaged would such events occur.

320. *COMMENT*: THE HYDROPOWER RESOURCES ON THE FOREST SHOULD BE DISCUSSED IN THE WATER RESOURCES SECTION. THE EXISTING POWER CLAIMS ON THE FOREST SHOULD BE LISTED AS WELL AS THE CONDITIONS UNDER WHICH DEVELOPMENT COULD OCCUR. AS PART OF THAT SECTION, THE HYDROPOWER RULES AND BASIN PROGRAM HYDRO RESTRICTIONS NEED TO BE ADDRESSED.

Response: Hydropower resources are discussed under the "Energy" and "Improvements" sections of Chapter III of the FEIS. A discussion of hydropower sites is included in the Current Demands, Wants, and Desires subpart of "Energy" in Chapter III A listing of the individual sites might serve a special interest or need for the commentor, but would not add substance to the FEIS. A listing of sites could be provided upon request The number of operating hydropower facilities and demand for additional sites is quite limited

The criteria or conditions for hydropower development are described in the Standards and Guidelines, Chapter IV of the Forest Plan. Site-specific criteria or conditions would be developed as part of the environmental analysis for a specific proposal Evaluation of specific proposals would include an analysis of whether the proposed project would be in compliance with the Water Resources Department's administrative rules for hydropower development (OAR 690-74).

Water Temperature

321. *COMMENT*: STREAM TEMPERATURE/CANOPY COVER OBJECTIVES SHOULD BE IMPLEMENTED BUT NOT BY A FIXED MINIMUM BUFFER WIDTH AND MINIMUM BASAL AREAS

The stream temperature goal contained in the Standards and Guidelines for Management Area 11 - Riparian (Chapter IV, Forest Plan) is to at least maintain current water temperatures in all Planning Basins. The width of the SMU specified in the Standards and Guidelines is a guide. The actual width may vary depending on resource protection needs identified at the project level by an interdisciplinary team The basal area specified in the Standards and Guidelines is the amount estimated to be necessary to meet effective canopy or stream shading requirements. It also helps ensure that enough conifers are retained in the riparian zone to provide a potential long-term source of large woody material for the stream and wildlife habitat needs.

322. *COMMENT*: PORTIONS OF ALL NINE MAJOR RIVERS HAVE HIGH SUMMER WATER TEMPERATURES. THE SMOLT REARING CAPABILITY IN 18 OF THE 19 PLANNING BASINS HAS BEEN REDUCED FROM 5 PERCENT TO 20 PERCENT BECAUSE OF TEMPERATURE PROBLEMS. HOW WILL MANAGEMENT ACTIVITIES UNDER THE PREFERRED ALTERNATIVE RESPOND TO WATER TEMPERATURES IN THESE BASINS?

Response: In the Preferred Alternative, seven of the 19 Forest Planning Basins would be managed with Riparian Prescription C designed to reduce summer water temperatures up to two degrees Fahrenheit over time (the next three decades). The remaining basins will be managed to maintain existing summer water temperatures as a minimum. The Riparian widths are expressed as a minimum area of consideration. On-site conditions may in certain cases show that wider areas are necessary to maintain or enhance fish habitat capability and water quality (FEIS, Chapter IV, "Management Prescriptions, Management Area 11 - Riparian"). Likewise, site conditions may indicate that the 100- or 150-foot widths are in excess of the riparian needs.

Certain Forest streams are given additional protection through allocations to Supplemental Resource which further maintain or enhance their high water quality and fish habitat values. In addition to the Riparian and Supplemental Resource areas and prescriptions, other stream protection aspects also apply. Some of the more significant of these include: (1) Allocation to Management Areas 1-9 which have no programmed timber harvest (FEIS, Chapter II, "Alternative Descriptions, Alternative S"); (2) Standards and Guidelines which are either directly or indirectly complementary to soil, water and fish habitat values; (3) Basin timber harvest constraints beyond MR levels (LRMP, Chapter IV); and, (4) Application of Best Management Practices (LRMP, Appendix F).

323. *COMMENT*: IN THE DEIS, ALTERNATIVE K ASSIGNS PRESCRIPTION B TO THE EAST FORK ILLINOIS RIVER BASIN RIPARIAN AREAS. THIS PRESCRIPTION WILL CAUSE A SIGNIFICANT INCREASE IN THE BASIN'S STREAM TEMPERATURES AND NEGATIVELY IMPACT THE BASIN'S FISH HABITAT AND POPULATIONS. ASSIGN THE MINIMUM LEVEL PRESCRIPTION WHICH RETAINS EXISTING STREAM SHADING TO THIS BASIN

Response: The purpose of Riparian Prescription B when applied to Stream Management Units (SMU's) at the project level is to, as a minimum, maintain existing summer water temperatures (LRMP, Chapter IV, "Management Prescriptions"). Only about 60 percent of the National Forest lands in the East Fork of Illinois River Basin are tentatively suitable for timber production. Much of the East Fork Basin would be managed as Wilderness, Designated Wildlife Habitat, or Backcountry Recreation Management Areas which have no programmed timber harvest in Alternatives G, K, M and S.

Cumulative Effects

324. *COMMENT*. CUMULATIVE EFFECTS OF SEDIMENTATION ON FISH HABITAT FROM PRIVATE LANDS (AGRICULTURAL, INDUSTRY AND RESIDENTIAL) OUTSIDE THE FOREST BOUNDARIES ARE NOT ADDRESSED. ALSO, STREAMS LYING PARTIALLY OUTSIDE NATIONAL FOREST BOUNDARIES MAY SUFFER FROM ON-FOREST ACTIVITIES BECAUSE THEY HAVE BEEN EXCLUDED FROM IMPACT ANALYSIS. A CUMULATIVE EFFECTS ANALYSIS MUST BE DONE FOR EACH PLANNING BASIN

Response: Chapter IV ("Fish") of the FEIS addresses the potential risk for on- and off-Forest cumulative effects as well as those of roading and harvest of private and Forest lands in multiple-ownership watersheds for each Planning Basin. The discussion under "Soil and Water" of Chapter IV (FEIS)

summarizes the potential risk for cumulative effects by alternative. Site-specific planning may require a cumulative effects analysis (LRMP, "Forest-wide Standards and Guidelines").

The harvest dispersion constraints for each Planning Basin were developed by analyzing past, current, and future management activities, multiple ownerships, geologic hazard, recovery potential, beneficial uses, and watershed and channel conditions. The past and projected level of harvest and roading on other lands in multiple-ownership watersheds was analyzed. The assumptions used to develop the harvest dispersion constraints are described in more detail in Appendix B of the FEIS. The monitoring program in Chapter V and Appendix D of the Forest Plan is designed provide the information need to verify the effectiveness of the harvest dispersion constraints for each Planning Basin, and the second level of harvest dispersion for Watershed Analysis Areas (LRMP, Forest-wide Standard and Guidelines). National Forest activities are not anticipated to affect the opportunity for other landowners to manage their lands in multiple-ownership watersheds, or result in adverse cumulative effects on and off-Forest.

325. *COMMENT*: THE POTENTIAL CUMULATIVE EFFECTS OF CONCENTRATING TOO MUCH HARVESTING IN ANY ONE WATERSHED IS A CONCERN. A RISK ANALYSIS OF THE CUMULATIVE IMPACTS INCLUDING THE EFFECTS AND PROBABILITIES OF MAJOR EROSION-TRIGGERING STORM EVENTS IS SUGGESTED.

Response Dispersing timber harvest activities over space and time is one fundamental method used in reducing the potential for cumulative impacts on soil, water, and fisheries. Timber harvest is limited to no more than 20 percent of each Planning Basin as a Management Requirement applicable to all alternatives except Alternative NC (FEIS, Appendix J, "Water Quality Management Requirements").

In addition, the Preferred Alternative S is designed using timber harvest dispersion constraints specific to conditions of each Planning Basin Factors in developing these included analysis of past, current, and future management activities; multiple ownerships; geologic hazard; recovery potential; beneficial uses; and watershed and channel conditions. The past and projected level of harvest and roading on other lands in multiple-ownership watersheds was analyzed (FEIS, Appendix B).

Table II-3 (Special Area Assignments) of the FEIS identifies the harvest dispersion constraint for each of the 19 Planning Basins. They were developed to prevent concentrating too much timber harvest in any one Planning Basin during a decade. The harvest dispersion constraint is applied to the total area of Management Areas 10-14 within each Planning Basin The process for developing the harvest dispersion constraints is described in Appendix B of the FEIS.

The second level of harvest dispersion is for smaller watersheds (Watershed Analysis Areas) of about 500 to 2,500 acres in area Standard and Guideline 7-15 in Chapter IV of the Forest Plan describes the requirements for project-level cumulative effects assessments for the Watershed Analysis Areas. A more detailed analysis must be done if timber harvest is proposed for more than 20 percent of a Watershed Analysis Area.

The analysis of the potential risk to the beneficial uses of water described in "Fish" (FEIS, Chapter IV) took into account the probability of cumulative effects resulting from resource management activities and major erosion-triggering storms

326. *COMMENT*: THE SISKIYOU NATIONAL FOREST DEIS AND FOREST PLAN FAIL TO ADDRESS CUMULATIVE EFFECTS CREATED BY SEPARATELY MANAGED RIPARIAN AREAS.

Response: Appendix B of the FEIS briefly describes the stream temperature modeling done for the Forest Plan. Riparian Prescriptions B and C were developed as a result of modeling stream temperatures in seven

Planning Basins. The analysis modeled both the removal of riparian shading within each Planning Basin, as well as regrowth of riparian vegetation in areas harvested in the past.

The goal of both Riparian Prescriptions is to at least maintain the stream temperature in all Planning Basins. The monitoring plan in Chapter V and Appendix D of the Forest Plan describes the monitoring to be done to verify the effectiveness of the Riparian Prescriptions and validate the assumptions made in the cumulative effects analysis. No cumulative effect on stream temperature created by separately managed riparian areas is expected

327. *COMMENT:* THE PLAN FAILS TO MENTION WHAT CUMULATIVE IMPACTS ARE UNACCEPTABLE THE MONITORING PROGRAM FOR CUMULATIVE IMPACTS IS INADEQUATE

Response: Chapter IV of the FEIS ("Fish") has been expanded to address the potential risk for on- and off-Forest cumulative effects, as well as those of roading and harvest of private and National Forest lands in multiple-ownership watersheds for each Planning Basin. The Monitoring Plan for fish, soil and water (LRMP, Chapter V and Appendix D) has also been expanded The Monitoring Plan is designed to ensure that Standards and Guidelines are met (LRMP, Chapter IV, "Forest-wide Standards and Guidelines").

Fish Habitat

328. *COMMENT.* MORE SHOULD BE DONE TO PROTECT FISHERIES. RIPARIAN ZONES SHOULD BE WIDER (1/4-1/2 MILE) TO PROTECT FISH AND WILDLIFE WITH NO LOGGING ALLOWED.

Response: In response to public input from individuals and agencies, the Preferred Alternative is specifically designed to manage Riparian areas for the benefit of salmonid fish habitats Seven out of 18 basins will have Riparian Prescription C designed to reduce temperatures and more fully protect the integrity of riparian areas. All seven are important salmonid producing basins (LRMP, Chapter IV, "Management Prescriptions"). Supplemental Resource areas have been designated along streams that have a high potential for adverse watershed impacts within the inner gorge and contain high-valued fish habitat. A combination special Management Areas with constrained or no programmed harvest border nearly all important salmonid producing streams; these land allocations include Partial Retention and Retention Visual, Designated Wildlife Habitat, Special Wildlife Site, Botanical, Wilderness, and Backcountry Recreation among others. For the most part, each of these special allocations extends at least 1/8 mile away from the streams.

The width of Riparian area and the amount of timber removed from those zones is determined during the environmental analysis process for individual timber sales. The Standards and Guidelines specify the minimum width of consideration and the maximum amount of shade canopy removed.

329 *COMMENT:* FISH HABITAT IMPROVEMENT PROJECTS SHOULD NOT BE USED AS MITIGATION FOR DAMAGE RESULTING FROM POOR MANAGEMENT. THE EFFECTIVENESS, BENEFITS AND COSTS OF ENHANCEMENT NEEDS TO BE ANALYZED.

Response: Fish enhancement is *not* designed simply to mitigate "poor" management. None of the alternatives will degrade salmonid habitat capability below the conditions prior to implementing the Forest Plan (FEIS, Chapter II, "Fish"). The Forest goal is to maintain or enhance water quality and fish habitat (LRMP, Chapter IV, "Forest Goals") The Preferred Alternative S was carefully designed to maintain and, in many areas, enhance water quality and fish habitat (FEIS, Chapter II, "Preferred Alternative").

Mitigation is a key element in the design of any alternative as described in the "Introduction" to Chapter IV, FEIS. Mitigation under the Preferred Alternative S includes managing land under restrictive Management Areas which have no programmed timber harvest, such as Supplemental Resource areas along important fish-producing streams. It includes the application of more stringent Riparian management direction -- seven of the most important salmonid basins on the Forest will have Riparian Prescription C (LRMP, Chapter IV, "Management Prescriptions"). Streamside Management Unit (SMU) prescriptions that are part of the environmental analysis for each timber sale or other activity are specified on-site, and are intended to minimize impacts to streams (LRMP, Chapter IV, "Forest-wide Standards and Guidelines")

Capital investments are planned to improve fish habitat. In some cases, they are planned to rectify old problems created by past activities such as closing roads to reduce sediment from erosion, replacing culverts with bridges to allow upstream passage, or stabilization of erosive slopes. In most cases, capital investments for fish improvement projects are designed to enhance existing habitat conditions or to create even more productive sites. An example of this work includes riparian planting to promote stabilization of naturally-occurring landslide areas or increase shade canopy to lower stream temperatures.

Actual benefits and costs associated with fisheries enhancement techniques are extremely variable considering individual stream and Planning Basin differences such as existing salmonid habitat of streams, geology, access, ability to perform work, etc Fish enhancement projects have been proven successful on the Forest An "Inventory of Fish Project Work" (1988; Planning Records) evaluated over 900 instream structures which had been installed from 1985-1987. Eighty-one percent of these are in place and meeting original design objectives

330 *COMMENT*: THE CAPITAL INVESTMENTS DISCUSSING SALMONID CAPABILITY IMPROVEMENTS NEED TO BE SPECIFICALLY DEFINED.

Response: Fish habitat capabilities have been enhanced through capital investment projects on nearly all the Planning Basins. The majority of instream fish habitat enhancement work involves rearing pool development or adding cover to existing pool areas to benefit juvenile anadromous or resident salmonids See the FEIS, Chapter III, and the LRMP, Appendix B (Table B-3) for more information regarding fisheries capital investments and activities.

331. *COMMENT*: FISH HABITAT IMPROVEMENT PROJECTS SHOULD BE PROHIBITED (OR HELD TO A MINIMUM) IN WILDERNESS AREAS.

Response. In response to public concern about structures in Wilderness, this has been changed in the Forest Plan (LRMP, Chapter IV, "Management Prescriptions"). No capital investments are planned for streams in Wilderness.

332. *COMMENT*: THE FOREST SERVICE SHOULD EXPLAIN FURTHER THE CRITERIA FOR INCLUDING OR EXCLUDING AREAS FROM THE SUPPLEMENTAL RESOURCE ALLOCATION.

Response: An explanation of criteria used in considering managing lands as Supplemental Resource Management Areas has been expanded in the FEIS, Chapter IV, "Fish." Factors influencing the choice of these areas were water quality, salmonid rearing capability, soil and geologic risk (i e., potential risk to soil and water elements), and associated values in this environment (notably thermal cover for wildlife, outstanding scenery or unique features, and higher valued recreation sites and trails). The Supplemental Resource area designation provides important protection of fish habitat in inner gorge areas (FEIS, Chapter II, Management Area 7).

333 *COMMENT*. ALLOWABLE ACTIVITIES WITHIN SUPPLEMENTAL RESOURCE AREAS NEED TO BE DESIGNED TO PROTECT FISHERIES.

Response: The primary consideration within Supplemental Resource areas is to manage the sensitive inner gorge environment for the protection and enhancement of fish and wildlife habitats Activities within the inner gorge areas would be designed by an interdisciplinary team through the NEPA process. Management Goals, Desired Future Condition, and Standards and Guidelines for Supplemental Resource areas are explained in LRMP IV, Management Area 7,Supplemental Resources

334 *COMMENT*: A MAJOR HABITAT REHABILITATION PROGRAM SHOULD BEGIN IMMEDIATELY TO OPTIMIZE THE NATURAL PRODUCTION CAPABILITIES OF THE CHETCO BASIN. IT WOULD BE ONE OF THE BEST INVESTMENTS FOR LONG-TERM BENEFITS.

Response: Fish habitat and mitigation is an important and very active part of the Siskiyou Forest resource program In cooperation with the Oregon Department of Fish and Wildlife, the Forest completed a "Chetco River Basin Anadromous Salmonid Habitat Overview." This document outlines fish population status, habitat description and limiting factors, habitat improvement objectives and opportunities, and habitat improvement priorities. Major salmonid habitat enhancement work in the Chetco River basin was initiated in 1987 by the Forest

335. *COMMENT*: FISHERIES DESERVE SPECIFIC FISHERIES MANAGEMENT PLANS.

Response· The concern for development of long-range management plans is shared by Forest personnel A Fisheries Management Plan is currently being developed on the Forest. Reinventory of the existing habitat and fish populations using the Hankin and Reeves method is occurring (LRMP, Appendix D) The inventory procedure will allow the Forest to better quantify changes in habitat condition and fish populations over time.

The new "Rise to the Future" Fisheries Program represents National emphasis on strengthening the fisheries program (LRMP, Chapter II, "Resource Summaries"). Forests in Region 6, including the Siskiyou, are currently in the process of developing long-term fisheries program management plans in cooperation with the State, other Federal agencies, sportsman's clubs and the public. Forest plan development offers guidance for development of Fisheries Management Plans.

336. *COMMENT*: ESTABLISH EXPERIMENTAL SECTIONS ON IMPORTANT SPAWNING RIVERS TO ENCOURAGE THE DEVELOPMENT OF KNOWLEDGE CONCERNING THIS RESOURCE.

Response· Fisheries research on the Forest is conducted by the Pacific Northwest Experimental Station. In coordination with Siskiyou National Forest and Oregon Department of Fish and Wildlife personnel, they are currently working in the Elk River basin, an important system for anadromous salmonids. An intensive fish habitat and population study is being conducted by Siskiyou personnel in Sucker Creek, a tributary of the South Fork Coquille River, to monitor the effects of habitat enhancement projects Much of the monitoring planned will be coordinated with the research scientists (LRMP, Appendix D). Further research needs are identified in the Forest Plan (LRMP, Chapter II, "Information Needs").

337. *COMMENT* PRESENTLY FISH ARE TREATED ONLY AS A COMMODITY IN THE PLAN, WITH NO INHERENT LONG-TERM BIOLOGICAL OR CULTURAL VALUE BEYOND THE SHORT-TERM ECONOMIC BENEFITS THEY CREATE.

Response The importance of salmonid fish for their long-term biological and cultural values is recognized. As stated in the Plan (FEIS, Chapter III, "Fish"), demand relates not only to harvest, but also to the values of maintaining wild stock genetics, viewing fish, or just knowing that fish exist and thrive in the local streams Increasing numbers of people enjoy observing adult salmon or steelhead moving upstream over low falls or spawning on shallow river and stream riffles.

338. *COMMENT.* THE ECONOMIC POTENTIAL OF PRODUCTIVE SALMON AND STEELHEAD STREAMS NEEDS TO BE ANALYZED.

Response: The economic values of sport fishing are important for local and tourist-based economies in southwest Oregon. We recognize that a large percentage of the adult salmonids which are caught by sport fishermen in this area are produced on Forest lands (FEIS, Chapter III, "Fish"). Economic analyses of predicted changes in fish output pounds and WFUD'S for individual planning basins are taken into consideration in the allocation of the riparian prescriptions and design of the timber harvest dispersion constraints (FEIS, Chapter IV, "Fish"). More detailed economic analysis is needed for the large fish-producing basins such as the Rogue River, as identified in the Forest Plan as future work (LRMP, Chapter II, "Information Needs")

339. *COMMENT.* IF ROAD MILES ARE UNDERESTIMATED, CAN WE ASSUME THE IMPACTS ON WATER QUALITY AND FISHERIES ARE ALSO UNDERESTIMATED?

Response· No. Potential impacts to salmonid fish and other beneficial uses from proposed management activities (including roads) are discussed in the FEIS (Chapter IV, "Fish") The analysis took into account the anticipated level of timber harvest and road construction, and the associated sediment yield index value for the next five decades. Using this period as an average levels out the large natural variability expected as a result of floods and low flow periods In addition, this provides a more accurate analysis considering the variation in actual harvest and road construction (the primary Forest elements affecting the degree of impact for any one period). Other indirect effects such as off-shore catch, shifts in short-term climatic patterns and ocean currents, etc, also effect short-term changes in fishery outputs which may mask impacts attributed to water quality changes

Project environmental analyses will further evaluate the effect of proposed timber harvest and road construction on water quality and salmonid fish habitat from both a local and basin context. Any under- or overestimates of scheduled and actual activity, including recent past and reasonable future plans, can best be evaluated when spatial and timing resolution is more defined.

340. *COMMENT*· LRMP FAILED TO MENTION IMPACTS FROM GOLD DREDGING ON SALMONID PRODUCTION.

Response: From a Forest-wide perspective, dredging and other mining activities are very localized and have only limited impact on the fishery resource based on recent past and present experience. Forest Service regulations require mineral development on Forest lands be covered with an approved operating plan. A major goal of operating plans is compliance with Federal and State water quality regulations Plans also specify such things as time of operations, methods of operation, equipment use, riparian area and fish habitat protection methods, etc. Operations are reviewed by Forest Service personnel to assess compliance with approved operation plans Standards and Guidelines in the Forest Plan give emphasis to addressing risk of surface disturbance and water quality impacts in developing plans of operation (LRMP, Chapter IV, "Forest-wide Standards and Guidelines").

Working closely with miners the Forest Service can normally assure that mineral operations are conducted to protect water quality and fish habitat. Guidance for acceptable mineral development techniques can be found in Water Quality Best Management Practices, Pacific Northwest Experiment Station, November, 1988.

341. *COMMENT*: THE NEED FOR ADULT FISH TO NEGOTIATE THE SEVERE WATER TEMPERATURE CONDITIONS FOUND IN THE ROGUE DURING SUMMER, AND THE LIMITED AREA UTILIZED FOR SPAWNING AND REARING HABITAT NEEDS TO BE ADDRESSED. THIS SUMMER RACE DESERVES SPECIAL PROTECTION. THE PLAN SHOULD IDENTIFY SUMMER STEELHEAD SPAWNING AND REARING HABITAT AND PROPOSE STRATEGIES FOR PROTECTION AND ENHANCEMENT OF THE HABITAT.

Response: In natural situations, temperatures (and, to a lesser degree, spawning and rearing habitat) are influenced by riparian areas, geology, and climate. Siskiyou streams have natural high water temperature problems (FEIS, Chapter III). In particular, these problems are severe in the upper Illinois River basin outside of the Forest boundary due primarily to off-Forest water withdrawals. This has significant impacts on downstream areas in the Rogue River used by summer steelhead and early-run fall chinook

The portions of the Rogue and its major tributaries (Illinois basin, including Silver and Indigo Creeks) within the Forest boundary lie within complementary land allocations such as Wilderness, Wild River, Scenic/Recreational River, and Supplemental Resource Management Areas. These designations combine to protect streamside areas, and will therefore protect or enhance stream habitats not only for summer steelhead, but other important salmonid species as well Outside of these special areas, all Riparian areas are to be managed with Prescription B or C designed to maintain or improve stream temperatures.

The Forest Service uses a stream classification system based on beneficial uses of water. Under this system, some intermittent streams can be elevated to Class I because they are used by spawning summer run steelhead Class I and II streams receive the highest level of protection (Refer to FEIS Chapter III, Soil and Water).

342. *COMMENT*: EFFORTS SHOULD CONTINUE AND/OR BEGIN TOWARDS MAINTAINING NATIVE FISH POPULATIONS SUCH AS CUTTHROAT TROUT AND ANADROMOUS SPECIES.

Response: Management of fish habitat and native fish species on Forest Service administered lands is a shared responsibility between the Forest Service, Oregon Department of Fish and Wildlife, and California Department of Fish and Game. Some of the best native fish habitat in Oregon is found within the Siskiyou National Forest. There is strong support for maintaining capability for native salmonid species. In response to public input, Alternative S was developed to increase protection of soil, water, and fisheries. Water quality and fish habitat will be maintained at or enhanced above present capability in each of the 19 Planning Basins in the Preferred Alternative (FEIS, Chapter IV, "Fish").

343 *COMMENT*: SOME INDIVIDUALS SUGGESTED THAT INTERMITTENT STREAMS WITH ANADROMOUS FISH SPAWNING USE SHOULD BE ELEVATED IN STATURE AND THAT TIMBER HARVESTING AND ROAD CONSTRUCTION BE EXCLUDED

Response: The Forest uses a stream classification system based on the beneficial uses of water (FEIS, Chapter III, "Soil and Water"). Some intermittent streams have been elevated to Class I status because they are used by spawning salmonid fish. All streams, whether intermittent or not, are managed to maintain or enhance water quality

344 *COMMENT.* THE WHITE STURGEON DESERVES MORE ATTENTION IN THE PLAN. DATA COLLECTION AND OTHER RESEARCH IS NEEDED AND A MANAGEMENT STRATEGY SHOULD BE DEVELOPED. THE WHITE STURGEON'S RARITY IS A CAUSE FOR CONCERN.

Response: The Oregon Department of Fish and Wildlife regulates fish harvest. The Forest Service manages habitat. The sturgeon is present in the Rogue River to Grants Pass (Savage Rapids Dam). More information is needed on this species. The Oregon Department of Fish and Wildlife is developing a basin fisheries management plan for the Rogue River system which will address the habitat needs and harvest concerns of the sturgeon. The Forest will cooperatively input to this plan. Our goal in Forest management is to maintain or enhance fish habitat capability and maintain the native species component Normally the protection and capital investments for salmonids should also benefit other game fish (FEIS, Chapter II, Management Area 11 - Riparian, and Chapters III and IV, "Fish"). These are principally oriented to the water quality concerns.

OLD GROWTH

Harvest of Old Growth

345. *COMMENT*: CONVERT OLD-GROWTH FORESTS TO SECOND GROWTH AS QUICKLY AS POSSIBLE TO MAXIMIZE NET WOOD PRODUCTION.

Response: Some of the Siskiyou National Forest old-growth inventory is unsuitable for timber management according to the criteria described in the FEIS, Appendix B, "Inventory Data and Information Collection--Suitability Analysis." The allocation of land to Management Areas in the Forest Planning process results in some old-growth forests being suitable but unavailable for harvest conversion Some of these allocations are necessary to comply with the requirements of laws and regulations; others are selected to maximize the net public benefits available from the resources of the Siskiyou National Forest. Old-growth stands located on unavailable or unsuitable lands are not planned for conversion in this Forest Plan.

Of the remaining Management Areas, all except General Forest have constraints on old-growth harvest to protect, maintain, or enhance the featured resource values. However, environmental and economic limits must be applied to the General Forest Management Area to meet legal and policy requirements, and the objectives of the Forest Plan. Size and duration of created openings, and dispersion of openings are principle environmental constraints on the rate of old-growth harvest. Nondeclining yield is the principle economic limitation on the rate of old-growth conversion. These constraints and their effects are discussed in the FEIS, Chapter II, "Management Requirements," and FEIS, Appendix B, "Constraints and Management Requirements."

The combined effects of land suitability, land allocations, and management constraints described above determine the extent and rate of old-growth harvest in the Forest Plan

346. *COMMENT*· THE SISKIYOU NATIONAL FOREST SHOULD BE ACCELERATING THE HARVEST OF OLD GROWTH TO MAKE ROOM FOR NEW GROWTH AND TO FORESTALL ANY PRESSURE ON THE HARVEST OF IMMATURE TREES NOW IN RE-GROWTH ON LANDS OTHER THAN ON NATIONAL FOREST LANDS. THE FOREST SERVICE SHOULD OUTLINE A MAJOR DEPARTURE TIMBER CUT POLICY FROM ITS PRESENT EVENFLOW POLICY OF ANNUAL TIMBER SUPPLY (WITHOUT IT EXCEEDING THE LONG-TERM SUSTAINED YIELD CAPACITY OF A FOREST).

Response: The Siskiyou National Forest is a deficit inventory forest which means the old-growth trees available for harvest must be metered out for 70-80 years before the young growth on the Forest is ready

for harvest If the harvest of old growth is accelerated now, then future harvest levels must decline until the younger stands are ready for harvest This option of departing from the non-declining flow policy is evaluated in the departure alternatives (B, A-Departure) of the FEIS

347 *COMMENT.* THE SISKIYOU NATIONAL FOREST CONTAINS 443,000 ACRES OF OLD-GROWTH TIMBER OF WHICH 138,000 ACRES ARE LOCATED WITHIN THE WILDERNESS AREAS THE REMAINING 305,000 ACRES OF OLD GROWTH ON YOUR FOREST ARE CURRENTLY BEING HARVESTED AT A RATE THAT WOULD TAKE 48 YEARS TO CONSUME. THESE ACRES SHOULD BE GROWING FIBER OF PRIME YOUNG TREES, NOT STAGNANT OLD GROWTH.

Response: The rate of harvest of the remaining old growth is of concern. Let's assume for a moment that the remaining old growth would be harvested at a faster rate...say all in 10 years Most professional forest managers would object because of the jeopardy to other forest values that such a rate of harvest would mean. Professional forest managers are concerned about water quality, wildlife, and a host of other forest values After the remaining old growth was harvested, the second growth would not have had sufficient time to grow to a merchantable size. The result would be a scarcity of timber the other 38 years. The rate of harvest is carefully planned and metered out to provide for forest values such as recreation, fisheries, and wildlife. Timber supply and community stability are also a serious part of planning the harvest rates

348. *COMMENT*: THE AMOUNT OF OLD GROWTH TO BE SOLD (EXCEPT AFTER A FIRE) SHOULD BE SUFFICIENT TO REGAIN AND CONTINUE STABILITY OF LOCAL LOG-DEPENDENT COMMUNITIES AND THE MARKET'S CRYING NEED

Response· The Forest only has influence on the amount of timber sold from the Forest, not on the amount of timber harvested. Cycles in the wood products industry have been a greater influence in community stability. The Forest has considered the cumulative effects assessment of timber supply and effects on community stability (FEIS, Chapter II, III)

349. *COMMENT*: REGARDING OLD-GROWTH TIMBER IN MULTIPLE USE AND/OR HARVEST AREAS THE OLD GROWTH SHOULD BE SYSTEMATICALLY HARVESTED AS PART OF THE TIMBER MANAGEMENT PLAN

Response: Mature and old-growth stands residing in Management Areas 1-9 are not available for timber harvest. Stands residing in Management Areas 10-14 will be harvested in accordance with Standards and Guidelines for the individual Management Areas.

350 *COMMENT*· OLD-GROWTH TREES IN WILDERNESS AREAS SHOULD BE SELECTIVELY CUT AND REPLANTED ON A SMALL SCALE SO THE OVER-RIPE TREES ARE USED BUT THE GROWING AND STRONG TREES REMAIN.

Response. The Wilderness Act prohibits any timber harvest in Wilderness

351. *COMMENT*: BEFORE MORE OLD GROWTH IS CUT, THE EXISTING AREAS SHOULD BE ACCURATELY MAPPED AND THEIR FULL RANGE OF NON-TIMBER VALUES EVALUATED THE FINAL PLAN SHOULD INCLUDE A GOOD MAP INDICATING THE LOCATIONS OF THOSE GROVES OF OLD GROWTH WHICH WOULD BE MAINTAINED BY THE PREFERRED ALTERNATIVE. THE VOLUME AND LOCATION OF OLD-GROWTH TIMBER AS IT RELATES TO TIMBER SALES IN THE FUTURE SHOULD BE IDENTIFIED AS WELL.

Response Management Areas 1 through 9 prohibit or severely restrict timber harvest (LRMP, Chapter IV, "Management Prescriptions"). A comparison of maps depicting Forest age classes (FEIS, Chapter III, "Vegetation") and Alternative S (map packet) will give a rough estimate of the location of protected mature and old-growth stands Almost all timber harvest programmed for the next decade will come from mature and old-growth stands located in Management Areas 10 through 14. The 10-Year Action Plan (LRMP, Appendix C) gives general locations and approximate volumes for sale activities in the first decade For more detail, a visit to the Planning section at the Supervisor's Office in Grants Pass is needed.

All land management activities, including timber sales, receive a site specific environmental analysis, and all non-timber values are evaluated are evaluated at that time Land allocation changes are recommended through this site specific analysis when not appropriate for timber management or other resources

352. *COMMENT:* ARE THE OLD-GROWTH ACRES ACCURATE TO 1985-1986 FIGURES? COMBINING OLD-GROWTH AND MATURE ACRES IS CONFUSING AND MISLEADING, AS A MATURE FOREST IS NOT OLD GROWTH, AND USE WAS NOT CONSISTENT THROUGHOUT THE DRAFT. TIMBER 160 YEARS OF AGE IS NOT OLD GROWTH. HOW MUCH OLD GROWTH WAS LOST IN THE 1987 FIRES?

Response: The DEIS contained various inconsistencies in the use of the terms "mature" and "old-growth"; this was not intentional. For analysis purposes, our data base does not differentiate between mature and old-growth forest We estimate that prior to the 1987 fires, the Siskiyou contained 443,000 acres of mature and old-growth forest; all is considered old-growth except for approximately 50,000 acres of mature Approximately 25,000 acres of mature and old-growth forest was lost in the fires. We have endeavored to make sure that references to mature and old-growth forest are straightforward and non-confusing in the FEIS.

In this Forest Plan, the data on acres of mature and old-growth forest is from the 1979 timber inventory updated for areas sold for timber harvest through 1984 A comprehensive resource inventory will be initiated on the Siskiyou in 1990 Data collected on mature and old-growth forest will enable us to refine our data base and help us to better manage this important component of the Siskiyou ecosystem.

The average age of stands in the old-growth category has been established at 160 years from the inventory statistics. Dominant trees in old-growth stands typically range from 200 to 300 years old, with individual trees occasionally reaching 400 years or more Our definition of old growth generally follows the Regional Guide (USDA-Forest Service 1984). See the description of Designated Wildlife Habitat (LRMP, Chapter IV, "Management Prescriptions") for a more detailed description. Our definition of old growth will probably be revised as result of the new resource inventory. Our old-growth stands are generally a mixture of ages and layers; most stands are not entirely comprised of large conifers.

353 *COMMENT:* HOW WILL YOU ADDRESS THE IMPORTANCE OF OLD GROWTH ECOSYSTEMS? PROTECT MUCH LARGER AMOUNTS OF OLD GROWTH ECOSYSTEMS AND FULLY PROTECT THE OLD GROWTH HABITAT AROUND ALL KNOWN PAIRS OF SPOTTED OWLS. FULLY PROTECT ALL REMAINING, OLD, LARGE REDWOODS WITHIN CHETCO RANGER DISTRICT. DO A COMPLETE INVENTORY OF THE SISKIYOU'S OLD GROWTH FORESTS AND PERFORM MORE BASIC RESEARCH ON THE IMPACTS OF TURNING THE OLD GROWTH FORESTS INTO TREE FARM PLANTATIONS.

Response: Alternatives considered in the FEIS included a range of "Old Growth and Mature Reserved and Unsuitable" acres, from 153,000 in the No Change Alternative to 289,600 acres in Alternative M The preferred Alternative S will retain approximately 181,000 acres of mature and old growth, reserved and unsuitable (FEIS, Table II-5, "Monster Matrix").

The importance of old-growth is stressed in many places in the documents. Allocations for Designated Habitat, Supplemental Resource, Backcountry Recreation and other sites (LRMP, Chapter IV, "Management Prescriptions") attest to the value put on old growth. "Biological Diversity" has also been added as a topic in the FEIS and as a monitoring element in the LRMP (Chapter V and Appendix D), this further underscores the importance placed on old-growth.

All nest sites and important roost sites of spotted owls will be protected (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"), however, extensive old-growth stands surrounding non-SOHA sites will not be preserved over the long-term. A significant number of old-growth redwood groves will be protected under the Preferred Alternative S; see Appendix F (FEIS) for a detailed discussion of Redwood Groves. A comprehensive resource inventory set to begin in 1990 will provide updated data on the amount of old growth on the Siskiyou. The Forest Service will continue to conduct research on mature and old-growth ecosystems.

354. *COMMENT.* OLD-GROWTH FOREST VALUES ARE NOT ADEQUATELY ADDRESSED IN THE FOREST PLAN. FLORA AND FAUNA DEPENDING ON THIS TYPE OF HABITAT ARE REDUCED PROPORTIONATELY. THE SPOTTED OWL IS JUST ONE OF OVER A HUNDRED RECOGNIZED SPECIES. THE BIG OLD TREES AND THE LIVING THINGS THAT NEED THEM COMBINE TO MAKE A LIFE FORM THAT SHOULD HAVE THE RIGHT TO EXIST FOR ITS OWN SAKE, IN ADDITION TO ITS VALUE TO HUMANS. WE ENJOY A TREMENDOUS BOTANICAL DIVERSITY THAT TESTIFIES TO THIS BELIEF. A LIST OF THE OLD-GROWTH DEPENDENT SPECIES OF THE SISKIYOU FOREST COULD REINFORCE TO READERS THE BROAD PURPOSES THESE AREAS FULFILL. SIMILARLY, A LIST OF CAVITY-DEPENDENT SPECIES WOULD BE HELPFUL

Response: Old-growth forests are addressed more fully in the FEIS Tables in Chapter II depict the amount harvested per decade and percent seral stages present at selected decades A more in-depth discussion of forest diversity has been developed for the FEIS as well. In Chapter III of the FEIS ("Wildlife") there is discussion of the number of wildlife species which use mature and old-growth forest habitat. NFMA provides important direction to the Forest Service: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and non-native species in the planning area" (36 CFR 219.19). All wildlife species are important, and the Forest Service is obligated to manage for all species.

Through land allocations, and Standards and Guidelines (LRMP, Chapter IV), the Forest's fish, wildlife, and plant resources will be maintained. No species will be reduced below viable population levels, and habitat for many species will be enhanced.

Although lists of old-growth and snag-dependent species would provide more detailed information, because of limited space we did not display these lists in the FEIS In the Wildlife section of Chapter III of the FEIS, we mention the estimated numbers of species in the two categories. Contact the Supervisor's Office in Grants Pass for a list of species and their habitats.

355 *COMMENT:* MANAGEMENT OF OLD-GROWTH TIMBER AS A RENEWABLE RESOURCE IS INAPPROPRIATE. ONLY SECOND GROWTH IS ECONOMICALLY RENEWABLE. OVERMATURE AND DECADENT OLD-GROWTH FORESTS DO HAVE HIGHER LOSSES OF MERCHANTABLE MATERIAL, BUT THOSE LOSSES ARE ACCEPTABLE GIVEN THE QUALITY OF LUMBER GENERATED AND STORED IN THESE FORESTS OLD GROWTH IS TOO PRICELESS TO DESTROY JUST TO HARVEST TIMBER WHOSE STUMP PRICE DOESN'T PAY FOR THE EXPENSES OF ROAD BUILDING AND "MANAGEMENT."

Response: Of the 443,000 acres of mature and old-growth forest that currently exist on the Siskiyou, approximately 391,800 will remain at the end of the first planning decade During this period, research is

planned to validate and refine proposed silvicultural techniques so that old-growth forest habitat may be available in perpetuity.

There have been many generations of "old growth" on the Siskiyou National Forest Each generation has its peculiar characteristics depending on the weather cycles and existing stand composition when it was conceived The present generation originated during the "Little Ice Age," a period of much cooler weather than we are presently experiencing While it is true that new generations will not be the same, they will be better adapted to the changing climate Death and disturbance such as fire are nature's way of bringing on a new generation for changing conditions. While the species may not be in the same proportions, the habitat created will be similar in structure and still appropriate for the animals that depend on it Old growth and its character have been repeatedly "renewed" by nature and can still be allowed to develop. In fact, all "old-growth" stands will in time be replaced They will succumb to succession (death) or be "destroyed" by fire.

356 *COMMENT:* WHAT WOULD AN OLD GROWTH CHARACTER STAND LOOK LIKE? HOW MANY TREES PER ACRE, HOW BIG IN DIAMETER, HOW OLD? HOW CAN AN OLD GROWTH ECOSYSTEM BE CREATED IN 250 YEARS ON EVEN THE BEST OF SITES? HOW MANY ACRES ON ROTATION WILL BE ABLE TO SUSTAIN GROWTH FOR THE 250 YEARS PLANNED? WHAT IS THE GROWTH OF THE TIMBER ON THESE SITES CURRENTLY? HAVE ANY OF THE TREES BEEN BORED TO DETERMINE GROWTH, MATURATION AND FUNCTION OF THE FOREST AS AN ECOSYSTEM? WE WOULD SUGGEST AN UNEVEN-AGED APPROACH TO HARVESTING ON A LIMITED NUMBER OF SITES, PREFERABLY THOSE ON SITE I, II, OR III GROUND.

Response Not all lands on the Siskiyou National Forest are managed on the same rotation. Some Management Areas, like Research Natural Areas, Botanical, Special Interest, Wilderness, and several other categories, are managed to maintain longer rotations essentially determined by natural ecosystem processes Other areas are specifically managed for wildlife species that require later successional stages to maintain viable populations Then there are lands (less than half of the Forest) that are managed for a variety of uses including timber products. The likelihood of old-growth conditions being "reached" and having a certain portion of the Forest in late successional stages is almost certain. Moreover, Standards and Guidelines (LRMP, Chapter IV) regarding timber management include guides for leaving much of the old-growth character and diversity intact.

Uneven-age management is just one tool that could be used to maintain habitat diversity. Class I and II Riparian areas (those areas along the larger streams and rivers) offer a "managed old growth" opportunity, most stands that have been harvested in these areas still maintain old-growth characteristics. Obtaining reliable information on the application of uneven-aged management under local conditions is identified as a "Forest Need" (LRMP, Chapter II) Thus, even-aged stands managed for timber will have elements of habitat commonly found in the later seral stages of succession

Because the character of old growth is dependent on the ecosystem, there is no one definition of old growth that could be universally applied across the Northwest. Just as old growth in the redwoods (a fire dependent system) differs from "old growth" in the chaparral (also a fire dependent system), old growth in the Siskiyou National Forest differs from old-growth found on the Willamette National Forest. Siskiyou managers have used thousands of plots to determine the character of the older stands in late seral stages. We have found and used many plots over 200 years old. Some stands are as old as 425 years, and we have found individual trees as old as 600 years. Our definitions are based on conditions within the forest and reflect the natural potential of our sites.

Site quality is not related to the longevity of a stand For example, some of the older stands in existence (4,000 year old bristlecone pine in the Southwestern United States) are very low in productivity, yet the redwoods (some stands are also very old) occur on some of the most productive sites in the world On

the Siskiyou, some of the oldest conifers are not "old growth" by the definition, but are classic in terms of their own characteristics The serpentinite-peridotite soils produce a sparse, open forest which is atypical to the surrounding lush, densely forested environment. The difference is not in the climate, aspect, or elevation, but simply due to the soil chemical imbalance The ability to provide "old growth" is dependent on understanding the relationships between ecosystem processes, the environment, and species physiological requirements Our direction is to continue to monitor activities, analyze the result of our management activities, and learn from our own analysis, and that of the research community.

357 *COMMENT.* IT IS NOT CLEAR WHETHER THE ACREAGES OF OLD GROWTH PROPOSED FOR PRESERVATION ARE SUFFICIENT OR THAT THEY WILL BE PRESERVED THE FINAL EIS SHOULD CONTAIN AN ELABORATION OF ADVERSE EFFECTS FOR EXAMPLE, HOW MUCH VIRGIN OLD GROWTH WILL BE LOST BY EACH ALTERNATIVE THE FINAL DOCUMENT SHOULD CLEARLY STATE HOW MUCH WILDLIFE NEEDS TO BE PRESERVED AND CLEARLY DESCRIBE HOW MUCH WILL BE PRESERVED, WHERE AND HOW.

Response: Quantitative and qualitative resource outputs for the alternatives considered can be found in Chapter II of the FEIS. Tables II-5 ("Monster Matrix") through II-7 ("Incremental Change Comparison of Planning Problem Response by Alternative"), display the estimated mature, old-growth and wildlife habitat for easy comparison More detailed discussion of the environmental impacts on old-growth and wildlife habitats are found in Chapter IV, "Environmental Consequences," of the FEIS.

Refer to the map of Alternative S (Preferred) accompanying the FEIS There is no timber harvest programmed for Management Areas 1-9. Compare the Alternative S map to the mature and old-growth forest map in the "Vegetation" section of Chapter III of the FEIS. This will show which areas of mature or old-growth Forest are protected, and their distribution. Regional direction has been followed for installing a habitat network for spotted owls (for details see the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide - Spotted Owl Guidelines). A network of habitat areas for pileated woodpeckers and pine martens has also been established. The composite network for all three species will maintain sufficient habitat for all species which use mature and old-growth forest.

358 *COMMENT·* THE FOLLOWING CONSEQUENCES ARE SUGGESTED IF OLD-GROWTH FORESTS IN THE SISKIYOU'S ARE REPLACED BY INTENSIVELY MANAGED, SHORT ROTATION, EVEN-AGED PLANTATIONS: A. SPECIES DIVERSITY WILL BE REDUCED B THE FUTURE'S RESERVOIR OF GENETIC MATERIAL FURNISHED BY OLD GROWTH FOREST WILL BE LOST; THERE WILL BE A LOSS OF GENE POOL DIVERSITY.

Response. In the FEIS (Chapter IV, "Environmental Consequences," especially the "Vegetation" section), there are several discussions that estimate the consequences of implementing each alternative on old-growth forests Some of these estimates for a particular alternative do not disagree with the above comment. The FEIS displays the range of alternatives considered that would protect various amounts of old-growth forests on the Siskiyou The preferred Alternative S allocates approximately 43 percent (465,000 acres) of the Forest to nonconsumptive management that has lesser direct impacts on vegetation.

Some old-growth stands on the Siskiyou will be replaced by intensively managed, shorter rotation, even-aged stands as a result of timber harvest The Organic Act and Multiple-Use Sustained-Yield Act mandates the harvest of timber on National Forests. Conversely, NFMA mandates that old-growth habitat be maintained Old-growth forests will be far from liquidated on the Siskiyou Old-growth habitats will remain under several land allocations including· Wilderness, Research Natural Area, Designated Wildlife Habitat, Special Wildlife Sites, Botanical, Backcountry Recreation, Wild and Scenic/Recreation River corridors, Riparian, Retention Visual, and Supplemental Resource These areas will serve as reservoirs for genetic diversity and provide for species associated with old-growth ecosystems.

359. *COMMENT* STUDY THE GENETIC VALUE OF THE OLD-GROWTH SURVIVOR TREES

Response: We feel that the oldest trees provide a source of genetic material that links us with past climates and adaption pressures. As it is wise to use historic information to shape the future, it is wise to retain these individuals as a source of seed and pollen to help shape future forests The plan provides for distributing old-growth stands throughout the forest. Many of these areas are along riparian corridors where the oldest trees reside. Other areas are distributed to provide habitat for species dependent on the later seral stages.

There are a number of studies now in progress (administered by the Research Stations of the Forest Service) studying the values of the older components of the forest. The National Forest System, to which the Siskiyou National Forest belongs, is not authorized to carry out research, but does cooperate with the projects of the Research Stations.

360 *COMMENT*: THE OLD GROWTH INVENTORY OFFERED IN THE PLAN IS A POSITIVE FIRST STEP BUT IS NOT SUFFICIENTLY INFORMATIVE WHERE ARE THE TRUE OLD-GROWTH STANDS, I E. FROM 500 TO 650 YEARS OLD?

Response: There are no stands on the Siskiyou from 500 to 650 years old. Individual trees occasionally attain that age, but stands do not. Fire frequency prevents stands from reaching that advanced age. Maximum stand age on the Siskiyou is seldom past 300 years

361. *COMMENT*: POCKETS OF REAL OLD GROWTH (200-YEARS AND UP) SHOULD BE INCLUDED IN ALL FOREST MANAGEMENT PLANS AS CORE AREAS FOR REPLENISHMENT OF ALL KINDS OF PLANT, FUNGAL, AND ANIMAL FORMS TO REBUILD FOREST HABITAT.

Response: The age of a stand is only one criterion for its inclusion as old growth. The number of tree species, the structure of the canopy and the forest floor, including the size and distribution of live and dead trees, are much more important than the age of the stand. The Siskiyou supports stands over three hundred years old that do not meet the accepted definition of old growth, as well as stands less than two hundred years old that do have old-growth character.

Some species require early seral stages for optimum habitat, while others require the later seral stages. Providing a diversity of habitat is a major aim of the plan. The Siskiyou Forest Plan (LRMP) does provide old growth distributed throughout the forest in all management categories.

362. *COMMENT:* MA8. THE DESIRED FUTURE CONDITION SHOULD BE BROKEN DOWN BY SPECIES, AS EACH USES DIFFERING COMPONENTS FOR MATURE AND OLD GROWTH, AND SOME DO NOT OVERLAP.

Response· There are differences between species; habitat requirements are spelled out in the Standards and Guidelines for Management Area 8 (LRMP, Chapter IV, "Management Prescriptions"). Areas for all three species also have similarities. For instance, spotted owl areas also must serve as habitat for pileated woodpeckers and pine marten (plus all the other species which use mature and old-growth forest).

363. *COMMENT*· PROTECT MORE OF THE OLD-GROWTH HABITAT ON THE INDIGO CREEK AND SILVER CREEK WATERSHED. LEAVE SUBSTANTIAL MATURE AND OLD GROWTH ALONG THE ELK, CHETCO, AND NORTH FORK OF THE SMITH RIVERS.

Response: More old-growth habitat has been protected from timber harvest in the preferred Alternative S (FEIS). Indigo and Silver Creek watersheds, in particular, have greater amounts of old growth contained in several large Management Area allocations with no programmed harvest, and on areas that are classified unsuitable for timber production. The Elk and North Fork Smith Rivers are included in the National Wild and Scenic River System. Naturally occurring old growth will be reserved within the classified Wild corridors and several overlapping Management Areas which also have no programmed harvest (primarily Designated Wildlife Habitat).

364. *COMMENT*. WHY WAS OLD GROWTH NOT SET ASIDE AS RECREATIONAL POTENTIAL BY ITSELF? HAVE ANY OLD-GROWTH STANDS, THE CATHEDRAL TYPE, BEEN SET ASIDE NEAR EASILY ACCESSIBLE ROADS OR TRAILS FOR RECREATIONAL PURPOSES?

Response: Five "cathedral" old-growth sites are listed as potential Botanical areas in the FEIS. All five sites are selected in the Preferred Alternative S. Most of the sites have very good recreational potential See FEIS Appendix F for more details Other land allocations such as Designated Wildlife Habitat and Supplemental Resource contain "cathedral" old-growth stands, but in the planning documents we have not taken credit for that aspect of their character.

365. *COMMENT*: I HARVEST WILD MUSHROOMS AND COLLECT AND MAKE WINE FROM WILD ORGANIC BERRIES. ANY MANAGEMENT OF THESE AREAS MEANS DESTRUCTION OF IRREPLACEABLE HABITAT. OLD-GROWTH STANDS SUPPORT MANY SPECIES OF CANTHARELLIS MUSHROOMS AND THIS IS THEIR ONLY HABITAT SECOND-GROWTH FORESTS ARE NOT ABLE TO SUPPORT THEIR MYCORRHIZAL ASSOCIATION.

Response: The Forest Service helps the people manage the land for many purposes. Management plans for medicinal, decorative, and edible plant species have been and are being developed. Habitat information on various plant species is continually being gathered and analyzed by the Forest's ecologists and botanists; this information is integrated into Forest activities and management.

Most berries are in the *Rubus* genus of the rose family and require early seral conditions to produce abundant crops and seem to prefer mineral soil. Mushrooms occur in later stages of succession where organic material has been incorporated into the soil surface layers. Old-growth stands are not the only habitat for mushrooms, and they are replaceable. Today's old-growth stands represent about the twentieth cycle of old growth since the recession of the last ice advance. The Forest Service plans to provide for old growth and a diversity of species for all purposes, including berries and mushrooms.

366. *COMMENT*· THE REGIONAL GUIDE HAS ESTABLISHED A REFINED DEFINITION OF OLD GROWTH FOR VARIOUS PLANT COMMUNITIES. DID THE SISKIYOU USE THE REFINED DEFINITIONS WHEN MAPPING OLD GROWTH?

Response: The Siskiyou's old-growth was mapped during a 1979 timber inventory. We were not able to use the "refined definitions." However, the Siskiyou's old-growth forest does contain the general characteristics associated with these stands (USDA Forest Service 1984b)· well into mature and over-mature stage, multi-layered canopy and trees of several age classes, standing dead trees and down materials, and insignificant evidence of human activities.

367. *COMMENT*· AT ONE TIME THIS ENTIRE AREA WAS OLD-GROWTH TIMBER, AND ALL BIRDS AND ANIMALS LIVED IN OLD GROWTH NOW THAT WE HAVE CUT MUCH OF THE OLD GROWTH, WE STILL HAVE THE SAME BIRDS AND ANIMAL SPECIES. THEY HAVE SIMPLY ADAPTED TO THE

CHANGE. NO MORE OLD-GROWTH FOREST SHOULD BE RESERVED FOR SPOTTED OWLS AND OTHER ENDANGERED SPECIES.

Response Except for introduced species like the opossum, wildlife species inhabiting the Siskiyou National Forest have lived here for centuries. Populations of these indigenous species have fluctuated considerably over time Forest fires, windstorms, and floods brought habitat change at periodic intervals, but these changes never occurred systematically over very large areas; populations of the species we have today were never reduced below viable levels by natural events.

Individual species do not adapt (in a short-term sense) to changes; their populations fluctuate in response to environmental changes. In large measure, wildlife species are creatures of instinct; their brains are programmed to accept certain habitat types and conditions Of course there is always some variability in behavior among individuals of a species, whether it be at the local or range level. However, the most important point is that wildlife species cannot simply "adapt" to a new habitat type; their instincts will not let them.

Instinctive behavior plays a larger role in the daily lives of the more primitive animals (such as amphibians) than with the more advanced (mammmals). The instincts of some species in the same group (such as birds) allow them to take advantage of a variety of habitats; other species are more restrictive in their requirements. For example, Oregon juncos utilize a variety of habitats, from openings to old growth On the other hand, the northern subspecies of the spotted owl is instinctively tied to mature and old-growth forest. Spotted owls are creatures of habit and cannot simply adapt to loss of their habitat.

As a society we are bringing systematic change to our forest lands. If sufficient amounts of habitat are not reserved for species that need mature and old-growth forest, then these species will eventually disappear. The Forest Service has developed Management Requirements to ensure that fish and wildlife habitat shall be managed to maintain viable populations of existing native and non-native species on the Siskiyou as required by NFMA (36 CFR 219.19).

368. *COMMENT*: TIMBER HARVEST IN OLD GROWTH (AS WELL AS IN MATURE FOREST) SHOULD BE REDUCED, BECAUSE 76 OF THE FOREST'S 250 WILDLIFE SPECIES UTILIZE SNAG HABITAT.

Response: A large number of the Siskiyou's wildlife species need snag habitat. That is why the Forest has stated, "Habitat capability for woodpeckers (indicators for cavity nesting species) should be continually maintained throughout the Forest at not less than 60 percent of maximum," (LRMP, Chapter IV) We also state, "The Siskiyou Wildlife Tree (Snag) Policy and Guidelines and District supplements should be followed for all project activities." In areas where timber is not harvested (about half of the Forest), snag habitat will be retained at existing levels, or approximately 100 percent of woodpecker needs. Given these levels of snag management, viable populations of cavity nesters will be maintained indefinitely on the Siskiyou.

Regional Management Requirements for woodpeckers are 20 percent of maximum, the Siskiyou is well above that level. Cavity nesters will remain a functioning component of the Siskiyou ecosystem.

Once the Plan is implemented, the Siskiyou will monitor snag levels in areas where timber is harvested to ensure that management direction is being met

369 *COMMENT*· ALTERNATIVE K DOES NOT ADEQUATELY PROTECT HABITAT FOR SENSITIVE SPECIES. NO DECREASE SHOULD BE CONTEMPLATED IN NUMBERS OF SENSITIVE AND INDICATOR SPECIES.

Response. The Forest Service is mandated by law to manage for multiple use, which includes harvest of timber. Protecting habitat for many sensitive and indicator species often requires restricting or precluding timber harvest activities The plan protects habitat to maintain viable populations of all species,

including sensitive and indicator species. The final Preferred Alternative S preserves significantly more habitat for sensitive species than did the DEIS Preferred Alternative K.

WILDLIFE

Habitat

370. *COMMENT:* FOREST FRAGMENTATION NEEDS TO BE CONSIDERED AND EFFECTS ON PROTECTION OF WILDLIFE AND SPECIES DIVERSITY. USE CORRIDORS, NO-CUT BUFFERS, AND OTHER CONNECTING HABITAT.

Response. Designated Wildlife Habitat areas are part of an interconnected network meeting Management Requirements. The areas are spaced close enough to provide for exchange of animals and their genes (FEIS, Appendix J)

The wildlife habitat issue highlights spotted owls, pileated woodpeckers, and pine marten because they are indicator species. Habitat provided for these three species also serves other species dependent on mature and old-growth forest. Habitat areas for these indicator species and their associated species are well distributed Special Wildlife Sites such as meadows, springs, and swamps are interspersed throughout the Forest

In addition, riparian corridors provide diversity along perennial streams. A number of important fish-producing streams (such as Lobster and Indigo Creeks) are designated as Supplemental Resource (1/8 mile corridor on either side of the waterway). The Elk, Rogue, Illinois, Chetco, and North Fork Smith Rivers are designated as Wild and Scenic Rivers. These land allocations ensure that corridors of unlogged or lightly managed stands with good wildlife habitat characteristics will occur at a variety of locations on the Forest.

Timber harvest activities will provide for interspersion of various seral stages and increased edge, which will increase habitat diversity. Maintenance of biological diversity is a cornerstone of the Forest Plan Preferred Alternative S.

371. *COMMENT*: SETTING ASIDE SCATTERED PARCELS OF OLD GROWTH FOR WILDLIFE PROTECTION, IN A PATTERN AS IF SCATTERED BY A GIANT SALTSHAKER, IS A FLAWED CONCEPT. ONE LARGE BLOCK SOMEWHERE WOULD BE MORE PRODUCTIVE IN THE LONG RUN.

Response: The Siskiyou's strategy is a combination of large blocks (Wildernesses) and smaller parcels arranged in a network that allows relatively free dispersal of individuals (FEIS, Chapter III, "Wildlife").

372. *COMMENT.* REMOVING MORE TIMBER WILL MAKE FOR BETTER WILDLIFE HABITAT

Response. For some species of wildlife this is true. But the Siskiyou harbors over 250 wildlife species, and their habitat requirements are very diverse (FEIS, Chapter III, "Wildlife"). Some will not do better if more timber is removed. Alternatives vary in their ability to provide habitat for various species of wildlife (FEIS, Chapter II, "Wildlife"). The Preferred Alternative was developed to achieve a balance of varied habitat types and stages to insure viable populations of existing native and non-native species are maintained on the Forest (FEIS, Chapter II, "Alternative S").

373 *COMMENT*. EXCESSIVE LOGGING ACTIVITY AS PROPOSED IN ALTERNATIVE K DESTROYS FISH AND WILDLIFE HABITATS WHICH THE FOREST SERVICE THEN MUST SPEND HUGE SUMS OF MONEY ON REHABILITATING.

Response: Timber harvest increases quality of habitat for some species of wildlife and decreases quality of habitat for other species Wildlife habitat areas have been designated to provide habitat for viable populations of species whose habitat will decrease with timber harvest. Riparian management is designed to protect fish habitat by reducing sediment input and reducing or maintaining stream temperatures. With proper planning, implementation, maintenance, and monitoring of activities using the set of Management Area prescriptions and Standards and Guidelines available for the alternatives, little effort in rehabilitating any resource should be required.

374 *COMMENT*· DEAD STANDING TREES SHOULD BE LEFT UPRIGHT (WHERE SAFETY CONSIDERATION PERMITS) TO PROVIDE NESTING SITES FOR CAVITY DWELLERS AND TO PROVIDE SLOWLY RECYCLED BIOMASS TO THE SOIL.

Response: Dead standing and downed trees are being left as habitat for wildlife. The existing Siskiyou National Forest Wildlife Tree (Snag) Guidelines require that snags and down logs be left for wildlife. The LRMP (Chapter IV, "Forest-wide Standards and Guidelines") contains specific Standards and Guidelines for retention of large woody material

375. *COMMENT*: WHILE MUCH ATTENTION HAS BEEN PAID TO SNAG RETENTION, IT IS NOT APPARENT FROM THE PLAN WHETHER THIS POLICY WILL PERMIT CAVITY NESTING SPECIES TO MAINTAIN THEIR CURRENT POPULATIONS GIVEN AN INCREASINGLY MONOCULTURAL, SHORT-ROTATION FOREST.

Response· It is assumed that habitat capability for woodpeckers will be maintained at not less than 60 percent of potential population levels. This will be accomplished by following the Siskiyou Wildlife Tree (Snag) Guidelines, as detailed in the Forest-wide Standard and Guidelines (LRMP, Chapter IV). These guidelines were designed with the best information available on cavity-nesting species and their habitat requirements. The snag guidelines may be revised as new research data becomes available.

376. *COMMENT*: NO METHODS ARE DISPLAYED FOR PROTECTING DEAD AND DOWN WOODY HABITATS FROM ACTIVITIES SUCH AS FIREWOOD CUTTING AND PRESCRIBED BURNING DURING SITE PREPARATION. INCLUDE STRONGER PROVISIONS FOR FUNDING TO INSURE TIMBER SALES WILL BE MONITORED AND ADEQUATE RETENTION OF SNAGS, WILDLIFE TREES, AND DOWNED WOODY MATERIALS IS OCCURRING. HABITAT SHOULD BE PROTECTED REGARDLESS OF COST TO TIMBER HARVEST.

Response· Forest-wide Standards and Guidelines prohibit the use of designated wildlife trees for firewood. Protective measures are applied on a site-specific basis. The Siskiyou does not lose many wildlife trees to firewood cutting because of steep terrain making access very difficult

Standards and Guidelines have been revised and strengthened (see Chapter IV of the Forest Plan). Refer also to the Siskiyou Wildlife Tree (Snag) Guidelines for further explanation (copy available at any Siskiyou National Forest Office). A falldown in timber yield (less than one percent) has been applied to the timber yield tables to account for trees left for wildlife (see Appendix B, FEIS). Protection of wildlife trees from prescribed burning is desirable; this issue is addressed in individual analyses done for specific timber sale areas

Timber sales will be monitored to insure that we are meeting our Standards and Guidelines (LRMP, Chapter V). The Standards and Guidelines have been revised and strengthened (LRMP, Chapter IV).

377. *COMMENT*: THERE SHOULD BE COOPERATIVE ROAD CLOSURES IN THE NATIONAL FOREST DURING VARIOUS BIG GAME SEASONS AND IN AREAS WHERE BIG GAME BREED AND WINTER.

Response: The Siskiyou National Forest will develop a Deer and Elk Management Plan within three years after the implementation of the Forest Plan (LRMP, Chapter V, "Project Planning"). Road closures are a key issue, and will be addressed in that plan.

378. *COMMENT*: TO A LARGE EXTENT, THIS DOCUMENT SHOULD BE A RECOVERY PLAN FOR A DECLINING SPECIES. THE PROTECTION OF "LARGE BLOCKS" OF HABITAT AND "STRONGHOLDS" OF POPULATION ARE TRADITIONAL MANAGEMENT TACTICS. WHY WEREN'T THE "LARGE BLOCKS" AND "STRONGHOLDS" OF HABITAT AND POPULATION IDENTIFIED AND RETAINED AS MANAGEMENT TOOLS IN AT LEAST A FEW ALTERNATIVES?

Response: Through land allocations, and Standards and Guidelines, the Forest's fish and wildlife resources will be maintained. No species will be reduced below viable population levels, and habitat for many species will be enhanced.

In all alternatives, habitat is protected in Wildernesses (LRMP, Chapter IV, "Management Prescriptions"). In several alternatives (including M, E and G), "large blocks" of habitat are protected outside of Wildernesses (FEIS, Chapter II, "Wildlife").

379. *COMMENT*. SPECIES INDICATIVE OF TRIBUTARY STREAMS AND WET MEADOWS SHOULD BE ADDED TO TABLES IN THE FINAL DOCUMENT.

Response: We chose not to use indicator species for these habitats. Tributary streams, wet meadows, and their endemic plants are protected under Management Area 9, Special Wildlife Sites, and Management Area 11, Riparian areas (LRMP, Chapter IV, "Forest Management Direction"). The Management goals for these areas include, in part, the protection of the unique plants and animals In addition, these species are protected in Wilderness, Research Natural Areas, and Botanical areas

380. *COMMENT*: COMMODITY PRODUCTS, HARVEST AND SILVICULTURAL TECHNIQUES ARE COVERED IN GREAT DETAIL. FISH AND WILDLIFE, ON THE OTHER HAND, HAVE FEW QUANTIFIABLE OBJECTIVES OTHER THAN REFERENCES TO MAINTAINING MINIMUM POPULATION VIABILITY. IF FISH AND WILDLIFE RESOURCES ARE TO BE GIVEN EQUAL CONSIDERATION AS REQUIRED BY LAW, THEY MUST BE TREATED WITH THE SAME DEGREE OF MANAGEMENT SPECIFICITY AS TIMBER.

Response: We have provided management specificity in the form of Standards and Guidelines. Assessments of habitat capability have been made for indicator species, but in most cases populations can only be estimated grossly Taken as a whole, the natural histories of 250+ wildlife species are amazingly complex. We have just begun to understand their relationships to one another and the land Research needs have been identified (LRMP, Chapter IV), habitat inventories have been planned (LRMP, Appendix B), and a comprehensive resource inventory of the Forest will begin in 1990. We expect to be able to make better-informed decisions when the Forest Plan is next revised; we also firmly believe that all species on the Siskiyou today will still be with us at the next revision of the Forest Plan. We have based our land management decisions on the best information available.

381. *COMMENT*: PROTECT FISH AND WILDLIFE HABITAT; DO THE BEST POSSIBLE JOB OF MANAGING FOR ALL SPECIES, FROM COUGARS AND DEER, TO BUTTERFLIES AND RATTLESNAKES TOO MUCH EMPHASIS HAS BEEN PLACED ON DEER AND ELK AT THE EXPENSE OF OTHER LESS SHOWY CREATURES. THE POPULATIONS OF SOME SPECIES ARE GOING TO BE REDUCED FROM PRESENT LEVELS; THE FOREST SERVICE NEEDS TO KNOW MORE ABOUT THE NEEDS OF INDIVIDUAL SPECIES BEFORE CONTINUING TO MANAGE THE FOREST FOR RESOURCES WHICH FOSTER CHANGE, MOST NOTABLY MANAGEMENT FOR TIMBER PRODUCTION.

Response. It is true that some species will diminish in numbers as more of the Forest is brought under management for timber production. However, NFMA provides important direction to the Forest Service: "Fish and wildlife habitat shall be managed to maintain viable populations of existing native and non-native species in the planning area" (36 CFR 219.19). All wildlife species are important to the Siskiyou; we are obligated to manage for all species. Through land allocations, standards, and guidelines, the Forest's fish and wildlife resources will be maintained. No species will be reduced below viable levels, and habitat for some species will be enhanced.

We considered all available information and established Management Requirements for various species, such as the pileated woodpecker The Forest cannot wait until all the information is in; it never will be. At this time we are taking stock of existing knowledge and options, and establishing allocations and Standards and Guidelines to govern our activities during the interval before the next revision of the Forest Plan. However, if new information becomes available in the interim which could have a significant impact on existing management policies and procedures, the Forest has the option to amend or revise the Plan In the case of the spotted owl, we expect a wealth of information to become available in the next five years from a large variety of research projects. This new information could result in modification of the Standards and Guidelines set in the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines).

382 *COMMENT*: THE PRESENTATION OF "THE OPTIMUM" HABITAT MIX FOR WILDLIFE SEEMS INAPPROPRIATE SINCE THERE IS NO CONSENSUS ON WHAT "OPTIMUM" MEANS. A DEER ADVOCATE WOULD HARDLY CALL A MIX OPTIMUM WHICH REDUCED DEER POPULATIONS TO ROUGHLY 55% OF PRESENT LEVELS. THE CALCULUS OF WHAT CONSTITUTES "OPTIMUM" PRESUMABLY IS WHAT ALTERNATIVE SELECTION IS ALL ABOUT

Response: The "optimum habitat mix" described in Chapter III of the DEIS was not meant to be a "consensus " On the Siskiyou, the term "wildlife" encompasses over 250 species; their habitat needs vary from openings to old growth. Because any single management action benefits SOME wildlife, but not all, the optimum habitat mix was devised as a tool to help the public weigh their thoughts on the adequacy of each alternative. The optimum mix was meant to be myopic in its vision; coordination needs with other resources were intentionally not considered. Because the optimum habitat mix was intended for use as a discussion tool by respondents to the Draft EIS and Forest Plan, it is not included in the final documents.

383. *COMMENT*: AN OLD GROWTH-DEPENDENT SPECIES WHICH HAS RECEIVED VIRTUALLY NO ATTENTION FROM THE FOREST SERVICE IS THE MARBLED MURRELET KNOWLEDGE OF NESTING HABITS AND LOCATIONS FOR THIS SEA BIRD IS SCANTY, BUT ALL PRESENT EVIDENCE INDICATES THAT IT NESTS IN OLD-GROWTH TREES WITHIN 20 MILES FROM THE OCEAN. CLEARLY, THERE IS RELATIVELY LITTLE REMAINING OF THIS ONCE-ABUNDANT HABITAT THUS, THE MARBLED MURRELET IS PROBABLY HEADED TOWARD EXTINCTION THE SISKIYOU NATIONAL FOREST IS, IN ALL LIKELIHOOD, PROVIDING NESTING SITES FOR THIS SPECIES CONCERTED EFFORTS SHOULD BE MADE TO LOCATE THE BIRD DURING NESTING SEASON BEFORE THEIR NESTING TREES ARE INADVERTENTLY CUT.

Response The Forest Service conducted an inventory for marbled murrelets during the spring and summer of 1988 (murrelets were found at six locations on the Chetco Ranger District) No nests were founds. An extensive survey for marbled murrelets will be conducted on the Siskiyou National Forest during 1989. In the future, work will be conducted to quantify habitat requirements, and delineate suitable habitat, and analyze present habitat capabilities. It is very possible that habitat needs for murrelets are being met by protection of river-associated mature and old-growth forests through other land allocations Mature and old-growth forest habitat along rivers is maintained under several land allocations, including Wild River, Wilderness, Supplemental Resource, Scenic/Recreation River, and Designated Wildlife Habitat. The Forest Plan does not designate old-growth forest along rivers specifically as murrelet habitat, and such designation under a Plan revision would not be likely unless additional habitat was required beyond that which is already protected Additional allocations could be proposed in the future if necessary to sustain a viable population of murrelets.

Sensitive, Threatened and Endangered Species (Animals)

384 *COMMENT*: AREAS OF KNOWN HABITAT OF SUCH SENSITIVE SPECIES AS SPOTTED OWLS AND GOSHAWKS SHOULD BE PARTICULARLY PRECLUDED FROM ANY PLANS FOR LOGGING.

Response: The Forest Service assumes that land allocations installed for Management Indicator Species representing mature and old-growth forest (spotted owl, pileated woodpecker, pine marten) will maintain a viable population of goshawks

A significant portion of the habitat presently suitable for goshawks, spotted owls, and other species which utilize mature and old-growth forest will be harvested as the Forest brings additional acres under rotation. However, enough habitat will remain to ensure that viable populations of all species will be maintained over the long term. As for spotted owls not within Management Area 8, all known nest sites and heavily used roost areas will be protected (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). In the case of goshawks and other raptors, active nest and roost sites will be protected (LRMP, Chapter IV)

385 *COMMENT*: PURCHASE INHOLDINGS AND SURROUNDING AREAS FOR ENDANGERED SPECIES HABITATS.

Response: No inholdings have been identified which have an effect on habitat for designated endangered species. This situation will continue to be monitored If necessary, key tracts could be purchased or acquired through land exchange.

386. *COMMENT*: ONE BIRD ALREADY ON THE ENDANGERED SPECIES LIST IS THE BALD EAGLE. A KNOWN NESTING TERRITORY FOR THIS BIRD EXISTS ON THE FOREST, YET THE PLAN OFFERS DISTURBINGLY LITTLE INFORMATION ON HOW THE FOREST SERVICE PLANS TO INSURE THE SURVIVAL OF THIS GREAT BIRD. A SITE-SPECIFIC BALD EAGLE MANAGEMENT PLAN SHOULD BE PREPARED FOR THE ACTIVE PAIR AND MANAGEMENT DIRECTION SHOULD INCLUDE IMPROVING SEARCHES FOR EXISTING WINTER HABITAT.

Response: Management direction for bald eagle habitat is contained in the Forest-wide Standards and Guidelines in Chapter IV of the Forest Plan. A site-specific management plan for bald eagles will be written within two years of Forest Plan publication. That plan will be tiered to the Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986) Interim management of eagle habitat will require informal consultation with the Fish and Wildlife Service any time a project proposal involves site disturbance which

might affect bald eagles. Such consultation will ensure that survivability of the species on the Siskiyou National Forest is not jeopardized.

The Siskiyou National Forest participates in the annual winter bald eagle count, in cooperation with ODFW and the National Wildlife Federation Although there is no systematic winter inventory for eagles, sightings by district personnel in pursuit of other field duties are recorded (and verified, when possible). These observations will be used in preparation of the Forest bald eagle management plan

387. *COMMENT*: THE TREATMENT OF BALD EAGLES AND OSPREY IS NOT CONSISTENT BETWEEN THE DEIS AND LRMP.

Response: In the Preferred Alternative, 53,000 acres of prime habitat out of 58,000 acres available are protected. Not all of the Forest's old growth is bald eagle and osprey habitat The Rogue River corridor contains the best bald eagle habitat (FEIS, Chapter II, "Comparisons of the Alternatives Considered in Detail").

388 *COMMENT*. PEREGRINE FALCONS WERE NOT DISCUSSED DESPITE THE FACT THAT FALCONS HAVE BEEN OBSERVED ON THE FOREST. ALTHOUGH SUSPECTED EYRIE LOCATIONS ARE ALREADY PROTECTED BY WILDERNESS AND WILD RIVER DESIGNATIONS, NOT MENTIONING THE PRESENCE OF THE BIRDS OR THE IMPORTANCE OF MAINTAINING CLIFF HABITATS IS AN OVERSIGHT.

LONG-TERM MONITORING OF ACTIVE BREEDING PAIRS IS NEEDED TO DETERMINE THEIR PRIMARY USE AREAS, AND HISTORICAL AND POTENTIAL EYRIES. ADDITIONAL MANAGEMENT DIRECTION TO PROMOTE CONSERVATION OF THE PEREGRINE IS NEEDED, INCLUDING CONSTRUCTION OF HACKSITES FOR REARING PARENTLESS YOUNG

Response· At the time the draft plan was written, we knew of no peregrines falcons on the Forest; we were beginning to formulate plans for potential hack sites. In the summer of 1987 the first active nest was discovered; in 1988 two more active sites were found The planning documents have been rewritten to reflect this new information. A peregrine falcon habitat inventory and management plan is required in the Forest-wide Standards and Guidelines (LRMP, Chapter IV). Reintroduction/hacking will be considered.

Peregrine habitat and monitoring of breeding pairs will be addressed as part of scheduled management plans (LRMP, Chapter IV, "Forest-wide Standards and Guidelines" and "Special Wildlife Sites - Management Area 9," and Chapter V, "Monitoring").

389. *COMMENT*. THE CONSTRAINTS WHICH ARE SUPPOSED TO ENSURE THE VIABILITY OF ALL WILDLIFE SPECIES HAVE NOT BEEN TESTED OR VALIDATED A MONITORING PROGRAM BASED ON MAINTAINING SPECIES' VIABILITY AT MINIMUM LEVELS IN INADEQUATE.

Response: The best available data was used to produce Standards and Guidelines for indicator species and others (LRMP, Chapter IV). Current and planned research, and monitoring for Forest plans will help validate the assumptions (LRMP, Chapter II, "Information Needs," and Chapter V, "Monitoring, and Appendix D).

390 *COMMENT*: THE PLAN MAKES REFERENCE IN SEVERAL SECTIONS TO THE NEED FOR MORE INFORMATION ON ENVIRONMENTAL REQUIREMENTS FOR SENSITIVE SPECIES. IT IS TO BE HOPED THAT THE FOREST SERVICE WILL GIVE HIGH PRIORITY TO THE GATHERING OF SUCH

INFORMATION AND TO ONGOING MODIFICATION OF THE PLAN AS THE NEED FOR CHANGE BECOMES EVIDENT

Response. More information is certainly needed on habitat for sensitive species, both plant and animal, as identified in "Information Needs" (LRMP, Chapter II). Considerable data is presently being collected on spotted owls. Good progress has been made on some of our sensitive plants; draft Species Management Guides have been prepared for *Bensoniella Oregana* and a few other species Wildlife and fish biologists and the Zone Botanist (shared between the Rogue River and Siskiyou National Forests) will be spending a significant portion of their time gathering information about sensitive species and recommending appropriate management The Forest is scheduled to host a regional meeting on sensitive plants in the spring of 1989. Information needs have been programmed into our budgeting process (LRMP, Appendix B, "Threatened, Endangered and Sensitive Wildlife and Plant Capital Investments"). Further information needs are also identified in the Forest Plan (Chapter II, "Information Needs"). If necessary, the Forest Plan will be modified (LRMP, Chapter V, "Monitoring and Evaluation" and "Amendment and Revision")

391 *COMMENT*. ONLY A FEW RESEARCH NATURAL AREAS AND BOTANICAL AREAS ARE PROPOSED IN THE DEIS ALL OF THE PLANTS IN TABLE F-2 SHOULD BE MANAGEMENT INDICATOR SPECIES, INSTEAD OF JUST THE FEW IN TABLE F-6 (APPENDIX F).

Response: Four potential RNA's (proposed by the PNW Research Station) are listed in the FEIS, along with 27 Botanical areas All RNA's are recommended in the Preferred Alternative S. Nineteen Botanical areas are recommended (all or in part).

If all plant species in Table F-2 (FEIS, Appendix F) were used as Management Indicator Species, there would be not point in having Management Indicator Species. Specific Management Indicator Species were selected because their population changes are believed to indicate the effects of management activities. These Management Indicator Species represent other species with similar habitat requirements Over 250 wildlife species inhabit the Forest, and at least 1400 plants. It is not feasible to monitor all species.

Spotted Owls

392. *COMMENT*: A 70 PERCENT REDUCTION IN SPOTTED OWL PAIRS OVER 50 YEARS DOES NOT SEEM RESPONSIBLE OTHER REDUCTIONS OF INDICATOR SPECIES LISTED IN THE PLAN ARE LIKEWISE UNDESIRABLE.

Response: Habitat capability calculations for spotted owl have been revised for the FEIS. Spotted owls are expected to experience a predicted population decline of a little less than 40 percent by the fifth decade. The population decline for the first decade is less than 10 percent. They same general trend will apply to the pileated woodpecker and pine marten. Options will be available at the beginning of the next planning cycle to protect more mature and old-growth forest, especially if research in progress shows that this is necessary to maintain viable populations of dependant wildlife. The Forest endeavored to create a Preferred Alternative S which would insure that wildlife habitat shall be managed to maintain viable populations of all existing native and desirable non-native species.

393 *COMMENT* RESEARCH DONE TO DATE ON SPOTTED OWLS AND THEIR HABITAT IS INCONCLUSIVE. NO HABITAT SHOULD BE SET ASIDE UNTIL FURTHER RESEARCH SHOWS CONCLUSIVELY THAT IT IS ACTUALLY NECESSARY, NO MORE LAND SHOULD BE SET ASIDE FOR THE SPOTTED OWLS, BECAUSE WITH EXISTING WILDERNESS, RESEARCH NATURAL AREAS, WILD RIVER, AND STREAM BUFFER STRIPS THERE ARE OLD GROWTH STANDS OVER THE ENTIRE SISKIYOU FOREST THAT WILL NEVER BE CUT, (OTHER PEOPLE BELIEVE) NO

MORE HABITAT SHOULD BE CUT UNTIL FURTHER RESEARCH CONCLUSIVELY DETERMINES HOW MUCH IS NEEDED TO MAINTAIN A VIABLE POPULATION

(MANY PEOPLE THOUGHT THAT) A SPECIFIC AMOUNT OF HABITAT SHOULD BE ALLOCATED TO SPOTTED OWLS; (OTHERS THOUGHT) NO HABITAT SHOULD BE SET ASIDE FOR SPOTTED OWLS SOME PEOPLE EXPRESSED A PREFERENCE FOR A SPECIFIC AMOUNT OF HABITAT PER DESIGNATED HABITAT AREA. A FEW PEOPLE EXPRESSED THE SAME CONCERNS ABOUT PILEATED WOODPECKER AND PINE MARTEN.

Response· The spotted owl has received considerable attention for the last 15 years. Much research has been conducted into the owl's habitat requirements, including home range size, juvenile dispersal, need for mature/old-growth forest, and food requirements. A number of radio telemetry studies on spotted owls are currently in progress; the knowledge base on spotted owls is constantly expanding. Extensive monitoring programs are being conducted to determine the effects of forest management over time As new information becomes available, adjustments may be made to management plans A mandatory evaluation of current planning for spotted owl habitat will occur five years after approval of the Spotted Owl Supplement to the Regional Guide (USDA Forest Service 1988b); Appendices C and D contain further information on Regional research needs and plans In addition, a comprehensive resource inventory will be initiated on the Siskiyou in 1989. Data collected on mature and old growth forest will enable us to do a better job of managing these important habitat types

Research is also being conducted into the habitat needs of pileated woodpecker and pine marten, although not at the same intensity as for spotted owls. The Siskiyou feels that based on current knowledge, allocations must be made now for indicator species representing mature and old-growth forest habitat. In some areas of the Siskiyou, adequate mature and old-growth habitat will simply not be available at the next revision of the Forest Plan. If more area has been set aside than necessary, habitat can be rededicated to timber management at the beginning of the next planning cycle; if the converse is true, options will already be forgone - cutover areas will not produce mature and old-growth habitat again for many decades.

The Forest Service is committed to maintaining viable populations of all wildlife species, including spotted owls. Standards and Guidelines detailed in Chapter IV of the Forest Plan insure a viable population of spotted owls will be maintained on the Siskiyou during the current 10- to 15-year planning period. The Siskiyou's habitat network for spotted owls conforms to the Standards and Guidelines contained in the Spotted Owl Supplement to the Regional Guide (USDA Forest Service 1988b). Forest and Regional Standards and guidelines conform to direction in the National Forest Management Act (NFMA)

The Siskiyou Forest Plan will meet the direction established by NFMA: *Fish and wildlife habitat shall be managed to maintain viable populations of existing native and non-native species in the planning area For planning purposes, a viable population shall be regarded as one which has the estimated numbers and distribution of reproductive individuals to insure its continued existence is well distributed in the planning area. In order to insure that viable populations will be maintained, habitat must be provided to support, at least, a minimum number of reproductive individuals and that habitat must be well distributed so that those individuals can interact with others in the planning area (219 19)*

394. *COMMENT*: CATCH OWLS AND MOVE THEM TO NEW TERRITORY

Response: Assuming that "owls" means spotted owls, this technique has been suggested from time to time by people in and outside of the Forest Service. Owls could be caught, and they could be moved The problem is there is no habitat to move the owls to All suitable habitat is occupied by other owls If the habitat base spotted owls depend on is reduced, the owl population is correspondingly reduced

395. *COMMENT*: FORGET ABOUT THOSE SPOTTED OWLS AS THEY ARE A MIGRATORY BIRD SO CAN TAKE BETTER CARE OF THEMSELVES THAN WE HUMANS CAN.

Response: Spotted owls are not migratory; they spend the entire year in the same general area At some locations owls may spend the breeding season at higher elevations, and the non-breeding season at lower elevations.

396. *COMMENT*. THERE IS NO CONCLUSIVE SCIENTIFIC EVIDENCE THAT SPOTTED OWLS ARE THREATENED OR ENDANGERED. THE BIT OF RESEARCH THAT HAS BEEN COMPLETED ASSUMES SPOTTED OWLS ARE OLD-GROWTH DEPENDENT AND FAILS TO SEARCH FOR OWLS LIVING AND SURVIVING IN SECOND-GROWTH TIMBER

Response: Spotted owls are not listed by the USDI Fish and Wildlife Service as threatened and endangered. They are classified as "sensitive" by the Forest Service Spotted owls are currently being intensively studied, much has been learned about their habits and habitat Spotted owls are dependent on mature/old-growth forest Spotted owls are occasionally found in non-typical habitat. Juvenile birds sometimes disperse to non-typical habitat, this does not mean that they can successfully live there long-term. A few nesting pairs have been found in what some have termed "second growth " On closer examination, it is apparent that these stands have the habitat character required by the owls for successful nesting. Smaller diameter trees may predominate in these stands, but these are areas that have not been clearcut in the past. In other words, the stand has natural character; for instance, large woody material is present in natural amounts (on the ground) Prey animals are present in sufficient numbers to sustain the owls. These stands also include at least some larger trees suitable as nest sites For more information, see the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines, USDA Forest Service, 1988b).

397 *COMMENT*: THE NORTHERN SPOTTED OWL IS NOW LISTED AS THREATENED IN OREGON AND IT MIGHT BE ASSUMED THAT IT WILL RECEIVE A FEDERAL LISTING AS ENDANGERED OR THREATENED BEFORE LONG IN THESE CIRCUMSTANCES, ANY DELIBERATE, HUMAN-INDUCED DROP IN THE SPOTTED OWL POPULATION OF THE FOREST IS UNACCEPTABLE

Response: The spotted owl is listed by the Oregon Department of Fish and Wildlife as a Threatened species; however, this does not have the same legal status as would listing as threatened or endangered by the USDI Fish and Wildlife Service under the provisions of the Endangered Species Act.

Region Six of the Forest Service has published a Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines, USDA Forest Service, 1988b) dealing with the spotted owl issue. The Forest Service goal is to preserve enough habitat to maintain a viable population of spotted owls through time (at least through the planning horizon of 150 years). The word "viable" is not a synonym for "maximum"; as old-growth stands continue to be harvested, less habitat will be available for spotted owls, and their population will drop. But the National Forests of the Pacific Coast will always preserve enough old-growth forest to maintain a viable population of spotted owls If new data becomes available that shows spotted owls need significantly more (or fewer) acres of old growth per pair than is currently allocated, then the Regional Guide and Forest Plan will be revised to reflect the new data A great deal of research is being conducted on spotted owls by federal and state agencies, and universities At present, well over 100 northern spotted owls are fitted with radio transmitters throughout the Pacific Northwest; data generated from radio telemetry and other types of studies will help fill in our knowledge gaps about their habitat requirements.

398 *COMMENT*: PRESERVE THE HABITAT OF THE NORTHWEST SPOTTED OWL (2000 TO 3000 ACRES AROUND EACH NESTING TREE) AND CONTINUE TO MONITOR AND RESEARCH ALL KNOWN PAIRS IN ORDER TO PREVENT LOCAL EXTINCTION OF OUR NORTHERN SPOTTED OWL

AN INTERAGENCY AGREEMENT SIGNED ON DECEMBER 1, 1987, BY THE DIRECTOR OF THE FWS AND THE CHIEF OF THE FOREST SERVICE COMMITS THE FOREST SERVICE TO ENSURE THE CONTINUED EXISTENCE OF A WELL-DISTRIBUTED NORTHERN SPOTTED OWL POPULATION THROUGHOUT ITS NATIONAL FOREST RANGE.

Response. A new interagency agreement between the USDA Forest Service and USDI Bureau of Land Management, National Park Service, and Fish and Wildlife Service was signed in August 1988. It focuses on the fact that all four agencies are integral to the success of maintaining a viable spotted owl population

At a minimum, the Forest will meet the Standards and Guidelines described in the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines, USDA Forest Service, 1988b). This means that on the Siskiyou, at a minimum, each Spotted Owl Habitat Area (SOHA) will consist of 1,000 acres of suitable habitat. The SOHA network (plus randomly sampled areas) will be intensively monitored for at least five years.

399 *COMMENT*. MODIFY THE ALTERNATIVES TO INCREASE THE NUMBERS OF SPOTTED OWL PAIRS OVER FIVE DECADES.

Response: Table II-48 of the FEIS, Chapter II, displays an estimate of the number of spotted owl pairs which could be supported by each alternative, at various decades. The numbers displayed are reasonable, but we will never be able to give exact counts of the owl pairs present at any given time, under any given alternative. Our estimates are based on general knowledge of habitat requirements for spotted owls, including home range. Table II-48 also provides an estimate of available habitat for all alternatives, for a variety of decades; these figures give you another perspective on the issue

400. *COMMENT*: HIGHER ELEVATIONS MAY REQUIRE MORE HABITAT FOR SPOTTED OWLS, BASED ON RESEARCH ONGOING AT REDWOOD SCIENCES LAB OWLS ABOVE 3000' HAVE HOME RANGES NEARLY DOUBLE OF LOWER ELEVATION OWLS. THE 1000 ACRES OF SUITABLE HABITAT SHOULD BE INCREASED TO 2200 ACRES AS AN AVERAGE.

Response. The size of spotted owl habitat areas on the Siskiyou has been set at 1,000 acres based on direction in the Spotted Owl SEIS (USDA Forest Service 1988b). A mandatory review of direction in the SEIS is scheduled in 1993; a review of the SEIS may occur at other intervals, if needed.

401 *COMMENT*: IN AN ATTEMPT TO PLACE SOHA'S IN RESERVED AND UNSUITABLE (FOR TIMBER HARVEST) AREAS, THE HIGHEST QUALITY AREAS AND THOSE WITH EVIDENCE OF OCCUPANCY AND USE MAY BE PASSED BY AND THE SPACING OF THE SOHA'S WILL BE STRETCHED TO THE FARTHEST LIMIT ALLOWED. THIS TENDENCY MULTIPLIED OVER THE OWL'S ENTIRE RANGE COULD SERIOUSLY AFFECT THE OWL'S VIABILITY.

SOHA'S ARE JAMMED INTO DESIGNATED WILDERNESS TO AVOID DECISIONMAKING. IT SEEMS PROBLEMATICAL AT BEST THAT THE SOHA'S IN THE KALMIOPSIS ARE ACTUALLY SUITABLE GIVEN THE FACT THAT MANY ARE UNOCCUPIED AND THE HABITAT HAS BEEN ALTERED IN THE NORTH BY RECENT FIRE

Whenever possible, Siskiyou SOHA's were set up at locations where spotted owls had previously been detected Spotted owls have been found at all but three Designated Habitat areas (sites outside of wildernesses). Although SOHA's were located in areas with little or no programmed harvest whenever possible, actual SOHA placement was driven primarily by dispersion requirements. SOHA's were not unilaterally relegated to the least productive sites.

Wherever possible, spotted owl habitats were placed in lands not suitable for timber production, this minimized opportunity costs to the timber program However, to meet Management Requirements described in the Spotted Owl SEIS (USDA Forest Service 1988b), it is necessary to allocate some habitat areas in locations otherwise suitable for timber management.

Wildernesses on the Siskiyou contain large areas of habitat suitable for spotted owls. These areas are the heart of the Siskiyou habitat network. Spotted owls have been found at over 20 locations in Wildernesses, even though Wilderness owl habitat has not received as much survey attention as areas of general forest As far as the 1987 fires are concerned, more owl habitat was affected outside of Wilderness than inside. Slightly over five percent (25,000 acres) of the Forest's mature and old-growth habitat was lost in the fires, and much of this burned acreage was not part of the designated habitat network for spotted owls.

402 *COMMENT*: THERE IS NO MENTION OF OCCUPANCY OF THE SITES (DESIGNATED HABITAT) BY THE WILDLIFE IN QUESTION. THE NFMA REGULATIONS REQUIRE A REPRODUCTIVELY ACTIVE PAIR OF OWLS IN THE NETWORK.

Response· The "presence" of spotted owls has been found at all but three of the Forest's Designated SOHAs. Of the three, one site is an island of old-growth in a sea of serpentine, and the other two were recently added to the Designated SOHA network as a result of a 1987 Regional Office review All three sites are needed to meet distribution requirements; there were no other logical alternatives to these sites. Reproduction is known at only five of the Designated SOHA's, but intensive monitoring efforts were only recently begun (1987); we expect to ultimately find that most Designated SOHA's contain breeding pairs of spotted owls.

403 *COMMENT*: ESTABLISH WIDE CORRIDORS LINKING PROTECTED HABITAT. EVEN THIS METHOD MAY NOT BE OF MUCH VALUE TO SPECIES SUCH AS THE NORTHERN SPOTTED OWL, WHICH REQUIRE LARGE RANGES

Response· The Forest Service has not relied on narrow habitat corridors (riparian areas along streams) to meet the habitat requirements of wildlife species with large home ranges, such as the spotted owl. Management Area 8, Designated Wildlife Habitat, was designed to provide habitat for creatures like the spotted owl which use large areas of mature or old-growth forest (LRMP, Chapter IV, "Management Prescriptions") Moreover, large blocks of habitat such as SOHA's are connected by Riparian areas (150 feet either side of Class I and II streams; 100 feet either side of Class III). Vegetative cover (tree cover) will be maintained in Riparian corridors; these areas will essentially be managed in an unevenaged condition. The corridors will serve as travelways and flightways for wildlife traveling between larger habitat blocks. Put another way, the Riparian corridors will serve as a cover network connecting various large blocks of older seral stages not managed for timber harvest

404. *COMMENT*: ONE OF THE KEY CONCERNS AFTER THE RECENT RASH OF FIRES ON THE SISKIYOU IS THE IMPACT ON SPOTTED OWLS. ACCORDING TO THE FOREST BIOLOGIST, A NUMBER OF SPOTTED OWL SITES WERE LOST IN THE FIRES. AS MANY AS 12 SITES WERE IMPACTED, NEARLY 20 PERCENT OF THE SISKIYOU NETWORK. THE INFORMATION IN THE DEIS NEEDS TO BE UPDATED

IF A CERTAIN PERCENTAGE OF SITES (SOHA'S) WERE LOST DUE TO FIRES, WILL THE FOREST PROVIDE MORE IN THE FUTURE TO ACT AS A BUFFER?

Response: Sections on the "1987 Fires" in Chapters II, III, and IV of the FEIS review effects of the fires on old growth and Spotted Owl Habitat Areas. Figures for mature and old growth are "post-fire" in the LRMP

If SOHA's are lost to fires, adjacent suitable habitat will be substituted. If suitable habitat is not available, then capable habitat will be substituted (see Standards and Guidelines for Management Area 8, LRMP, Chapter IV).

405. *COMMENT*: IF AN ADDITIONAL 1200 ACRES AROUND THE CORE SOHA IS WITHDRAWN FROM TIMBER HARVEST FOR THE PLANNING PERIOD (10-15 YEARS), BUT STILL USED AS TIMBER BASE IN CALCULATING ANNUAL HARVEST DURING THAT TIME PERIOD, THEN THE COMMERCIAL FOREST BASE OUTSIDE THE SOHA'S WILL BE OVER-CUT FOR 10-15 YEARS WITH POTENTIALLY DISASTROUS IMPACTS.

Response: In areas managed for timber, each Siskiyou SOHA will be 1,000 acres No additional acres will be allocated to any of these SOHA's. Given the above scenario, the effects could likely be significant.

406. *COMMENT*: RECREATION SITES, TRAILS AND ROADS SHOULD BE AVOIDED NEAR SPOTTED OWL NESTS. VQO'S MIGHT SERVE AS CORRIDORS BETWEEN SOHA'S.

Response: We have established a Standard and Guideline which directs that recreation and other activities occur 1,000 feet or more from nest sites or roost areas. Minimum stand size is established at 60 acres per intent of a Standard and Guideline established in the Spotted Owl SEIS (USDA Forest Service 1988b). Retention and Partial retention may or may not serve as habitat corridors between Designated Wildlife Habitat areas; this value has not been given to visual areas in the Standards and Guidelines

407 *COMMENT*: WHY ARE ONLY 40 SPOTTED OWL HABITAT AREAS ALLOCATED ON THE SISKIYOU?

Response: NFMA directs that each planning area (National Forest) will provide habitat to maintain well-distributed viable populations of all existing native and non-native species Each Forest developed its own spotted owl habitat network based on these criteria For more information, see the Final Spotted Owl Supplement (USDA Forest Service 1988b).

408. *COMMENT*: MAKE THE PROTECTION OF OWLS VERY SMALL WHEN THERE ARE TOO MANY OF THEM, THEY KILL OTHER BIRDS.

Response: According to Forsman and others (1984), birds comprise a small percent of an owl's diet (FEIS, Literature Cited).

Management Indicator Species

409. *COMMENT*: THE INDICATOR SPECIES APPROACH TO ASSESSING WILDLIFE VIABILITY IN RELATION TO SPECIFIC HABITATS IS A THEORETICAL MODEL OF QUESTIONABLE VALIDITY

Response: The indicator species concept is theoretical However, NFMA requires that the indicator species concept be used in developing Forest Land and Resource Management Plans. Specific indicator species were selected because past research has indicated that these species were strongly associated with certain habitats More research will be conducted on many of the indicator species and monitoring of habitat will continue through the planning cycle (LRMP, Chapter V and Appendix D).

410 *COMMENT*: HOW MANY PILEATED AND MARTEN SITES ARE ACTUALLY OCCUPIED BY THE SPECIES? NO MENTION IS MADE ABOUT HABITAT REQUIREMENTS OR WHY THESE WERE CHOSEN AS INDICATOR SPECIES.

Response: Although sighting information has not been systematically gathered, pine martens have been found in eight Designated Wildlife Habitat areas; pileated woodpeckers in six At first thought this seems quite low, but in past years the Forest has concentrated survey efforts on spotted owls, not pileated woodpeckers and pine martens. We expect to find evidence of pileated woodpeckers in most, if not all areas designated for their use Marten use will be harder to ascertain, although we expect that marten are using many of the designated areas We believe the habitat areas designated for pileated woodpeckers and pine marten are suitable; monitoring plans for both species are designed to determine presence (LRMP, Appendix D).

Based on our knowledge of the Siskiyou, we feel that 100 years is a reasonable estimate of the time it takes the average stand to reach the mature stage. Pileated woodpeckers and pine marten are thought to adequately represent other species which use mature forest habitat; they were selected as Management Indicator Species through Regional coordination efforts Their habitat requirements are displayed in the description of Management Area 8 (LRMP, Chapter IV).

411. *COMMENT*· THE SISKIYOU SELECTED THREE INDICATOR SPECIES TO REPRESENT OLD GROWTH HABITAT: THE SPOTTED OWL, PILEATED WOODPECKER AND PINE MARTEN. THE FOREST SERVICE IS CURRENTLY IN THE PROCESS OF CONDUCTING A NEPA ANALYSIS OF THE HABITAT NEEDS FOR THE SPOTTED OWL. NO SUCH NEPA ANALYSIS EXISTS FOR THE OTHER TWO INDICATOR SPECIES FOR OLD GROWTH USED BY THE SISKIYOU.

Response: Protection of spotted owl habitat is being addressed on a Regional basis through the SEIS because habitat management to support viable populations of spotted owls is a coordinated effort between many National Forests NEPA analysis of habitat needs of the pileated woodpecker and pine marten is being conducted on the Forest level through the Forest Plan The Siskiyou's analysis of habitat needs for these species was open to comment upon publication of the DEIS (FEIS, Appendices D and J)

412 *COMMENT*: RESEARCH BY KIM MELLEN, OSU GRADUATE STUDENT, INDICATES A NEED TO MANAGE 495 ACRES AS A CORE AREA FOR PILEATED WOODPECKERS. THE FOREST IS ENCOURAGED TO INCORPORATE THE FINDINGS INTO THE FINAL PLAN.

Response: The Forest's habitat network for pileated woodpecker is organized per Regional direction (USDA Forest Service 1986b) Pileated woodpecker habitat needs has been identified as a research need in Chapter II (LRMP, "Information Needs").

413. *COMMENT*: THE FOREST HAS NOT SELECTED AN INDICATOR SPECIES FOR RIPARIAN HABITATS, MEADOWS, OR UNIQUE WILDLIFE HABITAT AREAS. ODFW AND FOREST BIOLOGISTS SHOULD DISCUSS THE NEED FOR AN INDICATOR SPECIES FOR RIPARIAN

HABITAT. FOR MEADOW HABITAT, DEER AND ELK SHOULD BE IDENTIFIED AS INDICATOR SPECIES OF THIS FORAGE PRODUCING HABITAT.

Response. Currently, we do not have a suitable indicator species for riparian habitat (such as meadows), there is also not enough information to select indicator species for many of the other special habitats Research which may provide this valuable information is identified in the LRMP (Chapter II, "Information Needs"). The Forest will be open to consider additional indicator species in the future.

414. *COMMENT*: THE GOSHAWK SHOULD BE LISTED AS SENSITIVE AND RECEIVE MORE PROTECTION. CONSIDER USING THE GOSHAWK AS AN INDICATOR SPECIES.

Response: The goshawk is a sensitive species in California, but not Oregon. The few known nest sites are protected. Goshawks are protected under the Standard and Guideline for Raptors (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Surveys have not specifically been conducted for goshawks. However, surveys for the California part of the Forest are planned as part of the capital investment program (LRMP, Appendix B). There is no estimate of population size.

The goshawk was not used as an indicator species because of the perceived difficulty in monitoring population trends. For this planning period, it is assumed to be represented by the spotted owl. Based on inventory information collected during this planning period, the species may be used as a management indicator species in subsequent planning cycles.

415 *COMMENT*: THE INDICATOR SPECIES APPROACH IS UNDERCUT BY THE SYSTEMATIC REMOVAL OF FOUR OF THE SIX SPECIES LISTED IN THE SPECIES MATRIX IN APPENDIX J. IT APPEARS, AFTER READING APPENDIX J, THAT ALL OF THE ANIMAL SPECIES WHICH DEPEND UPON THE OLD GROWTH HABITAT OF THE SISKIYOU ARE RELYING UPON FOREST SERVICE INVENTORIES OF THE NEEDS OF THE PINE MARTEN AND THE PILEATED WOODPECKER. EITHER THE TEXT IS ABSURDLY INADEQUATE, OR YOU MUST OFFER MORE EVIDENCE THAT ELK, WOLVERINE, OTTER, SALAMANDERS, AND OTHER NATIVES ARE IN FACT GOING TO SURVIVE IN THE SISKIYOUS.

Response: No Siskiyou species were dropped from the species matrix in Appendix J of the DEIS. As indicator species, the spotted owl, pileated woodpecker, and pine marten represent over 150 other species which use mature and old-growth forest. Riparian areas (not represented by an indicator species) act as corridors connecting the habitat areas set aside for the three species mentioned above. These corridors will provide travelways for salamanders and other species. Where needed, habitat requirements for non-game species are addressed in the Forest-wide Standards and Guidelines (LRMP, Chapter IV) Standards and Guidelines for Special Wildlife Sites (Management Area 9) protect specific wildlife habitats, such as meadows and rock sites. Thermal cover for deer and elk is not addressed in depth; however this cover type is plentiful on the Siskiyou. A comprehensive management plan for deer and elk is scheduled as part of the Forest-wide Standards and Guidelines; thermal cover distribution will be one of the topics addressed (LRMP, Chapter IV).

We believe the mix of land allocations in the FEIS Preferred Alternative S will maintain viable populations of all existing native and desired non-native vertebrate species inhabiting the Forest.

416. *COMMENT*: SUFFICIENT MATURE AND OLD-GROWTH FOREST MUST BE MAINTAINED TO SUPPORT VIABLE POPULATIONS OF PILEATED WOODPECKERS, PINE MARTINS, AND SPOTTED OWLS.

Response· All three of these animals are Management Indicator Species for other wildlife which utilize mature or old-growth forest. The Siskiyou has developed Management Requirements to insure that populations of the three species mentioned above (plus all native and desirable non-native species) are maintained at viable levels. All alternatives in the Forest Plan (except NC) contain these Management Requirements (FEIS, Appendix J) For more detail on the Forest's management of habitat for spotted owl, pileated woodpecker, and pine marten, see Management Area 8, Designated Wildlife Habitat (LRMP, Chapter IV).

417 *COMMENT*· FOREST PLAN P.D-9 WILL THE FOREST MONITOR HABITATS, POPULATIONS, OR BOTH, FOR PILEATED WOODPECKERS AND PINE MARTENS?

Response: The Forest will monitor habitat, and attempt to establish animal occupancy/presence/abscence. For more detail, see monitoring plan elements CW121(a) and (b) in Appendix D of the Forest Plan.

418. *COMMENT*: THE USFS HAS NOT DEFINED NUMERICALLY WHAT THE "VIABLE POPULATION" OBJECTIVES ARE FOR SPECIES OTHER THAN SPOTTED OWLS, PILEATED WOODPECKERS AND PINE MARTENS. THE MINIMUM "VIABLE POPULATION" LEVELS FOR THESE THREE SPECIES ARE SUBJECTIVE JUDGMENTS MADE BY THE USFS AND ARE NOT SUPPORTED BY BIOLOGICALLY SOUND DATA.

Response: The FEIS and Forest Plan deal with habitat capability rather than populations. Habitat capability, however, is quantified in terms of animal numbers to give relative comparisons of theoretical population levels that could be supported under different habitat management emphases (FEIS, Chapter III, "Wildlife"). These numbers should be viewed as a measure of habitat rather than of population levels since population levels vary for many reasons other than habitat quality. It is not necessary to numerically define "viable populations" for the three species; an interlocking network of habitat areas between adjacent Forests insures that populations of the three species will be maintained throughout the Region.

Game Species

419. *COMMENT*· THE PLAN DOES NOT APPEAR TO ADEQUATELY PROVIDE FOR THE HABITAT REQUIREMENTS OF DEER AND ELK ON MANAGEMENT AREAS 13 (PARTIAL RETENTION VISUAL) AND 14 (GENERAL FOREST). TIMBER HARVEST OBJECTIVES AND/OR THE ROTATION AGE SHOULD BE MODIFIED SO AS TO INSURE THERE WILL BE ENOUGH FORAGE AND OPTIMUM THERMAL COVER TO MEET OR EXCEED THE OREGON DEPARTMENT OF FISH AND WILDLIFE POPULATION OBJECTIVES.

Response: The Siskiyou elected to use Forest-wide Standards and Guidelines for deer and elk habitat, rather than provide specific direction for each Management Area (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). The Standards and Guidelines were revised between the DEIS and FEIS, but are still general in nature They direct that a comprehensive Deer and Elk Management Plan be completed within three years after release of the Forest Plan Many topics will be addressed in depth, including road closures, habitat improvement projects (including permanent forage areas), forage quality, elk reintroductions, winter range capability, cover/forage ratios, and cover types (hiding, thermal, optimal thermal)

For example, as part of a Forest-wide deer and elk management plan, the Forest will be seeding and fertilizing a number of clearcuts on all Ranger Districts; an administrative study will give us important

information on the relationships between forage improvements and reforestation success. The Forest also plans to reclaim meadow sites lost to forest encroachment. These will become permanent forage sites We estimate that 3,500 acres of meadow could be reclaimed Other sites could also be converted into permanent forage sites; this will be analyzed as part of the Deer and Elk Management Plan.

Rotation age on the Siskiyou's managed timber stands will average 100 years; short rotations will not be undertaken to increase the ratio of forage to cover. Under the Preferred Alternative, future habitat capability for deer and elk will be relatively stable. However, a number of forage improvement projects for deer and elk are scheduled as part of the wildlife capital investment program (including KV) (LRMP, Appendix B). Under the Forest's previous land management plans, more land was allocated to timber management than in the Preferred Alternative S of this Forest Plan. In the long-term, this is good news for wildlife species that depend on older seral stages. On the other hand, this better balance of habitats for all of the Forest's creatures means that timber will be harvested on fewer acres each year, and populations of animals dependant on early seral stages will not increase over the long-term.

The Siskiyou is currently working with tentative population objectives suggested by the ODFW in 1980. As part of the management plan the Siskiyou and state fish and wildlife agencies will set coordinated population objectives. Present suggested objectives are based on limited data, and do not reflect changes in management direction established in this Forest Plan. At present, the Siskiyou contains adequate optimal thermal cover. As more and more of the Forest is brought under management, this may no longer be the case. The Deer and Elk Management Plan will address this potential problem.

420. *COMMENT*: HOW CAN THE FOREST, WITH OVER 1 MILLION ACRES, PROVIDE ONLY 309 ACRES TO ROOSEVELT ELK? THE FOREST CANNOT SUPPLY ENOUGH ELK FROM THE CURRENT POPULATION LEVEL WHY WILL MORE HABITAT NOT BE PROVIDED? WHAT IS THE CURRENT HERD SIZE? CAN IT BE INCREASED WITH ADDED INVESTMENT IN HABITAT, SEEDING AND ROAD CLOSURES? THE DISCUSSION IN THE DEIS DOES NOTHING TO SUPPORT ELK REINTRODUCTION ON THE SISKIYOU.

Response: The 309 acres include a few identified small sites which contain important (special) habitat for elk, this category of Special Wildlife Site was not meant to be an all-encompassing list of habitat areas for elk. The Forest will continue to provide habitat for an elk herd estimated at 1,350 animals In past years elk have been transplanted at a number of sites on the Forest; more transplants may be made, depending on the outcome of the Deer and Elk Management Plan which will be written after release of the Forest Plan (LRMP, Chapter V, "Project Planning"). A number of capital investments projects are planned which will benefit elk (LRMP, Appendix B).

421. *COMMENT*: THREE TYPES OF COVER NEED TO BE ADDRESSED IN THE STANDARDS: HIDING COVER, THERMAL COVER, AND OPTIMUM THERMAL COVER THE DEFINITIONS FOR THESE TERMS ARE FOUND IN "MANAGEMENT OF WILDLIFE AND FISH HABITATS IN FORESTS OF WESTERN OREGON AND WASHINGTON" (BROWN 1985).

Response: Cover requirements and road management are addressed in general terms in the Forest-wide Standards and Guidelines; they will be addressed more specifically in the upcoming Forest-wide management plan for deer and elk (LRMP, Chapter IV)

422. *COMMENT*: PROTECT THE MEADOWS WHERE THE ELK GRAZE.

Response: Meadows will be protected or enhanced for use by wildlife under the Forest Plan Enhancement activities could include prescribed fire, removal of encroaching conifers, or fertilization and

seeding. Meadows will be managed under Special Wildlife Sites (LRMP, Chapter IV, "Management Area 9" and "Forest-wide Standards and Guidelines") In addition, the Forest Deer and Elk Management Plan will include some site-specific improvement/protection measures.

423. *COMMENT*: PROTECT ALL ELK WINTER-RANGE, AND ALL UNIQUE INTEREST AND SPECIAL WILDLIFE SITES.

Response: All Unique Interest (MA 5) and Special Wildlife Sites (MA 9) are protected under the Preferred Alternative S Elk winter range is not deemed to be a critical habitat need on the Siskiyou, nevertheless winter range for deer and elk will be addressed in a comprehensive management plan scheduled to be completed within a few years after approval of the Forest Plan (LRMP, Chapter IV, "Forest-wide Standards and Guidelines").

424. *COMMENT.* MANAGEMENT DIRECTION FOR GAME SPECIES IS PARTICULARLY DEFICIENT, AND FOR SOME SPECIES TOTALLY ABSENT. CONSTRAINTS ON TIMBER MANAGEMENT ACTIVITIES ARE INCLUDED ONLY FOR DEER AND ELK BEAR, BAND-TAILED PIGEONS, TREE SQUIRRELS, GROUSE AND QUAIL ARE NOT EVEN MENTIONED IMPLEMENTATION OF THE PLAN WITHOUT NECESSARY MANDATORY CONSTRAINTS WILL RESULT IN SEVERE LONG-TERM ADVERSE IMPACTS TO MOST HARVESTABLE WILDLIFE SPECIES

Response: Standards and guidelines were revised and expanded for the FEIS due to public comments The mix of land allocations was fine-tuned. Not every species is addressed directly, but all species benefit from the array of land allocations, and Standards and Guidelines in place No timber harvest is programmed in Management Areas 1 through 9, or on lands in Management Areas 10 through 14 which are unsuitable for the production of timber. These lands cover half of the Forest.

The mix of land allocations, Standards and Guidelines described in these Forest Plan documents will maintain viable populations of all species. Game and non-game animals alike will fare well, and habitat for many species will be maintained at high levels.

425. *COMMENT*· THE APPARENT SIGNIFICANT DROP IN DEER HABITAT CAPABILITY IN MOST ALTERNATIVES DOES NOT SEEM REALISTIC

Response: After a review of the methods for calculating deer habitat capability, a computation error was found. Affected tables and text have been revised to reflect the correction Estimated habitat capability for the Forest was underestimated by approximately 25 percent. However, all alternatives and benchmarks contained the same error, the RELATIVE differences between alternatives are similar in both the Draft and final documents.

426. *COMMENT*: THE FOREST NEEDS TO DESCRIBE THE TYPES OF PROJECTS THAT WOULD INCREASE HABITAT CAPABILITY FOR DEER AND ELK, AND THE REASONS FOR THEM

Response. Capital investment tables have been extensively revised in Appendix B of the LRMP. Examples of structural improvements include nestboxes and platforms, water developments, tree topping, road closures, and information/ education displays; for more details, contact any Forest office. Inventory and survey projects result in identification of habitat improvement projects Funds for wildlife forage enhancement in harvest units, such as those improving deer and elk habitat, are included in the annual program budgets as exemplified by "CWKV" in Table B-1 of Appendix B (LRMP)

Other Wildlife Comments

427. *COMMENT.* NEITHER THE PLAN NOR THE DEIS RECOGNIZE THE IMPORTANCE OF HARDWOODS TO WILDLIFE SUCH AS DEER, BEAR, BAND-TAILED PIGEONS AND TREE SQUIRRELS, OR THE CONSEQUENCES OF REMOVING THEM.

Response. A small percentage of the Forest's hardwood acres may be converted to conifer plantations or cut for fuelwood during the next 10 years. Management options will still be available for most stands at the end of this planning period.

The Siskiyou Forest Plan is designed to guide managers for the next 10 to 15 years; at that time the plan will be revised. At this stage in the life of the Siskiyou, we have elected to stop, take stock of all available information and options, and make the best land stewardship decisions we could Many research needs (including hardwood/wildlife relationships) are identified in Chapter II of the LRMP. New techniques, inventories, and information will be used to revise the Plan at the next update. If warranted by new findings, this Plan may be supplemented or amended before the end of the planning period.

428. *COMMENT*: THE 1980 AND 1985 "NATIONAL HUNTING AND FISHING AND OTHER WILDLIFE RELATED USES" SURVEYS BY THE USFWS ARE ARE AVAILABLE AND WILL PROVIDE MORE RECENT DATA ON NONCONSUMPTIVE USE. THIS DATA NEEDS TO BE USED IN THE ANALYSIS.

Response: The 1980 survey was referenced in Chapter III of the FEIS.

429. *COMMENT*· INCREASE WILDLIFE USER DAYS TO 81,700 DAYS ANNUALLY.

Response. In response to public input, the method of calculation for Wildlife User Days (WFUD's) has been revised in the FEIS (Appendix B). WFUD's attributable to game animals are still calculated based on available foraging habitat in a given decade. WFUD's for nongame are now calculated differently. WFUD's for the FEIS Preferred Alternative S are calculated at 83,100 per year for the first decade. This includes WFUD's resulting from capital investments.

For the situation prior to the implementation of the Forest Plan, total game/non-game WFUD's are calculated at 80,900 per year. The game portion of the WFUD's is 40,450 per year (based on ODFW and Forest Service data). There are no reliable figures available for non-consumptive use, although it is considered significant (more than equal to game use, according to the Fish and Wildlife Service [USFWS 1977]). Therefore, for planning purposes, current non-game WFUD's are assumed to be equal to game (40,450) In the DEIS, non-game WFUD's rode the charts in tandem with game WFUD's. In the FEIS, a base of 40,450 WFUD's (annual) for non-game is set This figure has been increased by 1/2 of 1 percent (0.005) per year compounded annually, which is the projected level of increase in use of Forest resources by recreationists for the next five decades (Gibbs and others 1979). This change was made because non-game WFUD's most likely do not follow the same trends as game WFUD's. A downturn in acres harvested for timber might well result in a reduction of game WFUD's; non-consumptive use would probably not suffer.

430. *COMMENT*: REINTRODUCE GRIZZLY BEARS.

Response: Although this is an intriguing idea, the Siskiyou National Forest has not seriously considered reintroducing grizzly bears. Grizzlies were native to the Siskiyou, but were probably exterminated by the turn of the century. Incompatibility between grizzly habits and human use of the land would present serious obstacles to bringing the grizzly back.

A feasibility study could be conducted on the potential for reintroduction; the proper agencies to petition are the Oregon Department of Fish and Wildlife and California Department of Fish and Game Because the grizzly is protected and managed through the Endangered Species Act, the USDI Fish and Wildlife Service would also be involved in the feasibility study, and any reintroduction plans would have to be a part of the Grizzly Bear Recovery Plan.

431. *COMMENT*: THE SITUATION OF CARNIVORES, EXISTING AS THEY DO AT THE TOP OF THE FOOD CHAIN, IS OFTEN INDICATIVE OF THE HEALTH OF THE ECOSYSTEMS THEY INHABIT ATTENTION SHOULD BE GIVEN TO THE CURRENT SITUATION OF COUGAR, BLACK BEAR, RING-TAILED CATS, AND GOLDEN EAGLES, AND HOW THEY WOULD FARE UNDER THE VARIOUS PLAN ALTERNATIVES.

Response: The species you mentioned all occur on the Siskiyou. However, none of them were used as Management Indicator Species. Hence, these animals are represented by other species. See Chapters II and III of the FEIS for more detail. Under Alternative S (FEIS, Chapter II, "Preferred Alternative"), all of these species would remain at viable levels

432. *COMMENT*: THE DEIS SEEMS TO BE BASED ON THE ASSUMPTION THAT WILDLIFE POPULATIONS ARE ADVERSELY AFFECTED BY TIMBER MANAGEMENT. WILDLIFE POPULATIONS MAY BE MORE ADVERSELY AFFECTED BY HUMAN HARASSMENT THAN STAND MANAGEMENT.

Response· Human harassment, intentional and unintentional, is a problem with some species, notably big game animals In Chapter IV of the LRMP ("Forest-wide Standards and Guidelines"), the Deer and Elk Management Plan is stated to be developed within three years after implementation of the Forest Plan (LRMP, Chapter V, "Project Planning"). One of the aspects of the management plan will be an analysis of the effect of roads on wildlife in general and big game in particular.

433. *COMMENT*. BAND-TAILED PIGEON POPULATIONS HAVE BEEN ON A STEADY DECLINE CAN THIS PROBLEM BE ADDRESSED, WHETHER THE CAUSE BE HUNTING PRESSURE OR LACK OF HABITAT? ARE THERE MORE OSPREY NEST SITES POSSIBLE ON THE FOREST? HOW MANY SURVEYS HAVE BEEN CONDUCTED? HAVE ANY SITES BEEN ENHANCED, WITH PLATFORMS CONSTRUCTED OR STICK NESTS MADE TO ORDER?

Response. Management of the migratory band-tailed pigeon will require a range-wide effort; the Forest would not be able to tackle it alone. The Forest's osprey population appears to be increasing; any new sites discovered will be managed under Forest-wide Standards and Guidelines Surveys are conducted annually (LRMP, Appendix D) We are in the process of installing osprey nest platforms in a few selected locations, but we intend to relay mainly on "natural" platforms in most areas

434. *COMMENT*· FOREST MANAGEMENT GOAL #6 ADDRESSES MAINTENANCE OF VIABLE POPULATIONS OF NATIVE SPECIES. THIS COULD BE AT THE EXPENSE OF HUMANITY, AN EXPENSE WE CANNOT AFFORD. TO THEN ADD THE STATEMENT "DESIRABLE INTRODUCED SPECIES" IS GOING WAY TOO FAR IT IS BAD ENOUGH TO SACRIFICE FOR THE SPECIES ALREADY HERE

Response: "Desirable introduced species" generally includes game species such as wild turkey and ring-necked pheasant; species like the house mouse and starling are not "desirable." There are no plans to import more "desirable species " The NFMA provides the following direction to the Forest Service: "Fish

and wildlife habitat shall be managed to maintain viable populations of existing native and desired non-native species in the planning area" (36 CFR 219 19). However, in reviewing the Forest goals, the statement relative to introducing desirable species has been deleted as this was not a priority element for management.

435. *COMMENT*: MANAGEMENT PLANS HAVE NOT YET BEEN PREPARED FOR MOST WILDLIFE. WITHOUT PLANS OR OBJECTIVES THERE IS NOT MUCH CHANCE THAT HABITAT NEEDS WILL BE MET, ESPECIALLY WHEN COMPETING TIMBER MANAGEMENT IS PLANNED IN DETAIL WITH QUANTIFIABLE PRODUCTION OBJECTIVES.

Land allocations and Standards and Guidelines were developed to meet the needs of the Siskiyou's wildlife species (LRMP, Chapter IV). The overall objective is to maintain viable populations of all wildlife species. Standards and Guidelines developed for the Siskiyou Forest Plan contain direction for specific management plans including: deer/elk, bald eagle, peregrine falcon, wildlife sites, and sensitive plants.

436. *COMMENT*: ESTABLISH STRICT STANDARDS TO PROTECT EXISTING NEST SITES FROM MANAGEMENT TECHNIQUES USED TO IMPROVE OR ENLARGE THE MEADOWS. PROTECTING EXISTING NEST SITES WILL MAINTAIN STRUCTURAL HABITAT DIVERSITY WITHIN THE PROJECT AREA

Response: Management of meadows is discussed under Management Area 9 (LRMP, Chapter IV) If trees are killed to meet objectives for meadow reclamation, they generally will not be removed. This will provide habitat for a variety of cavity nesters. In addition, Standards and Guidelines for wildlife provide for protection of raptor nests (LRMP, Chapter IV).

437. *COMMENT*: THE STANDARDS AND GUIDELINES DO NOT PROVIDE THE NECESSARY MITIGATION FOR· (A) REDUCED FORAGE AND THERMAL COVER CAPACITIES FOR BIG GAME ON COMMERCIAL FOREST LAND; (B) A PLANNED 57 PERCENT REDUCTION IN OLD-GROWTH HABITAT; (C) REDUCED RECREATIONAL HUNTING OPPORTUNITY; (D) A 40 PERCENT OR GREATER REDUCTION IN CAVITY-DWELLING SPECIES HABITAT IN TIMBER EMPHASIS AREAS

Response. There are no realistic mitigation measures for a reduction in old growth The Forest has set a Standard and Guideline of 60 percent habitat capability for woodpeckers (in areas managed for timber); there is no mitigation for the reduction from 100 to 60 percent. Forage and cover needs for deer and elk are adequate for the short term; their long-term needs will be addressed in a Deer and Elk Management Plan. Because of a computation error in the DEIS, deer/elk habitat capability will not drop as much as much as predicted. In alternatives with timber harvests at levels close to the situation prior to Forest Plan implementation, recreational opportunities for big game hunting will not diminish appreciably in the future

438 439 *COMMENT*: WHERE DID THE 1 3 PERCENT INCREASED DEMAND FOR WILDLIFE COME FROM? WAS THE INCREASED DEMAND FOR NONHUNTING RECREATION INCLUDED?

Response. The 1.3 percent per year figure for hunting demand came from the Regional Guide (USDA Forest Service 1984) In the FEIS, recreation demand for non-hunting recreation was set at 0.5 percent per year (Gibbs and others 1979).

440. *COMMENT*: SEED CLEAR CUT AREAS WITH GRASS AND CLOVER FOR ANIMALS.

Response Some clearcuts are already being seeded with wildlife forage mixtures as part of sale area improvement plans. Sites chosen for this treatment are generally those with favorable soils and exposure where competition between grass and seedling trees is not a concern During the past few years it has been found that good results can be achieved using lower seeding rates (eight pounds per acre) for wildlife forage, which has increased opportunities for post-harvest treatment In addition, spur roads, landings and roadcuts are often seeded to provide wildlife forage and reduce erosion hazard. See the Forest-wide Standards and Guidelines (LRMP, Chapter IV) for more discussion. Seeding for animals is included in the Capital Investment Program outlined in Appendix B of the LRMP.

441. *COMMENT*: THE FOREST SERVICE SHOULD GIVE PRIORITY TO IDENTIFYING AND PRESERVING HABITAT FOR WOLVERINES ON THE FOREST

Response· The Forest may or may not harbor wolverines. A wolverine inventory has been included as a budget item in the Forest Plan (LRMP, Appendix B) Forest-wide Standards and Guidelines for wolverine are listed in the LRMP, Chapter IV.

442 *COMMENT*· THE FIGURES IN THE TABLE FOR WOODPECKER'S HABITAT AREA DO NOT ADD UP CORRECTLY.

Response· The woodpecker figures were meant to add up on a pro-rated basis. Minor errors were present; they have been corrected in the FEIS.

SENSITIVE PLANTS AND ASSOCIATIONS

443. *COMMENT*: PROTECT ALL THE RARE PLANTS THAT GROW IN THE SISKIYOU.

Response. Land allocation and Forest-wide Standards and Guidelines are two means in which rare plants can be protected. Part of the management direction for Management Areas 3 (Research Natural Area) and 4 (Botanical) is to protect their unique plant resources Forest-wide Standards and Guidelines Direct the Forest Service to evaluate all proposed projects that involve significant ground disturbance and which may affect sensitive plants (LRMP, Chapter IV).

444. *COMMENT*. THE PLAN LACKS A COMPREHENSIVE ACCOUNT OF ITS EFFECTS ON NATIVE FLORA, INCLUDING SENSITIVE SPECIES.

Response: The Planning documents display much information about the Forest's native plants. Chapters II, III, and IV (FEIS) discuss various aspects of the native flora, while Appendix F (FEIS) goes into considerable detail on the Forest's rare plant concentration areas Chapter IV of the LRMP details the Standards and Guidelines used to manage sensitive plant resources Inventory efforts will continue (LRMP, Chapter V and Appendix D). New information will result in changes in management techniques The Forest Plan is designed to be dynamic, rather than static. In recognition of the need for better information about sensitive plants, this is included in "Information Needs" in Chapter II, LRMP

445 *COMMENT*· MORE BOTANICAL, SPECIAL INTEREST, AND RESEARCH NATURAL AREAS SHOULD BE PROPOSED THE "OREGON NATURAL HERITAGE PLAN" INDICATES A MUCH

GREATER POTENTIAL THAN INDICATED. RECOMMENDED BOTANICAL AREAS ARE TOO SMALL TO RETAIN THE AREA'S INTEGRITY, OR SHOULD HAVE LARGE BUFFERS AROUND THEM. THE MANAGEMENT PRESCRIPTION FOR BOTANICAL AREAS IS TOO VAGUE, AND SHOULD NOT ALLOW GRAZING OR OFF-ROAD VEHICLE USE.

Response· The need and demand for more Botanical areas was a consideration in developing alternatives. In all, the Preferred Alternative S includes 22 Botanical areas and seven RNAs (FEIS, Chapter II, "Alternatives Considered in Detail"). These areas include populations of most of the sensitive plant species on the Forest "Research Natural Areas of the Pacific Northwest" lists RNA needs for planning (Dyrness and others 1975). The Siskiyou RNAs were developed with the idea of including as many cells as possible (FEIS, Appendix F).

The "Oregon Natural Heritage Plan" (State Land Board) was released in December 1988, too late to be of benefit in this FEIS. A re-evaluation of land allocation for preservation of sensitive plant communities on the Forest will be conducted at a future date based largely on data in the Heritage Plan. The Heritage Plan is, in part, a product of input provided by the Forest Service's Zone Ecologist for the Siskiyou, Rogue River, and Umpqua National Forests. The recommendations contained in the Heritage Plan will be viewed, however, by the Forest and Region more in context of the natural range of the species and its distribution than political boundaries alone. Coordination with other agencies, particularly to the south of the Forest, will be made The Forest Plan can be amended or revised, if appropriate, to bestow "protected" status on representatives of specific plant communities.

The boundaries of most Botanical areas take advantage of topography, and all are designed to encompass the particular plant populations which make the area unique Any necessary buffering of specific populations was taken into account when the boundaries were mapped out (FEIS, Appendix F). The Standards and Guidelines for Botanical areas are designed to protect, preserve, and enhance the exceptional botanical features of these areas (LRMP, Chapter IV, "Forest-Wide Standards and Guidelines") Off-road vehicle use is not permitted within RNA's; motorized use may occur only on roads and trails within Botanical areas Grazing is not permitted in RNA's and Botanical areas, except at Bigelow Lakes (an active allotment exists; it will be monitored).

446. *COMMENT*: INCLUDE VARIOUS REDWOOD STANDS AS BOTANICAL AREAS. THE SNAKETOOTH REDWOOD BOTANICAL AREA IS NOT ADEQUATELY PROTECTED, BECAUSE "20 ACRES OF THIS 21-ACRE AREA ARE TENTATIVELY AVAILABLE AND SUITABLE FOR TIMBER PRODUCTION." BURNING IN THE WHEELER CREEK RNA (IN ORDER TO MAINTAIN REDWOOD) IS QUESTIONABLE. THE FOREST SERVICE SHOULD PREPARE A SUPPLEMENTAL DRAFT PLAN EVALUATING THE DESIGNATION OF 4,820 ACRES OF REDWOOD FOREST LAND (POSSESSING MORE THAN 20 TREES PER ACRE) AS SPECIAL REDWOOD MANAGEMENT AREAS WHERE LOGGING AND OTHER COMMODITY USES WOULD BE PROHIBITED.

Response· Table F-3 in the FEIS, Appendix F does show 20 acres of the Snaketooth Redwood grove as "tentatively available and suitable for timber production," (the other acre is an existing road). This statement, however, is used simply to describe the capability of the land to support timber production; figures for ASQ and Long-Term Sustained Yield (LTSY) are a way of displaying tradeoffs. Recommended Botanical areas will not be managed as timber-producing stands (LRMP, Chapter IV, "Management Prescriptions"). The Snaketooth Grove is recommended as an Old-Growth Botanical area in the Preferred Alternative S.

If fire is excluded from the Wheeler Creek RNA, the area will eventually develop into a climax forest Tanoak is the climax species in the RNA However, the redwood stand in the RNA is relatively young and could be expected to sustain itself for another 500 years. It is safe to assume that natural fire will burn through the RNA sometime during that timespan, regardless of suppression policies.

A supplement dealing with allocation of redwood stands was not prepared. However, after publication of the DEIS, the options for allocating redwood areas to other land use designations were analyzed in response to comments. More protection of redwood stands was a consideration in developing the FEIS Preferred Alternative S which includes the recommended Redwood Groves Old-Growth Botanical area (FEIS, Chapter II, "Alternatives Considered in Detail," and FEIS, Appendix F) This Botanical area contains the best examples of old-growth redwood groves on the Forest not already protected within the Wheeler Creek Research Natural Area.

Because of the interest and sensitivity of large redwood trees, stands, and groves in Oregon, with requests for the status as to how the redwoods are treated in the Forest Plan and at the project-level under existing direction, a "Management Plan for Coast Redwood" has been prepared by the Chetco Ranger District (Planning Records; available at either the District Office in Brookings or the Supervisor's Office) The Forest manages the very northernmost end of the redwood's range. As such, basic background information and specific management guidelines for this single species was documented to make more visible the Forest's management efforts. Specifically, the objectives of the document are to: (1) Describe the existing conditions, current land allocation, and management direction, (2) describe the silvicultural treatment options for managing the species; and (3) describe monitoring needs

Decisions as to land allocations and accompanying Standards and Guidelines have been dealt with in the FEIS and Forest Plan. Actual management of redwood, surrounding forest, and potential for establishment of additional redwood forest will occur at the project level. Public notice and involvement in these silvicultural treatments will occur during scoping and environmental analysis of any proposed project

447. *COMMENT*: AN INVENTORY OF ALREADY DESIGNATED WILDERNESS AREAS SHOULD BE DEVELOPED (IF ONE DOES NOT ALREADY EXIST) SO THAT NEW PROPOSALS FOR BOTANICAL OR OTHER LAND WITHDRAWALS MAY BE MATCHED AGAINST THOSE AREAS ALREADY SO PRESERVED.

Response: The botanical resources and plant associations of the Forest's Wildernesses were considered when allocations were set for Botanical areas and Research Natural Areas See the introduction of Appendix F (FEIS) for a short discussion on the occurrence of *Darlingtonia* bogs, also, see Appendix F for a discussion of selection criteria for Botanical areas The same general rationale was applied to other land allocations, such as Research Natural Areas. The Wildernesses were used to satisfy minimum requirements wherever possible. RNA cells are sometimes designated in Wildernesses. However, existing Wildernesses do not contain examples of all representative ecosystems (cells) under Forest Service management (these cells may also not be available in areas managed by other government agencies). It is necessary to designate areas outside of Wilderness to protect resources that are not present elsewhere.

448 *COMMENT*· ONCE IT IS DETERMINED THAT THE PLANTS WITHIN ANY BOTANICAL AREA (MA-4) ARE DOING AS WELL OR BETTER IN THE MA 12-14 AREAS, THEN CHANGE THE APPROPRIATE AREAS TO OTHER ALLOCATIONS.

Response· Sensitive plants will continue to be monitored in areas where timber is harvested (LRMP, Chapter V, "Sensitive Plants," and Appendix D). Monitoring may reveal that some sensitive plants do well or better in harvested areas However, we suspect that this will not be so in most cases, which is why Botanical areas were designated In addition, the majority of the acreage in Management Area 4 is land unsuitable for timber harvest

449 *COMMENT*. CLASSIFY THIS NATIONAL FOREST AS A NATIONAL BOTANICAL/BIOLOGICAL PRESERVE AND NATIONAL CRITICAL HABITAT AREA

Response. This option is not available to the Forest Service. Such designation would require Congressional action. The Forest does contain an array of plant resources unique to the National Forest System. In recognition of this fact, 24 new Botanical and Research Natural Areas are considered for allocation in the various alternatives (FEIS, Appendix F).

450. *COMMENT*: THE FOLLOWING FEDERAL CANDIDATE SPECIES SHOULD BE ADDED TO THE LIST OF PLANTS· GENTIANA BISETAEA AND HORKELIA HENDERSONI.

Response· *G. bisetaea* is on the Forest Service list of Sensitive Plants (see FSM 2670 for detailed discussion of sensitive plants) *H. hendersoni* is not on the sensitive plant list for the Siskiyou because this species is known only from southwest Jackson County; it is not known from the Siskiyou (FEIS, Appendix F).

451. *COMMENT*: ESTABLISH A THOMAS J. HOWELL NATIONAL BOTANICAL DRIVE AND VIEWPOINT IN THE BABYFOOT LAKE AREA.

Response. This proposal as described would require Congressional action, therefore is outside the scope of this Forest Plan However, the basic idea of a Botanical Drive and Viewpoint would focus interest on the Forest's unique plant resources. A road/trail could be designated as a "botanical byway," with appropriate signing, and a road/trail brochure prepared of a "Thomas J. Howell National Botanical Drive and Viewpoint" in the Siskiyou National Forest Your suggestion, as modified, has been incorporated into the Capital Investment Program for Endangered, Threatened and Sensitive Species (LRMP, Appendix B)

452. *COMMENT*. WITHIN THE FOREST SYSTEM THERE SHOULD BE AN AREA SET ASIDE TO COMPARE THE NATURAL PROGRESSION OF NATURE TO THE MANAGED FOREST AS A CONTROL AND A FUTURE GENETIC RESOURCE.

Response: Various land allocations serve this purpose. Research Natural Areas are specifically designated for this purpose Other land allocations can also be used as controls: Wilderness, Botanical, and Unique Interest, or virtually all other allocations from Management Areas 1-9. Also, as we better define our plant associations, new RNA's may be proposed in future Forest Plans as additions to the system.

453 *COMMENT*. AS AN ALTERNATIVE SITE FOR A VIEWPOINT OF BREWER'S WEEPING SPRUCE (PICEA BREWERIANA) OUTSIDE OF THE KALMIOPSIS WILDERNESS AREA, THE AREA JUST NORTH OF PEARSOLL PEAK SHOULD BE CONSIDERED

Response. The uniqueness of Brewer Spruce is recognized. The specific site mentioned is not allocated for a Botanical site or a Unique Interest Area in any of the alternatives The area would be managed as Backcountry Recreation (Management Area 6) in Alternatives S, G, E, and M (FEIS, Chapter II, Table II-3, "Special Area Assignments"), which would maintain the option and access (via trail) for viewing The area will be added just north of Pearsoll Peak to our list of areas to inventory before the next revision of the Forest Plan (10 to 15 years from now). Depending on inventory findings, the site may be recommended as a Botanical area. In the interim, little potential exists for affecting this stand of Brewer Spruce

454. *COMMENT*: RETENTION OF ALL PROPOSED RNA's AND BOTANICAL AREAS FOR THIS PLANNING PERIOD IS NEEDED. AFTER NEEDED RESEARCH AND INVENTORIES HAVE BEEN COMPLETED AND EVALUATED, AN INFORMED DECISION CAN BE MADE AS TO THE LONG-TERM ALLOCATION FOR THESE AREAS

Response: All RNA's and all or part of 19 Botanical areas are allocated in Alternative S (Preferred).

455 *COMMENT*: UNDER MANAGEMENT GOALS, THE ROLE RNA'S CAN PLAY IN MONITORING THE FOREST PLAN SHOULD BE MENTIONED.

Response: The monitoring role of RNA's is discussed in the description of Management Area 3 (LRMP, Chapter IV).

456. *COMMENT*: WHETSTONE BUTTE AND FIDDLER MOUNTAIN SHOULD BE ADDED AS BOTANICAL AREAS BECAUSE THESE AREAS CONTAIN HIGH CONCENTRATIONS OF *LEWISIA COTYLEDON.*

Response: These areas are not included as proposed or recommended as Botanical areas in the FEIS The sites will be inventoried before the next revision of the Forest Plan; if warranted, they may be proposed as Botanical areas during preparation of the next Forest Plan.

MINERALS

457. *COMMENT*: THE PREFERRED ALTERNATIVE PLACES TOO MANY RESTRICTIONS ON MINERAL RESOURCE EXPLORATION AND DEVELOPMENT. A MANAGEMENT AREA SHOULD BE ESTABLISHED FOR MINERAL RESOURCE DEVELOPMENT

Response: In response to public input, Alternative S was developed with fewer restrictions on mineral development than the Preferred Alternative K of the DEIS. The FEIS Preferred Alternative S would only slightly decrease the number of acres having some degree of restriction on mineral exploration and development. (See the FEIS, Chapter III, where the measure for minerals is how much of the Forest is accessible with limited restrictions). The areas of known mineral potential have been mapped (FEIS, III-4); as many acres as possible of high and moderate mineral potential have been maintained in the General Forest category which places the least restrictions on mineral exploration and development (FEIS, Chapter II, "Alternative Descriptions"; Chapter IV, "Mineral Deposits," "Environmental Effects by Land Allocation") No additional areas are recommended for withdrawal in any alternative in the FEIS, although minimal acres bordering the Elk, Chetco, and North Fork Smith Rivers will be withdrawn as a result of the recent Omnibus Oregon Wild and Scenic Rivers Act of 1988.

A Management Area for minerals is not included With nearly three-quarters of the Forest available for mineral entry, and specifics of exploration and development largely attributable to the mining proponent, a Management Area which emphasized this resource likely be of little value to the public or Forest Service. While most Management Areas permit some degree of exploration and development, access prescriptions vary depending on the Management Area's primary resource focus and protection of inherent non-mineral resource values. (FEIS, Chapter IV, "Mineral Deposits- Environmental Effects by Land Allocation.")

458. *COMMENT*. MINING AND PROSPECTING ARE ANOTHER VITAL MEANS OF SUPPORT TO OUR ECONOMY. WITH THE REGULATIONS NOW IN FORCE, THE COST OF MINING IS PROHIBITIVE FOR SOME LOWER GRADE MINES. IF MORE RESTRICTIONS ARE APPLIED AND MORE LAND IS RESTRICTED TO MINING AND PROSPECTING, THE MINERAL RESOURCE WILL BE RESERVED IN AREAS WHERE ONLY WEALTHY MINING COMPANIES CAN AFFORD TO MINE.

Response: In developing Alternative S, the map of known mineral potential of the Forest (FEIS Chapter III, Figure III-4) was used to identify areas where mineral potential was most significant. The Forest then

attempted to minimize adverse effects to mining on areas identified as having high or moderate mineral potential. The level of access restrictions has not changed significantly in those areas (see Table IV-5, FEIS). A comparison of Alternative A and Alternative S shows very little difference in the number of acres on the Forest accessible with low to moderate restrictions (See FEIS, Table II-3).

459 *COMMENT*. CONSIDERING THE IMPORTANCE OF MINERALS IN MULTIPLE USE MANAGEMENT OF THE FOREST, THE PLAN SHOULD INCLUDE AN EXPLANATION OF HOW FOREST MANAGEMENT GOAL NO. 17 [FACILITATE MINERAL EXPLORATION . WHILE PROTECTING SURFACE RESOURCES...] WILL BE IMPLEMENTED CONSISTENT WITH AGENCY-WIDE MINERAL POLICY WHERE PLANNED ACTIONS MAY FURTHER RESTRICT AREAS OPEN AND AVAILABLE FOR MINERAL ENTRY AND DEVELOPMENT (LOCATION, LEASING, AND SALES).

Response. The Forest Plan contains Management Prescriptions for 14 Management Areas (LRMP, Chapter IV, "Management Prescriptions"). These prescriptions outline restrictions that will be applied to activities, including mining. Mineral lease applications, permits, contracts, and operating plans will be evaluated for consistency with the Management Prescription for the area in which they are located (LRMP, Chapter V, "Implementation Direction"). It is the policy of the Forest Service to promote mineral development. Therefore, to be consistent with Forest Service minerals policy, restrictions on locatable mineral activities must also be reasonable and cannot materially interfere with the conduct of legitimate mining activities.

460. *COMMENT*: THE DRAFT DID NOT ADDRESS MINING THOROUGHLY. MINING IN THE FUTURE COULD HAVE AS LARGE AN IMPACT AS TIMBER HARVEST ON THE FOREST. THERE HAS BEEN LITTLE RECLAMATION DONE IN THE FOREST. OPEN PITS AND PILES OF ROCK AND DEBRIS REMAIN THE FOREST SERVICE NEEDS TO ENFORCE RESTORATION OF THE FOREST AS A RESULT OF MINING. THE DRAFT WAS INACCURATE BY STATING THAT CUSTODIAL (ROADLESS) AREAS, WILDERNESS AND WILD RIVERS ARE WITHDRAWN FROM MINERAL ENTRY. THE DRAFT'S DEFINITION OF CUSTODIAL (ROADLESS) AREAS, WILDERNESS, AND WILD RIVERS INCLUDES MINING.

Response: The issue of mineral withdrawal from certain land allocations has been re-evaluated since the DEIS. There is a significant reduction in acres recommended for withdrawal in most alternatives from the DEIS to the FEIS. Several Management Areas, such as the Backcountry Recreation (termed "Custodial (Roadless)" in the DEIS), do not show additional areas recommended for withdrawal in the FEIS

Withdrawal is mandated by Congress for Wilderness and Wild portions of Wild and Scenic Rivers (Management Areas 1 and 2). The Wilderness Act of 1964 contained a provision that withdraws all designated Wilderness from mineral entry effective January 1, 1984, subject to valid existing rights. In the case of Wild rivers, the act designating them usually withdraws the Wild section of those rivers.

The prescription for the Custodial (Roadless) Management Area in the DEIS was quite restrictive, as written, relative to the mineral resource. In the FEIS, this Management Area has been renamed to Backcountry Recreation and prescriptions provided which emphasize the importance of motorized access, exploration and development of the mineral resource in areas of moderate to high potential. Restrictions, thereby, have been considerably reduced.

The Code of Federal Regulations, 36 CFR 228.8g, Aug. 28, 1974, now requires specific reclamation activities. Completion of the required reclamation is guaranteed by a bonding process Regarding restoration of old mining sites, the Forest can rehabilitate areas through appropriated funds If a rock pile from old placer mining is within a timber sale boundary, collected dollars (K-V) may also be used. Many

areas which were the site of old dredging operations have rehabilitated naturally. Standards and Guidelines for minerals (Chapter IV-66 of the Forest Plan) provide for reclamation on any new mining. The application of the 36 CFR 228 regulations requiring reclamation is triggered any time a plan of operation for activities with significant disturbance to surface resources is filed with the agency.

Site-specific information is needed before the effects of future proposals can be evaluated. New mining projects are managed through operating plans. An environmental analysis is made on all projects to insure that resource protection and rehabilitation measures have been incorporated into the proposal.

461. *COMMENT*: THE MINERAL ISSUE HAS NOT BEEN ADEQUATELY ADDRESSED IN THE PROPOSED PLAN, AND THE FOREST SERVICE IS VIOLATING "...CERTAIN STATUTORY RIGHTS OF CITIZENS TO PROSPECT, LOCATE AND DEVELOP LOCATABLE MINERALS ON LANDS OPEN TO SUCH ENTRY."

Response: Any lands not specifically withdrawn from mineral entry are open for prospecting, location, and development of minerals. Of the 1,092,302 acres of land on the Siskiyou National Forest, only 272,751 acres are withdrawn. Most of the withdrawn area (232,495 acres) is in Wilderness designated by Congress

Chapter IV of the LRMP states that, "The prospecting, development, and production of mineral and energy commodities shall be facilitated." It is Forest Service policy that minerals are resources to be managed like any other on the Forest.

462. *COMMENT* THERE IS NOT ENOUGH EMPHASIS ON MINERAL DEVELOPMENT ACCESS IN ANY ALTERNATIVES.

Response: In the development of alternatives, the Forest placed emphasis on responding to concerns expressed by the public. One measure of responsiveness by which the alternatives were compared is number of acres accessible to mineral entry with low to moderate restrictions (See the FEIS, Chapter II, "Features Common to All Alternatives.") The effect of each alternative on accessibility of minerals is summarized in the FEIS, Table IV-5. Terms used to describe accessibility can be found in the FEIS, Chapter III.

463 *COMMENT*: A MAP SHOWING THE MINES AND MINERAL RESOURCE LOCATIONS SHOULD BE INCLUDED TO PROVIDE A BASIC UNDERSTANDING OF WHERE KNOWN OR EXISTING RESOURCES ARE FOUND.

Response. The Mineral Potential Map in Chapter III of the FEIS gives general mineral information (see Figure III-4). Numerous maps and publications about mining and minerals either reference or readily available at libraries or from the Oregon Department of Geology and Mineral Industries

464 *COMMENT* A LIST IS NEEDED OF CURRENT MINERAL WITHDRAWALS, ACRES INVOLVED, AND MINERAL POTENTIAL FOR LOCATABLE AND LEASABLE MINERALS

Response. The FEIS, Chapter IV, "Mineral Deposits," lists this type of information by alternative See Table IV-5 and Figures IV-1 and 2 for a comparison of "Estimated Mineral Potential and Accessibility Limitations" under the various alternatives. Current minerals withdrawals are listed under Alternative A which represents existing management of the Forest.

465 *COMMENT:* TABLE IV-A IN THE DRAFT FOREST PLAN DOES NOT INCLUDE AN ESTIMATE OF MINERAL OUTPUTS. CONSIDERING THE LEVEL OF MINERAL DEVELOPMENT AND EXPLORATION WITHIN AND ADJACENT TO THE FOREST, THIS APPEARS TO BE AN IMPORTANT OMISSION.

Response: Under the mining laws, the locatable minerals program is based on self-initiation; that is, the miner going out to locate minerals. It is not part of the role of the Forest Service to determine mineral potential or outputs. The U.S. Department of Interior, Bureau of Mines, annually reports on mineral commodity output in Oregon and California, but not from private or Forest Service land. Additionally, since this information is confidential, it is displayed by the Bureau of Mines as total amounts produced in the state. The existing information which may be published is described in the FEIS, Chapter III, "Mineral Deposits." In Chapter IV of the FEIS, the effects of the various alternatives on minerals is evaluated in terms of restrictions on access. The FEIS, Table IV-5 also uses acres of the Forest accessible to mineral entry as a measure of responsiveness to public concerns.

466. *COMMENT*: THE FOREST SHOULD QUANTIFY THE VALUE OF THE MINERAL RESOURCE, TO THE EXTENT FEASIBLE, AND FACTOR THAT VALUE INTO THE VARIOUS ALTERNATIVES.

Response: Because of lack of information about the extent of various mineral resources, it is not possible to quantify their value. Based on a map of the areas of high mineral potential (FEIS, Chapter III, Figure III-4), the FEIS displays and evaluates the effect of the alternatives on these areas in terms of access restrictions. The known information is included in the description of Mineral Deposits, FEIS Chapter III; Chapter IV of the FEIS contains a discussion of the effect of each land allocation on the mineral accessibility. Chapter IV also contains graphs and tables that further display the effects.

467. *COMMENT*: THE MINERAL POTENTIAL RATINGS NEEDS BETTER DEFINITION CITING OF EVIDENCE USED TO ARRIVE AT RATINGS AND A DISCUSSION OF DATA SOURCES WOULD IMPROVE UNDERSTANDING. METHODOLOGY EMPLOYED TO DERIVE TOTAL ACREAGE IN EACH CATEGORY SHOULD ALSO BE INCLUDED. BEFORE ANY LAND IS EXCLUDED FROM MINERAL ENTRY, A DETAILED AND COMPREHENSIVE INVENTORY OF ITS MINERAL RESOURCE CHARACTERISTICS SHOULD BE CARRIED OUT. A MORE THOROUGH DISCUSSION OF FOREST SERVICE POLICIES AND PROCEDURES FOR MINERAL DEVELOPMENT IN RELATION TO THE "SOCIOECONOMIC ASPECTS" OF MINING WOULD BE HELPFUL

Response: Minerals are a major resource deserving equal attention with other resources in the Forest Planning process. The nature of mining law has influenced the knowledge available concerning quality and quantity of mineral resources; without such information, discussion of market and value is difficult Mineral exploration is self-initiating (by the miner) under the law, with the result that the Agency does not inventory mineral resources generally

The Forest's mining engineer used various studies previously completed for this area and their own professional expertise to complete a map that identified areas of mineralization (FEIS Chapter III, "Mineral Deposits"). Next, our geologist attempted to describe the potential for minerals to occur in areas identified as mineralized. To accomplish this, the three descriptive terms of high, moderate and low were used A definition of these terms can be found in the FEIS, Chapter III

Other information used to produce the mineral resource potential map is listed in the "Bibliography of the Geology and Mineral Resources of Oregon," produced by the State of Oregon Department of Geology To produce this map, Forest mining geologists used information from a number of sources plus their own personal knowledge of the area. Among published information used was a report prepared by S.P. March, S J. Kropschot, and R G Dickinson in cooperation with the U.S Bureau of Mines, Geological Survey

Professional Paper 1300, titled "Wilderness Mineral Potential, Assessment of Mineral Resource Potential in US Forest Service Lands Studies 1964-1984." This report discussed mineral potential in designated Wilderness. Another report used extensively was a "Mineral Resource Study for Siskiyou National Forest," prepared under contract with Oregon Department of Geology and Mineral Industries The primary product produced from this study was a mineral resource planning map.

The Forest mining geologists also used information in data bases maintained by U.S. Geological Survey and U.S Bureau of Mines for background to assist in interpretation and extrapolation of information on mineral resources. The next step was to evaluate the effect of Management Prescriptions on the accessibility of minerals Descriptive terms were again used to describe this effect. A definition of these terms can be found in the FEIS, Chapter III.

Certain Management Prescriptions tend to limit the accessibility of minerals. The economic effect of this action would depend on the type of mining operation planned. The effect of each Management Prescription on the accessibility of minerals is described in the Forest Plan document in the LRMP, Table III-9

These effects are summarized in terms of acres restricted by a particular Management Prescription. No attempt was made to quantify economic costs to the community, the state, or to industry as a result of increasing or decreasing access restrictions to prospect and develop minerals because there is not sufficient data available to make any intelligent estimates of these costs.

468. *COMMENT*: MINERAL POTENTIAL DATA DEVELOPED BY THE STATE OF OREGON, U.S. FOREST SERVICE MINERALS PERSONNEL, U S. BUREAU OF MINES, AND INDIVIDUALS FROM THE GRANTS PASS AREA MUST BE STUDIED TO UNDERSTAND MINERAL POTENTIAL. POTENTIAL SHOULD BE RESTUDIED, AND PLANNING REVISED TO OPEN UP ADDITIONAL LANDS FOR CRITICAL AND STRATEGIC MINERALS RATHER THAN DOUBLE RESTRICTED AREAS ON THE FOREST.

Response: The Forest received a number of responses expressing a desire for increased consideration of mining activity on the Forest. The primary desire was to allow more land to remain open to exploration and development of the mineral resource.

Because the Mining Laws are written so that the activity is self-initiating, it is not primarily the agency's responsibility to estimate potential. The Forest does make decisions about access for exploration and development through land allocations and management prescriptions.

The Forest Plan strives to maintain a balance of resource management. Table III-9 (LRMP) shows the allocation of land on the Forest to the various Management Areas identified and the effect of each allocation on mineral accessibility. The analysis of the Plan indicates little change from current conditions. See also FEIS Table II-3 for a comparison of acres accessible to mineral entry under the various alternatives. A discussion of current conditions, and explanation of Mineral Potential and Mineral Access can be found in Chapter III of the FEIS. A comparison of the effect of each alternative on access to mineralized areas is in Chapter IV of the FEIS. Table IV-5 shows little change in access restrictions on areas identified as having high and moderate mineral potential.

469 *COMMENT*: NONE OF THE ALTERNATIVES, EXCEPT FOR "AS IS," SERIOUSLY TAKE INTO ACCOUNT THE IMPORTANCE OF MINERALS IN THE NATIONAL FORESTS.

Response. It is the policy of the Forest Service to facilitate mineral exploration and development consistent with other multiple uses of the Forest. (LRMP, Chapter IV, Forest Goals). In the FEIS, Chapter III, "Mineral Deposits" provides background information about minerals on the Forest from a historical

perspective. The Comparison of Alternatives in Chapter II includes minerals in its discussion of "Features Common to All Alternatives " To track Planning Problem 9, the analysis of alternatives evaluates the effects of the various alternatives by access restrictions to the mineral resource (FEIS, Chapter IV, "Mineral Deposits: Significant Interactions, and Environmental Effects") Table II-3 in the FEIS includes acres accessible for mineral entry as a measure of resource outputs in comparing the alternatives and as an indicator of responsiveness to public concerns.

470. *COMMENT*: MINING SHOULD NOT BE PERMITTED IN SENSITIVE PLANT OR ANIMAL HABITAT. RARE EARTH MINERALS PRODUCE RARE PLANTS. PROTECT THEM. SLOW DOWN ON MINERAL DEVELOPMENT.

Response The Forest Service can only recommend that the Bureau of Land Management withdraw areas from mineral entry. But, while the Forest Service does not have the authority to withdraw areas from mineral exploration, it plays a part in setting guidelines for exploration because of its responsibility for managing surface resources.

The Forest recognizes that the unique soil conditions on the Siskiyou National Forest are one of the reasons such a diversity of sensitive plants exists on the Forest Some areas with rare or sensitive plants on the Forest have been allocated to Botanical or Natural Research Areas, with Management Prescriptions designed to protect the plants for which these acres are set aside (FEIS, Appendix F). As an agency responsible for managing surface resources, the Forest Service does impose reasonable restrictions on surface-disturbing activities, including mining, where other resource considerations warrant (LRMP, Appendix F, and FEIS, Chapter II). See also FEIS, Chapter IV, "Mineral Deposits- Environmental Effects on Land Allocations."

471. *COMMENT*: MORE ATTENTION SHOULD BE GIVEN TO RECREATIONAL MINING AS AN ENHANCEMENT TO MULTIPLE USE AND ECONOMIC RESOURCES.

Response: In response to public interest, the Forest Service is trying to develop a process within the recreation program that would allow this activity on certain areas with a simple type of permit. An example of such a program already exists on a neighboring Forest. The Rogue River National Forest has a Recreational Panning and/or Dredging Management Plan on the Applegate Ranger District.

472. *COMMENT*: 75 PERCENT OF THE FOREST OPEN TO MINING (UNDER ALTERNATIVE K) IS WAY TOO MUCH. MINING CAN DEVASTATE AN AREA, AND IT TAKES YEARS FOR NATURE TO REPAIR THE DAMAGE.

Response: Minerals are recognized as an important resource on the Forest (FEIS, Chapter III, "Minerals") The 1872 Mining Law allows the exploration and development of minerals on public land which is not specifically withdrawn from mineral entry. The Preferred Alternative S (FEIS) attempts to restrict mineral development only where serious conflict with other land allocations may result. On areas open to mineral entry and development, the Forest will work with the miner to allow mineral development in an environmentally sensitive manner. Forest Service regulations governing minerals (36 CFR 228 and 43 CFR 3000 series), as well as Standards and Guidelines for minerals (Chapter IV, Forest Plan), provide for reclamation of disturbed lands upon cessation of activity. Mineral development on the Forest has been at a very modest level, and this is not expected to change in the near future (FEIS, Chapter III).

473. *COMMENT*: IMPACTS FROM MINING CLAIMS IN THE KALMIOPSIS WILDERNESS ARE A SERIOUS CONCERN; THERE SHOULD BE AN END TO MINING IN THE WILDERNESS. SHORT OF

ENDING MINING, INCREASED MONITORING AND ENFORCEMENT OF REGULATIONS BY THE FOREST SERVICE IS NEEDED.

Response: When the Kalmiopsis Wilderness was designated in 1964 and expanded in 1978, the existence of valid mining claims was specifically recognized. (A valid mining claim is one on which a discovery was made prior to the Wilderness designation.) Mining activity and development was allowed to continue on those claims. This includes the use and maintenance of existing roads. No new mining claims can be located within designated Wilderness. The Forest does monitor mining claims; under Federal regulations (36 CFR 228), miners must have approved operating plans. If a miner proposes an operating plan which impairs Wilderness resources, the Forest will check the validity of the claim and contest it if appropriate. On valid claims, the Forest will work with the miner to minimize any conflict with Wilderness values (LRMP, Chapter IV, "Management Prescriptions," and LRMP, Appendix A).

474. *COMMENT*: THE STANDARDS AND GUIDELINES SHOULD INCLUDE, IN ADDITION TO THE FEDERAL REGULATIONS CITED, THE CALIFORNIA SURFACE MINING AND RECLAMATION ACT (SMARA) AMONG THE LAWS CONTROLLING THE ADMINISTRATION AND RECLAMATION OF MINED LAND IN THIS STATE.

Response: The California Surface Mining and Reclamation Act (SMARA) was overlooked in the Draft. In the Chapter IV of the Forest Plan, under "Forest-Wide Standards and Guidelines" for Minerals 10-2, this oversight is corrected.

CULTURAL RESOURCES

475. *COMMENT*: I WOULD LIKE TO SEE MORE WORK DONE TO RE-ESTABLISH OLD HISTORICAL TRAILS.

Response. The re-establishment of historic trails is addressed in Chapter III of the FEIS, "Cultural Resources." Although historic trails are not specifically listed, they are one of the site types referred to in the paragraph dealing with enhancement opportunities. The interpretation of the history of selected trail routes using signs, brochures, and other techniques is planned. Also, a feasibility study is planned (FEIS, Chapter IV, Cultural Resources Capital Investments, and Appendix B) for the interpretation of the historic Silver Creek Trail, most of which is no longer maintained.

476. *COMMENT*: NO NATIVE AMERICAN CULTURAL SITES/AREAS SHOULD PLAY SECOND FIDDLE TO ECONOMIC REQUIREMENTS; THEIR RELIGION HAS SUFFERED NEGLECT AND ABUSE BY SELFISH COMMERCIAL NEEDS

Response: This concern is addressed in Chapter III of the FEIS, "Cultural Resources," where cultural resource protection and the American Indian Religious Freedom Act (AIRFA) is discussed. This law provides for the protection of American Indian rights to "believe, express, and exercise their traditional religions." The Siskiyou National Forest has and will continue to coordinate with all appropriate tribes in planning. During environmental analyses of projects, American Indian traditional religious rights and values will be considered.

FIRE MANAGEMENT

Fire

477. *COMMENT*: MORE ATTENTION AND STUDY SHOULD BE GIVEN TO THE EFFECTS OF SLASH BURNING MONITOR THE NUTRIENT CYCLING AND MYCORRHIZAL FUNGI SURVIVAL IN EXISTING CLEARCUTS.

Response: Currently, the Siskiyou National Forest has four installations monitoring short- and long-term disturbance on nutrients and mycorrhizal formulation, including clearcutting and slash burning. In addition, the Forest has gone to lighter spring burns which have less adverse effects on nutrients and mycorrhizal Current timber sale contracts require the timber purchaser to leave large amounts of woody material (logs) for long-term site productivity. In the future there are plans to work with COPE (Coastal Oregon Project Evaluation) on the long-term effects of slash burning on soil nutrients, organic matter levels and mycorrhizal fungi. Soil productivity will be monitored to assess effects of organic matter and nutrient levels following timber harvest and site preparation (which could include burning) as described in Chapter V and Appendix D, "Soil Productivity," LRMP.

478. *COMMENT*: NATURAL FIRES (LIGHTNING CAUSED) IN WILDERNESS AND ROADLESS AREAS SHOULD BE EVALUATED, BUT NOT ACTIVELY SUPPRESSED UNLESS ADJACENT MANAGED FOREST LANDS, LANDMARKS, OR DEVELOPED SITES ARE THREATENED. NATURAL WILDFIRES WERE PART OF THE CYCLE IN THE FOREST IN PRE-MANAGEMENT TIMES. IN MANY AREAS THEY KEPT THE FUEL ACCUMULATION UNDER CONTROL SO THAT THE FIRES TENDED TO BURN FAST AND RELATIVELY COOL AND NOT AS HOT CROWN FIRES INCREASE THE AMOUNT OF MONITORING OF WILDFIRES IN WILDERNESS.

Response: Under the LRMP, each ignition will be reviewed to determine the appropriate suppression response (Chapter IV, "Forest-wide Standards and Guidelines"). The Forest Plan allows for the use of unplanned ignitions (lightning ignitions) as prescribed fires in portions of the Kalmiopsis and Wild Rogue Wilderness when certain criteria are met. Further discussions of prescribed fire in Wilderness is presented in Chapter IV ("Management Prescriptions") and Appendix A of the LRMP

479 *COMMENT*: LET THE FOREST GO BACK TO PERIODIC BURNINGS, OR IT WILL CONTINUE TO BE LOST TO SERIOUS FIRES.

Response: The Forest-wide Standards and Guidelines, and Management Prescriptions presented in Chapter IV of the LRMP provide for the use of prescribed fire from both planned and unplanned ignitions This will allow for the manipulation of natural fuels complexes in most Management Areas and thereby reduce the probability of large, catastrophic fires

480 *COMMENT*: THERE SHOULD BE A STRONG EFFORT TO PREVENT A CATASTROPHIC FIRE SEASON LIKE 1987 FROM HAPPENING AGAIN WITH PROPER FOREST MANAGEMENT (THINNING BRUSH, ACCESSIBLE MAINTENANCE ROADS ETC).

Response: The fire protection organization identified in the Forest Planning Process (FEIS, Appendix B, "Analysis Done Outside FORPLAN"), the Forest-wide Standards and Guidelines, and the Fire Management Direction for each Management Area (LRMP, Chapter IV) provide a reasonable assurance that large areas of the Forest will not be burned by wildfire on a routine basis The use of prescribed burning from both

planned and unplanned ignitions, post-harvest slash treatment, and the proposed roading within the planning period will also contribute toward preventing a repeat of the 1987 experience.

481 *COMMENT:* FOLLOWING CLEARCUTS, PLANTATIONS ARE FULL OF BRUSH CREATING A PERFECT FIRE ENVIRONMENT. WHAT SPECIAL FIRE-FIGHTING TECHNIQUES ARE USED IN THESE SITUATIONS? THERE'S NOT ENOUGH MONEY TO ADEQUATELY PROTECT THE FORESTS

Response: The key to protection costly investments, such as plantations, is a thorough, well-designed, site-specific fuel treatment accomplished after timber harvest and before the site is reforested Excessive amounts of residual slash has a potential for a high rate of spread. Once a wildfire starts in an inadequately treated plantation, it will generally spread rapidly until there is a significant change in fuel type or fuel continuity. Suppression efforts in these situations are generally very costly and unsuccessful.

Additional comparative discussions of fuels complexes, silvicultural systems and the effects on fire behavior is presented in the FEIS, Chapter IV, "Fire - Significant Interactions" and in the FEIS, Appendix G, "Selection of Silvicultural Systems - Comparison of Systems." A discussion of the fire management organizational planning efforts is presented in the FEIS, Appendix B, "Description of the Analysis Process - Analysis Done Outside of FORPLAN."

482. *COMMENT.* EVERY BIT OF FOREST LAND NOT DESIGNATED AS WILDERNESS SHOULD HAVE ACCESS ROADS FOR FIRE PROTECTION AND CONTROL.

Response: Over 2,000 miles of road would be available for immediate fire access in all alternatives (FEIS, Chapter II, "Fire"), and another 600 miles would be closed but available after some maintenance The road system would be supplemented by a recreational and administrative trail system of approximately 450 to 550 miles (FEIS, Chapter II, "Improvements") The completed system will provide good access to most of the Forest outside Wilderness. However, if Management Areas remain fixed over the planning horizon, many alternatives would have large blocks of land remaining essentially unroaded or smaller areas contiguous to Wilderness The discussion of the effects by alternative is provided in Chapter IV

483. *COMMENT:* ALL SLASH SHOULD BE MADE AVAILABLE FOR FIREWOOD CUTTING

Response: Varying amounts of slash will be made available at harvest units. The actual amount will depend on such factors as the economics of making it available, site-specific resource needs, etc. A detailed discussion of fuelwood is presented in the FEIS, Chapter III, "Energy "

484 *COMMENT.* SET-ASIDE AREAS SHOULD INCLUDE A NETWORK OF ACCESS ROADS FOR FIRE PROTECTION.

Response: The Standards and Guidelines for each Management Area include direction on transportation facilities and fire protection requirements (LRMP, Chapter IV) Roads provide one of the access modes for fire protection The other modes are trails, lookouts, and aerial spotter (detection) systems These latter modes are in most cases more compatible with Management Areas with less development Fire suppression activities also utilize these same modes

AIR QUALITY

485. *COMMENT.* AN ALTERNATIVE NEEDS TO BE FOUND TO SLASH BURNING PRESENTLY EMPLOYED ON THE FOREST. SLASH BURNING HAS MANY ADVERSE EFFECTS, INCLUDING AIR POLLUTION (AFFECTING HEALTH AS WELL AS SCENIC VIEWS), LOSS OF VALUABLE FIREWOOD, LOSS OF SOIL NUTRIENTS (DECREASING FOREST PRODUCTIVITY), AND LOSS OF ANIMAL HABITAT.

Response: Prescribed burning operations are conducted in accordance with the Oregon State Smoke Management Plan, which has an objective of maintaining air quality and visibility. Forest Service research is actively seeking new techniques and methods to reduce the amount of emissions associated with prescribed burning (LRMP, Chapter II, "Information Needs"). Many of these techniques have been included in the Forest-wide Standards and Guidelines for Air Quality presented in Chapter IV of the LRMP Soil productivity is monitored to determine effects of slash burning (LRMP, Chapter V and Appendix D)

Each prescribed burn, or slash burn, is executed under a site specific prescription which considers resource and management needs, as well as impacts to the forest resource. At the present, prescribed fire is one of the most cost effective methods of treating large amounts of slash generated by timber harvest The slash must be treated to reduce the risk of high intensity wildfire and the associated resource impacts

486. *COMMENT.* THE PROPOSED PLAN INCLUDES ONLY THE EMISSIONS FROM PRESCRIBED BURNINGS FOR DETERMINATION OF WHETHER THE FOREST MANAGEMENT PRACTICES MEET THE APPLICABLE FEDERAL AND STATE AIR QUALITY STANDARDS.

Response. The Oregon Smoke Management Plan, which provides operational guidance applicable to all prescribed burning on forests in western Oregon, deals only with emissions from prescribed fires Emissions from wildfires are not included in either the Smoke Management Plan or the LRMP A detailed discussion to this effect is presented in the Fire and Air Quality sections of Chapters III and IV of the FEIS.

487. *COMMENT*: WHY NOT INCLUDE FIRES IN WILDERNESS AS PART OF THE TSP EMISSIONS?

Response: Prescribed fires from planned ignitions in Wilderness will fall under the operational constraints of the Oregon State Smoke Management Plan and the emissions associated with this burning will be accumulated in the Forest's baseline value. Emissions associated with lightning-caused fires in Wilderness, which are managed as prescribed fires, are considered a natural component of the Wilderness ecosystem and, therefore, are exempt from the Smoke Management Plan. Emissions from wildfires are not covered by either the Oregon Smoke Management Plan or the Forest Plan

488. *COMMENT*: THE PROPOSED PROCEDURES INCLUDE NO PLAN FOR MONITORING EMISSIONS OF OTHER REGULATED SUBSTANCES AS REQUIRED UNDER THE OREGON STATE IMPLEMENTATION PLAN (SIP). THE PLAN SHOULD INCLUDE MEASURES FOR MONITORING THESE COMPOUNDS AND FOR ENSURING THAT THEIR CONCENTRATIONS DO NOT EXCEED THE APPLICABLE STANDARDS

Response· Section 110(a)(2)(C) of the Clean Air Act (PL 88-206) identifies each State as the agency responsible for the monitoring of criteria pollutants associated with the National Ambient Air Quality Standards. Monitoring details developed by the Environmental Protection Agency are described in 40 CFR Part 58.

489 *COMMENT*· MORE ANALYSIS SHOULD BE PRESENTED ON PROJECTED VS BASELINE POLLUTANT EMISSIONS.

Response: The analysis presented in the Air Quality section of Chapter IV of the FEIS indicates that the projected emissions for the selected alternative does not exceed the 1975-1979 baseline value of 7300 tons of TSP. Many of the techniques developed by Forest Service research to reduce emissions from prescribed burning have been included in the Forest-wide Standard and Guidelines which are presented in the Land and Resource Management Plan.

OTHER COMMENTS

GEOLOGY

490. *COMMENT*: THE DESCRIPTION OF GEOLOGY IS TOTALLY INADEQUATE. A STATEMENT IS MADE THAT GEOLOGY IS DIVERSE, YET YOU DEVOTE ONLY ONE PAGE TO THIS CONSPICUOUS CONTROL OVER ALL ELEMENTS OF ENVIRONMENTAL MANAGEMENT OF THE FOREST. A FIRST STEP TO IMPROVE THIS SECTION SHOULD BE A GEOLOGIC MAP OF THE FOREST SIMILAR TO THE ONE IN THE SOIL RESOURCE INVENTORY (SRI). EACH MAJOR LITHOLOGIC UNIT SHOULD BE IDENTIFIED, DESCRIBED, AND INTERPRETED IN TERMS OF COMPOSITION AND STRUCTURE AS THESE APPLY TO FOREST PRODUCTION AND ENGINEERING PROPERTIES.

Response: The "Topography and Geology" section in Chapter III of the FEIS has been revised to include a more comprehensive discussion of the geologic elements, geologic history, and the associated hazards. Geologic information has also been added to the "Soil and Water" section in Chapter IV of the FEIS. Geology maps and lithologic unit descriptions are included in the Soil Resource Inventory and project level work

For a better understanding of Chapter III of a NEPA document, the intent is to descriptions that are no longer than is necessary to understand the effects of the alternatives. With this intent, the Chapter should succinctly describe the environment of the area to be affected or created by the alternatives under consideration While geologic information is without question very important to the understanding of the effects, sufficient information has either been presented in the FEIS, made available in the Planning Records, or has been referenced. The reference cited are excellent and provide the reader with a far more thorough review of the resource than can be presented appropriately included in Chapter III.

Even more importantly, soil and landform developed on any particular rock type are not sufficiently homogeneous to make valid generalizations for long-term planning. To be meaningful, evaluations of slope stability and engineering characteristics of soil must be made on a site-specific basis

491. *COMMENT*: MAPS AND A GENERAL DISCUSSION OF SEISMICITY, ACTIVE FAULTS, AND OTHER GEOLOGIC HAZARDS, E G , FLOODING, VOLCANISM, ETC , SHOULD BE INCLUDED TO PROVIDE A BASIC ENVIRONMENTAL FRAMEWORK FOR ANY FUTURE PLANS FOR FOREST LAND DEVELOPMENT OR UTILIZATION.

Response. Within the Siskiyou Forest, there are no active faults, areas of volcanic activity, or known hot springs Geologic faults are shown on published geologic maps available from the Oregon Department of Geology and Mineral Industries and other sources. The effects on wetlands and floodplains is discussed in the FEIS, Chapter IV, "Specifically Required Disclosures" Floods occur most years in the narrow

canyons. Almost all areas subject to flooding are managed as riparian zones and do not have developments or habitations

492. *COMMENT*: ARE THERE MAJOR SAND AND GRAVEL SOURCES ON THE FOREST? IF SO, WHERE? IF NOT, WHAT SOURCES ARE USED AND ARE THEY SUFFICIENT FOR FOREST NEEDS?

Response: The Forest is self-sufficient in sources of rock to make aggregate for roads and other purposes. Occasionally, small quantities for special purposes are purchased from off-Forest sources. The on-Forest supply is essentially unlimited, although in a few areas it may become necessary to use low-grade rock or transport it further than is now customary. Very little alluvial sand and gravel is used. Most rock sources are bedrock quarries found throughout the Forest. Inventories are kept at the Siskiyou National Forest Zone Engineering offices in Grants Pass and in Gold Beach.

RANGE

493. *COMMENT*: NO GRAZING SHOULD BE PERMITTED ON THE FOREST. GRAZING IS A GOVERNMENT-SUBSIDIZED FUNCTION THAT SHOULD NOT BE TOLERATED ON THE ECOLOGICALLY-SENSITIVE FOREST NATIVE VEGETATION, INCLUDING RARE SPECIES AND FRAGILE RIPARIAN HABITATS, IS AT RISK FROM THIS ACTIVITY.

Response: Grazing is a legitimate use of the National Forest as provided in the Multiple-Use Sustained-Yield Act and MFMA Grazing on this Forest is negligible Grazing is not allowed in Botanical areas unless it is shown to *not* detrimentally impact endangered, threatened, or sensitive species Grazing is prohibited in Research Natural Areas (LRMP, Chapter IV, Management Prescriptions). Standards and Guidelines provide direction for protection of wildlife, ecologically sensitive areas, and biological diversity where conflicts may exist with grazing (LRMP, Chapter IV, "Forest-wide Standards and Guidelines")

Grazing fees on National Forest Lands are calculated through the formula prescribed in Executive Order No. 12548 (2/14/86). The formula allows for adjustment of fees based on livestock prices and production costs during a given year. In this respect, it is comparable to recreation, timber harvest, and like resource activities and uses on the Forest.

494. *COMMENT*: THERE IS A LACK OF INFORMATION IN THE DRAFT DOCUMENTS ON THE LIVESTOCK GRAZING PROGRAM ON THE SNF. A VERY BRIEF PASSAGE IN THE DEIS STATES THAT ABOUT 3,000 ACRES OF THE SNF ARE GRAZED, YET LITTLE REFERENCE TO THE EFFECTS OF THIS GRAZING COULD BE FOUND. ONLY VAGUE AND INCOMPLETE S&GS ARE PRESENTED IN THE DRAFT PLAN TO INDICATE HOW THIS PROGRAM IS TO BE MANAGED.

Response: Livestock grazing on the Siskiyou National Forest was not identified as a key issue due to the very limited extent of the program and demands of the local industry Almost all of the forage available to livestock is a by-product of timber harvest, called "transitory range." Following the harvest of timber, a grass seeding program or natural revegetation occurs which often produces forage palatable to livestock. If this forage can be made available to livestock without any significant environmental or resource conflicts, a grazing allotmment may be made available to the industry. This type of range is usually available for 15-20 years, but gradually becomes unavailable as the new Forest reclaims the site. A brief general discussion of range can be found in Chapter III of the FEIS. In addition, each Management Prescription discussed in Chapter IV of the LRMP includes a brief consideration of range The Monitoring and Evaluation Program for Range (LRMP, Chapter V and Appendix D) has been expanded in response to public input.

FUELWOOD

495 *COMMENT*: CONVERT WASTE TO WOOD PELLETS TO BE BURNED, NEARLY POLLUTION FREE, IN INDUSTRIAL BOILERS AND PRIVATE WOOD PELLET STOVES.

Response: The wood products industry uses wood residue as an energy source for its facilities, though consumption varies depending market conditions and distance from the forest site to the mill (FEIS, Chapter III, "Energy"). There may be a future time when wood residue products could be developed for private energy use as well as industrial use. Substitution of wood for non-renewable energy sources is identified as a need (LRMP, Chapter II, "Information Needs").

496 *COMMENT*: SPECIAL FIREWOOD-CUTTING AREAS SHOULD BE DESIGNATED FOR THE HANDICAPPED AND THE ELDERLY WITH SAFE, CLOSE ACCESS

Response· Designation of firewood cutting areas is outside the scope of the Forest Plan, but within administration of individual Ranger Districts. Ranger Districts on the Siskiyou National Forest periodically designate special areas for handicapped and elderly people

OTHERS

497 *COMMENT*: INVOLVE LOCAL RESIDENTS IN STAND-TENDING OPERATIONS

Response· This topic is outside the scope of Forest Plan decisions; however, nothing in the Forest Plan precludes the use of this proposal It has been and will continue to be considered as an administrative option in project level planning The land manager could adopt this proposal where it provides an optimum combination of environmental, economic, and social benefits.

498 *COMMENT*: TRAPPING AND ALL FORMS OF PREDATOR CONTROL SHOULD BE ELIMINATED.

Response: The Forest Service, like the public, offers suggestions on trapping seasons to the Oregon Department of Fish and Wildlife, and the California Department of Fish and Game. Petitions to eliminate trapping or modify regulations should be directed to those state agencies The Forest does no predator control (coyote, etc.). We occasionally do localized direct control of various rodent species where serious damage is occurring to conifer seedlings, but most animal damage control is preventative (such as vexar tubing to keep rodents away from seedlings).

499. *COMMENT*· BECAUSE OF ITS DETRIMENTAL IMPACT OF THE RESOURCE, THE FOREST SERVICE SHOULD TERMINATE THE CHINA PEAK TIMBER SALE AND DESIGNATE THE AREA NORTH AND EAST OF THE GRASSY KNOB WILDERNESS AND WEST OF THE SIXES SOUTH FORK SUPPLEMENTAL RESOURCE AREA AS THE CHINA PEAK SUPPLEMENTAL RESOURCE AREA. SINCE THAT SALE HAS NOT BEEN HARVESTED AND IS OWNED BY GREGORY TIMBER RESOURCES, INC , IT IS PRUDENT THAT GTR INC. OFFER TO RETURN THIS SALE WITHOUT CHANGE TO THE SISKIYOU NATIONAL FOREST

Response. Alternative S in the FEIS allocates this specific area to Management Areas 11 and 14 (Riparian and General Forest). Resource impacts have been evaluated several times the China Peak Timber Sale was planned, layed out, sold, and the road constructed under existing direction of the Mt Butler-Dry Creek

Land Use Plan (FEIS, 1976) and the site-specific Environmental Assessment (1981) for the sale This timber sale area was specifically addressed in the Congressional Record during preparation of the Oregon Wilderness Act of 1984 Provisions were installed by Congress to not jeopardize viability of this sale. The excluded area is not a "unique island effect" as it and other harvested private lands in the North Fork Dry Creek are outside the Wilderness boundary. The road constructed for the China Peak Timber Sale is one of the access routes to the newly created Wilderness, and offers a multiple-use benefit to the Forest visitor. The visual, soil, and water conflicts suggested for this area have been reassessed in terms of the new land management prescriptions and direction for the Elk/Sixes Planning Basin (Chapter IV, FEIS) and Appendix C (Grassy Knob).

500. *COMMENT*: MORE EMPHASIS SHOULD BE PLACED ON RESPONSES FROM PEOPLE THE PLAN WILL DIRECTLY AFFECT.

Response: All responses received have been review, considered, and recorded. Substantive comments contained in the responses to the DEIS and Proposed Forest Plan have been summarized in this Appendix K of the FEIS along with Forest Service's responsive statements

The public participation and involvement process does not provide for emphasizing public responses based upon the respondent's perceptions of the Plan's effects However, those directly affected are more likely to be actively involved than those who may not be directly affected

501. *COMMENT*: MORE ATTENTION NEEDS TO BE PAID TO PUBLIC RELATIONS AND PUBLIC INFORMATION INFORMATION WAS GOOD DURING THE FOREST FIRES, IT DOES NOT CONTINUE ON THE SAME BASIS FOR OTHER CRITICAL FOREST ACTIVITIES DURING THE YEAR. THERE SHOULD BE MORE COORDINATION OF FOREST ACTIVITIES WITH VARIOUS GOVERNING BODIES, SCHOOL BOARDS, COUNTY COMMISSIONERS AND CITY COUNCILS IN THE VARIOUS COMMUNITIES.

Response: Although the Forest does have a high profile public information program, and regularly uses brochures, radio, TV, and newspapers to tell the public about management issues and activities, more information can always can provided Intense public involvement in the Forest Planning process has occurred periodically since 1979. Public meetings, presentations to groups, news releases to the media, planning news letters, briefings, and meetings with interest groups, coordination with other agencies and individuals have occurred on a frequent and recurring basis. The Planning Team, resource specialists, District Rangers, and others have maintained an open-door policy, offering to discuss the Forest Plan, its process, and resource data with individuals and groups.

LIST OF RESPONDENTS

FEDERAL AGENCIES

US Department of Agriculture, Forest Service, Region 6, Forestry Sciences Laboratory
US Department of Energy
US Department of the Interior
US Environmental Protection Agency, Region 10

STATE AGENCIES AND ELECTED OFFICIALS

California Department of Planning and Research
California Regional Water Quality Control Board
Oregon House of Representatives, Bill Markham
Oregon House of Representatives, Walt Schroeder
Oregon Senate, Bill Bradbury
State of Oregon, Govennor Neil Goldschmidt

COUNTY AGENCIES

Coos County Board of Commissioners
Coos County Planning Department
Curry County Board of Commissioners
Curry/Josephine/Coos and Douglas Counties
Del Norte County Board of Supervisors
Josephine County Board of Commissioners
Linn County Board of Commissioners

INDIAN TRIBES

Tahana Whitecrow Foundation

CITY/MUNICIPAL GOVERNEMNTS

City of Brookings
City of Cave Junction
City of Glendale
City of Gold Beach
City of Grants Pass
City of Medford
City of Myrtle Point
City of North Bend
City of Port Orford
City of Powers
Port of Bandon
Port of Gold Beach
Illinois Valley Soil and Water Conservation District

BUSINESS AND INDUSTRY REPRESENTATIVES

Beaver State Sand and Gravel, Inc
Brauner Trucking, Inc
Broyles Lumber Co
C and D Lumber Co
Cardinal Trading, Ltd
Douglas Pacific Lumber Co
Douglas Timber Operators, Inc
Ellingson Lumber Co
Eugene F Burrill Lumber Co
Gebhardt's
Georgia-Pacific Corp
Gold Beach Plywood, Inc
Grayback Forestry Contracting, Inc
Gregory Forest Products, Inc.
H H Ketcham Timber Co
Hambro Forest Products, Inc.
Health Future Enterprises, Inc
Hi-ridge Lumber Co
Industrial Lumber Co , Inc
Mail Boat Hydro-Jets
McLininger and Sons, Inc
Medford Corp
Menasha Corp
Mountain Lumber Co , Inc
Pacific Lumber and Shipping Co
Pacific Power and Light Co
Pacific Southeast Forest Products
Prairie Wood Products
Roseburg Forest Products Co
Roseburg Paving Co
Sierra Forest Products
Sorenson and Adkin
South Coast Lumber Co
Teeco Corp
Timber and Wood Products Group
Tri-City Ready Mix, Inc
Tri-State Building Materials, Inc
Western Wood Products Assoc
Weyerhaeuser Co

ORGANIZATIONS

Agness School District No 4
Americal Fisheries Society
American Rivers
Associated Oregon Loggers, Inc
Association of O&C Counties
Audubon Society - Central Oregon
Audubon Society - Kalmiopsis
Audubon Society - Lane County
Audubon Society - Marble Mountain
Audubon Society - Mt Shasta
Audubon Society - New York City
Audubon Society - Siskiyou
Audubon Society - Western Region
Bandon School District
Breitenbush Retreat Center
Brookings-Harbor School District
Chamber of Commerce Bay Area
Chamber of Commerce Brookings-Harbor
Chamber of Commerce Coquille
Champer of Commerce Grants Pass/Josephine County
Chamber of Commerce Illinois Valley
Chamber of Commerce Medford/Jackson County
Chamber of Commerce Roseburg
Citizen's Task Force

Coos County School District
Coquille School District
Del Norte Taxpayers' League
Earth First! Siskiyou
Earth First! Upper Eel
Earth First! (WNETT)
Glendale School District
Gold Beach/Riley Creek School District
Gold Beach Union High School
Headwaters
Illinois Valley Grange
Independent Troll Fisherman of Oregon
Izaak Walton League
Josephine Forest Farm Association
Klamath Alliance for Resources and the Environment
Mazamas
Motorcycle Riders Association, Inc
Native Plant Society - Emerald
Native Plant Society - Northcoast
Native Plant Society - Siskiyou
Native Plant Society - Washington
Natural Resources Conservation Association - Deer Creek
Northwest Center for a Future
Northwest Forest Resource Council
Northwest Forestry Association
Northwest Mining Association
Northwest Rivers Council
Northwest Steelheaders Association
Northwest Timber Association
Obsidians, Inc
Ophil Elementary School
Oregon Environmental Council
Oregon Mr Longears Club
Oregon Trout
Pacific Fisheries Enhancement Corp
Pistol River School Board
Redwood Lions Club
Save the Redwoods League
Scenic Shoreline Preservation
Sierra Club - Oregon Rogue
Sierra Club - San Francisco Bay
Siskiyou County Office of Education
Siskiyou Mountains Resources Council
Society of American Foresters - Siskiyou
Southern Oregon Citizens Against Toxic Sprays
Southern Oregon Regional Economic Development, Inc
Southern Oregon Resource Alliance
Southern Oregon Timber Industries Association
The Nature Conservancy
The Wilderness Society
Takilma Community Association
The Oregon Rivers Council
Trinity Resource Action Council
Trout Unlimited of Oregon
Tualatin Dam Park Citizens League
Virginia 4-Wheel Drive Association
Wallowa Alliance
West Coast Alliance for Resources and the Environment
Western Forest Industries Association
Women's Oregon Trail Riders

INDIVIDUALS

Catherine Aal
Julia Abbott
Bruce Abel
Mildred Abell
Michelle Abernathy
Emil Abramouic
William Abrams
Ava Ackerman
Lupe Acosta
Ricky Acosta
Julian Adamaitis
Bart Adams
Don C Adams
Jerry & Karen Adams
Kathy Adams
Mitch W Adams
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Steve Adams
Roydon Ades
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Jennifer Affeldt
Valerie Agnew
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David Aikins
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D Jean Albertson
Jose Alcantar
Jacquoline Alden
Kory Aleshire
Dorothy Alexander
Robert T Alexander
Gary Allan
Matt Allbaugh
Dean Allen
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Wendy Allen
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Cathye A Allmer
Franklin L Alm
Michelle Alonzo
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Hussein J Amhaz
Jim Amos
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Becky Anders
Laurna Andersen
Betsy Anderson
Chaumcoy W Anderson
David Anderson
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Gregory Anderson
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Lorri Anderson
Mollie Anderson
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Ronnie W Anderson
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Tracey Anderson
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Evangeline Andreason
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Jane Andrews
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William H Anson
Fred Anthony

Gary Aasen
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Connie Abell
Robert S Abell
William Abernathy
Carla Abrams
Jovanka Acamovic
Sam Ackerman
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Wally Acosta
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Rene Aguilar
Natasha Aho
Karol Aimin
Michael Akers
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Faye Albertson
Michael Alcantaro
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Brett Alex
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Alme Allen
Delmar L Allen
Harriet Allen
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Rodney Leo Allen
Terilyn D Allendorf
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J Alroy
Alecia Altstaetter
Hector Alvarez
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Jacquelin M Ambrose
Ron Amelung Jr
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Joe Amicarella
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Betty Anderson
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Als Andren
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Jim Anglin
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Harold Anthony

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Robert L Abbott
Edward Abell
Kate Abelt
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Joshua Anderson
Leann Anderson
Lynne Anderson
O M Anderson
Robert Anderson
S Anderson
Stephania L Anderson
Walt & Rebecca Anderson
Paul S Andrade
Janeen Andrew
Edythe Andrews
Leonard Andrews
Ioakimides Andros
Anna D Anguiano
Edward Anselmi
Josephine Anstey
Talisa Anthony

Jane M Abatangelo
Stanley E Abbott
Elaine Abell
Nancy Abens
Joseph E Abner
Kendra Abrams
Sandra Acevedo
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Virginia Anthony

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Neilson Abeel Jr
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Keith Abernathy
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Rush Abrams
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Misty Barrett

Swami Prem Anudeva
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Geraldine Baldassarre
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Sidney Bales
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Nathan A Banry Sr
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S A Barber
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Gerald Barlow
Annette R Barnard
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Steven Barrett

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Alma J Batty
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Kathleen Bauer
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Barbara H Bean
Angie Beard
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M K Beatie
Philip R Bebout
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Karen Bedford
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Richard S Beeby
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Aaron Wood
David L Wood
Jeffrey P Wood
Kaya Wood
Louis A Wood
Norman D Wood
Robyn Wood
Wayne E Wood
Julie Wooden
William Woodruff
Roy Woods
Josh Woodward
Tim Wooley
Kevin Woolsey
Frank Word
Robert L Workman
Curtis Worsley
John Worthy
Charles Wrenel
Arlene Wright
Dale Wright
J Wright
Keitha M Wright
Shonna Wright
Willfred Wulk
Allan Wyatt
Grae Wyddn
Tim Wylder
Wiley Wynne
Donald Yacullo
Tonya Yarborough
Madie Yardley
Dannielle Yates
Andrew Yatsko
Michael Yeager
Wendy Yengst
Ronald S Yockim
Wayne D Yoesting
George York
Sherri Yost
Bert L Young

Brigg Young
Dale G Young
Donna Young
James A Young
Mark A Young
Sarah Young
Teresa Young
Jeanne Youngblood
Alice Youngermann
Norma Yovich
Gilbert A Zaccaro
Darvis Zakeri
Vincent Zanobelli
Edward Zaroskinski
Shelley Zaun
Dawn Zeglin
John M Zeleznir
Daniel Zellman
Mary Zeppler
S John Zia
Randall Zielinski
Delores A Zimmerman
R Dale Zimmerman
Kathleen Zimovan
Charles M Zipprodt
Patrick Zon
Matt B Zrebski
Marvin Zuber
Erik Zumalt
Steve Zuver

Chester Young
Dale L Young
Douglas Young
James F Young
Mike Young
Sonya Young
Tiffany Young
John Youngblood
Penelope Youngfeather
Nicolas B Yrajwen
Dawn Zachary
Catherine Zaler
Mark Zanoni
James F Zartler
Herb Zayat
Aaron Zeh
Kathrin S Zelinsky
Paul & Beth Zemtsett
Nardi Zermoglio
Jorene Ziebell
Jason Zilberbrand
Fred Zimmerman
Robert Zimmerman
Chris Zinchuck
Hans Zirgenbein
Katie Zonoff
Clynthia Zrinyi
Roxan Zuber
Leo Zupan
Roni Zwerling

Chris Young
Dan Young
Glenn Young
Kimberly Young
Philip T Young
Steven Young
Tim Young
Gail Youngelson
Milo Yount
Allen W Yunkherr
Jeanene Zagaseski
Rebecca Zamora
Suzi Zanoni
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Grayce Zbikowski
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Terry Zirk
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Cynthia K Zupfer
Warner Zwick

Christi Young
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Irene K Young
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Randall C Young
Susan Young
Tonia Young
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Robert Yourko
Constante M Yutuc Jr
Linda Zahradka
Chester Zanck
Mark Zapien
Leonard Zastera
Karl M Zearfoss
Cara Zeisloft
Mary F Zeller
Michael Zenner
Patricia A Zerwer
Steven Ziegler
John M Zimmerly
Joe Zimmerman
Tulia L Zimmerman
David Zinder
Adelaide Zivic
Carroll Clay Zosel
David Zuber
Shayn Zucker
Jim Zurcher
Tim Zwicky

Connie & Lon Young
Donald T Young
J F Young
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Ruth Young
Tanya Young
William R Young
W G Younger
John Yovich
Wilbert Zabel
Robert Zak
Estelle Zanck
Sally Zamowitz
Richard Zaun
Duane Zeckman
Laura Zeitlin
Tom Zeller
Alfred C Zenor
Sarah Zesmer
Andre Zielinski
Trudy Zimmerly
Ken Zimmerman
William Zimmerman
Scott Zink
Jennie Zollinger
Palmer Zottola
Jean L Zuber
Eddie Zuelke
Tony Zurlis
Janelle Zykan

AGENCY, ELECTED OFFICIAL AND INDIAN TRIBE RESPONSES

You can find copies of letters from agencies, elected officials and indian tribes on the following pages

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Tahana Whitecrow Foundation
P.O. Box 18181 • Salem, OR 97305

00284

December 3, 1987

Forest Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Dear Forest Supervisor:

We support Alternative M as a management plan alternative in protecting the Siskiyou National Forest. Your preferred alternative K does not do enough to sustain Southern Oregon's world class fish resources; more protection needs to be given to the Siskiyou's rivers, riparian areas and streamside lands. The North Kalmiopsis needs more protection for its long-term value for fisheries, water quality, recreation and wildlife in lieu of short-term profits from logging. As custodian of this region for the public, you need to protect the Siskiyou's fragile and priceless roadless area resources from logging and roadbuilding. The Preferred Alternative (K) is unacceptable because of the environmental damage which will be caused due to its extreme emphasis on logging. The annual cut needs to be lowered below your proposed 150 million board feet/year level.

The Forest Service needs to study creation of the Siskiyou National Park as an alternative in your final draft of the Forest Plan. The Park would provide the best and most complete protection for the beauty and health of this forest. It would also bring increased economic diversity and community stability and create many jobs. It would increase the region's ability to market its many attractions to tourists across the country. The idea deserves formal study and you and the Forest Service have a moral and legal duty to include this as an alternative in the Final Forest Plan.

The Forest Service has to utilize better forestry methods, logging systems and cutting strategies including:

a. less dependence upon roads which are like extensive strip mines causing erosion that chokes hatching salmon and steelhead;
b. more attention and study on the effects of slash burning; these cause health problems and are responsible for reducted visibility throughout the NW;
c. abandon plans to turn the Siskiyou's diverse forest ecosystem into a large industrial tree farm;
d. longer time periods between cutting cycles;
e. abandon clearcutting unless it is the most environmentally sound method;
f. develop and utilize more research into problems with regeneration and reforestation;

We ask that the Siskiyou's fish habitat and water resources receive much greater protection through the use of wider "Riparian Zones" in which logging is prohibited and stronger prohibitions on logging near fish-producing streams. We recommend you to recommend "Wild and Scenic River" status for the Chetco River and Elk river.

We ask the protection of scenic areas not be reduced from the current levels. We also ask for protection of the scenic areas seen from roads, trails, rivers and communities. We insist on the full protection of the "viewshed" seen from the entire Rogue and Illinois Rivers trails. We ask for protection of much larger amounts of old growth ecosystems and protection (full) of the old growth habitat around all known pairs of Spotted Owls. We ask full protection of all remaining, old, large Redwoods within Chetco Ranger District. We request that the Forest Service do a complete inventory of the Siskiyou's old growth forests and perform more basic research on the impacts of turning the old growth forests into tree farm plantations. We ask for greater protection of the Siskiyou's valuable trail system and recreation sites.

We do not want the Forest Service to build roads into the North Kalmiopsis Roadless Area, or log it by helicopters, following the Silver Fire. We oppose any road construction on Bald Mountain or Silver Peak. The trees are now much less valuable for lumber than before the fire while the environmental damage that logging would cause will be even greater after the fire than before. It simply doesn't make economic or environmental sense to salvage this forest-the land needs to be left alone to heal naturally, not further injured by logging.

Tahana Whitecrow

Melanie Smith, Executive Director

cc: Congressmen Bob Smith
Peter Defazio
Les AuCoin
Ron Wyden
Denny Smith
Senator Mark Hatfield
Senator Bob Packwood
file

02933

US ENVIRONMENTAL PROTECTION AGENCY
REGION 10
1200 SIXTH AVENUE
SEATTLE WASHINGTON 98101

SISKIYOU NAT'L FOREST
GRANTS PASS OREGON
DEC 28 1987
RECEIVED

REPLY TO ATTN OF: WD-136

Ronald J McCormick
Forest Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Dear Mr. McCormick

In accordance with our responsibilities under Section 309 of the Clean Air Act and the National Environmental Policy Act, we have reviewed the Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan (Plan) for the Siskiyou National Forest (SNF) The SNF is located near the coast in southwestern Oregon and includes 1,092,302 acres. The preferred alternative upon which the Plan is based provides for intensive timber management, wilderness, and special riparian areas. Designated wildlife habitat and supplemental resource areas are also emphasized Mineral exploration and development would be permitted.

Based on our review, we have rated the DEIS EC-2 (Environmental Concerns - Insufficient Information). Enclosed is an explanation of our EIS rating system. The primary reasons that we have environmental concerns are as follows

- The process for managing forest activities is not sufficiently explained so as to assure that adverse environmental effects, particularly to water quality, will be prevented We suggest more fully describing the management process of the SNF.

- Standards and Guidelines for water need to be more fully developed in the Final EIS/Plan, as does a water quality monitoring plan

The details of our comments are included in the enclosed review report. Several of the items identified in this review were discussed in the meeting we had with your staff on December 2, 1987. This interaction was very useful to us in becoming familiar with the issues and current management practices of the SNF.

We intend our comments to be constructive, and we are confident that by addressing our concerns and comments the SNF can present a Final EIS and Plan which more clearly show that important resources will be adequately protected, while providing SNF staff with the necessary flexibility to manage the forest on a day-to-day basis. While our comments are lengthy, we wish to acknowledge that certain components of the documents were particularly well done, such as the fisheries Standards and Guidelines and the fisheries monitoring plan.

Thank you for the opportunity to review the DEIS and Plan If you have any questions about our review, please contact Ann Uhrich of our Environmental Review Section at FTS 399-8516.

Sincerely,

for Robert S Burd
Director, Water Division

Enclosures

cc ODEQ
ODFW
USFS, R-1
USFS, R-4
USFS, R-6
USFWS, Portland
NMFS, Portland
BLM, Portland

U S ENVIRONMENTAL PROTECTION AGENCY
COMMENTS ON PROPOSED LAND AND RESOURCE MANAGEMENT PLAN
AND DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE
SISKIYOU NATIONAL FOREST, OREGON

GENERAL COMMENTS

Forest Management Process

One of the ways we assessed the environmental effects of the proposed alternative was how well the Siskiyou National Forest's (SNF) Draft Environmental Impact Statement (DEIS) and Plan described the forest management process By forest management process we mean those components which describe the "how to" of forest management with regard to protection of natural resources They can include the set of actions, decisions or data which are needed to comply with environmental standards prevent adverse effects, and improve existing environmental conditions Important components of the forest management process as we see them are described as follows

A data base of existing conditions from which technical experts and the public can judge the expected effects and level of uncertainty of the predictions

Best Management Practices (BMPs) and management area prescription development and implementation

Selection of BMPs for a particular activity and how uncertainty of BMP effectiveness is factored into selection and implementation

Through on-site inspection and administration during an activity, verifying that a particular activity is occurring as prescribed in contracts, leases or permits

Environmental monitoring before during, and after the completion of certain activities to determine whether impacts were accurately predicted

A feedback loop that is built into the process such that forest activities causing significant problems will be corrected before they are allowed to continue

Upgrading of BMPs or prescriptions to correct inaccurate predictions

The use of NEPA for project implementation

The DEIS and Plan describe the interrelationship between most of these components fairly well The decision flow diagram in the DEIS (p II-5) was especially helpful with regard to alternative development When and how BMPs are selected how uncertainty of BMP effectiveness is factored into the decision process and the commitment and role of on-site inspections in meeting standards and guidelines are components that need further explanation

Final decisions on site-specific projects will determine to a significant extent the adequacy of the level of protection provided for water quality and other resources The Final Plan should summarize or cite the criteria that will be used to determine when categorical exclusions, environmental assessments and environmental impact statements will be used in Plan implementation, especially with regard to assessing impacts to water quality and beneficial uses This would provide guidance and direction to Forest staff, and a general awareness of how these assessments will be used to interested and affected publics It would also strengthen the accountability of the Forest in implementing the Plan

Current Water Quality Status and Water Resources Inventory

The DEIS needs more information on the status of current water quality conditions There is a fish habitat map and some general discussion of beneficial uses by basin No specific information which describes the level of the use e g spawning and rearing, is presented by stream segment, though 27 key streams or reaches are mentioned (DEIS p III-111) There are *numerous assumptions about water quality conditions stated in the DEIS, but* little citation or summary of historical water quality data to back them up For example, several statements appear in both the DEIS and the Plan which indicate riparian areas and water quality are in good condition However, specific information or data summaries to support these general statements are not adequately presented We are confident they do exist and should either be presented or cited in the Final EIS

The Plan does provide a good start towards identifying a watershed inventory For instance the Forest has been divided into defined planning basins Beneficial uses by planning basin have been presented in Table III-12 of the DEIS Maps highlighting the location of uses such as fisheries and recreation are also provided However, tabular summaries of other key information by stream segments would be very helpful For example, refer to Attachment A

A complete watershed resource inventory summarizes facts, recorded measurements observations and other evidence which can be used to determine management objectives for rivers and streams Oregon's water quality standards and water quality management plans, for instance, were developed using inventory information An inventory is a key element needed for effective resource management The drainage objectives derived from the resource inventory then provide a means of evaluating the effectiveness of plan implementation The watershed resource inventory information for the Siskiyou should be better organized and strengthened to allow an adequate assessment of whether water quality goals are being achieved

Water Quality Standards Compliance

As you are aware, forest activities conducted in the Siskiyou National Forest must be consistent with Oregon's adopted Statewide Water Quality Management Plan This includes compliance with Oregon's Water Quality

Standards (WQS) and monitoring the effectiveness of achieving compliance The Plan does recognize, at various points, the importance of these considerations However there is no specific reference to OAR 340, Division 41 (Oregon's adopted Water Quality Standards), in the Standards and Guidelines Section of the Plan or in the Minimum Management Requirements (We do note that this is mentioned in the DEIS, p IV-230)

From information provided in the DEIS there is no real assurance that Oregon Water Quality Standards will consistently be met For instance, the DEIS mentions that anadromous fish spawning occurs in the Siskiyou National Forest It also states that there are 443,000 acres of old growth habitat (p II-72) This is about 40 percent of the Forest The location of the spawning areas relative to the old growth is not identified If harvest occurs in old growth areas which also support salmonid spawning, use of the streams could be adversely affected due to sedimentation (DEIS, p IV-76 to 81) This could constitute a violation of the antidegradation policy of Oregon's Water Quality Standards Another example is in basins 2 and 4 These have been identified as areas with sensitive uses where intensive harvest could occur Compliance with Oregon Water Quality Standards must be assured for specific stream segments

The FEIS should address compliance with the State's antidegradation policy This policy states that "where the existing quality of the water is better than the standards set, that such existing high quality will be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of such water and will not result in water quality less than that prescribed in the standard " This policy is reiterated in Federal regulations (40 CFR 131 13(a 2)) Many of the rivers in the Forest are high quality waters The FEIS should describe how Standards and Guidelines BMPs and other measures designed to minimize water quality impacts from Forest activities (e g , road construction timber harvest grazing mining, dam construction/operation), will ensure consistency with the antidegradation policy

The status of Outstanding National Resource Waters is conferred to rivers designated as Wild and Scenic For these waters, the antidegradation policy of the Water Quality Standards Regulations explicitly prohibits any lowering of water quality (40 CFR Section 130 12) The FEIS should discuss in detail how degradation of these waters will be prevented, given the mining, timber harvest and roading activities which may occur in some of the Forest's drainage basins containing or tributary to Wild and Scenic rivers

Water Quality Monitoring Plan

The water quality management discussions in both the DEIS and the Plan lack key information to evaluate potential effects on water quality For instance increases in sediment which affect fisheries are identified in the DEIS Yet little is presented, based on data which shows where this occurs

on the Forest Furthermore, no plan for monitoring future increases is presented or cited It makes it difficult to evaluate effects on water quality which would result from implementing the various options identified in the Plan Based on conversations with SNF staff, we understand that sedimentation has not been as critical a parameter as stream temperature with regard to fisheries on this Forest This fact needs to be discussed further in the Final EIS Is this true for spawning areas or rearing areas or both?

Achievement of drainage objectives, conservation practices and improvement projects can only be assessed by water quality monitoring and fishery habitat surveys The Plan does not identify a specific water quality monitoring program nor criteria for evaluating riparian areas (temperature, streambank erosion, etc) though Section V of the Plan references STORET as EPA's system for storing Siskiyou Forest water quality data A summary of the Forest's "Riparian Policy" would be helpful (It is currently only discussed in the DEIS, p II-9) Some general reference to fisheries monitoring is given in Table V-1 and a more detailed plan describing how it will be implemented is provided in Appendix O This is very useful

The Plan (p IV-39) and DEIS (p IV-230) recognize that approved "208" BMPs are a means to achieve and maintain WQS It should be emphasized that implementation of BMPs does not constitute compliance with WQS Measuring WQS compliance is accomplished through water quality monitoring programs Evaluating the effectiveness of meeting water quality standards on the SNF will be difficult without a monitoring plan which includes stream-specific references, water quality parameters, and sampling frequency We would support the recommendation to establish a multi-agency technical work group in Oregon to address these concerns and to assist the USFS in developing a water quality monitoring program tailored to individual forests

Domestic Water Supplies

Other beneficial uses of the water resource may be affected and need to be more thoroughly addressed in the Plan For example, there are several municipal watersheds in the Siskiyou National Forest (DEIS Table III-11) Are these unfiltered surface-water supplies? Under an EPA proposed rule as required by the 1986 amendments to the Safe Drinking Water Act, an agreement must be reached with the Forest Service that would allow the municipalities to have watershed control in order for them to continue to use these sources without filtration This is generally recognized in the DEIS (Appendix Volume II, J-6) However the proposed Plan does not provide a specific indication of how protection of these water supplies will be achieved

The DEIS (p IV-232) states that "State and Federal water quality criteria for suspended sediment and turbidity may not be met temporarily nor in some specific locations, (emphasis added) because of the difficulty in preventing all soil erosion from newly disturbed sites ' As previously noted, many of the Forest's streams are considered high quality waters which exceed State and Federal water quality criteria These waters must be maintained at existing high water quality levels Where water quality standards may not be met, management activities should be modified or rehabilitation efforts initiated to ensure compliance with water quality standards

5

Fisheries/Riparian Areas

Page III-101 of the DEIS states that "[w]ater temperatures in all nine major river systems of the Forest exceed optimum temperatures for salmonid[s] and in some cases, exceed upper lethal temperatures " Given the dependence on well-shaded tributary streams to provide cooler inflow to support salmonid survival in all of the Forest's river systems, we strongly recommend management of riparian areas (Management Area 11) under Minimum Level and Prescription C Although maintenance of water temperatures is projected under Prescription B the DEIS documents existing water temperature problems Water temperatures would be reduced and watershed conditions improved under Minimum Level and Prescription C (DEIS p II-47)

Air Quality

It is not clear how many cords of firewood are projected to be taken for personal use from the SNF each year over the first decade This needs to be identified in the FEIS as there is a potential for indirect effects on winter air quality in local urban communities via the firewood provided by the SNF There are also potential associated health effects

Forest land managers that provide firewood have a unique opportunity to educate the public regarding fuelwood use and air pollution through the permit process Pamphlets discussing the association between wood stoves air pollution, and health concerns or providing tips on efficient wood stove operation, for example could be distributed with fuelwood permits If appropriate literature is not readily available, we would be happy to provide examples that are being used elsewhere

Page III-97 of the DEIS states that the DEIS/Environmental Impact Report (DEIS/R) for the proposed Cal-Nickel Corporation's Gasquet Mountain mining project indicates no project-induced adverse air quality values in the Kalmiopsis Wilderness EPA Region 9's review of the DEIS/R indicated that the document was inadequate in addressing potential air and water quality impacts The conclusion that no adverse impacts to air quality will result from the mining project should not be made based on the DEIS/R

6

SPECIFIC COMMENTS

Land and Resource Management Plan

II-9 With regard to item number 8 EPA would be pleased to assist the Forest in developing a water quality monitoring methodology suited to your needs Please see Attachment B To assist with such an overall water quality management program we developed a water quality summary sheet A draft copy for the Siskiyou National Forest is enclosed for your information Please see Attachment A The intent is to identify a form for watershed resource inventories which could be used by EPA and the Forest Service to address water quality concerns Streams listed under "Drainage Objectives" only represent a starting point The Forest Service is encouraged to expand this list If you have any comments or questions please call Bruce Cleland in our Oregon Operations Office at FTS 423-3689

III-2 This is a good table which enhances the discussion

III-4 It is stated that "soil and water values are maintained by limiting site-disturbing activity in each watershed to no more than 9 to 13 percent of the area per decade " Is this in addition to the MMR level for water quality and riparian management which is discussed in the DEIS (p S-7)? Please clarify in the Final EIS

IV-1,2 These forest management goals are good, and are clearly stated

IV-13 The definition of terms is very useful and we commend its use With regard to the word "should," how will "unacceptable hardship or expense" be determined and by whom? Will timber sale contractors make this decision?

IV-14 The statement "the NEPA process must be followed to make a significant departure from the Standards and Guidelines" is confusing Please clarify in the Final EIS

IV-27 The Standards and Guidelines (S&G) for salmonid habitat are very good We strongly support coordination with the Oregon Department of Fish and Wildlife (ODFW) and suggest strengthening this Standard by stating that "basin plans shall be prepared "

IV-29 The S&G for range are good, but we believe that where conflicts occur, "management shall favor riparian areas" would be more appropriate

IV-29 Regarding number 4 under Timber Management does this refer to use of herbicides? Please clarify in the Final EIS

IV-36	In general, the S&G for soil and water are very good
IV-37	Regarding S&G number 7-6 It would seem that dropping the timber sale or some portion thereof would also be an option Providing examples of "appropriate mitigation measures" would be helpful Also when this situation occurs it should be a trigger for an increased level of monitoring in the vicinity
IV-40	Protection of domestic water supplies should be addressed under the S&G in the Final Plan In particular, areas of serpentine soils are a concern due to the potential for asbestos to enter the water
IV-47	What is meant by "electronic sites"?
IV-48	S&G under number 10-7 are very good We commend their use
IV-50	S&G under number 11-2 are also good
IV-58	EPA commends and supports the management area designations such as Supplemental Resource, Wilderness, Botanical Custodial, Retention Visual and Riparian which preclude or limit programmed timber harvest and roading activities We believe that water quality and fisheries will benefit from these designations on the SNF
IV-80	S&G under MA7-3 are good, however, the first paragraph does not indicate whether near maximum protection "shall" or "should" be provided (level of restriction is missing)
V-6	The outline of the monitoring and evaluation program (MEP) is good
V-11, D-16 17	How will Fish/Water MEP priorities be established?
V-12	Based on discussions with SNF staff, we understand that the annual cost of the MEP for Soil/Water shown in the Plan is not reflective of the entire budget allocated for BMP and water quality monitoring This should be discussed in the Plan, as the $3,000 figure would otherwise seem very low
V-14	Under MMBF Sold the threshold of concern is 30% less or greater than the planned ASQ (150 MMBF) for 2 consecutive years In either case, the threshold seems rather high How was this determined? Has the threshold compared to sustainable yield (180 MMBF) instead?
D-20	A description of how "project monitoring," etc will be implemented along the lines of the discussion on page D-16 would greatly strengthen this section of the Plan (F2 Soil/Water) Please refer to the General Comments under Water Quality Monitoring Plan

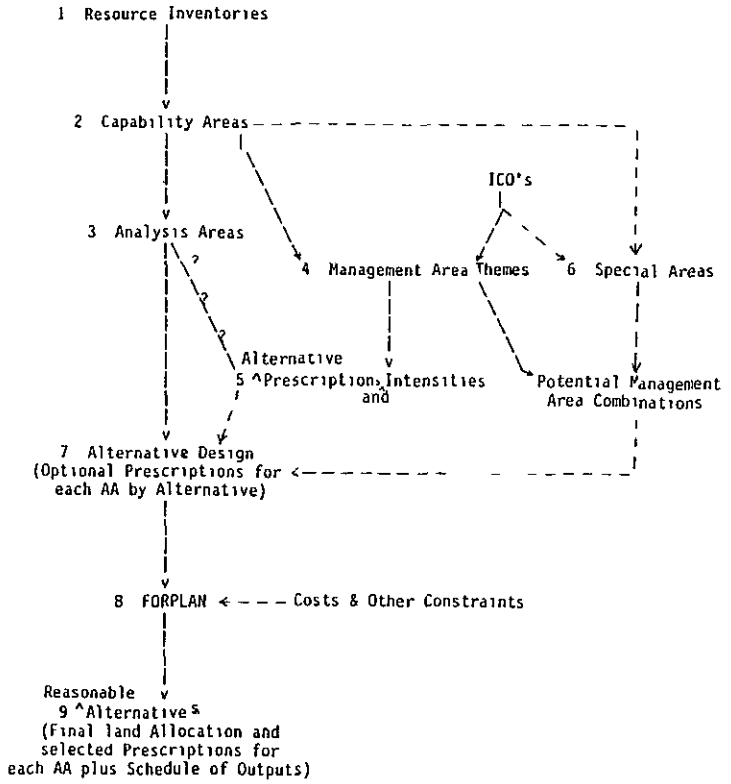


Figure II-1 Analysis Process During Alternative Development

8

Draft Environmental Impact Statement

S-9 We are pleased to see an alternative ("G") which emphasizes "the health and productivity of the Forest's water-related resources "

I-7 The scale of this map appears to be in error

II-3 through II-5 The discussion of the analysis process for developing reasonable alternatives was very useful Assuming the text is accurate, however, we would see the diagram looking a bit different (refer to Figure II-1, attached) Since *collections of Special Areas (6)* become the Management Areas, it would appear that what are generated in step (4) are really Management Area Strategies or Themes Also, we see nothing in the text linking step (3) with step (5)

II-8 We strongly support the use of Planning Basins and the Forest's effort to plan individual basin activities over space and time Please provide a *short description or citation* of the method used to determine that openings created by timber harvest be limited to 20% of the suitable land base per decade

II-23 The DEIS indicates that *herbicide use will be dealt with in separate* environmental analyses and NEPA documents at the Regional level We are concerned, however, that the programmatic EIS mentioned here may not be able to address specific cumulative impacts of herbicide use and other vegetation management activities within given basins on the SNF The Final EIS for the SNF should identify the process by which results of the programmatic EIS will be incorporated into the *Forest planning process, in order to ensure* that the environmental impacts of herbicide use and other forms of vegetation management activities are adequately assessed for the SNF

II-56 Soil and/or *sedimentation is not mentioned under Fish*, Soil, and Water This should be added in the Final EIS

II-126 It is stated that "fish habitat would be improved through land allocations that minimize soil disturbance and reduce summer water temperatures " However, on the previous page it is stated that under alternative K all planning basins except one would be under prescription B, with maintenance rather than reduction of water temperatures Please clarify

II-127 The discussion in the first paragraph is very good and bears repeating elsewhere in both documents *since the SRM areas are* essentially a special form of riparian management area

II-185 The table beginning on this page is different from that beginning on page 177 yet bears the same table number The table on *incremental* change is good but perhaps a bit difficult for the lay person For example, in order to compare planning problem #2 under alternative K to that under the no-change alternative requires 7 arithmetic calculations

9

II-213 Are natural sediment generation rates known for the Forest, or specific basins such that alterations could be compared to these rates as well as that of the Current Direction (A)? *This could be* important if sediment generation is currently very high relative to natural rates in the region If known, this should be included in the Final EIS

II-214 Figure II-21 seems to lack the "accompanying mitigation measures" discussed in the text above it

II-245 In the third paragraph, estimates of TSP production exceed the baseline value in six of the alternatives, not five

II-248 The subheading "Fish" is missing adjacent to the first full paragraph

II-249 *Application of Riparian Prescriptions B and C over entire* planning basins is very good We commend their use

II-260 The discussion of meadows is good A similar discussion for wetlands on the Forest *if any should be included in the Final EIS*

III-4 Comparing this figure with those on Pages I-7 and III-61 we note that planning basins 12 13, 14 16 and 17 are areas of very high precipitation and almost *all fall within the Chetco Ranger* District Comparing this information with other figures indicates that all have anadromous fisheries (p III-100) basins 12, 14, and 17 are still largely roadless (p III-34), basins 16 and 17 are especially sensitive with regard to erosion hazard (p III-65), and basins 13 and 16 have some of the highest densities of land tentatively suitable for timber (p III-87) The SNF could use this *information to emphasize the* Chetco Ranger District when developing and prioritizing its water quality monitoring plan for the Forest, as these are apparently basins in which land management activities have the potential to cause significant adverse effects

III-26 Are there major sand and gravel sources on the Forest? If so where? If not, what sources are used and are they sufficient for Forest needs?

III-59 The discussion of the Oregon nonpoint source inventory is good When you discuss conditions not exceeding "moderate in severity," *are you specifically referring to the Forest? Is natural* sediment production known for the Forest or similar areas in the region? What is the fate of sediment leaving the Forest? Does it accumulate at river mouths or elsewhere in the watershed? Does this have secondary impacts for harbors *such as the Coquille*?

III-60,61 Development and display of this information is very helpful to understanding water quality concerns on the Forest

10

III-65 We assume that by "regeneration" you generally refer to areas that have been harvested This should be clarified in the Final EIS

III-67 The last sentence on this page needs to be expanded upon For example, would "sufficient reason" be based on predictions that are based on past and future project monitoring, on modelling or on some other criterion? Does "significantly degraded " as used here, refer to exceedence of WQS?

III-110 With regard to Riparian Management, please add further discussion of the technical support for the assumption that 30 years will be required to fully realize the objective of Prescription C (2° F drop in temperature) Why would this only be applied to "basins where timber harvest already occurs"?

III-111 Under Habitat Maintenance, it would seem that harvest constraints of 9-13% per basin per decade would affect stream temperature as well as sediment and turbidity Also, how were the harvest constraints of 9-13% derived? For example was it a consensus process of managers and/or technical staff using best professional judgment, or some other methodology? A brief description and/or citation would be helpful and should be included in the Final EIS

IV-55 Regarding the term "moderate " does this definition imply that WQS would <u>not</u> be exceeded in this case? Regarding the tables following this page it would be good to present such tables based on natural sedimentation rates for the drainages (or at least one table with a Forest-wide average)

IV-64,65 The discussion beginning at the bottom of p IV-64 is excellent We endorse the use of basin-specific harvest constraints as appropriate

IV-76-IV-81 The discussion on these pages is also excellent We still have a question though with regard to how the terms "minor adverse" and "moderate adverse" relate to WQS Also, "moderate adverse" seems too high to allow for the Windruck basin under alternative K

IV-85 through IV-89 What land re-allocation allows the General Forest area to increase from 376 144 acres in alternative A to 470 818 acres in alternative K? Has this offset by allocating some of the Forest to Supplemental Resource areas? Pending the Forest's development of a water quality monitoring plan, we support the selection of alternative K as the preferred alternative at this point in time

IV-131 through IV-147 Under alternative K, if basins 2 4, 13, 15, 19, and 20 were managed under Riparian Prescription C, would this reduce the anticipated level of impact from "minor adverse" to "negligible"? In basins which are in a state of recovery or which have a large percentage of suitable lands with high erosion hazard due to roads and/or regeneration, we strongly recommend use of Prescription C

11

IV-232 Under Soils and Water, the DEIS indicates that BMPs S&Gs, and the Forest's MEP will more than offset any major or highly adverse soil and water impact In our view underlying assumptions are that the Forest will vigilantly implement these procedures and will receive a budget adequate to do so The Final EIS should discuss these or other assumptions, and how implementation would be affected by a reduced budget

IV-236 Under Soils and Water, the statement that 'no long-term effects to the water resource are known to occur from Forest management activities" appears to be used too broadly While this may be true given data based on current management practices it is surely in question with regard to past practices, as evidenced by the fact that certain drainage basins are presently in a state of "recovery " This issue should be clarified in the final EIS

01789

United States Department of the Interior

OFFICE OF ENVIRONMENTAL PROJECT REVIEW
500 N E MULTNOMAH STREET SUITE 1692
PORTLAND OREGON 97232

TAKE PRIDE IN AMERICA

SISKIYOU NAT'L FOREST GRANTS PASS OREGON JAN 19 19

January 14, 1988

ER 87/1155

Ron McCormick
Forest Supervisor
Siskiyou National Forest
P O Box 440
Grants Pass, Oregon 97526

Dear Mr McCormick

The Department of Interior has reviewed the Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan (PLRMP) for the Siskiyou National Forest. The following comments are provided for use and consideration when preparing the final documents

GENERAL COMMENTS

The DEIS and PLRMP are well written, providing a detailed analysis of each of 13 alternatives This effort has resulted in a clear, descriptive definition of the environmental impacts associated with each alternative.

Fish and Wildlife Resources

The analysis presented indicates Alternatives E, G and M would provide greater protection and development of fish and wildlife resources The Fish and Wildlife Service (FWS) favors these alternatives over the selected Alternative K The FWS also suggests that further consideration should be given to protecting stream habitat by establishing wider riparian zones where vegetation is preserved or managed for fish and/or wildlife.

An interagency agreement signed on December 1, 1987, by the Director of the FWS and the Chief of the Forest Service commits the Forest Service to ensure the continued existence of a well-distributed northern spotted owl population throughout its National Forest range Under the agreement, both agencies have agreed to coordinate efforts, including research and monitoring An annual progress report will be supplied to the FWS and the agreement provides for emergency action if a viable population is not maintained The final documents should refer to this interagency agreement The terms of the agreement should be reflected in relevant sections such as standards, guidelines and monitoring, of the final document

The general habitat diversity issue concentrates on spotted owls, woodpeckers, wildlife user days and acres of special areas This overlooks the very important issue of interspersion of habitats throughout the Forest and the resultant habitat diversity available for the rest of the wildlife community The minimum management requirements for created openings (eg 20 percent of the suitable land base to be harvested in a decade) does approach this subject, but the relationship to habitat diversity is vague Is this a threshold beyond which further harvest within a drainage is to be curtailed?

Is there a way to establish adequate interspersion of habitats to enable full utilization by species which require more than one type within a home range, or which require a particular edge habitat?

Through soil disturbance and removing sources of woody material from the riparian zone, salvage logging has the potential of having a severe adverse impact on fish habitat and might conflict with the objective of a Supplemental Resource Area established to protect critical fisheries habitat

Much of the discussion of fish habitat centers on stream shading to achieve desirable water temperatures. While this is an important consideration, and it may be more easily measured than some other factors, water quality, sedimentation and riparian vegetation are equally important. These factors are mentioned in the plan and EIS, but most of the analysis and prescriptions focus on shading Partial harvest within a riparian zone may maintain adequate shade, but still result in streambank disturbance, erosion of soil into the streams and destruction of riparian habitat so important to both fish and terrestrial wildlife

Threatened and Endangered Species

The following comments regarding listed threatened and endangered species are provided as part of informal consultation (1-7-88-I-24)

One bald eagle nesting territory is known in the Oregon portion of Siskiyou National Forest (Forest) A site specific bald eagle management plan should be prepared for the active pair Completion of a bald eagle management plan should be scheduled into the final plan

A significant amount of potential breeding and wintering habitat for bald eagle exists along the Rogue, Chetco, Illinois, Sixes and Coquille River drainages These areas have not been adequately surveyed for the presence of listed threatened and endangered species If bald eagle winter roosts or breeding habitat are present on the forest, special management considerations are often necessary Where the level of existing use by a species in the forest is not well known, as is commonly the case with bald eagle winter roosting habitat, adequate pre-project inventories are important The Forest should plan for completing necessary inventories to identify existing and suspected bald eagle use areas These activities should be incorporated into the final documents

The Pacific States Bald Eagle Recovery Plan has been finalized. This Recovery Plan identifies stable or increasing winter populations of bald eagles as one of its requirements before delisting can occur Therefore, it is important for the Forest to provide for long-term monitoring of known winter use areas Annual winter monitoring of bald eagle populations in key locations within the Forest should be included within the Forest's monitoring scheme (Proposed Land and Resource Management Plan, page V-10 and D-6) This monitoring effort should be part of a coordinated regional effort and is thus somewhat different from the peak use mid-winter count currently being coordinated with the Oregon Department of Fish and Wildlife A possible key monitoring route is the lower Rogue River from Watson Creek to the mouth Winter monitoring efforts should be coordinated with other monitoring efforts of the Oregon Department of Fish and Wildlife, Pacific Bald Eagle Working Team, and National Wildlife Federation

Regarding bald eagle recovery, five potential bald eagle territories or breeding habitat areas within the Forest have been identified by the Oregon State University Cooperative Wildlife Research Unit There is need for additional management consideration of

project effects on identified potential bald eagle territories and essential habitat elements, i e forage base, nesting habitat, perch availability, etc , on projects occurring within identified potential bald eagle breeding territories The suitability of essential habitat elements for bald eagles within identified potential territories should be maintained

The effect of timber management and other Forest management programs on potential bald eagle habitat is difficult to assess with the available information The FWS recommends that the Forest carefully coordinate any action which may affect potential nesting habitat with the Oregon Department of Fish and Wildlife, the FWS, and/or other persons with expertise and involvement with bald eagle recovery activities

Peregrine falcon recovery efforts in the Pacific Northwest are gaining momentum The recent discovery of nesting peregrine falcon on Forest lands is testament to these efforts. Previous informal consultations with the Forest on peregrine falcons have documented the need for long-term monitoring of active breeding pairs to determine primary use areas for management purposes The Forest appears to be aware of the need to coordinate and cooperate with Federal, State and private organizations involved in these recovery efforts In addition, there will be a need to monitor historic and potential eyries within forest boundaries Monitoring efforts should be clearly identified within a Resource Element for Peregrine Falcon in Appendix D of the Plan The importance and magnitude of the monitoring will increase over the next 10 years The FWS encourages the Forest to define additional management directions to promote the conservation of the peregrine falcon

Oregon Caves National Monument

Much of the area around the Oregon Caves National Monument and the access road appear to receive some environmental resource protection in terms of management prescriptions The only area not afforded some protection is along the southern boundary of the Monument which is to be managed as General Forest and which calls for "multiple-use development opportunities that are visually dominant on the characteristic landscape " A mix of management prescriptions on the east, north and west boundaries will provide mature old-growth habitat, quality fisheries, water, wildlife habitat and recreation opportunities, and multiple-use development opportunities not visibly evident to the casual visitor. While these prescriptions appear to afford some resource protection, we are particularly concerned regarding any activity in the upper watershed which could lead to landslide or otherwise impact the cave or other Monument resources or the chateau or chalet or other developments of the Monument

Another issue of concern, "viewshed," is at present a non-issue since all areas close to the Monument have been logged within the last 10 years. However, we encourage the Forest to consider the view from the Monument when a long range plan or an update to the current plan is prepared Land classifications adjacent to the Monument that are supportive of the Monument's land management objectives are supported by the National Park Service (NPS)

Cultural Resources

The cultural resource review that is usually conducted by the National Park Service was not performed for this Forest Plan Because of heavy priority work loads, the Interagency Archeological Services (IAS) Branch has been unable to review this document In the absence of the IAS review, we encourage the Forest to consider the comments of the State Historic Preservation Officer

National Wild and Scenic Rivers

The evaluation of the North Fork Smith and Chetco Rivers acknowledges the exceptional water quality, wildlife habitat, vegetation, scenic resources and fisheries on both rivers Both are actively used for a variety of recreational activities, as well as being notably free of impoundments, diversions, riprap, and other inappropriate development and, according to the Plan, both are easily managed as designated rivers Based on the evaluation of resource qualities, the North Fork Smith and Chetco Rivers seem to be excellent candidates for Wild and Scenic River designation

It appears that the negative recommendation was based solely on a subjective assessment of the need for designation Several of the suggested denigrating factors--the presence of designated rivers nearby, the lack of appeal for out-of-state visitors, and sufficient ecosystem representation elsewhere--are irrelevant to Wild and Scenic suitability The wilderness status of the upper watersheds of both rivers, a valid consideration in determining the most suitable way to protect the North Fork Smith and Chetco, seems a better indication of the appropriateness of designation than of unsuitability

In addition, the North Fork Smith should be given additional consideration for designation The Siskiyou National Forest contains roughly half the length of the North Fork Smith River of which the California portion is a component of both the State of California and National Wild and Scenic Rivers Systems Both the Forest Plan and the 1982 Nationwide Rivers Inventory concur that the Oregon portion of the North Fork Smith is eligible for National Wild and Scenic River System designation The Oregon portion could not be included in the 1981 designation of the California segment because the designation was requested by the Governor of California under the provisions of Section 2(a)(ii) of the Wild and Scenic Rivers Act, and there was no authority to include the Oregon portion Consequently, the river is divided on a political rather than a resource basis Nevertheless, the Forest Service is bound by the Wild and Scenic Rivers Act, particularly under Sections 7 and 12, to manage the undesignated portion in such a manner as to protect the values for which the downstream portions were designated This is particularly critical for those activities that might affect fisheries and water quality, the existing high quality of which are trademarks of the Smith River System

Based on the facts that the Oregon portion of the North Fork is eligible for the National Wild and Scenic River System, that a sizeable portion of the segment is already in wilderness, that the total river is now one of the most pristine components of the Smith River System and that the Wild and Scenic Rivers Act requires management consistent with maintaining downstream values, exclusion of the Oregon portion of the North Fork Smith from the National System does not seem appropriate

It appears that the Plan would authorize increases in timber harvest and road construction and the deterioration of scenic quality through reduction in Visual Quality Objectives in the corridors of the North Fork Smith and Chetco Rivers It is possible that these impacts would permanently preclude Wild and Scenic River designation of both rivers Therefore, we recommend that the North Fork Smith and Chetco Rivers be recommended for designation into the Wild and Scenic Rivers System or that the decision on potential designation be delayed until a full and accurate evaluation of suitability is conducted In the meantime, the North Fork Smith and Chetco Rivers should be managed as de facto Wild and Scenic Rivers

Mineral Resources

The Plan does acknowledge that the Forest lies in an important mineralized area of Oregon Missing, however, is any specific mention by mineral commodity as to current or estimated future exploration and development activity, except as contained in Chapter III of the DEIS The Plan should either reference this discussion or include an executive summary Minerals are treated only in very general terms and largely from the standpoint from areas withdrawn from mineral entry or where specific management considerations, such as RNA's, Botanical, Custodial, Special Habitat or Riparian considerations, will limit or require stipulations for approval of operating plans.

The Plan would be materially enhanced by inclusion of a map depicting the various Management Areas listed in Table III-9 (p III-12) together with areas of high, moderate, and low mineral potential as shown in Figure III-4 of the DEIS Such a map would aid both the Forest planner and Plan reviewer in visualizing the spatial relationship between the more than 25 percent of the Forest withdrawn from mineral entry and the affected mineral resources which may include Jurassic rocks containing chromite, copper, manganese, known gold, copper, mercury mining areas, placer streams, and nickel laterite deposits, to mention only a few

Although the report has a mineral potential map, it should be at the same scale as alternative maps and in color. Good examples are found in plans for the Kootenai National Forest, Montana, and the Okanogan National Forest, Washington Illustrations of mineral potential for each of the roadless areas are also needed

An alternative Evaluation Criteria for Nonenergy Minerals, such as that from the Wallowa Whitman National Forest, Oregon, would be useful, as would an alternative to the definition of access categories such as that from the Beaverhead National Forest, Montana

A list of current mineral withdrawals, acres involved, and mineral potential for locatable and leaseable minerals is needed The Los Padres National Forest, California, plan has a good example

A narrative section on definitions of mining exploration and development terms, what the operations involve, and the effects these activities have on the Forest is also needed The Beaverhead National Forest has a good example This would fit nicely in the appendices

SPECIFIC COMMENTS

DEIS

Page III-39 first paragraph, third sentence The acreages allocated to roadless management should be listed for each alternative mentioned in the final document

Page III-111 last paragraph The capital investments discussed in this paragraph need to be specifically defined

Page III-113 Table III-29 Species indicative of tributary streams and wet meadows should be added to these tables in the final document

Page III-124 fifth paragraph It is not clear whether the acreages of old growth proposed for preservation are sufficient or that they will be preserved The final document should

1) clearly state how much wildlife needs to be preserved and 2) clearly describe how much will be preserved, where and how

Page III-124 sixth paragraph The final document should be expanded to include old growth as an essential habitat

Page III-125, Bald eagle and American Osprey Management direction for the bald eagle on the Forest should include improving searches for existing winter habitat The Pacific Bald Eagle Recovery Plan has been finalized and published

Page IV-25 Table IV-5 is excellent, however, the Bureau of Mines suggests a modification of this as shown in attachment 1, using percentages rather than acreages It maybe easier to envision the comparison and comprehend the effects each alternative may have on mineral resources

The potential classification consists of five parts, with a range from high potential to very low potential based on current knowledge The availability classification consists of four categories, including withdrawn, specific legal protection measures, special management conditions, and standard operating conditions

The visual comparison of the effect of the alternatives on minerals on page IV-26 is excellent, as was the discussion of how minerals fare under each of the alternatives

Page IV-45 last paragraph The specific improvements for fish and wildlife should be identified as to what will be done, when, where, and by whom in the final document

Page IV-149, Wildlife The analysis of impacts to elk habitat and populations is surprisingly short A major assumption is made that timber harvest benefits elk by providing additional forage Much of the literature indicates that the quantity of forage is rarely limiting to elk in western Oregon Other factors which have been shown to be important. road densities, thermal cover, forage quality, old growth stands (called "optimal cover" by some), are mentioned in the discussion, but are apparently not given much weight.

Page IV-229. The Medford District of the Bureau of Land Management (BLM) has identified several areas where the Siskiyou National Forest's visual resource objectives, under some alternatives, conflict with BLM's objectives Specifically, along the road from Agnes to Bear Camp, the BLM is managing this area for intensive forestry and the Forest has identified this area for partial retention and retention There is also a similar conflict with visual objectives along Highway 42 near Cave Junction The BLM's visual objectives are less restrictive than the Forest's in this area

The BLM has begun to develop its plans for the 1990's for its lands adjoining the Forest in Oregon The Forest should consider preserving options for managing spotted owl habitats centered on adjacent BLM lands (or vice versa) which would require joint agency management, so that those options might be addressed in the BLM planning effort

BLM's Coos Bay District has received a nomination to designate the Hunter Creek Bog area (portions of sections 13 and 24, T 37 S , R 14 W , W M) as a Research Natural Area This nomination is based on the diversity of plant species occurring in the area Many of the same species occur on adjacent Forest Service lands in Sections 18 and 19 T 37 S , R 13 W Several of the species identified are State-listed sensitive species

Page IV-247, fourth paragraph The paragraph should be updated to include the presence of peregrine falcon on the Forest

Appendix F The following Federal candidate species should be added to the list of plants Gentiana bisetaea and Horkelia hendersonii.

PROPOSED LAND AND RESOURCE MANAGEMENT PLAN

Page IV-2 The Plan should include an explanation of how Forest Management Goal No 18 will be implemented consistent with agency-wide mineral policy particularly with regard to consideration of the importance of minerals in multiple use management of the Forest when dealing with actions that may further restrict areas open and available for mineral entry and development (location, leasing, and sales)

Page IV-6 Table IV-1 does not include an estimate of mineral outputs Considering the level of mineral development and exploration within and adjacent to the Forest, this appears to be an important omission

Page IV-21 third paragraph, Informal consultation Informal consultation with the FWS is advisable whenever the Forest determines there is a question of effect or determines if a Forest action "may affect" any Federally-listed threatened or endangered species A brief summary of consultation requirements with the FWS and outline of Forest Service threatened and endangered species review process would be helpful at the beginning of Section 4-2, page IV-21 An alternative would be to cite another document or provide a cross-reference if this information is provided elsewhere

Page IV-22, Bald eagle nesting sites Bald eagle primary and secondary zones should be established by actual use observations and site-specific information Secondary zones should reflect local physiographic conditions and site-specific information The Forest should develop a site-specific bald eagle management plan within 1 or 2 years

Page IV-22, Bald eagle winter habitat Section 4-4 should be expanded to include consideration for identification and conservation of bald eagle winter habitat

Page IV-23, Peregrine falcon The status of peregrine falcons on the Forest should be updated in the Plan

Pages IV-28 and V-3 The Forest should check with the National Marine Fisheries Service to determine if notification is desired of any mineral development that would affect anadromous fish habitat

IV-27 last paragraph It is not clear whether the snag retention policy discussed will adequately maintain self-sustaining populations of cavity nesting species This should be clarified

Page IV-29 Within the PLRMP, under Forest-wide Standard and Guidelines, it appears that precommercial thinning should be included as part of 6-1 Timber Management.

Page IV-83 first paragraph, last sentence Total acres available are stated to be 153,400 while on page III-9 it says 181,000 acres will be maintained in old growth for the same species discussed This apparent discrepancy should be resolved in the final document

Page V-10, Table V-1, Bald eagle Bald eagle productivity should be reviewed annually Bald eagle winter populations should be monitored for stable populations over a 5-year

period Management plans for potential and known bald eagle habitat on the Forest should be prepared

Page V-10, Table V-1, Sensitive plants. The 10 percent identified threshold of concern does not appear to be consistent with the 20 percent threshold of concern identified on page D-8

Page V-10, Table V-1, Peregrine falcon Monitoring needs for active and potential peregrine falcon sites should be identified

Appendix D A Resource Element should be established for peregrine falcon

SUMMARY COMMENTS

Based upon available information, the preferred alternative appears to have incorporated adequate programmatic guidance to ensure compliance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended (the Act) In conformance with the intent of Section 7(a)(1) of the Act, the FWS encourages the Forest to develop and implement conservation measures which will promote the recovery of listed species Should the Forest determine an action may affect a listed species, it is required to initiate consultation with the FWS.

Thank you for the opportunity to comment on your Proposed Plan and Draft EIS

Sincerely,

Charles S Polityka
Regional Environmental Officer

Attachment

01023

Department of Energy
Bonneville Power Administration
PO Box 3621
Portland Oregon 97208 3621

January 21, 1988

In reply refer to: AJ

Mr Ron McCormick, Forest Supervisor
Siskiyou National Forest
USDA Forest Service
P O. Box 440
Grants Pass, Oregon 97526

Dear Mr. McCormick

Bonneville Power Administration has reviewed the Draft Environmental Impact Statement (DEIS) on the Proposed Land and Resource Management Plan for the Siskiyou National Forest, and we offer the following comments

1. No Bonneville facilities are located or planned on the Siskiyou National Forest.

2 Although the EIS does address energy transmission corridors, it does not mention the long-range planning corridor that would connect the electrical transmission system near Murphy and Wilderville to the system near Agness and Gold Beach. This corridor, which provides a future corridor option across the Coast Range in southwestern Oregon, is listed in the 1980 Western Regional Corridor Study. The Study was prepared by the Western Utility Group and copies were provided to the National Forests We suggest that you refer to the Study for corridor information Also, we recommend that you include a map in the EIS showing the above-mentioned future corridor along with the existing corridors that were mentioned in the draft EIS

3. To be consistent with the treatment of energy corridors in other Forest Service EIS's, your EIS should establish corridor standards for management areas, specifically identifying corridor avoidance and exclusion areas The EIS and plan should address the impacts, if any, of the EIS alternatives on existing and planned energy transmission corridors

Celebrating the U S Constitution Bicentennial — 1787 1987

Attachment 1

		Non-energy Mineral Potential Category (MPC)[1]					Energy Mineral Potential Category (MPC)				
		I	II	III	IV	V	I	II	III	IV	V
Total acres of potential		579,789	425,032	1,142,700	0	0	216,257	376,288	1,382,040	173,036	0
	Access Category[2]	Percent of total acres of each MPC affected					Percent of total acres of each MPC affected				
Alt. 1	A	12	16	17	0	0	0	0	16	58	0
	B	27	2	4	0	0	1	4	12	7	0
	C	8	2	4	0	0	0	0	8	1	0
	D	53	80	75	0	0	99	95	6	34	0
Alt. 2	A	0	0	16	0	0	0	0	6	58	0
	B	16	2	3	0	0	2	5	8	1	0
	C	29	45	42	0	0	54	58	34	17	0
	D	55	52	40	0	0	45	36	52	23	0

[1]See attachment 2, from DEIS, Wallowa-Whitman National Forest, Oregon.
[2]See attachment 3, from DEIS, Beaverhead National Forest, Montana.

We appreciate having the opportunity to review the draft EIS. If you need further information on energy transmission corridors, please contact Mr John Hooson, Facilities Planning Branch, Office of Engineering, 503-230-3299 (FTS 429-3299).

Sincerely,

Anthony R. Morrell
Assistant to the Administrator for Environment

cc
Bob Sipe - USFS R-6, Portland
John Cheek - PP&L, Portland

00121

United States Department of Agriculture | Forest Service | Pacific Northwest Research Station | Forestry Sciences Laboratory 3200 SW Jefferson Way Corvallis, OR 97331

Reply to: 1920 Land and Management Resource Planning Date: November 12, 1987

Subject: Siskiyou National Forest Plan

Ron McCormick, Forest Supervisor

I have recently finished reviewing the Siskyou National Forest plan, concentrating on the treatment of Research Natural Areas (RNAs) In general, I was very pleased with how they were dealt with I do have some comments to make and will deal with each document separately.

LAND MANAGEMENT PLAN

p II-9. I am interested in your list of research needs for the forest In looking them over I can see that RNAs will play an important role in providing research field sites and in providing baseline information This section may not be the appropriate place, but I would like to see some mention of the role of RNAs in relation to the identified research needs

p IV-70 The section on standards and guidelines is generally very complete Under management goals I think it would be good to mention the role RNAs can play in monitoring the forest plan

p IV-71 In the section on lands I am in disagreement with your statement on roads The plan states that right-of-way grants for roads will be denied unless no other access is available The FSM states (4063.3 6) "Do not permit roads, fences, or signs on an established research natural area unless they contribute to the objectives or to the protection of the area." The statement in the plan seems to leave the door ajar for road building, this makes me nervous and seems to run counter to the manual intent

Appendix C In listing the timber sale plans for the coming decades it is very difficult, in fact impossible, to tell if any of them conflict with the established or proposed RNAs. My concern is not so much that there is a sale within an RNA, but the effects adjacent timber sales might have on the integrity of the RNAs I realize this is not something that can be dealt with in the plan, but I certainly hope that future timber sale planning will take into account the management of RNAs I look forward to working with the forest and the districts on this.

Appendix E-5. Under ORV closures only the established RNAs are listed I think the proposed RNAs ought to be listed as well This is consistent with the Regional Forester's direction that "candidate areas being seriously considered should be protected from uses which would negate their suitability for RNA designation".

DRAFT ENVIRONMENTAL IMPACT STATEMENT

S-13 The summary statement implies that the alternatives that include all four proposed RNAs will include representatives of all plant communities on the Siskiyou National Forest. This is not correct. There are a number of plant communities that are not included in established or proposed RNAs. It would be more accurate to say that "RNAs will include many representatives " Further on in the DEIS (p III-79) mention is made of the fact that more RNAs are needed to fill unfilled cell needs on the Siskiyou Forest This is good.

APPENDICES

I really have no comments on the appendices The coverage of the established and proposed RNAs is adequate

In summary I have very few problems with how the Siskiyou National Forest has dealt with RNAs I think the RNA program, its objectives and needs, have been well covered. I support the inclusion of all established and proposed RNAs in the forest plan alternative. I look forward to ongoing cooperation with the forest as we begin to work on the establishment records and land management plans

/s/ Sarah Greene

SARAH E GREENE
Research Natural Area Scientist
Pacific Northwest Region

cc.
Tom Atzet

03336

NEIL GOLDSCHMIDT
GOVERNOR

OFFICE OF THE GOVERNOR
STATE CAPITOL
SALEM OREGON 97310 1347

January 25, 1988

Ron McCormick
Forest Supervisor
Siskiyou National Forest
Grants Pass, OR 97526

Dear Mr McCormick

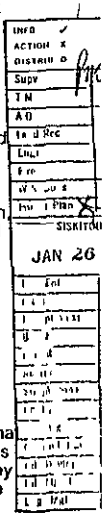
Active participation in federal forest planning is a high priority for all Oregonians It is essential that the hopes, needs and ideas of Oregonians be incorporated into these important resource plans In that context, this letter provides the State of Oregon's comments on the Siskiyou National Forest Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan (LRMP)

It is imperative to the State of Oregon that all federal land management plans be environmentally sound and provide stable, predictable supplies of commodities and amenities The state depends upon the Siskiyou National Forest for resources critical to Oregon's economy and environment

These lands provide a significant share of the employment in Coos, Curry, Jackson and Josephine counties through their impact on the timber, mining recreation, and fishing industries, and much of the revenues accruing to these counties is derived from use of Forest resources The importance of federal timber receipts to the maintenance of sound school and road programs in these counties cannot be overstated

In addition, the Forest contains critical watersheds and big game habitats, anadromous fish streams, spectacular Wilderness areas and the scenic Rogue River corridor, and is the home to a multitude of wildlife species

The State's objectives for the management of the Siskiyou National Forest are twofold 1) that these lands be managed in an environmentally sound manner so that future generations have the same opportunities we do to enjoy the bounty the lands can provide, and 2) that these lands produce the flow of economic benefits that they have traditionally provided Our comments here focus on evaluating your resource management planning from these perspectives



All affected State agencies have reviewed the DEIS and LRMP In addition, we held public meetings in Grants Pass and Gold Beach to hear, from the public, what issues relative to the proposed Plan were of special interest This letter and the detailed agency attachments highlight the State of Oregon's questions, concerns, and recommendations on these documents Please consider them in development of your Final Environmental Statement

Before sending this letter and the detailed agency comments to you, we made them available for public review Many letters urged the State to take positions on various issues Other letters suggested improvements in our draft As a result, we have made significant changes and/or additions to our discussions of "short rotations", proposals for a Siskiyou National Park, compliance with the Coastal Zone Management Act, mineral exploration and the importance of forest receipts to county revenues Several other changes have also been made

We wish to compliment the Siskiyou National Forest on an informative and technically well-written DEIS and LRMP While these documents are the bulkiest we have reviewed for a national forest so far, their size is *justified by the data, maps,* and disclosures they contain The small scale management area and resource distribution maps proved especially helpful to our State agencies Unfortunately, these documents will still be extraordinarily difficult for lay people to understand which further increases the importance of the State effort as an outside evaluator of your effort

With your help, we plan to construct our own State alternative for your Forest We had hoped to do this during the comment period, but information needs that still exist *prevent our constructing a State alternative yet* We still plan to construct the State alternative, though, and view this letter as a vehicle to help you understand our difficulties with your analysis and the additional data about your Forest we feel we need

The rest of this letter highlights our major information needs In outlining these requests, we wish to emphasize that we hope to work with you in a cooperative manner to obtain them Both the Federal Plans Coordinator and the agency contacts mentioned on the attached list are willing to discuss these comments further and meet with you to explain our suggestions for clarification and improvement and clear up any misunderstandings that we *may have*

Our comments on your Plan are organized into five main sections A) development of alternatives, B) estimation of resource effects, C) estimation of economic effects, D) fire salvage, and E) other considerations

A. Development of Alternatives

We are concerned that your development of alternatives may be unduly restrictive and may overemphasize the conflicts between commodities, amenities and environmental effects more than need be We feel that a wider range of choices should be examined Toward that end, we suggest three major areas in which we wish you to widen your range of choices 1) timber management intensification, 2) control of timber harvest by watershed, and 3) provision of big game habitat In addition, as we discuss below, we believe that you should consider the environmental and economic effects associated with the land allocations commonly suggested by people who advocate a "National Park" for parts of your Forest Finally, we discuss the need for the DEIS to acknowledge the mandates of the Coastal Zone Management Act and to address possible land exchanges with the State to consolidate ownerships

1 Management Intensification

The harvest schedule for the Siskiyou National Forest displays the characteristics of *a "deficit timber inventory" in which the nondeclining yield harvest* level starts below the long run sustained yield of the forest Moving that starting harvest level toward long run sustained yield requires either increased growth on existing merchantable timber stands or earlier availability of young stands that now exist and that will be created when the existing timber is harvested The Forest should look at two ways in which this increased harvest level might be achieved a) shortening rotation length in existing young stands and b) applying fertilizer to existing and future stands

a Rotation length

All alternatives except D1 require stands to achieve 95 percent of culmination of mean annual increment (maximum average growth) before harvest On the Siskiyou, this requirement means that most stands cannot be harvested until they reach 90-100 years of age Alternative D1 releases that restriction and allows harvest to occur when the stands achieve an age of 70-80 years Allowing these shorter rotations, which would begin 40-50 years from now, would allow a 10-12 percent increase in timber harvest

When shorter rotations are allowed across all planning periods, as is done in *alternative D1, the long term sustained yield for the Forest* declines as stands are continually harvested at rotations short of maximum average growth The critical period during which these harvests are needed occurs 50-70 years in the future when the plantations that now exist are cut for the first time Rather than plan to apply 70-80 year rotations perpetually to the forest, with the resulting decline in long term sustained yield, you should develop an alternative in which they are applied only to initial harvest of existing plantations This latter approach could enable an immediate increase in the nondeclining harvest without any falldown in long term sustained yield Please see the comments of the Oregon State Forestry Department(OSFD) and the Economic Development Department(EDD) for more discussion of this issue

We realize that legal questions may be raised by this suggestion The National Forest Management Act(NFMA) states " assure that all even-aged stands scheduled to be harvested during the planning period will generally have reached the culmination of mean annual increment of growth" and " exceptions to these standards are permitted for removing particular species of trees, after consideration has been given to the multiple uses of the area being planned and after completion of the public participation process applicable to the preparation of a forest plan " You should examine whether our suggestion above that you consider a shorter cutting age for existing plantations is legal under NFMA

b Fertilization

Your preferred alternative allows numerous timber management practices to increase timber yield including release, precommercial thinning, and commercial thinning Fertilization is not among them Our discussions with you suggest that you believe stand fertilization would increase stand growth but that little of this increase would translate into increased harvest now because of the peculiarities of your particular timber schedule You should reevaluate this conclusion while paying particular attention to fertilization of existing stands Fertilization of 60-90 year old stands, as often done by the forest industry, could payoff in the near future Fertilization of plantations, combined with the shorter rotations discussed above, could help alleviate your deficit inventory difficulties You should consider fertilization on these stands, and also on future stands, with and without commercial thinning

2 Controlling Timber Harvest by Planning Unit

Fundamental to your analysis is the division of the Forest into 19 planning units which roughly follow watershed boundaries We applaud this geographic resolution and your use of it to portray the outputs and environmental effects associated with each alternative It goes a long way to making your proposal comprehensible to the public by enabling them to understand the implications of the plan for each watershed We wish however, that you would indicate the location of these planning units on your alternative maps, thus making them even more visible

Controlling activity rates, such as final harvest, in these watersheds is part of this approach Doing so ensures that the harvest and associated roadbuilding, will not concentrate in a particular watershed in some period beyond acceptable limits

Your approach focuses on controlling the acres of clearcutting per period by watershed, with a harvest limit per period of 9-13 percent of the available acres allowed in the preferred alternative More than any other restrictions, these "dispersion constraints" may control the possibility of increases in the timber harvest level We have some difficulty understanding both the rationale for setting these restrictions at the particular level chosen in the preferred alternative and also the benefits and costs of levels different from the ones chosen You should explain

your rationale and also portray the implications for the preferred alternative if the harvest limits are raised or lowered We are especially interested in your display of the level at which the constraints move from distributing the harvest among watersheds to controlling the overall harvest level Because of the central role that these constraints play in your analysis, and their impact on the ability of management intensification to increase timber harvest, we feel that a full understanding of the implications of setting them at different levels must come before we can develop a State alternative

3 Big Game Habitat

We are concerned that big game numbers appear to decrease under alternatives The Oregon Department of Fish and Wildlife (ODFW) believes that this decrease can be mitigated by increasing the production and distribution of quality forage and cover Toward that end, ODFW suggests that the forest seed and fertilize 1000 acres of well-distributed clearcuts per year for big game forage, while reducing the number of trees planted on these sites to prolong production of quality forage In addition ODFW suggests that the Forest establish permanent forage sites, five to ten acres in size, at a rate of 100 acres per year These sites would then be managed as meadows with desirable forage species planted and fertilizer periodically applied Finally ODFW suggests that timber stands adjacent to the forage areas be treated to provide cover for the foraging animals We request that your analysis include these suggestions so that we can assess the benefits and costs, including any timber yield effects, of their adoption

4 Proposals for a Siskiyou National Park

Numerous proposals have been made to establish a new national park centered on major portions of the Siskiyou National Forest The State will not take a position on these park proposals until completion of the forest plans and we feel that the forest planning process is the appropriate vehicle in which to consider the environmental and economic effects of the land allocations associated with these proposals We realize that some alternatives, such as Alternative M and Alternative E, already address this issue, but you should ensure that you systematically cover the land allocations associated with all reasonable proposals Without such an analysis, you may not meet the requirement of the National Environmental Policy Act that requires you to consider all reasonable alternatives

5 Compliance with the Coastal Zone Management Act

We could not locate in the DEIS and LRMP recognition that portions of the Siskiyou National Forest are located in Oregon's coastal zone and therefore are subject to the requirements of the federal Coastal Zone Management Act

The Siskiyou National Forest needs to identify the Land Conservation and Development Commission as Oregon's coastal zone agency and its role in administering the requirements of the federal consistency process Under this process, all federally conducted or supported activities (including development projects) directly affecting Oregon's coastal zone must be consistent to the maximum extent practicable with the mandatory, enforceable policies of the state's coastal zone program In Oregon, such policies consist of the adopted statewide planning goals, acknowledged city and county comprehensive plans and the statutory authorities and regulations of relevant state agencies See the Land Conservation and Development Department's comments for more details

6 Land Exchange

The State Land Board owns many parcels of land in and around the Siskiyou National Forest Many are geographically isolated from other state-owned forest lands making them difficult to manage efficiently In addition as discussed in the comments of the Division of State Lands, some of these areas border proposed botanical areas, supplemental resource areas or other areas of special environmental significance

The national forest planning process offers a unique opportunity for the State and the Forest Service to consolidate their land holdings Legislation enacted in the 1987-1989 session of the Oregon Legislative Assembly authorizes the Division of State Lands to dispose of isolated sections and fragments of state lands that are not suitable for management by the State Land Board Acting on behalf of the Land Board the Division is identifying scattered and isolated parcels in and near the national forests for possible sale or exchange

Your LRMP recognizes land ownership adjustment as a tool that can be used to support its management goals We request that you work with the Division of State Lands to assess whether mutually beneficial land exchanges can be made Toward that end, please see the detailed comments of State Lands and especially some proposed changes there in the wording of your DEIS and LRMP that might facilitate this process

B Resource Effects

The State agencies feel that you have done a credible job, in general, in estimating the effects of your activities on various resources The standards and guidelines in the LRMP are clearer and more objective than in any other forest plans we have received A number of questions and information needs remain, however, before we can develop a State alternative

We highlight here some of our major information needs relative to resource effects More detailed discussions about them can be found in agency comments, especially those of OSFD, ODFW, Water Resources Department, Department of Environmental Quality (DEQ) and the Natural Heritage Advisory Council addition to the comments by Division of State Lands Our discussion here is divided into seven parts 1) minimum management requirements, 2) timber, 3) fish and wildlife, 4) stream flow, 5) water and air quality, 6) roadless areas, and 7) rare plants

1 Minimum Management Requirements

All choices for managing the Forest must embody standards and practices to ensure basic protection of the environment such as maintenance of air quality, water quality, and the diversity of plants, animals, and ecosystems In fact, we rely on your setting of these requirements to ensure that any forest planning alternative will not deprive future generations of their rightful share of the commodities and amenities that your Forest can provide

You use "minimum management requirements" to disclose this baseline level of environmental protection, and, as you know, few aspects of national forest planning have generated more controversy In part because of this controversy, the requirements are still somewhat unsettled since both the Final Environmental Statement for the Northern Spotted Owl and a policy paper on development of minimum management requirements from the Secretary of Agriculture are due out soon

One of the major criticisms about the setting of these requirements is that they were done without public involvement Your "Sensitivity Analysis for Minimum Management Requirements (Appendix J)" is a major step toward alleviating this criticism We feel, however, that it should go further Specifically, we believe that you should more systematically demonstrate that you have examined the possible ways of meeting each management requirement and have selected an efficient method of doing so given the objectives and constraints of the preferred alternative Your analysis on the amount of old growth habitat compares designated vs managed habitat in the manner suggested here You should extend this analysis to your other requirements

2 Timber

The starting timber inventory and the yield projections for existing and future stands form the basis of any estimate of the sustainable timber harvest level Yet my staff had significant difficulty understanding how your modeling assumptions affected these key components Specifically, we would like to know 1) how the acres and volume by age class represented in your forest planning analysis for potentially suitable timberland relates to the results from your last timber inventory, 2) how the growth projected on your existing stands in that analysis relates to the growth found in your last timber inventory, and 3) the rationale for any differences uncovered between assumed and actual inventory and growth

We understand that you projected growth on existing young stands and on future stands with a modified version of a model called "DFSIM"-- a model that did not include information from your geographic area in its development Recently Oregon State University has finished a model called "ORGANON" that provides, for the first time, timber growth and yield projections specifically designed for Southern Oregon We request that you compare DFSIM and ORGANON results for representative sites and justify which model should be used

In the past regenerating timber stands has been difficult on parts of the Siskiyou National Forest Because the projected wood flow from the Forest depends, in part, on initial plantation success, we would like more information on recent plantation survival and growth and on procedures to avoid past difficulties

Further research is recommended in the area of Port Orford cedar root rot We encourage the Siskiyou to apply the appropriate silvicultural prescriptions and monitor efforts to control this disease

3 Fish and Wildlife

We have further broken our fish and wildlife discussion down into a) riparian and instream habitat b) supplemental resource areas, c) dead and down woody habitats, and d) road management

a Riparian and Instream Habitat

Streams and rivers on the Siskiyou National Forest provide the spawning and rearing habitat for a fishery of unparalleled value for both sport and commercial uses ODFW is concerned about the high summer water temperatures found in portions of all nine major river systems on the Forest We would like information on the benefits and costs of more or less use, than proposed, of the riparian management strategy that would manage vegetation to reduce water temperatures (prescription C)

In addition, sediment production can impact the fishery We are unclear about the range of measures considered in the Forest Plan to reduce sediment production On page II-212 you state that "the amount of accelerated sediment varies directly with the amount of road construction and timber harvest" How did you select the road building and logging methods to consider for each type of ground? Could other methods produce less sediment, although perhaps at higher cost? How does the riparian prescription chosen affect sedimentation? What about instream structures to control sediment?

b Supplemental Resource Areas

Areas considered highly productive (or critical) habitat for fish or wildlife, or necessary for the maintenance of high quality watershed conditions, have been designated by the Forest as supplemental resource areas No timber harvest is programmed for these areas The preferred alternative allocates the land along some, but not all, streams and rivers to this category, including the visual corridor along the Rogue River We do not understand the criteria used to include or exclude areas As an example, ODFW believes that the riparian areas in the Elk/Sixes Planning Basin should be added to the supplemental resource areas to protect the high fish values there We request that you explain further your criteria for including or excluding areas from this allocation

c Dead and Down Woody Habitats

ODFW believes that the Forest has established an excellent standard for amount of wildlife trees and down woody material to be planned for in timber sale areas However, the Forest has not displayed standards or methods for protecting these dead and down woody habitats from activities such as firewood cutting and prescribed burning during site preparation We would like that information in order to assess the adequacy of these standards and the benefits and costs of this dead and down policy

d Road Management

Road management and selective closure have gained prominence in recent years as a crucial element in maintaining habitat for big game You should work with ODFW and OSFD to develop specific criteria for establishing road closures to meet wildlife objectives that are fair to forest users These standards are especially important for roadless areas you propose to develop

4 Stream Flow

The Water Resources Department believes that the Siskiyou National Forest has done a good job at identifying the water resource issues for soil, water, and riparian zones in the forest and that the DEIS and LRMP have identified provisions to protect and improve watersheds and riparian areas In addition, the division of the Forest into planning units for analysis makes the presentation of resource effects more understandable to the Department

The Water Resources Department derives its goals from Water Resources Commission basin programs that provide direction for managing water resources important to the State Two basins (South Coast and Rogue River) encompass the forest boundary and both have approved basin programs The Department is especially concerned about the adequacy of summer low flows and effects

on downstream users in these basins We request that you utilize the programs for both basins as a reference for water resources information Forest activities should be compared to basin program goals and water policies As an example, the DEIS recognizes that the forest lands provide a majority of water for downstream users but fails to mention that minimum streamflows have been established on many streams in the area and explain how forest practices affect these flows

5 Air and Water Quality

Regarding air quality, DEQ's primary concerns are those of air quality impacts from prescribed burning and burning of the Forest's fuelwood by the public in nearby urban areas As pointed out by DEQ, prescribed burning smoke is a major source of fine particulate emissions within the State More analysis should be presented on projected vs baseline pollutant emissions and on the potential for intensive utilization of woody residues for industrial purposes Particulate emissions in the vicinity of the Siskiyou are of particular concern due to EPA's new PM-10 standard

Regarding water quality, DEQ's concern is that the Plan be consistent with Oregon's adopted Statewide Water Quality Management Plan for forest practices as required by the Clean Water Act The Plan recognizes goals of meeting water quality standards and protecting beneficial uses of water DEQ feels, however, that needed information is lacking in the DEIS and LRMP to assess adequately the water quality effects of activities, including analysis of baseline water quality conditions in individual steams and the effects of planned forest activities on those streams

6 Roadless Areas

You have a land allocation category called "Custodial Roadless Areas" that we have not encountered on other national forests In your DEIS (page II-209), you state one of the reasons why unroaded ares are allocated to this allocation in some alternatives "unroaded areas are allocated to Custodial (Roadless) management so that the effects of management on lands adjacent to designated wilderness are minimized, and wilderness potential maintained " Many reasons exist why you may wish to keep areas undeveloped including provision of dispersed recreation opportunities, maintenance of fish and wildlife habitat, and enhancement of natural diversity We do believe though, that the rationale quoted above runs counter to the intent of the 1984 Oregon Wilderness Act and request that you adequately explain the reasoning behind your custodial roadless allocations or not make such allocations

7 Protection of Rare Plants

The Siskiyou National Forest contains the highest concentration of sensitive and rare plant species of any National Forest in Oregon It has been estimated that over 9 percent of the plant species of concern in the state occur on the Siskiyou, and several species are found nowhere else The DEIS does an exceptional job in defining the Forest's responsibility with regards to sensitive plant species protection The information presented on individual species in Appendix F allows for careful review of the potential Research Natural Area and Botanical Area ability to protect the habitat of these plants

Because of the high number of rare plant species known to occur on the Siskiyou National Forest, it is important for the Forest to conduct searches in non-project areas for additional occurrences of these plants and for new varieties, including areas already in protective status such as Wildernesses According to our Natural Heritage Advisory Council, the importance of these basic botanical inventories is often overlooked in the overall management of rare species Therefore, we recommend that the Forest indicate in the LRMP that it intends to begin inventorying all potential habitat for sensitive species to further knowledge of such species

Botanical areas on the Forest are intended to contain the best representations of unusual plants indigenous to southwestern Oregon According to the Natural History Advisory Council, the Forest has done an outstanding job of identifying potential botanical areas that form the backbone for the protection of rare species across the Forest The preferred alternative lists eight sites for designation, but leaves out a number of sites that rank of equal importance as botanical areas We could not find justification of why some high-priority sites were listed and some were not and request that this information be provided

D Economic Effects

We have several suggestions for improving your analysis and portrayal of the economic affects associated with your preferred alterative We have highlighted eight major areas of concern here 1) enhancement of the fishery, 2) restriction of mining, 3) enhancement of tourism and recreation possibilities, 4) provision of visual quality, 5) portrayal of recreation activity value, 6) estimation of the supply and demand for recreational activities, 7) portrayal of the timber harvest and employment impacts of the preferred alternative, and 8) estimation of supply and demand for timber Please see the comments of EDD, the State Economist, Department of Geology and Mineral Industries, Parks and Recreation and OSFD for more details

1 Enhancement of the Fishery

The fishing industry plays an important economic role in Coos and Curry counties through the salmon and other fish harvested, and as part of the scenic backdrop that attracts tourists In addition, recreational fishing attracts a significant number of tounsts, and South Coast citizens have made major commitments to fishery improvement through our Salmon and Trout Enhancement Program

Environmental conditions on the Forest affect the size and quality of this fishery, even though we now lack the information to quantify exactly cause and effect Investments in fish structures and facilities can affect the capacity of the forest as a fish producer, but we are uncertain of the relationship between these investments and fish production in the preferred alternative This analysis should be expanded substantially, because we all need to know the opportunities here In that discussion you should document the past performance of such structures and the degree to which the preferred alternative depends on them to maintain the fishery

In the DEIS (page III-110), you point out that the "demand for the commercial fishery far exceeds supply" and that four "actions offer excellent means to potentially satisfy demand for salmonid fisheries derived from forest habitat production" 1) riparian management, 2) capital investment, 3) supplemental resource areas, and 4) timber harvest dispersion Then on III-112 you give a qualitative assessment of these four techniques to affect salmon habitat We could not find, however, a quantitative assessment of the benefits and costs associated with different combinations of the four fishery enhancement techniques As an example, we need to know the least cost way, in terms of timber production impact, of improving the fishery While this assessment in some ways is the flip side of the discussion above on the impact of basin constraints on timber harvest, it is complicated by the interaction of four possible ways to improve the fishery Information on this interaction will be an important ingredient in development of a State alternative

2 Mineral Exploration

The Siskiyou National Forest is a geologically diverse area with occurrence of gold, silver, nickel, chrome, cobalt, copper, manganese, molybdenum, mercury, coal, limestone, and other minerals The mining industry, partly though the use of Forest minerals, provides approximately 200 jobs and $2 9 million in payroll in the adjacent four county area While the demand for Forest minerals is highly variable, many are strategically important and maintaining access to them is of State concern In that light we view with apprehension the proposal in the preferred alternative that increases acreage on the forest under "moderate" mineral restriction from 196,000 acres to 353,000 We request further justification on a site-specific basis of why this reclassification is needed

In addition, the Forest should quantify the value of the mineral resource, to the extent feasible, and factor that value into the various alternatives These values can be very high on particular sites and should be considered in evaluating different alternatives

Finally, the Forest should better document the acres of prime mineral potential in each mineral restriction category A large number of acres in the "low" category of mineral restrictiveness may have little significance unless a substantial number of these acres have significant mineral potential

3 Enhancement of Tourism and Recreation Possibilities

Recreation plays an important role in the region's economy, especially in connection with use of the Forest's rivers Thousands of people each year raft the wild section of the Rogue and Illinois Rivers and journey up and down the lower Rogue in tour boats and rafts Protecting and enhancing those river-based recreation opportunities must be an important part of the Forest Plan We cannot tell whether the Forest has examined all investment possibilities for enhancing the river corridors and adjacent areas for recreation use As an example, could tourism be increased through an upgrading of the Grants Pass-Gold Beach road as suggested by the Division of Parks and Recreation?

Also, we did not find in the LRMP a schedule for reviewing the Wild Rogue Management Plan Given the importance of this plan to guiding use of the area, a regular review schedule should be established

4 Visual Quality

Maintenance of scenic quality in the Rogue River and Illinois River corridors should be a high priority in the Forest Plan Carefully protecting the view from the rivers is an important element in the management of these world-class attractions

On other parts of the Forest, we need more information about the costs and benefits of different visual catagories before judging their desirability

You have apparently reduced the acres in the "retention" and "partial retention" visual categories from the levels at which you currently operate We need to understand the benefits and costs to the preferred alternative of restoring all or part of these acres As an example, the Division of Parks and Recreation is especially interested in assuring that the area seen along the Bear Camp Road is allocated to retention

Discussions with your staff suggest that the "partial retention" visual allocation costs relatively little in foregone timber production Given the standards and guidelines of this allocation, however, OSFD believes that the cost may be greater than portrayed because of the masking effect by constraints such as those of harvest dispersion In addition, others worry that the small clearcut size allowed will raise logging costs resulting in the potential for below-cost sales We request that you provide us with more information on the factors controlling the costs of visual allocations

5 Improving Recreational Activity Valuation

Your analysis apparently reduced the value of recreational activities by 37 percent In addition, you assigned a 0 percent real price trend to these activites while applying a one percent real price trend for timber We believe that these assumptions can result in a serious undervaluation of the contribution recreation makes to the wealth derived from the Forest, and you should support these assumptions or change them

6 Estimating the Supply and Demand for Recreational Activities

The LRMP estimates that recreational use will increase overall at a rate of 5 percent annually It is not clear on what this growth rate is based If it is based on historical trends, they should be displayed by activity If it is based on projected population growth, the trend is too conservative We believe that you should base your projections of recreation use on historical use trends on the Forest and demographic trends from locations that provide a majority of your use where such data exists These trends should be activity specific and any population-based trends should be based on the latest state and federal estimates Your analysis should also highlight the different growth rates in demand by in-state and out-of state recreationists

7 Timber Harvest and Employment Impacts of the Preferred Alternative

The lumber and wood products industry provides a substantial portion of manufacturing employment in Coos, Curry, Jackson, and Josephine counties and a major share of these counties' budgets as pointed out by the State Economist, Economic Development Department, and the Intergovernmental Relations Division County road and school budgets depend heavily on their share of federal timber receipts A resource plan that maintains these economic benefits from timber production is a high priority for State involvement in planning for your Forest

Your DEIS compares the timber harvest and economic effects of the alternatives to the average for 1975-84 and to Alternative A (the "current situation") We feel that, in addition, the harvest for the last few years should serve as a benchmark

Comparing proposed future harvest to a past harvest reflecting occurrences for the past 10 years has some validity on a long term basis since these years include a number of industrial cycles The 1975-84 averages for timber harvest, timber sales and timber-based employment, however, do not represent what the surrounding counties have experienced over the last few years These counties recently have experienced a much higher timber-based employment level than the 10-year average as companies cut their accumulated timber-under-contract with the return of high stumpage prices

Your conclusion that the timber harvest under the preferred alternative will rise in comparison to the 10 year average may cause people to believe that the timber supply will expand under the new Forest Plan with associated economic growth and economic benefits In reality, though, the projected increase in jobs, personal income and payments to counties has already been realized through the higher harvest levels of the last few years In fact, the 1985-87 harvest level slightly exceeds the proposed maximum harvest level under the new Plan Thus, we actually face a possible contraction in timber-based employment under the proposed Plan in relation to the situation that now exists

In summary, we believe it is imperative that the Forest compare the proposed maximum timber harvest to the harvest of the last few years in addition to the 10 year average and alternative A

8 Estimating the Supply and Demand for Timber

The projected future timber supply from other ownerships presented in the DEIS is undocumented and seems inconsistent with projections made by the OSFD and Oregon State University It appears that the Forest may have presented an overly optimistic view of the potential future timber harvests on other public and private lands We request that you document your analysis and compare it to other published reports

E Fire Salvage

The recent catastrophic fires on your Forest have created the need, in your eyes, to proceed with a process separate from, and parallel to, the forest plan As we understand it, you plan to write Environmental Assessments on the less controversial fire-damaged areas and an Environmental Impact Statement on the Bald Mountain area Further, you have told us that about 230 MMBF of timber was damaged in the fires, that you could potentially salvage a maximum of 175 MMBF over the next few years, and that you will substitute salvage for green sales where possible

We support your general approach to this difficult problem with the following stipulations 1) the damaged timber should be quickly and thoroughly salvaged unless unacceptable environmental impacts will be created, and 2) you should ensure that the EIS covers all areas of controversy to avoid protracted legal delays

We have two further requests in the salvage of fire-damaged timber 1) that payment to the counties be based on gross receipts as done in ordinary timber sales rather than on net receipts as sometimes done in salvage sales, and 2) that green sales be mixed with salvage sales as needed to ensure timber offerings from all Districts on the Forest

We do not yet fully understand how the fires and their aftermath will affect your forest plan, including how they will affect the suitability of land for different allocations and the outputs that can be expected We request that you provide us with this information as soon as it becomes available

F Other Considerations

The Siskiyou National Forest is the fifth of the thirteen national forests in Oregon to publish a management plan When the aggregate effect of all of Oregon's national forest plans has been determined, the State of Oregon may need to modify its position and recommendations on individual plans Therefore, we urge you not to adopt any plan until the cumulative effects of all draft, revised draft, and supplemental national forest plans are known by the public

We urge you to continue managing the Siskiyou National Forest under the existing management plan until a new plan is in place or until amendments to the existing plan are developed and approved with participation by the State of Oregon New constraints should not be applied in the interim to existing plans in contemplation of the new plan without full public participation

Attached to this letter are reviews of the Siskiyou National Forest DEIS and LRMP completed by affected State agencies These reviews consider the economic, social, environmental, and legal aspects of the planning documents They contain substantive technical comments that should be considered an integral part of the State response

Thank you for the opportunity to respond to the Siskiyou National Forest DEIS and LRMP The State of Oregon stands ready to help you as you move forward to complete your Forest Plan For assistance on our comments about the overall planning process and procedures, feel free to contact Norm Johnson, Federal Forest Plans Coordinator For assistance on particular resource issues, please contact the appropriate individual on the enclosed list of agency contacts

Sincerely,

Neil Goldschmidt
Governor

NG cs

Attachments

1036N

STATE OF OREGON
Parks & Recreation Division

INTEROFFICE MEMO
378-6597

TO Norm Johnson
Federal Planning Coordinator

DATE December 2, 1987

FROM Don Eixenberger DE
Research Analyst

SUBJECT Review of the Siskiyou National Forest Plan

The U:S. Forest Service (U.S.F.S.) plays a major role in the provision of recreation in the State of Oregon. It is an indispensable element in maintaining a diverse quality of recreational opportunity which will gain even greater importance as the state's population grows and as out-of-state tourism plays an even more crucial role in the state's economy For example, federally administered lands provide over 30 percent of the state's campsites and picnic tables, 50 percent of its hiking and bridle trails and 60 percent of its ORV areas. Thus, while the plans assume that the U.S.F S provides 7 5 percent of outdoor recreation nationally, in Oregon, it is likely to be 3 to 4 times that amount if not more.

The U.S.F.S. is also the near sole provider of certain types of outdoor recreation in the state. Much river recreation and most snow activities and primitive and semi-primitive recreational opportunity are dependent on public lands managed by the U S.F S. Yet while demand for outdoor recreation opportunity of all types continues to grow, in many cases, the resources to provide those opportunities are shrinking. Forests such as the Siskiyou form a mosaic of irreplaceable recreational richness and diversity which will take on even greater importance for Oregon's future.

General Comments

There are two general issues which emerge from the Siskiyou Forest Plan that give cause for concern They are the

1. Economic valuation of recreation *
2. Projections of recreational demand.*

* These two issues are discussed in greater detail in the attachments.

Economic Valuation of Recreation

The economic values of recreational activities have been discounted by 37 percent.* In addition, recreational values have

*as stipulated by the 1985 R P A

been assigned a 0 percent per year real price trend throughout the life of the plan while a one percent per year real price trend for timber was used for harvest scheduling analyses.

We believe these adjustments to be unsupported and result in a serious undervaluation of the contribution recreation makes to Present Net Value (PNV).

These discounted values could have especially significant effects when specific areas of the forest are considered. PNV for recreation is presented forest wide, yet recreation is often feasible and/or concentrated in a specific area (e.g. an accessible roadless area, a river corridor). If an appropriate presentation of the economic benefits of recreation vis-a-vis other resource values is to be made, site or area specific analyses should be made. Otherwise there is a risk of trading of high recreation values for potentially marginal timber values.

Economic benefit analyses should be recast with recreational values appropriate to the Siskiyou Forest. They should also be formulated for specific areas of recreational use, especially where recreation and timber allocations may be in conflict. (One example of such a specific area would be the Rogue River corridor.)

Projections of Recreational Demand

The plan estimates recreational use to increase overall at a rate of .5% annually. It is not clear on what this growth rate is based. If it is based on historical trends in the forest those trends should be displayed. Such trends should also be estimated in terms of specific activities which have different growth rates. River based recreation, for example, is likely growing at a much faster rate than hunting. Such differential growth rates obviously require different planning strategies and allocation of resources.

If the .5% growth rate is based on population growth, it is likely too conservative. For example, from 1985 to 2005 the four county zone of primary influence for the Siskiyou are projected to have annual increases as follows: Coos - .5452, Curry- .5677, Jackson - .9750, Josephine - 1.0870. Western Oregon overall is currently projected to increase at .9305% per year *

* Preliminary Draft State Population, Employment and Income Forecasts (medium case), Oregon Department of Transportation, Policy and Planning (with the assistance of the Ad Hoc Forecasting Committee) October 8, 1987.

These projections are conservative. Using a .5% growth rate seriously risks mismanagement of recreation resources and development in meeting future need. If projected population growth is the basis for estimating future recreational use, it should also take into account the portion of forest recreationists from out-of-state. Use on the Siskiyou must be significantly influenced by visitors from California which has a higher projected growth rate than Oregon.

The importance of projections of recreation use not only affects planning, in estimating future R.V.D.s, it also affects the economic benefits of recreation, especially if focused on a specific recreational area. This has immense bearing if meaningful allocations are to be made between recreation and other resource.

We suggest the following:

1. Where possible, projections of recreational use should be activity specific.

2. Projections should take into account historical trends in the forest.

3 Where population projections are utilized, they be based on the current estimates of those state and federal agencies with responsibilities for formulating those estimates.

4. Recreational use projections should reflect the effects of those users from areas different population growth such as out-of-state.

Developed Recreation

Overall the plan does not address the placement of future recreational use of the forest. Over the next two decades, accelerated road construction is planned, especially in the existing roadless areas. This will provide greater access to the interior of the forest with the likelihood of changing current recreational use patterns and increasing recreational use overall. An analysis should be made to examine the flexibility of planned site development to address such potential changes.

The plan appears to adequately meet future need for developed camp sites in the forest, although this analyses should perhaps be recalculated using more exact demand projections as discussed previously. According to the 1983 State Comprehensive Outdoor Recreation Plan (SCORP), an oversupply of campsites in the four

county areas of the Siskiyou prevails through the year 2000. What is at issue is the placement of new campsites to utilize the full opportunity of the Siskiyou and respond to changing use patterns. For example, at present, the Galice District has only one developed site.

One identified shortfall indicated by the SCORP is in the number of picnic sites. SCORP shows the four county areas needing over 800 picnic tables by the year 2000. This implies a need for more day use and short term recreation facilities.

The SCORP also cites a need for over 500 more miles of hiking/walking trails and over 100 miles of bridle trails in the four county areas of the Siskiyou. The preferred alternative K plans for some 100 miles of new trail. Perhaps consultation should be made with other recreational land providers in the area to determine what portion of future demand is appropriate for the Siskiyou to meet. Type and placement of trail development is not apparent in the plan. For example, public comment described in the plan calls for greater emphases on day or loop type trails and interpretive trails.

Much recreation in the Siskiyou has and will continue to be oriented to back country wilderness use and to river activities. However, there appear to be many opportunities to accommodate a wider spectrum of the recreational user, the more casual and/or time limited recreationist who may be a local resident or a tourist whose destination lies elsewhere.

To meet the needs of such recreationists, we suggest more emphasis be placed on the following

1 development of accessible day use loop trails, perhaps less physically challenging to the average recreationist

2 development of interpretive trails and sites

A major area for this type development would be along the Grants Pass-Gold Beach Road. At present full utilization of this route by recreationists is limited by the condition of the Bear Camp section between Grants Pass and Agness Widening of this section would open up trans forest recreational and tourist travel between Grants Pass and Gold Beach. It would provide greater potential for the type of recreational development discussed previously.

In terms of developed recreation then, we suggest the following

1. Examine placement of developed campsites and trails for responsiveness to expanded recreational use of the forest.

2 Consider development of day use picnic sites, trails and interpretive sites to accommodate wider spectrum of recreational users.

3. Consider modifications to Bear Camp Road to allow greater recreational transit in the forest

Dispersed Recreation

We are supportive of the management direction calling for a broad range of recreational opportunities including the range of opportunities as delineated by the Recreational Opportunity Spectrum (ROS). Under the preferred alternative K, the supply of primitive and semi-primitive non-motorized outside of wilderness will fall short of demand by the second decade of the planning horizon. According to the plan, this unmet demand can perhaps be met by opportunities along various river corridors and wilderness areas of the Siskiyou or by opportunities in other neighboring forests. However, wilderness areas and river corridors of the Siskiyou will also gain in use through time. Wilderness use is expected to reach capacity by the fifth decade The plan does not examine what impacts additional use caused by the shrinkage of unroaded opportunities will have on these substituted areas. Quite likely limits of acceptable capacity may be reached during the life of the plan which will present serious management problems and recreational dislocations. Substitution of roadless areas in neighboring forests is also unfeasible; all the plans thus far issued in Oregon pose similar dramatic reductions of such areas. As the national forests in Oregon are the near sole suppliers of forested primitive and semi-primitive opportunities, the cumulative impact is a serious decline of recreational diversity throughout the state.* With these concerns in mind, we suggest the following

1. Within the forest, seek ways to provide a greater diversity of recreational opportunity For example, strategic location of wildlife MMR areas might also provide semi-primitive non-motorized opportunities.

2. Develop a region 6 wide plan describing potential cumulative impacts of forest planning on recreational diversity and

* See the enclosed attachment for a discussion of Recreational Diversity

prescribing how future demand as determined by the ROS will be met.

3. Schedule road building and harvesting in the Siskiyou in ways allowing future options to meet the goals of such a plan.

Scenic Rivers

We are supportive of management goals for the Rogue and Illinois Rivers, especially those goals for protection of the scenic viewsheds. In different ways, both rivers are unique recreational resources in Oregon. The Illinois provides a challenging rafting experience in pristine settings. The Rogue provides a diversity of opportunities unequalled elsewhere in the state and has very important economic values for both Gold Beach and Grants Pass. When appropriate the wild and scenic management plans for both the Illinois and the ROgue should be scheduled for review and/or change.

The Chetco River is on both state and federal inventories having potential for inclusion in the Wild and Scenic River system; the North Fork of the Smith is on the federal inventory. We urge that both rivers be managed to retain their eligibility until final designation can be decided.

Scenic Viewsheds

As mentioned, we support retention visual objectives for the Illinois and Rogue viewsheds as stipulated in alternative K. We also support retention visual objectives described for the Oregon Caves and Highway 199. Bear Camp under alternative K would receive only partial retention under option 1. As discussed previously, this travel route widened and properly managed has potential for becoming an important recreational tourist route. It should be considered for retention visual objectives.

In addition, we believe consideration should be given to visual protection along the Winchuck, Pistol, Elk, and Sixes Rivers.

The Bonneville Power Administration commissioned the Pacific Northwest Rivers Study with the purpose of identifying the importance of river resources so as to minimize conflicts with hydropower development and to conserve important river resources In the recreational segment of this study, the Winchuck, Pistol, Elk, and Sixes Rivers were all rated as "outstanding", primarily

for their anadromous recreational fishing values *

Visual values along major recreational trails in the forest should also be protected. While it seems apparent such values are protected along the Illinois and Upper Rogue River Trail, it is not evident that the Boundary Trail is. Other trails with historic value should also be considered for visual management.

* Recreational Values on Oregon Rivers, Oregon State Parks and Recreation, April, 1987

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Recreational Issues in the 1986 Forest Plans
Oregon State Parks and Recreation Division

The Oregon Parks and Recreation Division has the responsibility for reviewing the National Forest Plans for recreational concerns in Oregon This charge stems from the focus of the Statewide Comprehensive Outdoor Recreation Plan and the state policy on outdoor recreation (ORS 390.010) In addition, the findings of the Governor's report on Oregonians Outdoors has provided direction to the division In the current round of planning three issues have risen which appear to be common to all the forest plans. This led to the creation of the following issue papers:

1 The Economic Value of Recreation

2 Recreational Demand and Forest Planning

3. Recreational Diversity

The accuracy of estimating future demand effects the economic benefits of recreation, the determination of value and demand are important to how forests should be managed for diversity and in ascertaining the trade off between recreation and other resource values on public lands

The underlying theme of these issue papers is to bring into discussion certain methodologies used by the U.S F S which are pertinent to recreation and which likely have bearing on the resource trade offs made in the forest planning process.

Issue Paper I

Economic Value of Recreation U S Forest Plans

The U S. Forest Service is now issuing its proposed forest management plans for review. Review of two forests have been completed· the Deschutes and the Wallowa-Whitman. It is now apparent that certain methodologies and assumptions regarding the economic contribution of recreation are being uniformly applied throughout the plans.

Choices among management alternatives in the plans are heavily influenced by what is called Present Net Value (PNV). The PNV for each alternative is the total monetary value of all resource products (such as timber and recreation) minus the costs of managing a planning area. Our anlysis concludes that the estimates of the contribution of outdoor recreation are seriously undervalued as a result of using inappropriate methodologies. This will have serious consequences for the preservation of a stable and diverse spectrum of outdoor recreational opportunity in Oregon.

A brief discussion of these methodologies follows

1. Through the 50 year "life" of the plans, recreation values are assumed to change at rates equal to inflation Other values, such as timber, are assigned real price increases in addition to inflation.

   This assumes that outdoor recreation is not subject to supply/demand ratios. Yet the resource base for most outdoor recreation is finite, limited For example, there are only so many miles of trout streams, so many slopes suitable for skiing, etc. Yet demand for these resources continues to grow It is a basic economic law that increasing demand for a limited supply creates a real increase in price

2. Each recreational activity has been given a value through *travel cost methodologies The current forest plans use such* activity values averaged across the northwest (Region 6) These values were then reduced by 37.5% Thus a day of trout fishing regionally valued at $75 is reduced to $14

   The use of regional values across all forests and the reduction of those values by 37 5% is unsupported. The quality and attractiveness of recreational activity varies widely from forest to forest The draw these forests have on tourism also varies greatly.*

*Attachment A contains a detailed discussion of these methodologies by Rebecca L. Johnson, Assistant Professor, Resource Economist, Department of Resource Recreation Management, Oregon State University, Corvallis, Oregon While these comments were made pertinent to the Deschutes National Forest, the same methodology is being used in all the forest plans

Issue Paper II

Recreational Demand and Forest Planning

Reliable estimation of demand for future recreation activities in the national forests is crucial for a variety of reasons. First, the current round of forest management plans recommend harvest levels and resource use decisions which will have serious impact on the supply of various types of recreational opportunities and settings. Should projections of recreation demand be underestimated, the potential for overuse and degradation of the remaining recreational resources will increase Second, resource allocations are in part determined by the economic benefits contributed by those resources The value of recreation is determined in part by estimates of recreational visitor days or demand. If this is not appropriately projected, an accurate estimate of recreational value cannot be determined and misallocation of resources may be made. Finally, if demand estimates are incorrect, proper development of management approaches and support facilities (campgrounds, picnic areas, trails, etc) is difficult

Thus far, the current round of forest plans measure current use in terms of developed recreation (e g campground use) and dispersed recreation (e g. hunting, hiking). Current recreational visitor days in these two areas are then projected to increase over the life of the plan at a rate equal to the projected state population growth

While questions have been raised as to the accuracy of various projections of state population growth, our contention is that population is not a reliable estimate of future recreational demand

To begin, the use of population projections assumes that forests are alike in their attractiveness and draw visitors solely from within Oregon The national forests in Oregon have diverse recreational offerings and attract recreationists from divergent locales. One only has to compare the offerings of the Deschutes National Forest, a major tourist attraction, with its rich diversity of recreation opoortunities and settings, to those of the Ochoco which principally attracts local resident hunting and fishing Growth in the Deschutes likely exceeds state population growth while that in the Ochoco may approach it or be less

As present and future recreational demand may differ from forest to forest, so does that demand differ by activity For example, it appears that winter sports are growing at a faster rate than hunting or camping. The demand for whitewater boating in Oregon is growing at a rate greater than population Yet the forest plans thus far group recreation use rates only as "dispersed" or "developed " Such "averaging" is like looking at the demand for ponderosa and lodge pole pine as a single entity, the greater demand and value of one activity or resource is masked by the lesser

Appropriately applied to a given forest, travel cost methodologies provide a sound valuation of recreational activity.

These methods, the 0 percent real growth rate assumption and the further 37.5 percent devaluation of recreation activity values seriously confound and underestimate the value of recreational resources and their contribution to Present Net Value. The result is that the formation of alternatives is distorted. Therefore, management decisions based on them risk serious misallocation.

The problem is further confounded when these values are applied uniformly from forest to forest. Some forests have exceptionally high quality recreational opportunities which draw many visitors from out-of-state. Recreational activities in these, properly estimated, will have high economic value

Other forests have lesser quality opportunities with less attraction for non-local visitation. Recreational activities there would likely have less economic value. Applying a uniform method not responsive to these differences risks trading high quality irreplaceable recreational opportunities for low value timber resources.

To address these concerns, the following should be done:

1. Develop some grounded measure of yearly real price increase for recreational resources

2. Reestablish appropriate travel cost and willingness to pay values for recreational activities.

3. Develop the measures in 1 and 2 specific to the recreational supply and demand in each forest.

4. Reformulate the alternatives based on the recreational values specific to each forest.

Issue Paper III

Recreational Diversity and the National Forests

The richness and variety of the Oregon landscape is often taken for granted In the space of a few hours drive a traveler can leave the hustle of a metropolitan area, visit the coast, climb the verdant Cascade mountains and descend to the high desert plateau. Much use is made of this landscape and its resources One of the most prominent is recreation.

The variety of natural resources translates into a diversity of recreational opportunity unparalleled elsewhere. Its spectrum ranges from that of a highly developed urban park with high social interaction to an isolated natural forest setting where a lack of man made developments and solitude are found. These resources and the diversity of recreational opportunity they represent, both existing and potentially, figure importantly in not only maintaining the quality of life Oregonians have come to expect, but also in meeting the expectations of visitors to the state.

U S. Forest Service (U S.F.S.) planning is particularly crucial where this diversity is concerned Overall, federally managed lands constitute 51% of the total state area Those under U S F.S management provide some of the most important recreational opportunities in the state, many of which are unobtainable elsewhere

Among the goals in National Forest management are "to maintain or increase the variety of recreational opportunities, to make those opportunities available to all segments of society, and to provide a range of quality recreation opportunities in an undeveloped forest environment " In recent years U S Forest Service planners have paid increasing attention paid to the motion that people not only seek out certain activities but also desire certain experiences in those physical and social settings appropriate for those experiences Out of this concept a planning system evolved called the Recreational Opportunity Spectrum (ROS)

Briefly stated, the ROS is a land management system currently comprising six classes designed to provide a particular array of activities, settings and experiences These classes are primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban. Much U S F S planning now entails estimating demand for specific recreational opportunities defined along the ROS and appropriating land allocations to provide those opportunities *

In the current round of forest planning, a common feature seems apparent More and more forest land is being committed to timber production. Roadless areas of the forest are increasingly being

*A description of the ROS classes is contained in Attachment B

Using a generic measurement for recreation demand increases those problems described earlier; a rapidly growing activity such as cross country skiing would be managed with the same attention and energy as slower growing activities.

To address this issue, the following should be done*

1. Estimates of recreational demand should be based on the historical use and growth in each forest.

2 Within each forest, growth in demand should be activity specific.

scheduled for cutting. But "primitive" and "semi-primitive" recreational opportunities are dependent on these roadless areas These opportunities and settings are lost as lands are put into production and become "roaded natural" for recreational purposes. The problem is well documented in the plans. For instance as the Deschutes 1986 DEIS states:

> ". . . some aspects of the recreation opportunity spectrum, are becoming more difficult to retain
>
> For example, as remaining roadless areas are either designated as wilderness, or roaded and developed for other uses, there are fewer opportunities for the semi-primitive and primitive recreation experiences outside of wilderness areas. Related to this is the idea that as more and more roadless areas are either developed or designated as wilderness, future generations will have fewer options regarding how to best manage them to meet changing needs "

In the Wallowa-Whitman the plan aptly recognizes that in certain cases, opportunities will fall short of demand in 20 years. The plan assumes that those seeking primitive experiences can use the wilderness areas. Those seeking semi-primitive opportunities would use "roaded natural" areas or be replaced by other users

The trend appears obvious. As more roaded areas are converted to other uses, primitive and semi-primitive opportunities will diminish while demand for these opportunities continue to grow The shortfall in some cases will likely be critical within twenty years

Yet the Forest Service along with the BLM are virtually the sole providers of these opportunities They are important settings for such activities as hunting and fishing, whitewater boating, primitive camping and hiking, winter nordic touring, horseback riding and wildlife observation. Some are appropriate for management as semi-primitive motorized activities (e g trail bikes, snowmobiles) Above all, these areas provide those primitive and semi-primitive opportunities to people unable to utilize wilderness areas They also allow levels of management and use not allowed or restricted in wilderness areas. They provide in many areas the large scale vistas forests which both Oregonians and out-of-staters value. Indeed, the quality of both developed and dispersed recreational activities in the forest would be lessened by their diminishment.

To address this issue, the following should be done

1 Conduct a region wide analyses of the supply and demand for recreation on forest lands in terms of the ROS.

2 Reformulate the economic benefits of recreation so that trade offs between recreation and other resources might be more appropriately made (see issue paper #1 and #2 in this series).

3 Develop a plan describing how recreational diversity as determined by the ROS will be maintained to meet future demand

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Attachment A

COMMENTS ON THE RECREATION VALUES FOR THE DESCHUTES NATIONAL FOREST PLAN

In summarizing the reationale for adjusting the initial values of the Resource Evaluation Group, the plan states that TCM values need to be adjusted to be comparable with marginal values of other forest outputs (p 193). The nationwide demand elasticity of 2 is used to show that if the Forest Service increases quantity of outdoor recreation in the nation by 7.5% (their current share of quantity), price should decrease by 37 5% There are several problems with this logic:

-- The prices which are being adjusted downward were estimated when the F S. land was a part of the total quantity. In fact, many of the studies which were used to generate the recreation values were done for F.S sites Studies that were done on non-F S sites would frequently have had F.S. sites as substitutes, and regional models would have included these F.S substitutes directly in the estimation. It is erroneous to assume that the F.S land is an addition to quantity which will lower these values which were estimated at a time when F S. land was already a part of the total quantity

-- A nationwide demand elasticity for outdoor recreation may be a poor representation of the elasticity for specific recreation activities Similarly, the percentage of the total quantity of outdoor recreation in the U S. that the F S land represents may be a poor representation of the percentage that is relevant in the Deschutes National Forest. If adjustments are to be done, an attempt should be made to use regional or Forest-related factors for adjustment whenever possible.

Other reasons stated for adjusting the values downward were related to problems with the TCM, including an assertion that TCM studies typically are done for higher quality sites, substitutes are not accounted for, and trip length is not accurately measured While any of these may be true for a particular study, several points should be made

-- Values for some activities were based on CVM studies instead of TCM studies. Adjusting these values downward for problems with the TCM is clearly erroneous.

-- Not all of the studies used single-site TCM models, and therefore an adjustment for substitutes may or may not be necessary There is clearly no single factor to adjust all of the values by to account for exclusion of substitutes - it would vary by site

-- Aside from the argument of whether or not TCM studies accurately measure trip length, there is no reason to believe that trip length is consistently over-estimated, and therefore no reason to adjust these values downward as a result of this contention

If the planners for the Deschutes National Forest are not satisfied with the activity values estimated by the Resource Evaluation Group, they should make an attempt to find recreation valuation studies which have been done in the Pacific Northwest region for specific activities which are provided on their Forest. It appears that planners want recreation values to be comparable to other forest resource values, and therefore the same effect should be made to find values which reflect as accurately as possible the conditions that exist on the Deschutes National Forest.

Attachment B

Recreation Opportunity Spectrum (ROS) - An array of recreational activities, settings, and experiences used as a basic framework in planning and managing the recreation resource This spectrum is divided into the following classes: primitive, semi-primitive non-motorized, semi-primitive motorized, roaded natural, rural, and urban.

Primitive - Area is characterized by essentially unmodified natural environment of a size or location that provides the opportunity for isolation from sights and sounds of people. The user has the opportunity to be a part of the natural environment, often with a high degree of challenge and risk in which to use a maximum degree of outdoor skills The area is managed to be as free as possible from evidence of people-induced restrictions and controls Only essential facilities for resource protection are used Motorized use within the area is normally not permitted.

Semi-primitive Non-motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people The user has the opportunity for a high degree of interaction with the natural environment. The area is managed in such a way that minimum on-site controls and restrictions may be present Facilities are primarily provided for the protection of resource values and safety of users Motorized use is not normally permitted.

Semi-primitive Motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people except for facilities essential for the use of motorized equipment. The area is managed in such a way that minimum on-site controls and restrictions may be present, but are subtle Facilities are primarily provided for the protection of resource values and safety of users Motorized use is permitted Limited primitive road construction to enhance recreation opportunity is permissible

Roaded Natural - Area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of people Such evidences usually harmonize with the natural environment Interaction between users may be low to moderate, but with evidence of other users prevalent Resource modification and utilization practices are evident, but harmonize with the natural environment Conventional motorized use is provided for in construction standards and design of facilities

Rural - Area is characterized by substantially modified natural environment Resource modification and utilization practices are to enhance specific recreation activities and to maintain vegetative cover and soil Sights and sounds of humans are readily evident, and the interaction between users is often moderate to high A considerable number of facilities are designed for use by a larger number of

people Facilities are often provided for special activities. *Moderate densities are provided far away from developed sites.* Facilities for intensified motorized use and parking are available.

Urban - Area is characterized by a substantially urbanized environment, although the background may have natural appearing elements. Renewable resource modification and utilization practices are to enhance specific recreation activities. Vegetative cover is often exotic and manicured. Sights and sounds of humans, on-site, are predominant. Large numbers of users can be expected, both on-site and in nearby *areas. Facilities for highly intensified motor use and parking are* available with forms of mass transit often available to carry people throughout the site.

Department of Transportation
HIGHWAY DIVISION
Region 3
P O BOX 1128 ROSEBURG OREGON 97470 PHONE 440-3399

November 18, 1987

In Reply Refer to File No.

Mr Ron McCormick
Forest Supervisor
Siskiyou National Forest
P O. Box 440
Grants Pass, OR 97526

Dear Mr McCormick.

Subject Siskiyou National Forest
Proposed Land and Resource Management
Plan. Draft Environmental Impact
Statement

These four following recommendations and "areas of concern" have been identified as not being adequately addressed in the draft EIS.

1. General Highway Impacts

The draft identifies U S. 199 (Redwood Highway) and Oregon 46 (Oregon Caves Highway) as major accesses to the Siskiyou National Forest area, but it does not evaluate or analyze the impacts the LRMP would have on them Varying amounts of logging and recreation traffic can affect advance construction and maintenance planning This is particularly crucial at access points A more specific explanation of the potential impacts would be very useful to us Also, please note that forest activities can impact U.S 101 (Oregon Coast Highway) and Oregon 242 (Powers Highway) to a slightly lesser degree Neither of these highways received attention in the draft.

2 Highway Vision Clearance

Thinning of the trees along highways is an important safety feature for the traveling public. Clear zones between the highway and the timber can benefit the motorist in two ways One is by reducing the potential for big game collisions. The other is the reduction of shading, which in turn reduces ice, snow, or frosty areas. The final document should include this information as a policy for timber harvesting and land management along state highways.

Form 734-1629

Mr Ron McCormick
November 18, 1987
Page 2

3 Protecting Material Sources

The Oregon Department of Transportation is interested in protecting aggregate and material sources The extraction and processing of aggregate is too often prohibited when conflicting uses are allowed to encroach on these resource sites. The draft document indicates a very good level of retention of these sites, but it lacks guidelines or language that protects them from the adjacent uses and zones or encroachment by them in the future

4 Maintaining Interagency Coordination

The final document should include some policy language that encourages coordination between the Forest Service and the Oregon Department of Transportation concerning maintenance or widening and improvements to state highways within the national forest boundaries It is important to our agency that these types of activities are allowed without extensive time delays for permitting and planning processes

Thank you for the opportunity to comment on the draft I hope the comments are constructive and useful for you. Please keep us informed about the status of your plan, and good luck

Cordially,

Ken Norton

Ken Norton
Region Planning Representative

kn/sh

STATE OF OREGON INTEROFFICE MEMO

December 21, 1987

TO Norm Johnson, Federal Plans Coordinator

FROM Pam Wiley, Planning and Management Analyst
Division of State Lands

SUBJECT DSL Comments on the Siskiyou National Forest LRMP and DEIS

Attached are final comments from the Division of State Lands on the Siskiyou National Forest Land and Resource Management Plan and Draft Environmental Impact Statement

As we have discussed, the national forest plans generally have little impact on the division or the natural resources under Land Board jurisdiction. Impacts are related primarily to potential conflicts between management objectives on national forest lands and adjacent state-owned lands, concerns over the plans' treatment of research natural and special interest areas identified through the State Natural Heritage Areas program, and opportunities presented by the plan for mutually-advantageous state/federal land tenure adjustments

All the attached comments relate to comment category #6 from the Governor's Executive Order, "comparison of the proposed plan to agency goals and state and federal legal requirements " We are also suggesting some new language to acknowledge and clarify the state's role in regulating activities in waterways in the forest

I have forwarded specific comments of the Natural Heritage Advisory Council (NHAC) previously under separate cover As I have stressed previously, comments on biological diversity and Research Natural Areas are made on behalf of the Natural Heritage Advisory Council and do not represent a formal Land Board position

Please let me know if you have any questions regarding these comments.

jb
0001b

cc Jerry Phillips, ODOF
Ken Graham, ODOP
Janet Neuman, DSL
Earle Johnson, DSL

FINAL COMMENTS

DIVISION OF STATE LANDS
COMMENTS ON THE SISKIYOU NATIONAL FOREST LRMP AND DEIS

(NOTE This review responds to comment area #6 in the Governor's Executive Order, "comparison of the proposed plan to agency goals and state and federal legal requirements." The Division of State Lands has no comments regarding #1-5 and #7)

1 Impact of the plan on state-owned land and resource management - surface property interests/land tenure adjustments

The State Land Board owns some 132 000 acres of land in Western Oregon. This land is predominantly in forest use. Most of the acreage (96 000 acres) is consolidated in the Elliott State Forest, with the balance in isolated parcels scattered over the region

Day-to-day management of the Elliott State Forest is handled by the state Department of Forestry under contract with the Land Board While the balance of state-owned land is also certified to forestry use its isolated unconsolidated character makes it difficult to manage actively

A small portion of the state-owned land base in Western Oregon is located in, adjacent to or nearby land owned by the federal government. In the case of the Siskiyou National Forest, the state of Oregon has surface property interests in approximately 6,000 acres of such land Analysis of the management designations assigned to the federal lands, both under the current or "no change" alternative and the forest's "preferred alternative," shows the following state-owned parcels to be potentially affected by forest policies.

- Sec 16, T32S R13W - Curry County
  [Gov't. Lot 4 (39 92 acres) SW 1/4 (160 acres), SW 1/4 SE1/4 (40 acres), total acres 239.92]

  This parcel is bordered on the south and east sides by the Siskiyou National Forest (SNF) on the west side by BLM land and on the north by private land Current national forest management designations are general forest with a small designated wildlife habitat area to the south Under the preferred alternative, the bulk of surrounding lands remain in the general forest designation with part of the designated wildlife habitat area reclassified to "supplemental resource area "

The key management objective for supplemental resource areas, "maintenance of near natural conditions while permitting limited levels of activity such as through-road construction or habitat improvement projects " would not appear to present significant conflicts with management of state-owned lands. However, this is a highly mineralized area and the division may issue leases for mineral development on this parcel in the future Mineral development activity could affect wildlife habitat conditions

Sec 36, T35S R8W - Josephine County
[W1/2 (320 acres), W1/2 E1/2 (160 acres), Govt' Lots 1,2 3 and 4 (158 28 acres), total acres 638 28]

This parcel is bordered on the north west and south sides by the SNF and on the east by BLM Under the "no change" alternative, the majority of surrounding SNF lands are designated as general forest A small "partial retention visual area" abuts the western edge of the parcel and a small "designated wildlife area" is located near, but not adjacent. Under the preferred alternative, a small "special wildlife site" has been recommended directly adjacent to state-owned land The key management directive for this category "precludes programmed timber harvest activity but allows site-disturbing activities that are not contrary to the overall objective of preserving special wildlife habitats " Lack of access to this site makes it of limited value to the state for forestry purposes, making it a possible candidate for sale.

Sec 16, T35S R11W - Curry County
[E1/2 (320 acres) E1/2 W1/2 (160 acres) Gov't. Lots 1-4 (127.76 acres), total acres 607.76]

This parcel is bordered on all sides by national forest lands. Management area designations under the preferred alternative are substantially the same as under the "no change" alternative A new "special wildlife area" has been recommended just west of the parcel.

Although no prospecting permits have been issued on this parcel, minerals such as copper, asbestos, chromite and manganese are known to exist in the area The parcel has limited road access via National Forest Road 350 Prospecting permits may be issued in the future

- Sec 15, T35S R12W - Curry County
[Gov't Lot 2 (23 37 acres)]

This small parcel along the Rogue River near Agness is actually located outside the national forest, but within the Rogue River wild and scenic river boundaries

- Sec 16, T38SS R8W - Josephine County
[S 1/2 (320 acres), S 1/2 N 1/2 (160 acres), Gov't Lots 1-4 (173 54 acres), total acres 653 54]

This parcel is bordered on the west by the SNF and on all other sides by BLM land A small parcel of privately-owned land abuts the eastern boundary of the state-owned land This parcel includes a portion of Eight Dollar Mountain. It is located in a highly mineralized area, with considerable potential for future prospecting permits Several communication sites on the parcel are already under lease to the division

The "preferred alternative" identifies a large new "botanical area" bordering the western edge of the parcel The key management direction for botanical areas indicates that such sites "would not have programmed timber harvest, and other ground-disturbing or vegetation-manipulating activities may be significantly restricted " To the extent that these restrictions limit road development in the area, they may limit the division's ability to issue mineral prospecting leases in the area Conversely, to the extent that the rare plant resources found in this area extend into state-owned land, the division's management objectives on adjacent lands may be inconsistent with the forest's

- Sec 16, T41S R12W - Curry County
[Gov't Lots 13, 14, 15, 17, 18, 19, 20 (149 acres)]

This parcel is bordered on the north and east sides by the SNF, on the west by private land and on the south by the state of California The "preferred alternative" designates surrounding lands as "general forestry " Nearby there is a supplemental resource designation (along the East Fork of the Winchuck River) These lands may be located either within adjacent or close to the Winchuck Recreation Complex

To summarize, some 2,300 acres, or approximately 40 percent of the Land Board's holdings in this area may be affected by plan policies and management objectives

The Common School lands identified above are geographically isolated from other state-owned forest lands, making them difficult to manage efficiently The State Land Board has for many years pursued a policy of consolidating its scattered and isolated landholdings to allow better management of the land in keeping with its constitutional charge to "manage lands under its jurisdiction with the object of obtaining the greatest benefit for the people of this state, consistent with the conservation of this resource under sound techniques of land management." (Section 5, Article VIII, Oregon Constitution.)

To date most of the Board's consolidation activities have taken place in Eastern Oregon, where some 600,000 acres of state-owned rangeland are located Since 1969, Land Board consolidation efforts have involved the exchange of over one million acres of state and federal land The exchange program has resulted in more efficient management and more productive rangelands, and has greatly enhanced the Board's ability to meet its constitutional charge

Although consolidation efforts of the Land Board have thus far focused primarily on Eastern Oregon rangelands, opportunities exist to improve management of forest lands as well There remains in state ownership some 125,000 acres of scattered and isolated parcels of Common School lands. Most of this land -- some 80,000 acres -- is rangeland, but a significant 45,000 acres is forest land Of the forest land, an undetermined amount of acreage is located in, adjacent or in close proximity to U S. Forest Service land.

The national forest planning process offers a unique opportunity for the Land Board, acting through the Division of State Lands, to continue and expand its efforts to consolidate its land holdings Legislation enacted in the 1987-89 session of the Oregon Legislative Assembly authorizes the division to "dispose of isolated sections and fragments of sections of state lands which are not suitable for management according to longe-range policies of the State Land Board." Acting on behalf of the Land Board, the Division of State Lands is identifying scattered and isolated parcels in and near the forests for possible sale or exchange under this law.

Land ownership adjustment has been recognized by the Siskiyou National Forest as a tool which can be used to support its management goals The plan sets forth a general land adjustment policy in Section 9 of "Forest-wide Standards and Guidelines" (LRMP, IV-43 - IV-44) According to the stated policy, all non-federal lands inside the National Forest boundary, and a limited amount of National Forest land, shall be placed in one of five land ownership planning groups Group 1 - Congressional direction· Group 2 - Special management areas; Group 3 - General forest (private), Group 4a - Private land not to be acquired, Group 4b - National Forest land available for exchange, and Group 5 - Lands needing further study. The plan further states that proposals emphasizing consolidation of land ownership should be favored

(Figure IV-3 depicts proposed land adjustments on the forest Only one parcel of state-owned lands is identified as potentially suitable for a tenure adjustment. This parcel, Section 16, T35S, R11W in Curry County, is completely surrounded by the forest It is identified as "needing further study ")

More specifically, the same section of the plan identifies non-federal land in the Winchuck Recreation composite as an acquisition priority, but recommends against fee simple acquisition of non-federal lands in the Agness townsite area and within the Wild and Scenic River system

The State Land Board owns approximately 200 acres adjacent to the forest in the Winchuck area. The land, bordered on the north and east sides by the forest, is comprised of Government Lots 13, 14, 15, 17, 18, 19 and 20 in Section 16, Township 41S, Range 12W The Board also owns a parcel of land within the bounardies of Rogue River Wild and Scenic River Area The Board may be interested in selling this land to private parties. Alternatively the Board may wish to pursue land sale or exchange with the Forest Service involving these and numerous other parcels in or adjacent to the Siskiyou and other national forests.

Recommendation

The Division of State Lands suggests the following language change in the plan to facilitate a mutually beneficial exchange program between the Forest Service and the State Land Board.

On page IV-43 amend paragraph 1 of Section 9-3 to read

All non-federal lands inside the Siskiyou National Forest boundaries a limited amount of non-federal lands lying immediately adjacent to the Siskiyou National Forest boundaries and a limited amount of National Forest land shall be placed in one of the following land ownership planning groups (See Figure IV-3 Land Adjustment Map)

On Page IV-44, replace existing group 5 with a new "Group 5 - State-Owned Lands" as follows

Group 5 - State-Owned Lands

Definition - This group includes Common School lands owned by the State of Oregon and potentially available for sale or exchange to public and private entities It includes lands adjacent to special management areas within the forest which could be adversely affected by sales to private parties or state-permitted leasing activities. Adjustments will be made only after careful review and consultation with the Oregon Division of State Lands, the Oregon Department of Forestry, and the Oregon Department of Fish and Wildlife

Renumber existing "Group 5" to "Group 6"

Finally, amend the last paragraph on page IV-44 to read

The above guidelines should be followed, however, it may be necessary to deviate from this ranking to take advantage of opportunities as they arise Proposals that emphasize protection of special forest resource values and consolidation with land ownership should be found.

2 Comparison of the proposed plan to state legal requirements

The division administers the state of Oregon's Removal-Fill Law which regulates the removing and filling of materials from and in the waters of the state Filling or removal within the beds and banks of non-navigable waterways in forest lands for forest management practices in accordance with the Oregon Forest Practices Act is exempt from regulation under the Removal-Fill Law However, removing and filling for activities not related to forest management practices in accordance with the Forest Practices Act such as road or bridge construction construction of in-stream structures to improve fish habitat and mining are subject to the requirements of the law

Chapter III of the Draft Environmental Impact Statement "Affected Environment," discusses mineral policy and planning problem #9, "How should mineral resources of the Forest be developed in coordination with management of other resources?" This section notes that "[M]ining will most probably be from placer deposits located along and near various stream courses being known to contain gold-bearing gravels" and that "sand and gravel production for road-related purposes represents the highest continuing mineral use in the Forest."

Recommendation

Either of those uses could require a state removal/fill permit or state lease (for activities on navigable waters, described earlier). To clarify this, we suggest adding the following language on p. III-32, under the list of Forest Service policies regarding minerals management

Advise persons interested in aggregate or other hardrock mineral mining operations of the possible need to obtain state or local permits, e g , mining within streams may require a lease or permit from the Oregon Division of State Lands.

3 Research Natural Areas

(Comments forwarded under separate cover)

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Page 7 of 7

COMMENTS ON THE SISKIYOU NATIONAL FOREST PLAN

Forest Plan comments from the Oregon Natural Heritage Data Base usually are restricted to addressing the following issues. the protection of threatened, endangered and sensitive species, the designation of special interest areas, unique habitats and Research Natural Areas; and the more general topic of conserving natural diversity on National Forests.

Our general overview of the Siskiyou National Forest Plan is that it appears to address all of the issues that are appropriate for the region. The Plan is exceptional in its identification of potential botanical areas and it recognizes the importance of the Forest in terms of rare plant endemism and protection in southwestern Oregon. Research Natural Areas that have been proposed by the area ecologist are slated for designation by the preferred alternative. One of the principal negative aspects of the preferred alternative is the almost complete entry into all remaining roadless areas on the Forest. This could have grave consequences for the conservation of natural diversity on the landscape level in southwest Oregon.

More specific comments, organized by subject matter, are detailed below.

Threatened, Endangered and Sensitive Species

Most of the concern for rare species on the Siskiyou National Forest is centered on plants, although there are several rare animal species that also occur there. The discussion that follows deals almost entirely with the plant species on the Siskyou but is also applicable to rare animal species that are found there.

The Siskiyou National Forest contains the highest concentration of sensitive and rare plant species of any National Forest in Oregon. It has been estimated that over 9 % of the plant species of concern in the state occur on the Siskiyou and several species are found nowhere else. The DEIS of the Forest Plan does an exceptional job at defining the Forest's responsibility with regards to sensitive plant species protection (Appendix F) and the information presented on individual species in Table F-2 allows for careful review of the proposed Botanical Areas in the various Forest Plan alternatives. Appendix F also describes the potential Research Natural Areas and Botanical Areas.

The management of sensitive plant resources is appropriately indexed to the Forest Service Manual (section 2670) and management practices are included in the Standards and Guidelines in Appendix F of the DEIS The only clarification that we would like to see in the Forest-wide Guidelines is in reference to the second

paragraph in that section on page F-7. It is stated that any proposed projects that involve significant ground disturbance and have the potential to alter habitat of plant species will be evaluated to determine if sensitive species are present. First, the term "evaluated" should be better defined as to include on the ground inventories and referral to professional botanists for management advice. Secondly, it should be noted that very little information on rare or sensitive plant species habitat has been collected to date which makes it difficult to predict the affects of management activities on habitat.

Because of the high number of rare plant species known from the Siskiyou National Forest it is important for the Forest to also conduct searches in areas that are non-project areas, especially areas that are already in a protective status such as wilderness. The importance of these basic botanical inventories is often overlooked in the overall management of rare species. However, the collection of such information can at times lead to the de-listing of some species when they are found to be in a significantly larger numbers than once believed and occurring in areas that are secure. Therefore we recommend that the Siskiyou National Forest indicate in the Forest Plan that they intend to begin inventorying all potential habitat for sensitive species in order to further the knowledge of such species.

Research Natural Areas
The Siskiyou Forest Plan preferred alternative proposes the designation of all of the sites that have been recommended by the area ecologist for the Forest. The Oregon Natural Heritage Data Base supports this position and would like the Forest to also include some language in the sections that concern Research Natural Areas (RNAs). Because it is believed that the existing and proposed RNAs are not sufficient representation of the natural diversity of this region it will be necessary in the future to identify and designate additional RNAs to protect areas. The Siskiyou National Forest should make note of this in the Forest Plan by indicating that additional RNAs will undoubtedly be recommended and that the Forest is committed to protecting these recommended areas until they can be fully evaluated by the area ecologist, the RNA Committee, and other knowledgable scientists

Special Interest Areas-Botanical
The 22 special interest areas that are proposed in the Siskiyou National Forest Plan include all of the known concentrations of rare plants on the Forest. Detailed investigations of boundaries of the proposed areas has not been conducted but because of the long standing commitment to protection of rare plants by the Forest it is believed that boundaries are for the most part adequate to protect the habitats intended. The selection of the areas that are recommended for protection in the preferred alternative is outlined in the DEIS and is open for comment. All of the potential botanical areas are ranked according to their importance.

The preferred alternative lists 8 sites for designation as botanical areas: Bear Camp Areas 1 & 2, Bigelow Lakes, $8 Mountain, Days Gulch, Iron Mountain and Iron Mountain addition. These areas all had a priority rank of 6 or higher.

Other areas that were not included in the preferred alternative that also had a priority of 6 or higher included Bigelow Lakes addition, Grayback Mountain, Oregon Mountain, Rough and Ready Flat, Snow Camp and Snow Camp addition, Sourgame, Vulcan, and Waldo Ridge. There was no justification presented for not including these sites for designation and the Oregon Natural Heritage Data Base recommends that they must be designated as botanical areas along with the areas proposed in the preferred alternative in order to follow the criteria established in the Forest Plan.

The Siskiyou National Forest has done an outstanding job identifying potential botanical areas that form the backbone for the protection of rare species across the Forest. It is critical that the Forest recommend all of the above mentioned areas and reconsider the areas that have not been recommended. In many cases there are few if any resource conflicts for these important areas, therefore the designation can only act to further the important work the Forest has begun for rare plants within its boundaries. The total acreage of proposed botanical areas is quite insignificant compared to the acreage of the general forest. If all of the proposed botanical areas were designated this would result in an increase of only 28,000 acres above the acreage recommended (7300 ac.) in the preferred alternative. This is a relatively small area that would lead to greatly enhanced protection of botanical resources on the Siskiyou National Forest.

Conservation of Natural Diversity
The rather unwieldy topic of planning for natural diversity on the Siskiyou National Forest is not addressed in a comprehensive fashion in the Forest Plan. Indications of how the preferred alternative will plan for natural diversity protection can be found in the description of the future condition of the forest (pg. IV-2, Forest Plan). The almost total conversion of the general forestlands to managed forests with an average rotation age of 100 years does little to provide for landscape level conservation of natural diversity. As large portions of watersheds are dedicated to timber production there is an increasing potential for loss of self-sustaining old growth forests.

The Siskiyou National Forest needs to look at conservation of natural diversity from the viewpoint of the entire Forest, including the timber producing lands, riparian zones, wilderness areas and botanical/research natural areas. Areas that are already protected will continue to function as important sites for the maintenance of natural processes and ecosystem functions. Managed lands adjacent to these natural areas will derive some of the benefits from the natural areas. But the vast majority of the

Forest may be too far from protected areas to actually utilize the areas as habitat The best solution to this dilemma lies in the roadless areas on the Forest.

Currently there are a number of roadless areas on the Forest that are quite well dispersed over the landscape. These areas are destined to be roaded during the term of the Forest Plan if the preferred alternative is chosen. Protection of the currently unroaded areas on the Forest is the most ready solution for the protection of natural diversity across the Forest. By maintaining a large system of roadless areas, of sufficient size to contain functioning ecosystems, ecosystem processes will be allowed to continue unimpeded. These roadless areas have innumerable benefits for wildlife resources, watershed, and recreation as well, thus their importance is truly multi-faceted.

The protection of roadless areas coupled with designation of long term rotation areas within commercial timberlands would help meet the needs of natural diversity on the Siskiyou National Forest for the foreseeable future. In the unlikely event that long term research shows that too much roadless land was set aside, then these areas can at a later date be allocated for other purposes.

This concludes the Oregon Natural Heritage Data Base's comments on the Siskiyou National Forest.

NEIL GOLDSCHMIDT
GOVERNOR

Department of Fish and Wildlife
OFFICE OF THE DIRECTOR
506 SW MILL STREET, P O BOX 59, PORTLAND OREGON 97207 PHONE (503) 229 5406

January 21, 1988

Mr K Norm Johnson
Federal Plan Coordinator
155 Cottage Street, N E
Salem, OR 97310

Dear Norm

Enclosed are our final comments to the Siskiyou National Forest DEIS and Proposed Land and Resource Management Plan Even though we have areas of concern with the proposed plan, we found the descriptions of the affected environment, environmental consequences, standards and guidelines, and monitoring to be thorough and specific

Two areas of concern are the projected decrease in big game populations in all alternatives and the management prescriptions to maintain water temperatures in all but one planning basin, even though those water temperatures are high

Sincerely,

Randy Fisher
Director

rro
enclosure

Oregon Department of Fish and Wildlife (ODFW) Comments
on the Siskiyou National Forest
Draft Environmental Impact Statement and Proposed Plan
January 22, 1988

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GENERAL COMMENTS

Oregon Department of Fish and Wildlife wishes to compliment the Siskiyou National Forest on an informative and well written DEIS and proposed plan. The proposed plan and DEIS are by far the bulkiest documents the Department has reviewed to date The increased size of this document is justified by the data, maps, and disclosures found on those pages. The small scale MA and resource distribution maps were especially helpful.

Habitats for fish and nongame wildlife appear to be well addressed in the forest-wide and management area standards and guidelines. Standards for big game habitat effectiveness are adequate on a site specific basis. However, optimum Forest-wide distribution of thermal cover and forage for deer and elk is not provided in any alternative, resulting in predicted declines in deer and elk populations in every alternative.

ODFW comments and recommendations are meant to be constructive and lead to positive results. The comments are based on ODFW understanding of the National Forest Management Act (NFMA), the Clean Water Act, Executive Order 11990, and key provisions of the Wildlife Policy of the State of Oregon

OREGON DEPARTMENT FISH AND WILDLIFE CONCERNS AND RECOMMENDATIONS

In March of 1985, the Department developed fish and wildlife habitat protection criteria for forested lands in Oregon These criteria establish the minimum standards, that ODFW feels are necessary to meet the Wildlife Policy for the State of Oregon (ORS 496 012) The focus of our recommendations is on the implementation of *ODFW fish and wildlife habitat* protection criteria.

ODFW finds any departure alternative objectionable because wildlife resources would be diminished by accelerated damage to habitat. Departure timber harvesting risks even flow of recreational and commercial opportunities associated with fish and wildlife

We feel our position on the amounts and condition of needed habitats is realistic and reasonable. The Department offers recommendations for the following

1 Big game habitat
2 Access and Travel Management
2 Riparian and instream habitat
4 Dead and down woody habitats
5. Land allocations

1 Big Game Habitat

ODFW is concerned with the projected decrease in big game numbers on the Forest

The following recommendations are designed to meet the Department's concern for the projected decrease in big game numbers These recommendations should also help meet ODFW benchmark of 32,400 black-tail deer and 6,700 Roosevelt elk. The recommendations would require additions to and modification of proposed standards and guidelines for Management Area 13 (Partial Retention) and Management Area 14 (General Forest) The objective of these recommendations is to increase *production and distribution of quality forage and* cover to meet the above deer and elk benchmarks. The desired level of forage production includes the quality of the forage, the length of time a site produces forage, and the distribution of the forage sites. Production of quality forage is determined by the forage species *that are seeded and the application of* appropriate fertilizers.

The Forest needs to seed and fertilize 1,000 acres of clear-cuts per year for big game forage. These clear-cuts need to be well distributed and adjacent to optimum thermal cover sites The Forest needs to reduce the number of trees planted on these sites to prolong the production of quality forage.

In-addition to the forage enhancement projects, the Forest needs to *establish permanent forage* sites, five to ten acres in size, at a rate of 100 acres per year for this planning period These permanent forage sites need to be managed under the MA 9 prescription for meadows Desirable forage species need to be planted on these sites as well as periodic applications of *fertilizer The effectiveness of this practice* will need to be evaluated at the end of this planning period

Three types of cover need to be addressed in the standards Hiding cover, thermal cover, and optimum thermal cover The definitions for these terms are found in "Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington" (Brown 1985)

Hiding and thermal cover are lost on clear-cut areas and thermal cover is reduced on thinned units The Forest has stated that Brown (1985) would be used as a guideline for management of cover Cover management objectives need to be tied directly to the management of forage sites The relationship of forage areas to hiding cover and thermal cover needs to meet the guidelines stated in Brown (1985) Cover areas adjacent to

forage areas should not be thinned until hiding cover for elk has developed in the forage area. All forage sites should have a visual barrier between the opening and adjacent roads. The visual barrier would reduce disturbance to deer and elk from vehicle use of the roads.

While thinned stands provide some forage and hiding cover, thermal cover is reduced by the thinning operation. When planning thinning projects, the Forest needs to ensure that adequate thermal cover is nearby.

When evaluating habitat effectiveness (HE), the Forest must use the Wisdom model adopted by Forest Service, BLM, and ODFW in February 1986. An HE of .5 would be an acceptable goal for the Siskiyou. Subbasins not to exceed 6,000 acres need to be used as permanent HE monitoring areas.

2. Road Management

The Department has documented that forest roading, as it affects habitat and hunting, was the number one concern of big game hunters attending elk workshops in 1984. Deer hunter surveys by the Coos Bay District of the Bureau of Land Management showed the majority of hunters support some road closures. Excess roading diminishes habitat effectiveness and fair chase, causes concern for poaching and increases stream siltation. The projected road density in the proposed plan averages over three miles of open road per square mile, reducing the effectiveness of elk habitat by nearly 70 percent.

The Department generally recommends open road densities not exceed 1 1/2 miles per square mile for resources protection. Demand for hunting quality may require a seasonal reduction in open roads in certain areas. The Forest states there are now 2.33 miles of open road per square mile of roaded Forest, and about 1 1/2 miles per square mile are arterials and collectors. The Department recommends that all existing and planned local roads be serious candidates for year-round physical closure with emphasis to protect forage areas. Seasonal "area closures" are one way of responding to demand for hunting quality.

The Department recommends that the Forest develop specific criteria, in cooperation with ODFW, for road and seasonal area closures separate from the ORV plan.

The Department recommends that all new road systems developed in the now existing roadless areas, be close to public vehicle use. This direction would help meet habitat objectives for big game and would not allow a use pattern to develop.

3. Riparian and Instream Habitat

The Department has a concern for the high summer water temperatures found in portions of all nine major river systems of the Forest. These temperatures exceed optimum conditions for salmonids and, in some cases, exceed the lethal limits for salmonids. The Forest was very explicit in stating the management direction for Riparian Prescriptions "B" and "C", (DEIS II-47); "Prescription B is designed to manage vegetation to maintain water temperatures, while Prescription C manages vegetation to reduce water temperature and improve watershed conditions."

High water temperatures on the Forest are the result of natural conditions and/or removal of stream cover. The Forest has identified 18 of the 19 Planning Basins as having high water temperatures that reduce smolt habitat capability potentials by 5 to 20 percent.

The Department recommends that the Forest identify which streams and rivers have high water temperatures due to removal of cover and which are from natural conditions. The Department recommends Riparian Prescription C, Minimum Level Prescription, or the Supplemental Resource (MA 7) prescription be applied to all streams and rivers that have or would have high water temperatures resulting from the removal of stream cover. For streams that have high water temperatures due to natural conditions the forest should look for enhancement opportunities to reduce the temperatures.

The Forest has stated "the more important instream cover components for survival of Forest salmonids include pool depth and instream wood debris." ODFW agrees with this statement.

Woody debris has been identified as a limiting factor in all 19 Planning Basins. While Riparian Prescription B would provide for some large woody debris in the streams, Riparian Prescription C, Minimum Level Prescription, and Supplemental Resource (MA 7) prescription would give greater benefits over time in both water temperature and long-term input of natural large organic debris to stream and river systems.

The Forest has defined "large woody debris" as material over 12 inches in diameter and 15 feet long. Brown (1985) states that large woody debris should be over 18 inches in diameter. The Department recommends minimum standard for large woody debris be 18 inch DBH with an average DBH of 22 inches.

Pool depth has also been identified as a limiting factor in all 19 Planning Basins. The Forest has an on-going program to increase the depth of pools on selected streams. ODFW recommends that the Forest continue this practice in all of the Planning Basins.

The Forest needs to better discuss the possible consequences of development in roadless areas that would potentially increase sediment levels in associated streams.

The Forest has direction to use structural fish habitat improvements to mitigate impacts from forest management activities. The effectiveness of the proposed improvements to mitigate losses in natural habitat conditions has not been fully demonstrated. Protection of existing natural habitat conditions is the desired approach. When the Forest does elect to use habitat improvement projects, the project needs to be evaluated to determine if project objectives have been met.

4. Dead and Down Woody Habitats

The Department has a concern for the management of dead and down woody habitats. The Forest has established an excellent standard for amount of wildlife trees (snags and green trees) and down woody material to be

planned for in timber sale areas However, the Forest has not displayed standards or methods for protecting these dead and down woody habitats Activities such as firewood cutting and the use of prescribed fire for site preparation can reduce dead and down woody habitats to unacceptable levels

The Department recommends that the Forest identify, by inclusion or reference, the methods that would be used to protect dead and down woody habitats. The protection methods should be stated in the Forest-wide Standards and Guidelines section of the Land and Resource Management Plan.

5 Land Allocations

The Department offers the following comments and recommendations for land allocations

MA 3 Research Natural Areas

limited inventories for sensitive plant species and habitat conditions. Areas with unique habitats or sensitive plant species, which are a reflection of unique habitats, may also provide unique habitats for nongame wildlife More research and inventories will be needed to determine the relationship of these unique habitats to nongame wildlife

For the above reasons, the Department recommends retention of all proposed botanical areas for this planning period. After needed research and inventories have been completed and evaluated an informed decision can be made as to the long term allocation for these areas.

MA 5 Unique Interest Areas

The standards for this MA meet some of the Department protection criteria All unique interest areas should be allocated to MA 5

MA 6 Custodial (Roadless)

The Department has a concern for the development of roadless areas The primary concern is the development and use of new road systems Vehicle use of roads reduces habitat effectiveness for deer and elk and diminishes the quality of the hunting experience for those preferring to hunt in areas of solitude.

The Department would support the proposed MA 6 allocation in Alternative K if ODFW recommendations under Big Game Habitat and Access and Travel Management are implemented Otherwise, the Department recommends retention, for this planning period, of all roadless acreages not assigned a more restrictive MA. This recommendations is made on the premise that all wildlife habitat protection standards would be met in all developed areas.

MA 7 Supplemental Resources

The Department supports the MA 7 allocations in Alternative "K". The Department strongly recommends the addition of all riparian areas in the Elk/Sixes Planning Basin to MA 7 The high fish values of the Elk/Sixes Planning Basin warrant the protection level of the Supplemental Resources prescription. The MA 7 allocation would also help protect the Department's Elk River hatchery. This planning basin is the Forest's third largest producer of Fall Chinook, second largest producer of coho and searun cutthroat, and the sixth largest producer of adult steelhead This planning basin also rates second for high erosion hazard due to regeneration and third for high erosion hazard due to roads.

MA 8 Designated Wildlife Habitat

The Department supports the allocation in Alternative "K" This management prescription along with more restrictive MA's at recommended levels, should maintain a satisfactory level of old growth ecosystems.

MA 9 Special Wildlife Site

All special wildlife sites (24,004 acres) not allocated to more restrictive MA's, should be allocated to MA 9 The limited amount of meadows in this management strategy represent the only permanent big game forage sites offered in the alternatives.

DEIS CHAPTER II

P.II-47 Management Area 11 Riparian

The Forest has stated that high water temperatures are a problem on most Forest streams. The high temperatures are a common problem in Southwest Oregon due to natural conditions and past cover removal

The Forest states "management activities shall have, as a major emphasis, the protection and enhancement of salmonid fish spawning, rearing, and migration habitat." In order to protect and enhance salmonid habitat, the Forest needs to compensate for the high water temperatures. Riparian Prescription C and the Supplemental Resources (MA 7) Prescription, are the only strategies stringent enough to accomplish this objective The Forest needs to adopt Riparian Prescription C for the MA 11 allocations or allocate the riparian areas to MA 7

P.II-130 (First paragraph) - Bald eagle and osprey habitat will be provided on 52,000 acres along rivers and streams Table I-67, Appendix I, however, indicates 34,165 acres of this habitat will be in wilderness Are these wilderness acres along the Wild and Scenic Rogue and Illinois Rivers? (DEIS II-130-1) Caution should be used when placing importance on the Illinois, Chetco, and other coastal streams which do not have anadromous fish runs at the time of bald eagle and osprey nesting There is an active osprey nest on the Illinois

P.II-153 Table II-15

This table shows that in Alternative "K", 26,888 acres are assigned to MA 11 as Minimum Level Prescription. On page II-259, Table II-64 indicates zero acres under the Minimum Level Prescription Judging from the rest of the document, Table II-15 is correct.

P II-207 Table II-33 Wildlife and Fish Habitat Structural Improvements

The Forest states that 95 percent of the 1910 structural projects are nest structures which are replaced inconjunction with meadow improvements.

The Forest objective for meadow improvements is desirable and supported by ODFW ODFW recommends the establishment of strict standards to protect existing nest sites from management techniques used to improve or enlarge the meadows. Protecting existing nest sites will maintain structural habitat diversity within the project area

P II-256 The Forest predicts a decrease in deer populations in all alternatives due to reduced forage and diminished habitat capability A decrease in population is not desirable and does not meet ODFW benchmarks The Forest needs to include standards in MA's 13 and 14 to increase big game habitat capability See ODFW recommendations for Big Game Habitat

AFFECTED ENVIRONMENT

P III-11 Why is the total botanical acreage in Figure III-3 less than the total acreage of the three identified areas? (DEIS III-3-1)

P III-13 The Regional Guide has established a refined definition of old growth for various plant communities. Did the Siskiyou use the refined definitions when mapping old growth? (DEIS III-13-1)

P III-33 How many miles of new road construction has occurred since 1984? (DEIS III-33-1)

P III-36 What is the direction for managing the 135 (plus) gates on the Forest? (DEIS III-36-1)

P III-70 As a result of the 1987 fires, this section needs to be updated The effects of the 1987 wildfires on MMR habitat distributions also needs to be addressed.

P III-81 Old Growth

"Old growth is well distributed throughout the Forest (Figure III-12)." Figure III-12 does not distinguish between mature stands (101 years plus) and old growth stands The Forest needs to make this distinction in the final EIS.

P III-85 Table III-17

The table displays 15,000 acres of riparian habitat as having had some timber harvesting. Page III-59 states "There are approximately 175,500 acres of riparian areas on the Forest..." What is the condition of the 160,500 acres of riparian area that is not displayed in Table III-17? (DEIS III-85-1).

(Last paragraph) Explain the statement "Old growth cannot be sustained forever."

P III-90 What is the relationship between the "Timber Types and acres listed in Table III-19 and the "Successional Stages" and acres listed in Table III-17 on page III-84? (DEIS III-90-1)

P III-99 The Department commends the Siskiyou on an excellent discussion of fish resources on the Forest How current are the stream surveys referred to in the discussion and what type of data were collected in the survey? (DEIS III-99-1)

P.III-113 The Forest has not discussed peregrine falcons that are on the Siskiyou. Endangered peregrine falcons have been observed in the Wild and Scenic Rogue River Corridor. Suspected eyrie locations are already protected by Wilderness and Wild River designations, but the plan should mention the presence of these birds along with the importance of maintaining the cliff habitats in the Forest.

P.III-117 The first paragraph states that natural and created openings provide the bulk of the feeding habitat for deer and elk These areas also provide the forage base for domestic sheep on the Forest How much forage is allocated to domestic sheep grazing and what is the season of use? (DEIS III-117-1)

(Second paragraph, fourth sentence) This sentence should read "The Oregon Department of Fish and Wildlife (ODFW 1985) has proposed a cover/forage ratio of 80 20 for the Siskiyou National Forest Thomas (1979) warned that habitat effectiveness rating methodology "is poorly related to, and therefore not a good predictor of, densities of big game animals." In 1980, the Department announced a benchmark of 32,400 (over winter) black-tailed deer for the Siskiyou National Forest. The Forest states the April population estimate for black-tailed deer is 26,000 animals. What year was the estimate made? (DEIS III-117-2)

Clarify the statement about the difference in population estimates from procedures used by the Forest and ODFW

Explain how the 90 year rotation would produce habitat capable of supporting 25-35,000 deer? (DEIS III-117-3) The proposed direction would not allow for the maintenance of a quality forage base What is the potential density of deer and elk on suitable timber lands managed for optimum big game habitat? (DEIS III-117-4)

P.III-119 Elk

The Forest should mention elk winter range capability and the ODFW elk population benchmark of 6,700 animals for the Siskiyou National Forest.

Habitat Types Not Represented by Indicator Species

The Forest has not selected an indicator species for riparian habitats, meadows, or unique wildlife habitat areas. ODFW recognizes the difficulty in selecting an appropriate indicator species for riparian habitats. Department and Forest biologists should discuss the need for an indicator species for riparian habitat. For meadow habitat the Department recommends deer and elk be identified as indicator species of this forage producing habitat.

The Forest states that scattered unique wildlife habitat areas amount to 25,004 acres. Most of these areas were identified because unique habitat was provided for a given species or a group of species, these species need to be the indicators for their specific habitats.

P.III-120 (Last paragraph) "Many citizens feel.. that the Forest, as a whole, must provide habitat to maintain viable populations of all native and desirable non-native wildlife species " The Forest should point out that the maintenance of viable populations is a legal requirement under NFMA.

P III-122 Nonconsumptive Use

The 1980 and 1985 National Hunting and Fishing and Other Wildlife Related Uses Surveys by the USFWS are available and will provide more recent data on nonconsumptive use The 1985 report will be out in November, and the Oregon data will follow sometime this winter. In 1985, 109.7 million adults spent $14 billion on nonconsumptive wildlife activities nationwide

Nonconsumptive wildlife use in the Rogue and Illinois Wild and Scenic Rivers is an important part of the boating and hiking experiences for thousands of users. This use, coupled with nonconsumptive uses elsewhere on the forest, will more than likely exceed hunter use figures for the forest.

Optimum Habitat Mix

The Forest needs to state that the optimum habitat mix is from the Forest point of view

P III-124 Meadow Habitat

ODFW endorses the management standard of protecting existing meadows and reclaiming those meadows that have been encroached upon by trees.

ENVIRONMENTAL CONSEQUENCES

P IV-4 Table IV-I

Fish habitat improvement (A) would have a direct effect on fish as well as an indirect effect

P IV-29 (Fifth paragraph) The purpose of road closures includes reduced harassment to big game and meeting demand for an increased quality hunting experience Roads that are closed for these purposes need to be closed to all motorized vehicles

P IV-151 (Fifth paragraph). The mitigation measures identified in ODFW recommendations would apply to all alternatives These measures should maintain or increase big game numbers on the Forest The Forest states ". as yet unidentified projects would increase total habitat capability .. " The Forest needs to describe the types of projects that would increase habitat capability for deer and elk

(Sixth paragraph) Acceptance of lower hunter success rates or increasing interest in nongame species are not mitigation

(Eight paragraph) The standards and guidelines do not provide the necessary mitigation for

a. Reduced forage and thermal cover capacities for big game on commercial forest land
b A planned 57 percent reduction in old-growth habitat
c. Reduced recreational hunting opportunity
d. A 40 percent or greater reduction in cavity dwelling species habitat in timber emphasis areas

P.IV-231 (Seventh paragraph) Add to end of 2nd sentence " . because necessary habitat standards are not integrated into management direction for MA 13 and 14 "

After 3rd sentence add "The goals are achievable with specific management direction to invest in forage enhancement projects, manage cover and access, and cooperate in restocking elk in their historical range."

PROPOSED PLAN

P I-2 (Fourth paragraph). The Forest needs to add the proposed "Roosevelt elk plan" and "black-tail deer plan" to the list of documents that will provide guidance for management activities These plans should be referred to as "habitat" plans. The elk plan needs to address a stocking program

P.IV-9 (Second paragraph) " .the Plan will manage 507,000 acres of selected suitable lands " Table III-I indicates 529,000 acres of selected suitable lands Which figure is correct? (PP IV-9-1)

STANDARDS AND GUIDELINES

Proposed modifications to the standards and guidelines (Forest-wide and Management Area) would apply to any alternative the Forest selects for implementation

P IV-13 The Department compliments the Siskiyou Forest for the definition of terms used in this section.

P IV-20 4-1 Fish, Wildlife, and Sensitive Plants

"Fish and wildlife habitat resources... shall be managed in cooperation with State Fish and Wildlife agencies " With this statement in mind ODFW recommends the next sentence be rewritten to read ". . habitat shall be managed to provide for optimum levels of all species of fish and wildlife and prevent the serious depletion of any indigenous species, (ORS 496.012)

P IV-23 Maintenance of Potential Nesting Habitat

ODFW compliments the Siskiyou Forest for proposing the standard for protecting potential bald eagle nesting habitat.

P IV-24 4-6

The Department should be a cooperator in the spotted owl surveys and selection of SOHA's.

P IV-25 4-11 Deer and Elk Habitat

The first paragraph states Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington (Brown 1985) should be used for management of deer and elk habitat Below this paragraph the Forest states "where practicable ", this line needs to be eliminated as the Forest has set direction in the first paragraph

"Blocks of hiding cover are most effective when at least 600 feet wide," needs to be rewritten to read "Blocks of hiding and thermal cover should be 600 to 1,200 feet wide."

The Forest needs to add the definition of optimum thermal cover (Brown 1985) to the glossary.

(Next to last paragraph) Change to read "Maintain thermal cover within 200 feet ..."

(Bottom of page) The term "where practicable," needs to be eliminated.

P IV-26 (Top of page) Change to read "Roosevelt elk herds should be reestablished ."

P IV-27 4-12 Salmonid Habitat

The proposed habitat quality standards and guidelines are very good and have the endorsement of ODFW See recommendation section for riparian and instream habitat.

4-13 Wildlife Tree Habitat

How would snags and down wood be protected from site preparation activities? (PP IV-27-2)

P.IV-29 5-1 Range

ODFW recommends the following addition to the standards

"Allotment plans shall contain utilization standards designed to maintain healthy riparian plant communities for the protection of soils, water quality, fish, and wildlife habitats."

6-1 Timber Management

Timber Management practices influence the potential value of big game habitat. Proposed reforestation stocking levels limit the production of forage and the proposed thinning levels limit the availability of thermal cover Proper management of these two activities can be beneficial to big game (See recommendations)

P.IV-33 6-9

(First paragraph, second sentence) Strike ". to the extent practicable" at the end of the sentence.

Who is responsible for management decisions to exceed the 60 acre limit for created opening? (PP IV-33-1)

P IV-34 6-10

Harvested areas are considered created openings until crop trees are at acceptable stocking levels and exceed 4 1/2 feet in height. Created openings are separated by areas not classed as created openings A concern to the Department is the amount of hiding and thermal cover that could be lost in areas where created openings are placed next to areas with 4 1/2 foot trees This concern may not materialize if the proposed standards and guidelines for 4-11, deer and elk habitat, are followed How would the Forest manage cover adjacent to created opening? (PP IV-34-1)

P IV-36 7 1 Soil and Water

The Forest has done an excellent job of establishing measurable standards that can be monitored and evaluated

P IV-37 7-5

(Second sentence). Change to read " cut and fill slopes shall be protected from erosion."

7-8 Terrestrial Ecosystems

How does this standard differ from the standards listed in 4-13? (PP IV-37-1)

P IV-38 7-10 Riparian Ecosystem

What is the Forest using as a standard for determining vegetative diversity? (PP IV-38-1)

P.IV-39 (Top of page) Generally large woody debris that are keyed into stream banks serve a useful purpose and are not the result of a management activity The Forest needs to make this distinction in the standard

P IV-52 (Top of page) "Road closures should be implemented .."

MANAGEMENT AREA PRESCRIPTIONS

P IV-68 The Department is concerned with maintaining the angling opportunities in the Wild and Scenic Rogue River The present cutoff date of September 15th for permit requirement, allows the *general public to enjoy angling this portion of the river in the* fall months ODFW would not favor any changes in river regulations which would adversely affect angling opportunities for the general public. This concern also applies to management of MA 10 areas

P IV-85 MA 8 Table IV-7

Research by Kim Mellen, OSU graduate student, indicates a need to manage 495 acres as a core area for pileated woodpeckers The Forest is encouraged to incorporate the findings into the final plan

P IV-91 MA 9-5 Wildlife and Fish

Strike "where practicable" at end of first sentence

MA 9-7 Meadows and Meadow Buffers

The Forest proposes to restore meadows to their former size using 1940 aerial photos as a reference point. ODFW recommends that the 1940 photos be used as a reference to locate the meadows, but that site specific surveys be used to determine the former size of the meadows.

The MA 11 Desired Future Condition

Desired future condition under ODFW proposal would be old growth riparian habitat

"The vegetation in the riparian zone will be a mixture of hardwoods, with some conifers scattered throughout." How much *conifer would be scattered throughout the riparian zone?* (PP IV-98-1)

P IV-99 MA 11-4 Wildlife

In the hardwood riparian habitats thermal cover would be for summer use only

P IV-106 MA 13 Partial Retention Visual

See recommendation section.

P IV-108 MA 14 General Forest

See recommendation section

P.V-10 The proposed monitoring for wildlife appears to be adequate. The size of monitoring areas for deer and elk should not exceed 6,000 acres and preferably would not exceed fourth order watersheds.

P B-7 Table B-4 Wildlife Capital Investments

The Forest should describe the reasons for and types of structural improvement projects for wildlife proposed in the plan. For example, what is the target species for approximately 180 nest structures to be constructed each year

The Forest needs to clarify some of the projects and units of *measure, (i e , Meadow Survey and Habitat Plan* has a unit of measure of structures)

In Table B-4, five of 14 projects relate to sensitive plant surveys Why are these charged as "Wildlife Capital Improvement?" (PP B-7-21) If there were funds allocated for wildlife forage enhancement of final harvest units, would they show in Table B-4? (PP B-7-3)

The Department will be particularly interested in the results of the Forest's planned surveys for bald eagle, black bear, beaver, wolverine, and big-eared bats (Table B-4).

P D-9 There is confusion as to whether the Forest will monitor habitats, populations, or both, for pileated woodpeckers and pine martens ODFW wishes to work with the Forest to select appropriate monitoring methods

P.D-13 C7 Black-tail Deer and Roosevelt Elk

An important component of deer and elk habitat evaluation is forage quality The Forest needs to include forage quality in the monitoring plan.

P D-14 (Paragraph A). The Forest needs to use "A Model to Evaluate Elk Habitat in Western Oregon," 1986 (Wisdom) when evaluating habitat effectiveness

D-16 Fish/Water Monitoring

The Forest needs to monitor the effectiveness of structural habitat improvements to meet planned production objectives

ODFW Fish and Wildlife Habitat Protection Criteria for Forested Lands
(March 1985, Rev. 9/86)
(copy attached)

The following is the ODFW interpretation of how well the Siskiyou Draft Forest Plan complies eith the ODFW criteria.

Old Growth

1 The Forest exceeds criteria

2 Cannot determine if existing populations of old growth dependent species will be maintained

3 Old-growth stands are dedicated, meets criteria.

4 Woodcutting is prohibited in dedicated old growth stands Cannot determine status of roads.

Snags

1 Inventory is included, meets criteria.

2 One-hundred percent criteria in old growth will be met.

3 Sixty percent criteria is met

4 Protection methods not discussed, compliance cannot be determined.

5 Monitoring is planned but is subject to funding, meets criteria

Dead and Down Woody Material

1 Standards are based on published guidelines, meets criteria

2 Protection strategies are not addressed

3 Monitoring is planned but is subject to funding, meets criteria

Hardwoods and Minor Conifer Species

1. Ten percent stocking criteria is met.

2 Criteria for at least 25 percent of stand to be left to natural succession appears to be met

3. Cannot determine amount of acres of hardwoods in migratory winter ranges.

Riparian

1. Acreage and condition are discussed

2. Evaluation parameters are met.

3 Management is to improve habitat values in Elk Sixes drainage and maintain conditions in other drainages on the Forest.

4 Habitat restoration is planned. However, shading level on Class III streams would be 75 percent.

5 Length of time for restoration is not addressed, compliance with criteria cannot be determined.

6 Monitoring is planned but is subject to funding, meets criteria.

Meadows, Freshwater Wetlands, Natural Openings

1. Criteria for effectiveness is exceeded

2&3 Criteria for peripheral vegetation is exceeded

4. Management activities are designed to protect natural value of habitats, meets criteria.

5. Current acreage is protected, some lost acreage will be restored, meets criteria

Cliffs, Rimrock, Caves, and Talus

1. Sites are allocated to MA 9 Special Wildlife Site. Protection is based on published guidelines, meets criteria.

Aquatic Habitats

1 Maintenance, enhancement, and restoration are described, meets criteria.

2 Changes by decade are displayed, meets criteria.

3. Baseline is current level, meets criteria.

4. Monitoring is planned but is subject to funding, meets criteria

In-Stream Habitat

1 Maintenance, enhancement, and restoration are planned, meets criteria

Water Quality

1 Desired temperature and sediment levels may not be met.

2 Monitoring is planned but is subject to funding, meets criteria

Water Quantity

1. Cannot determine the overall effects on water yield and timing of discharge.

2. Monitoring is planned but is subject to funding, meets criteria

Elk and Deer Habitat

1 N/A

2 ODFW benchmarks would not be met

3 a N/A
b. Recordkeeping would be based on TRI compartments Standard is met if TRI compartment does not exceed 6,000 acres

4. Road density is described, amount of cover and forage are not addressed. Forage quality is not addressed

5. a1. N/A
a2 Distribution of cover is not addressed.
b1. N/A
b2. Optimal thermal cover with 21" dbh trees is not addressed

6 Special habitat areas are addressed and most are allocated to MA 9

7 Descriptions of current condition and changes by alternative are included Maximum potential population is not described

8 Monitoring is planned but is subject to funding, meets criteria

9 Habitat management procedures in Brown (1985) would be followed Forest needs to use Wisdom HE model to evaluate effectiveness.

Species of Special Concern

Bald Eagle 1&2. Recovery plan would be followed.

3. Monitoring is planned but is subject to funding

Peregrine Falcon 1 Inventory is not displayed.

2. Existing sites are not addressed
3. Monitoring is not addressed

Northern Spotted Owl Defer to SEIS comments.

Western Snowy Plover, Western Spotted Frog N/A

Road Management

1 No specific plan to meet criteria is included.

2 Impacts of roading are addressed.

3 Standard of new road construction is to avoid important wildlife habitat

4. Management of existing roads to minimize conflicts needs to be planned

Grazing

1 The grazing program on the forest is small but is not addressed or described in the affected environment chapter

2. Allocation of forage is not described

OREGON
ECONOMIC DEVELOPMENT DEPARTMENT
595 Cottage Street NE
Salem Oregon 97310 U.S.A
Telephone (503) 373 1200
Telex 82H81
Cable ORECONDEV
FAX (503) 581 5115

January 19, 1988

Dr K Norman Johnson
Federal Forest Plans Coordinator
Governor's Office
Executive Office Building
155 Cottage Street NE
Salem, Oregon 97310

Dear Norm

After evaluating the Draft Environmental Impact Statement (DEIS), and proposed Land and Resource Management Plan (LRMP), for the Siskiyou National Forest, the Oregon Economic Development Department (OEDD) would like to offer a few comments on the proposed plan

OEDD's primary goal is to provide jobs for Oregonians Through promotion of Oregon's business climate, OEDD provides leadership, assistance, and incentives to businesses in order to retain Oregon's industrial base, recruit new business to the state, and create a climate that welcomes expansion and start-up businesses in Oregon

In this light, our comments on the Siskiyou National forest Plan and DEIS are intended as an analysis of the Forest Service LRMP's impacts on Oregon's industrial base in Southern Oregon Specifically, OEDD will look at the impacts on Forest Products, Fisheries, Mining, Tourism, and Recreation

FOREST PRODUCTS INDUSTRY

The forest products industry in Southern Oregon produces numerous products including saw timber, plywood, shakes, pulp, arrows and others Lumber and wood products manufacturing, including logging, is the largest employer in Coos, Curry, Jackson, and Josephine counties The level of employment ranges from about 13 percent to 25 percent per county

Neil Goldschmidt
Governor

The goals of the Siskiyou National Forest as outlined at Page IV-1 of LRMP include providing a sustained yield of resource outputs at a level that will maintain a healthy Forest ecosystem and that will promote the stability of local communities and provide for regional and national economic needs

The Forest's preferred alternative represents the Siskiyou's effort to balance economic and other environmental considerations to meet the above goals

Members of the forest products industry desire an alternative that is based upon maintaining the historic supply of timber from the Forest One industry group, Southern Oregon Timber Industries Association (SOTIA) has proposed such an alternative Although we have not investigated every aspect of the proposal, there are some elements that we support and suggest that the Forest Service investigate and consider in the final EIS.

The SOTIA proposal suggests that the Forest Service may increase the Allowable Sales Quantity (ASQ) for the Forest by using shorter rotations on some existing plantations for one rotation Industry suggest that this could increase the ASQ between 10 and 14 mmbf.

The SOTIA proposal also suggests that the Forest Service could increase the ASQ by 1 mmbf by using a more accurate conversion factor and by incorporating the effects of fertilization into their forecast

If these aspects of the SOTIA proposals do result in the increases in ASQ that they suggest, that would bring the ASQ up from 150 mmbf annually, to a number that will provide stability to the local communities

The Forest Service Analysis suggests that the trade-off for alternatives within ASQ above 150 mmbf is a decrease in water quality and significantly less old growth Shorter rotations on existing timber stands will have little, if any, impact on old growth The Forest should seriously consider this proposal, however we would not support it if impacts on water quality are too severe

After listening to the public comments during the State meetings in Grants Pass and Gold Beach, the local industry people also voiced concern over the amount and timing of fire salvage that will be available off the forest Although this issue is not addressed in the planning documents, the impacts on community stability of the region would be detrimental if the fire damaged areas on the Siskiyou and surrounding forests were not open for salvage in a timely manner.

It is likely that the amounts of salvage timber will be very high, particularly on the neighboring forest in California

Also voiced in our public meetings, however, was a concern over the impacts of fire salvage operations on the sediment levels of the area's streams and rivers It is important that sediment impacts be at a level to insure maintenance of the high quality water and fish habitat

FISHERIES INDUSTRY

The Siskiyou National Forest is one of the premiere forests in the country in production of commercial and recreation fisheries There are only two dams on the Rogue System and the rest of the rivers run free. The fish species on the Forest include: chinook salmon, coho salmon, steelhead, trout, sturgeon, and shad.

Demand for anadramous sport fishing is very high and will increase as the tourism and retirement communities in Coos and Curry Counties grow Maintenance of and improving the current supply of fish is crucial to meeting this demand and supporting this growing economic base in the community.

Coos and Curry counties rank high in terms of total commercial fish landings in the state, accounting for as much as one-third of the total commercial fish and seafood landings in the state The fishing industry supports jobs in food processing second only to wood products in the region.

The Forest Service's proposed plan addresses the importance of the fishery industry in a very thorough manner The proposed alternative in terms of riparian management, capital investment, habitat maintenance and improvement, timber harvest dispersion and the proposed supplemental resource areas goes a long way toward satisfying the excess demand for fisheries off the Forest.

A particular concern to the industry raised at the state public meeting is the level of sediment in the streams and rivers that is the result of road building, and fire salvage logging Again, OEDD would like to stress the importance of maintaining or lowering the sediment levels in the streams and rivers to support a growing commercial and sport fishing industry

MINING INDUSTRY

The Mining Industry provides approximately 200 jobs and $2 9 million in payroll for Coos, Curry, Jackson and Josephine counties The Siskiyou National Forest is a geologically diverse area with occurrence of gold, silver, nickel, chrome, cobalt, copper, manganese, molybdenum, mercury, coal, limestone, and other minerals In 1984 there were 8,100 mining claims recorded with BLM, most are for placer gold In 1984 there were 125 approved operating plans, two coal leases and 27 active mineral permits. Demand for minerals found within the Forest is highly variable, dependant on markets and cost of production Currently, gold, sand, and gravel are in high demand Strategic minerals, nickel, cobalt, chrome and manganese,

are currently not in high demand However, for those minerals where other primary sources are in politically volatile areas, demand could surge at any time

The mining industry expressed it's concern with the Forest Service plan during the State meetings in Grants Pass Their primary concern is with accessibility to the Forest Citizens have a statutory right to prospect, locate, and develop minerals on lands open to such entry Of the 268,000 acres of land withdrawn from mineral entry, 34,400 acres have high mineral potential, 83,200 acres have medium potential and 151,200 acres have low potential

The Forest preferred alternative proposes an increase in the acreage on the Forest that is under "moderate" mineral restriction, from 196,000 acres to 353,000. A "moderate" restriction for mineral access applies to lands that are managed so that other forest resource considerations require special mitigative measures An example of this, and the primary reason for the increase, is mineral development in visually sensitive areas, along travel routes or rivers. In this case, the mining operation may occur with special lease stipulations or plan of operation considerations Using visual corridors as an example, this means that a mineral exploration or extraction operation would have to be shielded by trees or terrain so as to not significantly alter the landscape from the road or river

Another industry concern relates specifically to the number of botanical research areas, and the existence of threatened and/or endangered plant species in some of the mineralized areas Specifically, the rare soil types that are indicative of nickel laterite deposits also support these rare threatened and endangered plant species.

The Forest has indicated in the LRMP that the conflicts that could arise in these situations will be resolved on a case-by-case basis, according to Forest Standards and Guidelines OEDD suggests that in interpretation of these Standards and Guidelines, a fair evaluation of the community's economic needs be considered in their final determinations

TOURISM AND RECREATION INDUSTRIES

The Siskiyou National Forest and the Southern Oregon Coast serve as the access point for hundreds of thousands of tourists annually into Oregon The sport fishing and other river recreation, primitive and developed recreation on the forest all serve as a crucial draw to tourists from around the world Maintenance of high quality viewshed from the rivers, roads, and trails is imperative for the development of a fast growing industry in Southern Oregon. Also, maintenance of high quality sport fishing enhances and increases the demand for the regional tourism facilities

The Forest's preferred alternative manages fewer acres for visual protection than the current direction The reduced visual assignments were made in areas that do not have heavy recreation use and will be allocated to general timber production. The emphasis in the Forest proposal is on visual quality along major travelways and rivers OEDD is cautiously supportive of the Forests proposal on this issue We will be spending more time in the near future on the Forest to further evaluate this aspect of the Forest proposal.

CONCLUSION

The Siskiyou National Forest has done an outstanding job in development of a lengthy but thorough plan and DEIS. OEDD is very supportive of the general direction of the Forest preferred alternative However, we would suggest that the Forest consider the impacts of shorter rotations, fertilization and a different conversion factor on the ASQ in the final EIS Also, we would like to emphasize the importance of water quality and sediment levels to Southern Oregon tourism and fishing industries The impact of the scenic values of the Siskiyou National Forest can not be over emphasized Visual quality contributes substantially to the area's potential as a tourism and retirement destination

If you have any questions on these comments, or if OEDD can help you in any other way, please do not hesitate to call.

Sincerely,

David H. Lohma

David H Lohman
Deputy Director

DHL rhs

STATE OF OREGON INTEROFFICE MEMO

TO Norm Johnson DATE November 18, 1987

FROM William H Young, Director, Water Resources Department

SUBJECT Comments on the Siskiyou National Forest Resource Management Plan and Draft Environmental Impact Statement

In response to the Governor's Executive Order for forest plans, the Water Resources Department submits the following comments for the Siskiyou National Forest.

The Water Resources Department believes the Siskiyou National Forest has done a good job at identifying the water resource issues for both soil, water and riparian zones in the forest. Both the DEIS and LRMP have identified provisions to protect and improve watersheds and riparian areas. In order to evalaute the success of those provisions, we suggest initiation of an annual review to verify the adequacy of the specific measures.

The comments that follow offer suggestions as to methods or ways to improve the alternatives and the planning documents

1. The forest should incorporate Water Resources Commission basin program provisions for the two basins (South Coast and Rogue River) that encompass the forest boundary Basin programs provide direction for managing water resources important to the state. Adequate streamflow during the low flow months and effects on downstream water use are major concerns. Currently, summer flows are inadequate in those two basins. Hopefully, forest practices will complement state efforts to maintain or improve existing flows and not create additional water resource problems.

The Forest Service identifies the Rogue River report as a reference for water resources information In addition, we suggest the Forest Service use the basin programs when dealing with the varied forest management activities on the forest. Forest activities should be compared to basin goals and water policy Finally, we recommend the Forest Service inform hydro electric applicants the Water Resources Department administrative rules for hydroelectric development (OAR 690-74 Standards for consideration of Applications involving hydroelectric projects) must be fulfilled.

2 The alternatives allowing higher timber harvests could be improved by using the more restrictive timber harvest methods to protect watersheds Even though the alternatives provide some protection by using forest standards, minimum management requirements, and resource

management areas, we suggest, whenever possible, the highest protection procedures be imposed on timber harvest methods to protect the watersheds.

3. The Forest Service should develop better maps that portray the data by planning units. Planning units should also be put on all maps Currently, the maps only identify the alternatives. Better mapping could assist the readers to judge the adequacy of the forest service alternatives and protection by designated management areas.

We appreciate the opportunity to review and comment on the Siskiyou National Forest. If you have any questions, please contact Jake Szramek at 378-3671.

Lists of Attachments
DEIS & LRMP Comments
South Coast Basin Program (September 25, 1984*)
Rogue River Basin Program (June 19, 1984*)
Administrative Rules for Hydro Electric (OAR 690-51).

0807j

REVIEW OF THE SISKIYOU NATIONAL FOREST DEIS & LRMP

The Water Resources Department has organized its comments into 5 sections

I. Comparison of DEIS & LRMP with Agency Policies and Programs
II. Suggestions for Improving Alternatives
III. Comments on Management Area Goals and Strategies
IV Assessment of Forest Service Alternative
V. Specific Comments

I. Comparison of DEIS & LRMP with Agency Policies and Programs

The Siskiyou National Forest is encompassed by parts of two of Oregon's drainage basins the South Coast Basin and the Rogue River Basin. The Water Resources Department has produced basin reports for each basin The Rogue River Basin Study is dated January 1985, and the South Coast Basin report is dated January 1963. In addition, the Water Resources Commission has adopted basin programs which identify the water resources policies for each river basin Those basin programs contain findings and policies as to how the water resources will be managed in those basins. The Rogue River Basin Program was most recently revised in June 19, 1984, and the South Coast in September 25, 1984 In both basins, water use is important for a variety of beneficial uses including. municipal, industrial, domestic, irrigation, fish life, mining, recreation, wildlife and power development

For example, water uses in general are limited in certain parts of each basin. In the South Coast Basin, the surface and ground water resources are classified for domestic, livestock, municipal, industrial, fire control, irrigation, agricultural use, mining, power development, recreation, wildlife and fish life uses (For additional information, see South Coast Basin Program pages 5-12). In the Illinois River Basin, the waters are classified for domestic, livestock, municipal, irrigation, agricultural use, power development, industrial, mining, recreation, wildlife and fish life uses including propagation (for additional information see Rogue River Basin pages 34-44 and pages 45-49). For a more concise review of program findings and policies for the Rogue River portion of the Siskiyou National Forest, the Middle Rogue (pages 26-44) and the Lower Rogue Basin (pages 45-49). Those finding should be incorporated into the forest plan

A hydroelectric discussion is included in the mineral resources section The Water Resources Department believes the hydropower resources should be discussed in the water resources section. As part of that section, the hydropower rules and basin program hydro restrictions need to be addressed

For example, in the Illinois River, the basin program specifies that in order to protect, maintain and perpetuate anadromous fish habitat and propagation, several stream reaches are not to be diverted, interrupted or appropriated for hydropower development purposes The Forest Service discussion on forest hydro restrictions should be consistent with state standards as found in the basin program (See pages 38 -41 and pages 47-49 in Rogue Basin Program for a complete list of the restricted streams).

The Forest Service identifies 20 planning basins as represented in Figure III-8, page III-61 DEIS The basins should correspond to the drainage basins as identified by the Water Resources Department. We would suggest that those planning units be highlighted on all the mapping in the planning documents. The Forest Service cited the Rogue River Study as an excellent description for the water resources conditions within the entire Rogue River Basin However, there was no mention of any reports for the South Coast basin. The South Coast basin report, although dated, contains information on water supplies. The Freshwater Resources of the Oregon Coast, 1974, is also an applicable reference Finally, one additional report that could be of assistance to the Forest Service as it pertains to water resources is the Josephine County Water Resources Management Work Program June 1987. The county is actively involved in the management of the water resources within the county.

The Forest Service describes the water resources on the forest in section III-57 Soil and Water The 20 planning basins are identified and tables provided to list forest lands that affect municipal watersheds and beneficial uses on the forest (Figure III-8 and Table III-11 &.12). The Forest Service does an adequate job in the portrayal of the forest's water resources, but in many instances, the basin programs were not used to characterize water management in the 20 planning units. For example, Bear Creek on the Winchuck River has 1 cfs reserved for municipal use. In addition, the basin program for the South Coast identifies reservoir sites that need to be protected· SF Coquille River at Eden Ridge site 430 (Forest Service does mention this site), Wheeler Creek site 241 and EF Winchuck River site 243 The Forest Service recognizes that the forest lands provide a majority of water for downstream users but the plan fails to mention that minimum streamflows have been established on many of the streams in the area Since those flows are important for fish life, the Forest Service should be sure that upstream forest management practices do not reduce streamflows below recommended levels (See Minimum Flow Tables)

The basin programs also list the state's scenic waterways including the Rogue from the Applegate to Lobster Creek Bridge and the Illinois River from Deer Creek to the mouth. In addition to the federal designation, the state designation should be cited including the state's management plans for those areas.

Finally, one last point that needs to be addressed is the groundwater resources on the forest The Water Resources Department did not find any discussion on groundwater. Since this is an important resource in the area, we would suggest the Forest Service inform the Water Resources Department of any potential groundwater problems encountered We believe problems could come to your attention during the review of forest management activities

II. Suggestions for Improving Alternatives

A Additional Alternatives

The alternatives that are described in the DEIS cover a wide range of possibilities for forest management The WRD suggests that the Siskiyou National Forest consider and evaluate alternatives that provides full consideration to the water and soil resources, including estimates of current water uses, instream flow requirements, protection of water quality, watershed conditions and protection of wetland and floodplain values and groundwater resources.

In summary, the Forest Service should review existing alternatives and modify the hydropower sections by including all stream restrictions as identified in the basin programs and listed in the administrative rules.

The WRD recommends that all areas with minimum streamflows be protected Any forest activity that would produce adverse effects to the watershed should be avoided and or mitigated. Inventories should be made to determine which forest lands need special management practices to protect streams with minimum streamflows.

Data currently available suggests that all the alternatives with the management prescriptions and management area restrictions have sufficient safeguards to protect the water resources to at least minimum levels

III Comments on Management Area Goals and Strategies

A Modifications to Forest-Wide Standards and Guidelines

In the review of the Forest-Wide Standards and Guidelines (LRMP IV-13-57), and the Management Prescriptions (LRMP IV 58-110), we offer the following comments.

The text on page IV-13 describes the type of direction and degree of restrictions with four different levels by the terms, "shall", "should", "practicable", and "may" As part of the following comments regarding the type of direction and degree of restrictions, we would prefer the term "shall" be used to make the action mandatory in all cases we identified, as opposed to the term "should" where the action is required unless a justifiable reason is presented for not taking action The Water Resources Department believes the distinction between shall and should is so minor that the tougher standard needs to be applied

Recreation 1 1-9 The Forest Service is mandated to provide sufficient maintenance to protect soil and water values as part of recreation sites As part of this recreation program, the Forest Service should develop a process to accomplish adequate maintenance as soon as needed and determine what would trigger the maintenance. In order to accomplish this task, we would suggest an inventory be made of existing sites that require maintenance and identify sites that have a potential for soil erosion

Fish and Wildlife 4 4-2 This section should include some reference to the variety of upstream timber harvest activities and how those activities can affect downstream flows needed for the support of aquatic life

Salmonid Habitat 4-12 As part of the stream inventory, flow needs for the rearing, spawning and migration components of habitat improvement should be identified.

Range 5 5-1 In any range improvement activities, the range requirements should include or identify the water needs for livestock Water supply requirements for livestock can be important because of the low summer flows on the forest. We would also suggest programs be developed to maintain streambanks from animal use that would create streambank erosion.

Timber 6 6-1 When selecting a timber harvesting method for any proposed sale, an analysis should be made to determine the potential water flows that could result from the selected harvesting method Effects on downstream users need to be considered

Soil and Water 7 7-2 *Soil Compaction or Puddling* The standard of 85% of affected areas should be in a non-compacted and non-puddled condition is somewhat confusing. The 85% standard needs more explanation. It is unclear why or for what purpose one would use the 85% percentage without using the percentage compacted with roads.

Soil Erosion 7-4 A list should be developed to include all areas that are subject to erosion or already eroded *The list should identify* the location, nature of the problem, cause and what it would cost to repair the damage The list could be used to budget and schedule the repair and maintenance of the sites The list could be used to review the effects of timber harvesting mitigation programs

7-9 In this section, the term "should" be changed to "shall". Any activity that has the potential to affect the water resources must be analyzed. Water yield improvements and other enhancement activities need to be given higher standards. Forest Service activities should not impair the water conditions downstream. It is not acceptable to allow conditions that would degrade the water resources especially during the summer low flow period

Riparian 7 7-11 The standard for activity created debris should be changed to "shall" Additional safeguards need to be placed upon activity created debris entering the waterway With all the protection being afforded to Class I-IV streams, it appears ill-advised to allow activity created debris to enter a waterway other than by accident Granted this debris will be cleaned out, but any activities that could create instream problems need to be prevented before it happens.

7-12 The Forest Service should inventory forest lands and determine areas with significant water for domestic and municipal systems As part of this inventory, the Forest Service should attempt to identify possible problems

that could occur from forest practices and develop a process to inform downstream users in case of emergencies The Water Resources Department can assist with this task

7-15 A report should be prepared describing basin conditions for the 20 planning basins. It should be kept updated with past, current and future proposed activities. This report could describe water yield, vegetation cover, land use and other water uses This might be accomplished in conjunction with the long-term Watershed Analysis Area maps being produced by the Forest Service.

Lands 9 9-6 B. Non-recreation uses. Any water use activities on the forest that require water right permits should be coordinated with the WRD.

Minerals 10 This section should refer to both the basin program restrictions to hydro development and the hydro rules. We would suggest, however, that this section be moved to the soil and water section, because hydro power is not part of the forest mineral base.

Road Building 11 11-2 & 11-5 Construction and Reconstruction The specified construction methods shall include provisions for reducing environmental impacts with particular emphasis or protecting soil and water values. This protection scheme should be expanded to include a section describing how the road system will be monitored to detect potential hazards and what methods will be used to repair any erosional problems as soon as detected

B. Modifications to Management Prescriptions

MA 1-9 Wilderness A list is needed to identify all existing degraded sites that could affect water resources As part of this task, a maintenance schedule should be prepared.

MA 7-5 Timber We believe a section is needed to explain the statement that timber harvest *can be permitted in some areas to produce specific benefits* for fisheries and water resources. This new section needs to explain how and what timber harvest benefits will result to fisheries and water resources from the long-term effects from timber harvest

MA 7-8 Soil and Water The degree of protection from accelerated soil erosion resulting from management activities within supplemental resource areas "shall" be minimized or preserved This standard needs to be mandatory

MA 7-9 Water Quality efforts "shall" be made to rehabilitate degraded sites or other areas yielding high levels of sediment or turbidity. This standard needs to be mandatory.

IV Assessment of Forest Service Alternatives

The WRD assessed three representative alternatives:
Alternative C with emphasis on timber management opportunities;
Alternative G promotes the health and productivity of the forest water related resources, and
Alternative K the preferred alternative

As a general rule in the review of the Forest Service alternatives, the WRD would prefer alternatives that minimize disruption to the natural forest ecosystem Those types of alternatives provide the greatest benefit to the water resources in both quantity and downstream effects on water use
In the alternatives that provide for the greatest amount of timber harvest, the standards and prescriptions for soil and water, and fish life should alleviate some of the undesirable effects for water supply and require mitigation to protect and enhance the resource. Those planning basins would contain the following provisions· no more than 20% of any planning basin will be harvested during a 10-year period and prescription levels B and C would be used for riparian management In addition, the direction and restrictions as described in the forest wide standards and guidelines, and management areas would assist in providing protection to the water resources. Those three conditions provide some type of analysis and or action before any activity is performed that could affect water resources

The WRD believes that those items provide a degree of resource protection to the water resources. We would recommend, however, that monitoring programs be established to identify and mitigate potential problems as soon as discovered to protect the resource.

Alternative C would have one of the highest impacts on the water resources Alternative C would result in the largest amount of sediment and largest peak sediment loads due to high harvest levels Alternative C has the highest amount of land selected as suitable for timber production This creates some concerns for the various management areas that have large acreages tentatively suitable for timber production. Lands in management area Supplemental Resource classification would be lost to the timber classification Alternative C also provides the lowest expenditures for capital investment for fisheries and riparian management. In many instances, planning basins with low level timber harvests would come under increasing harvest levels creating the potential for more soil erosion and water degradation problems.

According to the various protection proposals for classification, basins would not receive more that a 20% harvest per decade and riparian protection would be at level B The tables list the various harvest levels over time, many of the planning basins do not attain the 20% level of harvest, but the percentages could reach that level. The effects on the basins with relatively low harvest levels would be unknown if harvest levels went up to 20% Losses to timber harvest would be high within the Supplemental Resource Management Areas Only two streams would be protected under this category We would recommend the Forest Service re-evaluate the 30 streams

with exceptional salmon and steelhead rearing capabilities and make sure the streams are protected All streams with minimum streamflows should also be added to the list and protected. Minimum flows is one of the methods used to protect aquatic life and we suggest the Forest Service take this protection policy into consideration

Alternative G emphasizes the protection and enhancement of the Forest's non-timber resources and is designed to encourage the health and productivity of the Forest's water related resources. Soil disturbances would be limited to 9-13% of the area in all 20 watershed planning basins per decade and riparian prescription C standard would be used. The land around all 30 creeks would be allocated to Supplemental Resources Management Area. The forest would require less capital outlay to repair because the forest would not be subject to major timber harvesting. Protection would be afforded to 13 of the 14 management areas. This alternative would provide maximum protection to the water resources.

Alternative K the preferred alternative
Alternative K is a compromise between a high timber harvest and a low timber harvest. It attempts to address the desires of a wide range of users and still supply goods and services to the economy Soil disturbing activities are limited to 9-13% of the planning basins per decade and 13 of the 30 streams would be part of the Supplemental Resource Management Area Riparian prescription B would be employed in all areas except for the Elk/Sixes River where riparian prescription C would be used for Class I and II streams. We would recommend that all 30 streams and streams with minimum streamflows be protected for aquatic life. Protection of those flows should include all tributaries which provide the water

Summary

In many of the alternatives, conflicting resource problems have been recognized The Forest Service has done an adequate job of identifying possible problems that could result from conflicting uses. We believe the Forest Service has used the various. planning questions, forest-wide standards, management areas, minimum management requirements and the type of direction and degree of restriction afforded by the terms "shall" and "should" in an attempt to determine the best methods to protect the resources on the forest.

V
Specific Comments

DEIS

Table S-1 Riparian page S-21
According to the 3 riparian prescription levels of management, the forest minimum is designated as level B. In Table S-1 there is a row for a " Pre Minimum" level It is unclear as to what "pre minimum" means.

Page 11-8 & 11-9 The text describes 3 levels of riparian prescriptions

being level A,B, and C. The text on II-9 omits the description for level C

II-39 MA 7 Supplemental Resource Areas should list the 30 streams for reader assistance.

The List of Tables on viii. lists Table II-16 Special Assignment Areas as being on page II-140 but in fact the table is located on page II-155.

Page II -27 to II -53 The 14 management areas list the total amount of acres listed in each area and the amount of acres that is tentatively suitable for timber production A map is provided to identify the lands in the management area. We would suggest that the map for each management area identify both the acres for the management area and those acres suitable for timber production.

II-195 Hydropower is of special interest to the state and a better discussion is needed to identify the hydropower sites on the forest and how the Forest Service will coordinate with the Water Resources Department on hydro power applications. Additionally, the Forest Service should consider the Water Resources Department administrative rules for hydro and use the basin programs to determine what streams are restricted for hydro development.

II-213 Soil and Water The Forest Service should set-up a monitoring program to measure the effects of timber harvest on sediment and water yields and the effects of watershed improvements on water yield

III-22 Hydropower This section should list existing power claims on the forest and identify under what conditions development can occur

III-40 Water Storage Development Reference the potential storage sites in the forest area with those listed in the WRD basin programs.

III-42 Water storage Developments. In certain areas of the report the discussion centered around the fact that the forest had low summer flows and water-users were in short supply This section needs to be expanded to include the need to create or save water for downstream users to offset low summer flows.

PROPOSED LAND AND RESOURCE MANAGEMENT PLAN

Resource Management Protection

II-8 Fish habitat and Watershed Condition This section should clarify the difference between watershed conditions and conditions for fish habitat Most of the improvements are for instream modification with large woody debris to benefit fish life There is no information as to how the watershed will be managed to provide better conditions to the stream.

II-9 Research and Information Needs A section should be added to address 1. the needs for more information on forest runoff, forest management techniques and streamflow, 2. the benefits of maintaining additional

riparian areas along stream courses to protect the quantity and quality of the water supply, 3. determine the forest harvesting techniques or streamflow The forest does allude to this, but we would suggest a section on forest harvest and streamflow.

III-4 3. This section should list the streams that are protected It seems $350,000 will be spent to maintain and enhance fish habitat improvements. Is money available to protect or make land improvements that could be beneficial to streamflow? This section is not clear as to where the money will be spent and if there is a difference between actual fish improvements benefits and watershed benefits from increased sedimentation and erosion.

IV 2 Forest Management Goals We would suggest the Forest Service add a goal to this section to include the protection of watersheds The goal should reference the policies of the Water Resources Commission as found in the basin programs

IV -11 The Forest Service mentions improving watershed conditions on more than 450 acres yearly. How does this compare with acres needed for improvement? On page IV-12 some of the projects listed the need to prevent erosion, establish stream thermal protection and other improvements in the soil and water regime of the forest A complete list of projects should be provided.

IV -36 7-2 Soil and Water This section should include the goals of the WRC as defined in the basin programs for the Siskiyou National Forest

IV -37 7-5 & 7-6 A process should be included to make sure the system for mitigation is working

IV-38 7-9 Water yield improvements activities need to be given a higher priority

IV -39 7-13 Instream Flow The flows for instream uses need to be maintained and protected on the forest lands.

IV -40 7-15 Forest management activities should be referenced to basin programs for water use and coordinated with the WRC The watersheds identified in the watershed analysis area (WAA) maps should reflect the state's watershed basins

Finally, the Forest Service should develop a section that addresses the question of monitoring for the protection of water resources.
0808J

Department of Environmental Quality
811 SW SIXTH AVENUE, PORTLAND, OREGON 97204-1334 PHONE (503) 229-5696

RECEIVED
DEC 02 1987
EXECUTIVE DEPARTMENT

December 2, 1987

K Norman Johnson
Federal Plans Coordinator
Executive Department
155 Cottage St. N.E.
Salem, OR 97310

Re Draft Environmental Impact Statement for the Siskiyou National Forest Plan

Dear Mr Johnson

The Department has reviewed the draft Environmental Impact Statement (DEIS) for the Siskiyou National Forest Plan and provides the following draft comments for use in preparing the coordinated state response. These comments are related to air quality and water quality impacts of the proposed Plan. The Department does not recommend a "preferred alternative" at this time. The deficiencies outlined below reflect a need for background information that is necessary for the Department of Environmental Quality to evaluate before selecting an alternative After this information is included in the DEIS, the Department would be more capable of recommending a preferred alternative.

Regarding air quality, the Department's primary concerns are those of air quality impacts from forest prescribed burning and the burning of the Forest's fuelwood by the public within urban areas It is important that the Forest Plan DEIS clearly demonstrate that the Forest Service is not subsidizing the public's use of fuelwood. Both of these issues focus on the Forest's policy of the highest and best practicable use of forest residues. The Forest Plan should work toward better developing management alternatives that will minimize prescribed burning smoke while supporting the utilization of woody residues

Regarding water quality, the Department's concern is that the Plan be consistent with Oregon's adopted Statewide Water Quality Management Plan for forest practices as required by the Clean Water Act It is important to ensure that the proposed activities of timber harvest, road construction, chemical handling and usage, sewage disposal, livestock grazing and other forest land activities comply with Oregon's Water Quality Standards and Guidelines and be monitored for their effectiveness in compliance The Plan does recognize goals of meeting water quality standards and protecting beneficial uses of the water We are pleased with the consideration and detail given to water quality protection and management However, important

information is lacking in the Plan and DEIS necessary to adequately assess the water quality effects of the activities in a multiple use forest, including water quality analysis of baseline water quality conditions in individual streams and the effects of the planned forest activities on those streams. In particular, there is a need for plans to protect domestic water supply water quality in intensively managed watersheds as a result of stricter safe drinking water act requirements.

Thank you for allowing us the opportunity to review the draft EIS. The Department looks forward to reviewing the proposed state response

Sincerely,

Lydia Taylor for
Fred Hansen
Director

FH:p
MP1154
Attachment

State of Oregon
Department of Environmental Quality

Comments on the Draft Environmental Impact Statement
for the Siskiyou National Forest Plan

I Air Quality

The following comments summarize Department of Environmental Quality, Air Quality Division concerns that should be addressed in the Draft Siskiyou National Forest Plan Comments are organized into 4 major sections, each of which should be addressed in the Draft Forest Plan

A Attainment and maintenance of air quality standards

B Prevention of significant deterioration requirements

C. Visibility protection of Class I areas

D. Consistency with respect to Federal and State of Oregon environmental policies.

The principal issue of concern to the Department is that of air quality impacts related to forest prescribed burning, urban air quality impacts resulting from residential use of fuelwood from the Forest and the highest and best practicable use of forest residues A basic requirement of all National Forest Plans is presentation of an analysis of planned prescribed burning in relation to past burning activities If it can be shown that projected annual and daily air pollutant emissions do not exceed, or are expected to be less than that which occurred during the 1978 baseline period (using emission estimation methodology for baseline and future years developed by Sandberg, et al, USDA Forest Service), then issues discussed in Sections A and B are satisfied and no additional technical analysis of these issues is required. Work recently completed by Sandberg was part of the USDA Forest Service Region 6 Vegetative Management EIS This work should be included in the alternative analysis

A Attainment and Maintenance of Air Quality Standards

Management alternatives should be evaluated with respect to the Clean Air Act and Oregon Clean Air Implementation Plan requirements. The first issue that must be addressed is that of impacts on air quality standard attainment and maintenance. Table 1 lists Federal and State of Oregon air quality standards. Specifically, analysis of the alternatives should demonstrate that the proposed action will not cause or significantly contribute to air quality standard violations Air quality impacts within attainment areas must not exceed Prevention of Significant Deterioration (PSD) increments (Table 2) or cause violations of air quality standards.

B. Prevention of Significant Deterioration

Part C of the Clean Air Act, requires the Department to insure that pollutant increments in Class I areas (Table 2) do not exceed specific limits adopted by Congress irrespective of the originating source. To assure that these increments are not exceeded due to planned increases in prescribed burning emissions, a technical analysis of the impact of planned burns on nearby Class I wilderness (Kalmiopsis Wilderness) and Class II lands would be required. As noted above, such an analysis would not be required if it can be shown that the proposed burning activity would not exceed that which occurred during the baseline period. If the analysis indicates significant impacts, specific quantifiable measures designed to mitigate the impacts must be described in the Draft Forest Plan.

C. Visibility Protection For Class I Areas

The Oregon Visibility Protection Plan requires the protection of visibility within Class I areas during the period of the July 4th weekend to Labor Day, inclusive. During this period, the Siskiyou Forest Smoke Management Program must be conducted such that smoke is not intentionally transported into Class I wildernesses. The Draft Forest Plan should evaluate the impact of proposed increases (if any) in prescribed burning activities on the Visibility Protection Plan specifically with respect to assuring the continued protection of visibility within Class I areas.

D. Consistency With Federal and State Environmental Policies

Department policy (OAR 340-20-001) requires that Highest and Best Practicable Treatment and Control be applied to pollution sources within Oregon OAR 340-13-005, Environmental Standard for Wilderness Areas, set forth policy on environmental impacts within wilderness lands while USDA Forest Service Region VI policy (Service Manual No. 2400, Supplement 347, March 1985) requires that, in recognition of the value of forest residues utilization, prescribed burning only be accomplished for those units where all other alternative treatments are unacceptable.

1. Fuelwood cutting program consistency with environmental policies:

The Department has become increasingly concerned about residential wood smoke impacts on urban air quality. Fuelwood cutting programs managed in the Siskiyou National Forest are a major and inexpensive source of fuelwood for Southern

Oregon and Northern California residents. The Draft Forest Plan should evaluate and discuss the serious environmental consequences of the fuelwood program and it's consistency with Federal and State environmental policies. Specifically, the DEIS should clearly demonstrate that woodcutting fees are not subsidizing the public's use of fuelwood

2 Highest and best use of wood residues:

Department policy (OAR 340-20-001) requires that highest and best practicable treatment and control be applied to pollution sources within Oregon. Since prescribed burning smoke is the largest source of fine particulate emissions within the State, the Draft Forest Plan should include consideration of an alternative that assures the highest and best practicable treatment of forest residues focusing on intensive utilization of woody residues for industrial purposes It is important that the Forest Service work toward alternatives that will minimize prescribed burning smoke while supporting the utilization of woody residues for industrial purposes.

Table 1
National Ambient Air Quality Standards

SO2	Primary	80 ug/m3, annual arithmetic mean 365 ug/m3, 24 hour average
PM10	Primary	50 ug/m3, annual arithmetic mean 150 ug/m3, 24 hour average
NO2	Primary & Secondary	0 053 ppm, annual arithmetic mean
CO	Primary	9 ppm, 8 hour average 35 ppm, 1 hour average
Ozone	Primary	0 12 ppm, 1 hour average
Lead	Primary	1.5 ug/m3, quarterly arith. mean

Table 2
Maximum Allowable Increases
(PSD Increments)
(Micrograms Per Cubic Meter)

Class I Areas Pollutant	Annual	24-Hour	8-Hour	3-Hour
SO2	2.0	5.0		25 0
TSP	5 0	10 0		

Class II Areas Pollutant	Annual	24-Hour	8-Hour	3-Hour
SO2	20 0	91 0		512.0
TSP	19 0	37 0		

Class III Areas Pollutant	Annual	24-Hour	8-Hour	3-Hour
SO2	40.0	182.0		700 0
TSP	37 0	75 0		

For further information regarding air quality, contact John Core(229-5380)

II. Water Quality

The Management Plan and DEIS were reviewed within the concept that land management activities have the potential to beneficially or adversely impact the quality of the waters in the forest land downstream from the forest. The Management Plan has the opportunity to improve existing degraded resources and to maintain or protect existing desired resource conditions. The level of emphasis placed on water quality conditions and the processes used to protect that quality, play an important role in providing guidance to the managers on a project-by-project basis in the future

The Water Quality Division comments are detailed in the following five sections

A. Consistency with Provisions of the Clean Water Act.

1. Policy

Fish habitat, recreational uses and water for domestic use are all recognized beneficial uses of the waters within and emanating from the Siskiyou National Forest. The Department of Environmental Quality's statutory obligation is to protect, maintain, and improve water quality for these uses. The Department does this, in part, with the help of the Federal Clean Water act and Oregon water quality standards contained in the Oregon Administrative Rules.

The draft Siskiyou Forest Plan provides goals for water and environmental quality while managing the forest's other natural resources. To strengthen these statements and avoid misinterpretation of goals, we suggest specific reference to Oregon's water quality standards (OAR 340, Division 41) be made for Goals 18 and 21 (Plan, p. IV-2). Reference to Oregon's forest practice rules (OAR Chapter 629, Division 24) should also be made for Goals 19, 20 and 22 since these rules are currently recognized as best management practices (BMPS) for silviculture in Oregon.

The forest staff should be commended for their definitive work that went into producing the Forest-Wide Standards and Guidelines section of the proposed plan. To further strengthen items in this section we offer the following comments.

1. We agree with the definitions of degrees of restriction provided on page IV-13.

2. We suggest adding reference to OAR Chapter 340, Division 41 (Oregon Water Quality Standards) and applicable USFS references to the Oregon DEQ/USFS Region 6 Memorandum of Understanding dealing with nonpoint source pollution management The reference to these documents tend to get lost by only mentioning them in the DEIS.

3 This section of the plan must provide standards for wastewater systems. We request that the following language be added to page IV-26 of the Proposed Plan. "Sewage treatment and disposal facilities shall be approved by the Department of Environmental Quality or its contract agents and shall be in compliance with rules of the Environmental Quality Commission".

4. We request that directional tree falling be included in the standards discussion of Item 7-11 on page IV-38

5. The DEQ agrees with the process described for establishing, revising, and monitoring for compliance with best management practices in Item 7-14 on page IV-39. The monitoring aspects of this effort are of particular interest to the DEQ. We make comments regarding monitoring and evaluation later in this letter.

6. We request that the words "should", "will" and "where practical" be replaced by the word "shall" in the "WATER AND SOIL" section on page IV-81 It is our opinion that the plan can not achieve the Goal of Management Area 7 without the word "shall" as defined on page IV-13 The current language on page IV-81 allows too much flexibility and interpretation to achieve the stated goal. The word "shall" makes the activity mandatory rather than discretionary.

7. We are concerned about salvage logging after fire We recognize the value of the damaged timber after fire and the need to log it out as soon as possible However, we are concerned that salvage logging focuses intense, concentrated management activities in a watershed where the proposed plan may have intended to disperse intense management over time and geographic areas to minimize cumulative impacts In light of the current problem on the forest due to fires, how will the forest minimize impacts on streams and water quality during salvage logging? Can the logging be dispersed geographically over a two year period? If not, then how will the streams be protected?

When reading the whole plan and the draft environmental impact statement, it is apparent the staff knows the water quality problems and how to correct and protect water quality The discussions of effects on fisheries and water quality by each alternative in each planning basin was helpful in our review However, more specific stream quality discussions are necessary to be able to compare proposed management activities against existing stream conditions. The comparisons we did make generated some concerns.

1. The basic assumption that timber harvest and roads cause sediment production is accurate However, what is disturbing throughout the environmental consequences discussion in the DEIS, is the basic erroneous assurption that sediment production can be controlled only by cutting fewer trees and constructing fewer roads It is the DEQ

opinion that water quality protection can be achieved if the proper BMP is installed and maintained, and that it be monitored and evaluated for its continued effectiveness to achieve water quality goals.

2. The discussions beginning on pg IV-131, regarding environmental consequences, should be expanded to discuss in more detail the specific BMPs that need to be applied on specific streams to meet water quality and fish habitat goals. References need to be made to USFS technical manuals that describe these BMPs. This type of discussion is very important for the planning basins proposed to have significant amounts of timber removed and which have streams currently in degraded conditions (e.g., Basin 2, 4) From the discussion in the DEIS and Plan, it is hard for the reader to understand how streams and water will be improved with increased timber production using the basic assumption that timber harvest and roads cause uncontrollable sediment production

B Review of Water Quality Monitoring Plans

The proposed plan addresses the issue of monitoring and evaluation of management activities on various resources including soil, water, fish and cumulative effects We agree with the approaches displayed in the plan. However, we do have concerns for what is proposed and the need to improve the approach to be most effective.

1. The goal of a monitoring program to protect the water resource should be assessment of the changing water quality, not assessment of BMP effectiveness. The BMPs are tools to achieve water goals and should be monitored for their effectiveness to achieve water quality protection. However, BMPs are not the end products.. Good water quality is the end product and, therefore, should be the focus of monitoring.

   We suggest the forest staff use the Nez Perce National Forest final plan, Appendix A, Forest Fishery/Water Quality Direction by Prescription Watershed approach and specific elements as a starting point for improving the Siskiyou monitoring plan Please pay particular attention to the focus on beneficial uses of water in the streams and to the stream and water quality parameters monitored.

2 It is unclear in the proposed plan how the results of the water monitoring efforts will be displayed to the resource managers to modify their management strategies as necessary

A more frequent contact with the resource managers is necessary to ensure timely and effective decisions to protect water quality. We suggest that the plan be improved to show (a) the mechanism for the results of water quality monitoring to be transmitted to other resource managers and (b) how frequently these communications will be made.

3. Adequate and guaranteed funding of a monitoring program is necessary. The proposed plan displays costs for monitoring but doesn't ensure that the monitoring will take place. It is our position that monitoring of the plan implementation is not voluntary or optional, but mandatory. Our position is based on an interpretation that monitoring is a requirement of the National Forest Management Act (NFMA) to, "(E) insure that timber will be harvested from National Forest System lands only where —

   (iii) protection is provided for streams, streambanks, shorelines, lakes, wetlands, and other bodies of water from detrimental changes in water temperatures, blockages of water courses, and deposits of sediment, where harvests are likely to seriously and adversely affect water conditions or fish habitat" (Section 6, NFMA).

   If the Siskiyou National Forest staff cannot ensure that water quality monitoring will occur, then they cannot ensure that they are indeed protecting the resources described in the above NFMA citation. It is our opinion that this is a violation of NFMA requirements.

C. Review of Management Strategies and Alternatives

The DEQ made no attempt to determine a preferred alternative for water quality. We recognize that this is a land management plan, so we are concerned with the various levels of potential water quality impacts from those land activities We also recognize that differences in management intensity of an activity will create varying potential impacts on water quality.

We reviewed all alternatives and management strategies and prescriptions found in the Plan and DEIS with interest in the potential for water quality impacts and the opportunities available to ensure water quality protection We assumed that the higher the level of soil disturbance by activities, the greater the potential for erosion problems; also the greater the encouragement for recreation, the greater the potential for additional water quality problems.

If the proposed preferred plan alternative can maintain water quality standards or improve water quality to meet those standards, then the DEQ could support the preferred alternative. However, the assumption by the forest staff that the only way to reduce water quality impacts is by less timber production and road building makes it difficult to use the projected impacts in Figure IV-3 through IV-15 and still accurately access the effects of the management alternatives.

In addition, the DEIS and plan lack important information such as baseline water quality data for specific streams to assist in judging the effects of alternatives on water quality Appendix B of the DEIS cites sources of data For our assessment, lists of streams and their condition would be more helpful. We suggest the forest staff consider constructing lists similar to those used in the Nez Perce National Forest Plan and Final EIS.

D Review of Management of Special Use Watersheds

We looked specifically at how the plan intends to manage domestic water supply watersheds Municipal water supplies are identified in Table III-11 of the DEIS. The proposed plan recognizes the need for protection of the water quality for this beneficial use via the broader goal statement #21 on page IV-2 of the proposed plan

Our comments relative to protection of water quality for domestic use center on the current Safe Drinking Water Act that requires municipalities to obtain written agreements with land owners to control pollution in their respective watersheds. The proposed plan must comply with the Safe Drinking Water Act requirements This requirement is accurately stated on page J-6, DEIS Appendix Volume II Our concern is that the proposed plan does not offer a plan. It offers only broad statements for protection of water quality We request that the proposed plan develop and then display the management direction and environmental impacts for managing the resources in the identified municipal water supply watersheds This could be accomplished by specific discussion of domestic water supply watershed needs within Management Area 7 - Supplemental Resource beginning on page IV-79 of the proposed plan. Doing this still does not relieve the forest from developing agreements with each municipality

E Review of the Plan for Groundwater Quality Protection

The plan virtually ignores the groundwater component of the hydrologic cycle Although groundwater probably will be minimally

affected by forest management activities, the plan should recognize the importance of groundwater quality protection and discuss the following points:

1. Activities that affect groundwater quality will eventually affect surface water quality. Conversely, changes in surface water quality might be reflected in groundwater quality.

2. Lakes with unique pristine water quality may need special groundwater protection requirements to prevent nutrient enrichment, particularly with regard to sewage disposal practices associated with intensive recreational use

3. All sewage disposal practices need to be in compliance with state requirements Please refer to these requirements in the plan.

4. Groundwater protection planning should be included in all chemical handling practices, in the forest. This would include, but not be limited to herbicides, pesticides, fertilizers, and degreasing solvents at maintenance shops.

5 Activities and procedures that minimize erosion, and surface water runoff also will increase infiltration, allowing for more stable year round stream flows.

MP1154

General File #7-2-3-300

Forestry Department

OFFICE OF STATE FORESTER

2600 STATE STREET, SALEM, OREGON 97310 PHONE 378-2560

MEMORANDUM

SUBJECT DEPARTMENT OF FORESTRY REVIEW OF THE SISKIYOU NATIONAL FOREST PLAN

TO K Norman Johnson, Federal Planning Coordinator

FROM James E Brown, State Forester

DATE November 25, 1987

Attached is the Department of Forestry's review of the Siskiyou National Forest Draft Environmental Impact Statement and Proposed Land and Resource Management Plan for use in the State of Oregon s coordinated response to the USDA Forest Service

The primary emphasis of the Department s review is to insure that the Siskiyou National Forest plan provides an acceptable balance of environmental and economic conditions A primary measure of the economic performance of the plan is the level of timber harvest which supports jobs and local government

The Siskiyou planning team should be commended for the considerable amount of work they have done in producing the planning documents and for their cooperation with the state agencies as we have reviewed the draft forest plan

Our review has concluded that the potential exists to meet the needs of the Siskiyou's resource users as well as the goals and objectives of the Board of Forestry's Forestry Program for Oregon The Department s review points out opportunities to achieve this potential Areas where further analysis should be provided for public review in the Final EIS are also indicated

Two points should receive particular emphasis in the state s response First, management of the Rogue River corridor should be treated as a unique and separate part of the forest plan Second, given the release language of the 1984 Oregon Wilderness Act, land allocations to the Custodial (Roadless)" Management Area are inappropriate in this round of planning Other management areas are presented in the DEIS which provide a full range of options for the management of the Siskiyou National Forest's remaining unroaded lands

The Department of Forestry looks forward to working with the Governor s office, other state agencies, the Forest Service and the people of Oregon in developing a sound, balanced plan for the Siskiyou National Forest

JEB/DM
Attachments

12/2/87

General File
7-2-3-300

OREGON STATE DEPARTMENT OF FORESTRY
REVIEW OF THE SISKIYOU NATIONAL FOREST'S
DRAFT ENVIRONMENTAL IMPACT STATEMENT AND
PROPOSED LAND AND RESOURCE MANAGEMENT PLAN

The Oregon State Department of Forestry s Resource Planning Section in cooperation with other Department staff, has reviewed the Siskiyou National Forest s Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan (LRMP) Our comments focus on six areas of importance

1 Comparison of the DEIS alternatives with the basic objectives of the Board of Forestry's Forestry Program for Oregon -- Page 2

2 Coordination with Department of Forestry programs -- Page 3

3 Effects of the Siskiyou s modeling assumptions and proposed activities on timber yields -- Page 5

4 Factual errors and omissions in the planning documents -- Page 17

5 Economic considerations -- Page 20

6 Needed clarification of planning direction -- Page 26

A summary of this review is provided on page 31

COMPARISON OF THE DEIS ALTERNATIVES WITH THE BASIC OBJECTIVES OF THE BOARD OF FORESTRY S FORESTRY PROGRAM FOR OREGON

(DEIS page II-240) The Oregon State Board of Forestry s 1982 Forestry Program for Oregon (FPFO) contains three basic objectives for the management of national forest lands They are

1 Maintaining the maximum potential commercial forest land base consistent with other resource uses while assuring environmental quality

2 Identifying and implementing economically feasible levels of intensive forest management required to achieve cost effective growth and harvest

3 Maintaining community stability by considering the projected timber harvests from other ownerships in setting the harvest from national forest lands

The Department of Forestry appreciates the discussion in the Siskiyou National Forest DEIS devoted to the Forestry Program for Oregon Unfortunately, the forest has not addressed the FPFO in the format specified in the May 2, 1985, July 15, 1985, and May 13, 1986 Regional planning directions As a result, the Siskiyou has incorrectly compared the DEIS alternatives to the FPFO objectives An August 14 1987 memorandum from the Department of Forestry to the Siskiyou National Forest (See Attachment 1) contains an explanation of this situation

The Siskiyou has also failed to produce the table, required by the Region, which compares the assumptions used in developing the FPFO with the structure and assumptions used in developing the alternative that most closely meets the FPFO objectives This information should be provided in the Final EIS

The revised comparison of the DEIS alternatives as shown on Attachment 2 indicates that only Alternative C fully meets the compatibility standards for all three objectives None of the alternatives meet the timber harvest targets provided to the forest in an April 2 1985 correspondence from the Department of Forestry These targets were revised downward at that time to account for the reduction in the commercial forest land base on the Siskiyou that had occurred since the 1980 Oregon Timber Supply Assessment was published

These timber harvest targets for the first five decades are

Decade 1	40 7	MMCF/Year
Decade 2	39 1	
Decade 3	36 5	
Decade 4	37 2	
Decade 5	40 8	

Management constraints, inventory differences, and yield table differences may prevent direct comparison of these targets with the DEIS alternatives However, they provide a tangible measurement of the Forestry Program objectives These targets should be provided to the public in the Final EIS

The failure of several DEIS alternatives, including the preferred, to meet the basic FPFO objectives indicates that the Siskiyou National Forest has embarked on a management direction that is different from the management envisioned by the Board of Forestry in 1982 A primary reason for this result is the continued reallocation of commercial forest lands (in addition to the allocations in the existing management plan) in each alternative to strategies that prohibit timber management or reduce timber management opportunities below the full yield potential

The Department of Forestry believes that the Siskiyou still has the potential to mold additional alternatives that fully satisfy the FPFO objectives The forest is encouraged to construct such alternatives incorporating the other recommendations by the Department and to provide an opportunity for public review

COORDINATION WITH DEPARTMENT OF FORESTRY PROGRAMS

Fire Management - (LRMP page IV-52) The Department of Forestry supports a policy of applying aggressive, cost effective suppression action to wildfires that threaten life, private property public safety improvements, or investments Coordination of protection planning and suppression efforts with other protection agencies, including this Department, should be included as a part of these guidelines

The Final EIS should more thoroughly discuss how large areas of unroaded and unmanaged forest land increase the hazard and risk of catastrophic wildfires as well as the cost and difficulty of suppressing them The brief reference to this issue on page C-123 of the Appendices prophetically warned of the risks of large high intensity fires in the North Kalmiopsis roadless area The Silver Fire has provided tangible evidence of the magnitude of these risks It also will serve as a costly and potentially long lasting reminder of the continuing threat to the resources on the Siskiyou National Forest resulting from large, inaccessible unroaded areas

Smoke Management - (DEIS, pages IV-116, 231) The Siskiyou should more clearly emphasize compliance with the Oregon Smoke Management Plan since the Environmental Protection Agency (EPA) has approved Oregon s plan as meeting the requirements of the Clean Air Act as amended in 1987 Unplanned ignitions should be used as prescribed fires only if compliance with the Oregon Smoke Management Plan can be assured

Even though wildfires are random events on the forest this summer's experience indicates the extreme magnitude of the negative effects that natural fires can have on air quality The DEIS text makes several references to the contribution of prescribed fires to airshed degradation However, it fails to note that the management activity of prescribed burning reduces the risk of catastrophic natural and man-caused fires which can generate severe and unplanned reductions in visibility

Forest smoke will originate on the Siskiyou whether or not prescribed burning occurs Through the use of smoke management techniques and by employing sophisticated controlled burning methods, the effect of prescribed fires on visibility can be minimized The Department of Forestry supports full use of this and other management tools in order to prevent the significantly greater air quality problems and the other social and environmental costs which result from wildfires in areas of untreated fuel accumulations

Oregon Forest Practices Act - (DEIS, page IV-230) The Oregon Forest Practices Act provides minimum standards for soil and water protection and for the maintenance of forest productivity The Environmental Protection Agency has certified the Forest Practices Act as providing the 'best management practices for protecting fish life and water for domestic uses from non-point pollution sources on forest lands and as meeting the requirements of the Clean Water Act as amended

To demonstrate consistency with the Clean Water Act, the Siskiyou Final EIS should discuss how the alternatives will satisfy the requirements of the Forest Practices Act Particular attention should be given to the newly adopted rules for riparian area management The forest s standards and guidelines for riparian areas should reflect the full intent of the Forest Practices Act as well as demonstrating consistency with the approved rules

The Final EIS should also expand on the statement on page IV-229 of the DEIS which reads

> " conflicts may exist between State administration and enforcement of Best Management Practices (BMP's) on private timber harvest activities versus those practices implemented through the Forest s policies, and Standards and Guidelines

What are these potential conflicts and how could they be resolved? It would seem that the Forest Service s actions should be compatible with the practices required on private land since both are intended to satisfy the Clean Water Act Instead there is some evidence that the Forest Service s standards are more costly to implement and provide less flexibility and less opportunity for timber management than the Forest Practices Act riparian rules

EFFECTS OF MODELING ASSUMPTIONS AND PROPOSED ACTIVITIES ON TIMBER OUTPUT LEVELS

Minimum Management Requirements - (App , page B-105 J) The Board of Forestry has recognized in the Forestry Program for Oregon that forests are important for providing a full range of uses and benefits including wood production water quantity and quality, recreation wildlife fisheries, and forage As a result the Board has adopted a policy to encourage and promote forest management practices which will maintain and enhance the full range of social and environmental benefits of the forest

Based on this Board policy, the Department of Forestry supports the maintenance of viable populations of indigenous forest plants and animals It is therefore appropriate that the U S Forest Service provides a minimum level of protection for forest resources in its national forest plans and presents the public with a range of alternatives which meet or exceed this minimum level

However the Department believes that two basic improvements in the application of minimum management requirements (MMRs) proposed for implementation by the Siskiyou or the proposed revisions suggested by the Regional Office are needed First there is a need for further documentation and analysis by the Forest Service Second increased public involvement in the MMR decision making process must be permitted

Please consider the following specific concerns and recommendations

Need for Further Documentation and Analysis

1 Data Uncertainty - The credibility of the plan could be increased significantly if the MMR s were submitted to peer review That review would help assure that the most current data and a broad base of professional expertise are reflected in the plan

2 Alternative MMR Strategies - Only one set of MMR strategies is proposed in the plan and the sensitivity analysis provided in Appendix J only varies the intensity of that one set Where alternative methods for achieving the same objectives are available displaying them would be beneficial and possibly avoid later conflicts with NFMA and NEPA public disclosure requirements

3 Inconsistency Among National Forests - Based on the information provided in the forest plans published in Region Six to date, it appears that similar national forests may be modeling their MMRs differently, thereby providing inconsistent levels of protection and inconsistently applied constraints on other resources No published documentation supports these differences or explains how each forest's MMR package provides for the minimum level of protection, as required or suggested by NFMA If alternatives are displayed, as recommended in number 2 above, this concern would be overcome

The need for and design of each MMR should be clearly explained in the forest plan A display similar to the August 22, 1984 Wildlife MMR matrix produced by the Region should be included in the Final EIS This now outdated matrix provided important data on the number of habitats being designated by each national forest for each indicator species, the acres of suitable land involved, and a measure of the effect of these allocations on timber management Similar displays could be constructed for soil, water quality, and riparian MMRs

Increased Public Involvement in MMR Decisions

4 Public Review - The decision making process consists of two elements

a *The identification of the level of protection or* management that will be the "minimum level" target suggested by NFMA

b The methods chosen to effect this level of protection and management

In the Siskiyou s planning process to date, these decisions and assumptions used in developing the MMRs were finalized and incorporated into all alternatives without the provision of any opportunity for full public review as required by NEPA and NFMA This action by the Forest Service makes the planning process vulnerable to legal challenges and prevents the agency from gaining the valuable input that the public and other resource professionals could have provided the Forest Service

The process for implementing MMRs must be opened up fully to public review By doing so, the Forest Service may be able to develop new alternatives that are more responsive to public concerns

5 Legal Sufficiency - Minimum management requirements were developed by the Forest Service based on the Region s interpretation of the NFMA requirements Other parties, including other Forest Service Regions, have interpreted these requirements differently Unless the Forest Service improves the analysis of MMRs by adequately considering the concerns of environmentalists, forest industry representatives, and other parties, litigation of the MMR issue seems likely

Snag Management - (DEIS, page II-255, App , page B-108) The text states that

"[t]he present Siskiyou Wildlife Tree (Snag) Guidelines are designed to maintain woodpecker populations at 60 percent of the maximum habitat capability in managed stands'

The cost of this 60 percent level of snag habitat on timber yields is less than one percent of the allowable sale quantity Yet, the Siskiyou has modeled Alternatives B C , 'D , and "D1' so that they can only provide the MMR snag habitat at the 20 percent level while all other alternatives provide a 60 percent minimum It seems that the FORPLAN model was only given two options for snags on managed lands, 60 percent or 20 percent No intermediate choices were permitted The DEIS provides no explanation for this enforced inflexibility in the model

Since there is apparently no significant timber benefit for this lower level of habitat, it appears that all alternatives could provide 60 percent of the maximum habitat capability on managed lands and, thereby, an even higher forest-wide average If this is possible without a reduction in timber harvests or a significant increase in fire risk, the Department of Forestry would support such a modification

The Siskiyou National Forest should continue to insure that its methods for providing snag habitat at or above the MMR level are as efficient as possible and that the chosen methods are the least constraining on timber management

Two Forest Service publications, Wildlife Habitats in Managed Forests and Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington discuss ways of providing snag habitat while minimizing the effects on timber management Please consider these points

1 High stumps may provide adequate habitat for some species

2 Emphasizing snag retention downslope from roads protects snags from firewood cutting

3 Snags do not have to be evenly distributed Some clumping of snags into small patches may actually enhance nesting habitat for some species as well as improve efficiency

4 Selecting individual trees or small clumps of trees for snag retention or snag creation may be preferable to imposing a long rotation over a larger area, especially in terms of the effects on timber harvest levels

5 The selection criteria for replacement snags should include the economic value of the tree Limby, deformed, and broken topped trees should be selected over sound, straight, clear boled trees if wildlife habitat is the purpose for retention

6 Areas not suitable for timber management should be managed to provide 100 percent of their snag habitat potential Active management can include the creation of snags to achieve this potential where custodial management can not

Also note that the 1987 Oregon Legislature has passed HB 2152 which removes the requirement in Oregon law that snags be felled within 250 feet of the exterior boundaries of harvested units planned for burning. This change in the law should allow the Forest Service and other landowners more flexibility in retaining wildlife snags in clearcut harvest units

Unroaded Area Allocations - (App C) The Oregon Wilderness Act of 1984 states that unroaded areas which were not designated as Wilderness

". shall be managed for multiple-use in accordance with land management plans. .'

and that

" such areas need not be managed for the purpose of protecting their suitability for wilderness designation. "(Emphasis added)

In keeping with the intent of this law, the Department of Forestry strongly recommends the elimination of the "Custodial (Roadless)" Management Area 6 as an option in this round of planning

Consideration of unroaded area retention outside of Wilderness is entirely appropriate to meet specific resource demands such as semiprimitive recreation, botanical areas, or wildlife habitat The Siskiyou has provided other Management Area choices (3, 4, 5, 7 8, and 9) which will set aside vast areas of unroaded lands in most DEIS alternatives for these purposes

It is not appropriate that

" unroaded areas are allocated to Custodial Roadless management so that the effects of management on lands adjacent to the designated Wildernesses are minimized and wilderness potential maintained. ." (DEIS, page II-209)

The 1984 Wilderness Act clearly states that

"Congress does not intend that designation of wilderness areas in the State of Oregon lead to the creation of protective perimeters or buffer zones around each wilderness area The fact that nonwilderness activities or uses can be seen or heard from the areas within the wilderness shall not, of itself, preclude such activities or uses up to the boundary of the wilderness area"

The Department of Forestry recommends that unroaded lands which support productive forests be returned to the suitable land base and that the timber volume from these productive lands be included in the regulated timber harvest schedule On the Siskiyou, this would mean that 153,466 acres of the 314,025 acres of unroaded areas of the forest would still be retained to meet MMR requirements, and to provide semiprimitive and primitive recreation, research natural areas, wildlife habitat, and scenic vistas This total would be in addition to the 234,538 acres of Wilderness and Wild River lands on the forest, meaning that even under the most timber-oriented alternative 36 percent of the Siskiyou would remain roadless.

Management of the South Kalmiopsis roadless area deserves a special reexamination by the Forest Service This 105,421 acre area contains only 25,359 acres of suitable land unconstrained by MMRs A significant portion of this area could be retained for unroaded use with no effect on timber management Nevertheless, many of the DEIS alternatives assign all or part of the South Kalmiopsis to General Forest Management Area 14, even though no access or harvesting is planned

The Siskiyou should consider establishing a new Management Area designation for the South Kalmiopsis which emphasizes the management of the unsuitable lands for both their present unroaded use and their potentially high future mineral values

Old Growth Habitat - (DEIS, page II-22) According to the DEIS 85,537 acres, or 7 8 percent of the forest must be maintained as old growth to satisfy minimum management requirements It is important to note that under the most aggressive timber alternative presented by the Siskiyou (C), 36.9 percent or nearly five times the MMR level of old growth would be present after the ten year life of the plan. More than twice the MMR level of old growth acreage would still remain 140 years in the future.

From this analysis, two conclusions can be drawn First, the potential exists to maintain timber harvest levels near the existing plan s potential yield and still provide an abundant reserve of old growth timber during the life of this proposed plan Second, it seems that the Siskiyou has presented a very narrow range of alternatives for public review A broader decision space' of choices should be provided in the Final EIS The result would be a planning document that more closely meets the intent of NEPA and NFMA

Timber Yield Tables - (App , page B-33) The Siskiyou National Forest should consider the use of the recently released SW ORGANON timber yield model in the forest plan A preliminary analysis of this state-of-the-art model indicates that forest management may generate significantly more wood from the Siskiyou than the DFSIM model estimates with the same rotation lengths (See Attachment 3)

It appears that by substituting the SW ORGANON model the Siskiyou may be able to increase timber sale levels while continuing to maintain and protect other forest resource uses Another benefit of the use of SW ORGANON is the flexibility it allows in modeling initial stands below 300 trees per acre The Siskiyou s DFSIM model lacks this capability

The Siskiyou s empirical yield tables were developed using a process that the Region 6 Planning Task Force working paper described as a make do system which includes the statistically undesirable feature of interacting regression equations Growth models such as SW ORGANON would provide a more valid and accepted mechanism for estimating these yields The Forest Service should investigate the potential of this new model for both empirical and managed yield tables and utilize it where it is applicable

The Final EIS should also discuss and justify the forest's failure to develop separate yield tables by site and the incorporation of a 5 percent basal area cap on regression equation estimates These two assumptions could significantly influence the resulting timber yield projections and indicate that problems may exist in the development of the Siskiyou s empirical yield tables

Wild and Scenic Rivers - (DEIS, page III-51, App E) It is clear from the public input have received that maintaining the integrity of the Rogue River corridor is supported by most southwest Oregon residents To emphasize the importance of this resource, the Forest Service should consider the management of the Rogue River as a separate and unique part of the Siskiyou plan The Department of Forestry supports a level of management which preserves those qualities which are critical to maintaining the recreational experiences that the Rogue River currently provides

The Department of Forestry also supports the Siskiyou National Forest s recommendation not to include the inventoried segments of the Chetco and North Fork Smith Rivers in the Wild and Scenic Rivers System The low level of public interest in formal designation of these rivers and the close proximity of more outstanding Wild and Scenic Rivers are the primary reasons for this conclusion Other management strategies in the forest plan are available to preserve the existing character of these rivers

Visual Management - (DEIS pages III-127 IV-170, App page B-28, LRMP, page IV-105) The Siskiyou has chosen to impose constraints for visual management in every alternative Like the MMRs previously discussed, the standards and guidelines for visuals have been implemented without public review, without the exploration of alternative strategies, and without an adequate tradeoff analysis

Discussions with the planning team have revealed that the primary reason for these minimum visual standards was to present only "politically implementable alternatives in the DEIS Since the purpose of the DEIS, as required by NEPA, is to include the public in the decision making process, the Siskiyou must justify this action which has significantly narrowed the decision space of the plan

Because timber outputs are directly affected by these requirements, the Department of Forestry has several additional concerns about visual management on the Siskiyou

1 The Forest cites the need to maintain visual quality adjacent to Wilderness areas to preserve opportunities for primitive recreation in spite of a specific Congressional direction that this buffering action is not intended

2 The Forest provides visual corridors along Wild and Scenic Rivers that average 3 to 5 miles in width even though the Congressionally designated boundaries are only one-eighth to one-fourth of a mile on each side of the rivers These additional visual corridors include background and unseen areas, yet these areas are assigned to a management allocation with very restrictive constraints on timber management

3 The standards and guidelines for Partial Retention Management Area 13 are extremely constraining on timber management They include a target tree size of 30 inches DBH, rotation lengths of up to 130 years, and the designation of harvest units as 'openings until regenerated vegetation reaches 20 feet In "seen areas clearcuts are limited to a maximum size of eight acres with a harvest dispersion rate of 8 percent Retention standards and guidelines are still more restrictive

4 Under Alternative "C , the alternative least constrained for visuals, 86,551 acres, including 67,657 suitable acres, are allocated to Partial Retention Management Area 13

5 All alternatives are constrained to provide a minimum level of visual management, but the purpose, rationale and tradeoffs for this decision are omitted from the 'common constraints discussion in the DEIS Appendices

6 Unseen" areas which are not visually sensitive are included in the Retention and Patial Retention management areas in each alternative The DEIS is not clear in describing the management direction for these unseen areas

According to the Siskiyou planning team the cost of these visual constraints is a reduction of about 1 percent on allowable sale quantity in the preferred alternative The impact on timber volume is low because timber harvesting is also constrained in all drainages by a 9 to 13 percent harvest dispersion requirement Alternatives with the MMR harvest dispersion level of 20 percent on most drainages would have a much greater allowable sale quantity reduction for visuals

Neither the DEIS or the planning team have discussed the economic cost of these constraints in terms of present net value returns to the federal government, and payments to counties It is likely that reductions in these factors would be more significant than 1 percent Such restrictive dispersion constraints may also make road construction and the resulting timber sales impractical and uneconomical

The Department of Forestry requests that the following information be provided in the Final EIS by the Siskiyou

1 A summary of the costs, in terms of present net value and allowable sale quantity of the level of visual management included in each of the DEIS alternatives

2 An analysis of the tradeoffs that would occur if the visual management diameter and harvest dispersion constraints were increased, reduced, or eliminated

3 An explanation of how the diameter and harvest dispersion requirements were selected and an analysis of the tradeoffs that would occur if more restrictive and less restrictive requirements were used

4 A summary of the anticipated recreation use, by decade of each corridor designated for visual management

Departure From a Nondeclining Even Flow Harvest Schedule - (DEIS, page IV-192) 36 CFR Part 219 .6 provides direction to the Forest Service on utilizing timber harvest schedules in alternatives which depart from a nondeclining even flow schedule Such alternatives are to be evaluated if it is reasonable to expect that overall multiple use objectives would be better attained

Regional direction goes on to require consideration of departure alternatives in several situations Among these are

1 When timber harvests from other ownerships are expected to decline

2 When needed to meet Forestry Program for Oregon objectives

Clearly, these two situations exist on the Siskiyou National Forest They point out the necessity that a departure harvest schedule be given serious consideration in the decision making process

The Siskiyou has presented three implementable departure alternatives However, none of these departures address the harvest declines on southwest Oregon industrial lands that are projected to occur from 1990 until 2030 Departure alternatives which accelerate harvests in these decades would be more useful than those presented in the DEIS

It is important to note that any of the alternative land allocations could be managed under a departure harvest schedule Such departure schedules should be formulated so that they increase the level of timber harvest from 1990 to 2030 while existing private forests are growing to harvestable size The Siskiyou should also coordinate its timber harvest schedule with adjacent national forests and other public ownerships This action will assure that the timber supply issue is addressed as effectively and efficiently as possible

Coordinated departures which take into account the differing age distributions of these different ownerships should be considered All departures should be regulated by a 10 percent decadal harvest change constraint to avoid the environmental, economic, and management disruptions that are likely with large changes in timber harvest levels

Culmination of Mean Annual Increment - (App B-116) Region 6 has implemented a minimum management requirement, based on Forest Service regulations, that even-aged stands scheduled for harvest will generally have reached the culmination of mean annual increment of growth (CMAI) The constraint, when combined with the nondeclining even flow requirement and the existing Siskiyou National Forest timber inventory, significantly reduces the allowable sale quantities of the DEIS alternatives

The Siskiyou appears to lack timber on suitable lands in the 50 to 70 year old age classes Because of this there is a shortage of harvestable timber in decades 5 to 7 as available old growth stands are depleted Under NDEF, this shortage limits timber harvests in all previous decades After this critical time period, timber harvests increase dramatically as fast growing, regenerated stands reach merchantable size

According to Forest Service regulations, exceptions to the minimum rotation age requirement are to be " evaluated if it is reasonable to expect that overall multiple use objectives would be better attained"

Specifically, exceptions are permitted

> for removing particular species of trees after consideration has been given to the multiple uses of the area being planned and after completion of the public participation applicable to the preparation of a Forest Plan" (36 CFR Part 219 16)

The Siskiyou has formulated Alternative "D1" which shortens rotation lengths from a forest wide average of 100 years at 95 percent of CMAI to an average of 80 years This harvest schedule reduces the effect of the inventory gap on harvest levels, resulting in an increase in allowable sale quantity of 15 1 million board feet per year. It is important to note that the environmental costs of these shorter rotations appear to be minimal Final harvest acres under Alternative D1 are actually less than for Alternative "D" in the first decade as shorter rotations give FORPLAN more flexibility for timing choices As a result, more high site areas are harvested sooner The DEIS states that shorter rotations would also increase big game habitat capability on the Siskiyou

In addition to shortening rotations in all decades to address this scheduling problem, the Siskiyou s Final EIS should consider

1 Shortening rotations only during the critical decades

2 Increasing intensive management practices in those stands planned for harvest during decades 5, 6 and 7

3 Coordinating the Siskiyou s harvest schedule with adjacent national forests and other public ownerships These other forests may be able to depart from NDEF during the decades that the Siskiyou has an inventory shortage

4 Use the FORPLAN model to maximize timber output by allowing timber harvests to vary within a plus or minus 10 percent range by decade This would permit the model to more efficiently deal with the Siskiyou inventory as it changes over time

All of these harvest schedule scenarios could be utilized under any of the DEIS alternatives The Department of Forestry urges the Forest Service to seriously consider such creative strategies for maintaining a higher level of allowable sale quantity

Geotechnical Methodology - (App , page B-33) A Department of Forestry geotechnical specialist has reviewed the Siskiyou National Forest plan to evaluate how mass soil erosion, surface erosion, and the cumulative effects of soil movement were described and modeled The 'best management practices to be used in road construction and timber harvesting were also reviewed (See Attachment 4)

From this review the following conclusions have been made

1 The surface erosion model appears to be based on sound methodology

2 The landslide inventory is limited by two problems
  a The aerial photo inventory may not have detected landslides hidden by forest cover
  b Road failures based on older practices may overestimate future failures and sediment production using current best management practices

3 Utilizing actual sediment delivery as calculated using the model, inventory and FORPLAN would probably be more appropriate for assessing geologic hazard than using slope steepness and rainfall

4 A more complete discussion of the best management practices, especially relating to mass soil movement and the transportation network, is needed in the Final EIS

5 It is unclear how the results of the cumulative effect model were used to generate the harvest dispersion factors and riparian prescriptions in the DEIS alternatives

6 The Final EIS should consider the effects of mass soil movement on other resources, such as stream structure and downstream water uses, in addition to sediment delivery by streams

Fertilization - (LRMP, page IV-29) The Siskiyou may not have fully considered the opportunities for fertilization to increase timber yields on the forest The Department of Forestry requests a more thorough analysis of the potential use of this management tool Our review of the planning documents indicates this has not been done For example

1 The Forest-wide Standards and Guidelines state that fertilization may occur "as practicable" with no specific criteria provided

2 The costs of fertilization have been provided in the DEIS Appendices but the benefits, including gains in tree growth have not

3 The Siskiyou has only considered one fertilizer application, based on Regional direction and has only considered one age for application for each site

4 The Siskiyou's managed yield tables indicate that without commercial thinning, one fertilization could shorten 95 percent of CMAI rotation lengths by 10 to 20 years depending on site It is not clear if this potential has been considered in addressing the harvest scheduling problems the Siskiyou has in future decades

The Final EIS should examine a wider range of options for the use of fertilization and fully discuss the costs and benefits these options would generate

FACTUAL ERRORS AND OMISSIONS IN THE PLANNING DOCUMENTS

Sediment Yields - (DEIS, page II-213) Table II-20 indicates the 'mean percent change in estimated accelerated sediment compared to current program. .", with Alternative "A" selected as the current program The table shows that the percent change in sediment will vary from +14 percent for Alternative "C" to -81 percent for Alternative "M" This table is misleading in that it only addresses the small amount of sediment produced in addition to background sediment

According to the DEIS on page III-59, 88 percent of the sediment produced on the Siskiyou is the result of natural erosion processes and past harvesting and road building Only 12 percent is the result of new activities It would be more informative for the Siskiyou to describe how total sediment production will vary by alternative

Using the data for decades 1, 2 and 5 provided in Table II-17, it appears that Alternative "M' would reduce total average sediment for these decades by 10 percent More importantly, Alternative "C", which allocates the most land to timber management, would increase the average total sediment for these three decades by only 2 percent.

The Siskiyou should provide this information to the public and describe the benefits and costs, if they are measurable of this 2 percent increase and discuss the margin of error of these sediment production estimates

Optimum Wildlife Habitat Mix - (DEIS, page III-123) Table III-31 provides the Siskiyou s estimate of the "optimum' land allocation for wildlife on the forest The term optimum is undefined and the potential populations that would be supported by such an allocation have not been presented It is also uncertain if the demand for game fish and wildlife were considered in developing this mix

Clearly, this habitat mix would not be optimum for deer since this land allocation would allow only 453,000 acres to be managed for timber production The DEIS states on page III-117 that to maintain the existing deer population of 26,000, " 600,000 acres of the forest would need to be managed for timber harvest' Even then, the Oregon Department of Fish and Wildlife population objective of approximately 32,600 animals would never be met Shorter timber rotations were not considered despite the statement on page III-126 that they would increase the habitat capability for big game The Final EIS should more adequately discuss the meaning and implications of this subjective land allocation

Opportunity Costs of Fixed Land Allocations - (DEIS, page III-160) The Siskiyou states that in addition to minimum management requirements, old growth timber on 20 percent of the forest will be preserved through fixed land allocations, particularly Wilderness The DEIS also states that no opportunity costs are displayed for this old growth that has already been set aside Unfortunately, very real and very significant opportunity costs do exist that should be displayed in the Final EIS

This example illustrates a larger problem in national forest planning The public has not been fully informed about the timber values that have been lost through land allocations which limit or prohibit timber management Therefore the public cannot easily determine the actual or potential levels of values produced by the national forest They also cannot examine the tradeoffs that have been made by previous land allocation processes nor trace the continued erosion of the commercial forest land base Since these fixed land allocations involve 22 percent of the Siskiyou National Forest acreage, this issue must be addressed to fulfill NEPA and NFMA requirements

Jackson County Employment - (DEIS, page III-141) The typographical error on Jackson County's 1983 covered employment in the agriculture, forestry, and fisheries sector should be corrected. This number is 796 jobs, not 74.

Effects on Lifestyles, Social Organization, and Attitudes - (DEIS, page IV-201) Table IV-15 presents a very subjective analysis of a topic that is nebulous to begin with. It is unclear to the reader what information is being communicated. In addition, the table seems to contain several errors. For example, Alternative "D1" is assigned a "-" rating for the "Timber Related" parameter, while Alternative "D" received a "+". Since timber harvests are higher in "D1", a "+" rating should be expected. The same illogical relationship exists with Alternatives "K" and "K dep".

Alternative "D1" is assigned another incorrect relationship for "Primitive Recreation Acres". This alternative has the same land allocation as Alternative "D" but "D1" is given a "+" rating while "D" received a "-".

This portion of the DEIS is of little value to the public in its present form and should be revised to include additional explanations or deleted in the Final EIS.

Alternative Illustrations - The DEIS and the accompanying maps include illustrations which presumably are intended to show the public what the landscape will look like under each alternative. These visual interpretations are very subjective and nothing in the text explains their meaning.

Since all of the scenes depicted in these 13 illustrations will exist somewhere on the forest under every alternative's land allocation, their use in this context for comparison purposes is inappropriate. The Department recommends deleting these oversimplified and biased drawings from the Final EIS.

Major Values Relating to the Resource - (App., page B-90) The text provides a lengthy discussion of the values, attitudes, and opinions of southwest Oregon residents. The conclusions made in this discussion are purely subjective and are based on undocumented assumptions and opinions. A more scientific survey of the values of a random sample of southwestern Oregon residents was conducted by the consulting firm of Moore Information in 1986 for the Oregon State Board of Forestry.

Some of the results of this survey include:

1. Sixty-nine percent of the area's residents believe forests are important to the state as a source of wood products, jobs, and tax revenues.

2. Fifty-five percent believe timber harvesting is necessary to keep forests healthy.

3. Seventy-three percent believe avoiding future timber shortages is an important state policy.

4. Eighty-three percent support the practice of harvesting old growth timber.

More specific information, such as this survey which will be provided to the planning team, would be more useful in the DEIS than the text that is now present. The Final EIS should revise this section to provide a more accurate, documented discussion on this topic.

ECONOMIC CONSIDERATIONS

Fixed and Variable Costs- (App., page B-53) The criteria for identifying fixed and variable costs and for including those costs in FORPLAN appear to be based upon simplifying the model formulation rather than seeking the most economically justifiable solution. Only selected costs are considered as variable costs in FORPLAN, even though all costs, except those which are legally mandated, are probably variable over the 50 year planning horizon. All fixed costs are determined outside the model and, in effect, are "protected" from the model's optimization decisions.

The DEIS provides no way to judge the appropriateness of these costs or the resulting benefits as compared to other possible combinations. Given the magnitude of change proposed among the alternatives, a less arbitrary process is needed. The FORPLAN model is a powerful tool for this analytic purpose; therefore, all variable costs and fixed costs can and should be included. The conclusions reached by the forest may be valid but documentation is needed to support them, and to inform the public of the data, the tradeoffs, and the rationale used for decision making .

Logging Costs - (App., page B-65) Stumpage values used in the FORPLAN model were derived from sold timber sale data. It is not possible to determine from the text if logging costs were also based on sold volume or on harvested timber sale data. If different data sources were used for these two factors, a distorted economic analysis would result. The Final EIS should provide this information. Both stumpage value and logging costs should be based on harvested volume instead of sold volume so that timber sales which were returned to the Forest Service under the provisions of the Timber Contract Payment Act of 1984 are not inappropriately included in this analysis.

Existing stands which average 30 inches in DBH were assigned General Forest logging cost of $622 per thousand board feet (MBF). Future managed stands in General Forest were given an average logging cost of $556 per MBF for trees 24.1 inches in DBH or larger. It does not appear reasonable that logging costs for managed stands will be less than for existing stands of significantly greater diameter. The Siskiyou should explain the derivation of this assumption in the Final EIS.

Historical Costs - (App., page B-60) According to the text, the costs used in the economic analysis were derived from a variety of sources. Forest-wide average costs were derived from 1980 data. Cost for species type conversion were developed from 1980 data from one Ranger District. Logging costs are based on a 1973 to 1982 average while other variable costs used a 1975 to 1980 time frame. Overall, the Siskiyou has used inconsistent and outdated cost information which may not provide an accurate, recent historical average. In particular, the utilization of one year's data is totally inadequate for developing a new 10 to 15 year forest plan. The economic analysis should use the most recent cost information available and a standard time reference that includes several years.

Precommercial Thinning and Other Management Costs - (App., page B-62) The Siskiyou's precommercial thinning cost of $242 per acre is significantly higher than costs assumed by other landowners and agencies. Cost estimates from the Pacific Northwest Regional Commission, the Forestry Incentives Program, and from the Department of Forestry's own land managers indicate a cost of about $110 per acre is appropriate for southwest Oregon. The Southern Oregon Timber Industries Association cites an even lower cost on industrial lands.

Even if lower costs do not affect the land allocations of the alternatives or the outputs produced, they do affect the present net value, returns to the federal government, and payments to counties that each alternative can provide. The Siskiyou should examine all cost estimates, especially those with high administrative cost components, and seek opportunities to reduce them to a level that is comparable to other landowners in the area.

Regional Timber Demand and Supply Projections - (DEIS, page III-145; App., page B-52) All timber availability projections for southwest Oregon predict large drops in timber harvests on industrial ownerships during the next several decades. The most recent work by Forest Service Economist Kent Connaughton may support these conclusions (See Attachment 5).

This decreased supply comes at the same time as demand for wood products is predicted to increase. For example, building remodeling is expected to utilize 15 billion board feet (BBF) of the total 50 BBF of United States lumber consumption. At the same time, the 15 percent surcharge on Canadian lumber imports will reduce this imported supply source. Recent projections by Clear Vision Associates show that the bid price for westside Douglas-fir Forest Service stumpage is expected to jump from $187 per thousand board feet (MBF) in 1987 to $224 per MBF in 1988.

Japanese housing starts will total 1.71 billion in 1987, more than is expected this year in the United States. Because of the lowering of the value of the dollar relative to the yen, American lumber and logs will be more attractive in the Japanese market. The import share of softwood timber arrivals at Japanese sawmills will increase from the 1985 level of 52 percent to 60 percent in 1988. Douglas-fir log exports to Japan from Oregon and Washington in 1988 are expected to be 19 percent higher than in 1987. Total overseas exports from the two states will be more than 3 BBF next year.

These trends indicate that competition for a scarce resource, Oregon's timber stumpage, could increase dramatically in the coming years, benefiting those owning standing timber. Those companies without adequate fee timber could be severely damaged, unless adequate supplies of timber are available from the public ownerships in southwest Oregon.

With this intense competition for southwest Oregon stumpage, it is unrealistic for the Siskiyou to conclude that a horizontal demand curve exists for the forest's timber. A demand function could be calculated for use in FORPLAN. If this is not possible at a forest level, it is possible at a timbershed level. The southwest Oregon Subregional Market Model will soon be available to make reasonable estimates of stumpage demands for various ownerships. Region 6 may use this model in their analysis of the cumulative effects of the forest plans. A similar analysis should be incorporated in the Final EIS for the Siskiyou National Forest and provided to the public for review.

The alternative to recognizing the possibilities for increasing demand for public stumpage is a return to the destructive speculative bidding of the late 1970s. Such an action combined with restrictive monetary and fiscal policies on a national level could force Oregon's economy into another recession.

The Final Plan should also provide the analysis required by former Chief Peterson in his January 12 1987 memorandum to the Regional Forester The memorandum, entitled Planning the Management Of the Timber Resource on National Forest Lands provides specific guidelines for improving the discussion of timber supply/demand relationships by acknowledging recent events, changed conditions, and new information As Chief Peterson stated, " the rationale [behind the forest s conclusions] must be clearly articulated in the appropriate planning documents and our assumptions regarding potential future demand be reasonable and supportable

Historical Local Timber Supply and Demand - (DEIS, page IV-195) The Siskiyou National Forest has chosen to use the period 1980 to 1984 to represent historical timber consumption in the four county area Because of the recession the use of this time frame is inappropriate Using data from the years 1968 to 1977, the forest could have used a harvest level of 1,325 million board feet (MMBF), compared to the DEIS figure of 869 MMBF This older number is larger than the Siskiyou s high projection' for consumption until at least the year 2015

The 1986 Oregon Timber Harvest Report shows the four-county timber harvest level at 1,179 MMBF, up from the 1985 level of 1,125 MMBF Both of these years exceeded the Forest Service s high projections for the years 1986 to 1995 The harvest level may have been even higher if additional stumpage had been available for harvest

The Siskiyou s analysis appears to minimize demand by using recession-influenced historical data and undocumented future projections This analysis should be revised using the southwest Oregon Subregional Market Model as soon as it is available

Future Local Timber Supply and Demand - (DEIS, page IV-195) The projected future timber supply from other ownerships discussed in the DEIS is undocumented and is inconsistent with projections made by the Department of Forestry Oregon State University and the Forest Service s own researchers It appears that the Siskiyou has presented an overly optimistic view of the potential future timber harvests on adjacent national forests and other ownerships that downplays the importance of Siskiyou timber in meeting future demand in southwest Oregon

Attachment 5 of this review presents the most recent harvest projection for this part of the state It illustrates the dramatic drop in industrial harvests that will occur after 1990 The Siskiyou must improve it treatment of this critical issue in the Final EIS

Historical Economic Data - (App page B-84) The historical information presented on economic trends in the four-county area contains data that is at least four years old Since that time, the lumber and wood products industry has recovered and unemployment rates have decreased dramatically from the recession levels of the early 1980s More current information would not support the conclusions drawn from the text and the tables on pages B-84 to B-88

For example, except for Coos County, wage and salary employment for the first five months of 1986 was 2 8 percent greater than for the same period in 1985 This increase was greater than the Portland metropolitan area experienced According to 1987 Employment Division projections lumber and wood products employment statewide has increased by 7 percent since 1983 Payments to counties and stumpage prices have also increased during this period

By updating the data presented in this discussion, the Siskiyou will provide a more accurate summary of the economic trends in southwest Oregon

Community Stability - (App , page B-93) The Forest Service appears to be avoiding the community stability issue by stating that [c]hanges in national economic factors cause a much more profound impact on the economy of southwest Oregon than do changes in Siskiyou National Forest policies and actions" In fact, both of these factors are important As industrial timber harvests temporarily decline and as available supplies of old growth timber are reduced second growth timber will provide a greater proportion of the timber supply However, much of Oregon s competitive advantage lies in the unique strength and appearance qualities of old growth The Forest Service along with the Bureau of Land Management, will be the only available sources of high quality old growth timber in the coming decades

Opportunities for growth in personal income and employment lie in increasing the value added to the timber harvested The wood qualities needed for some kinds of remanufacturing are best provided by old growth Since the Siskiyou National Forest is a major supplier of old-growth in southwest Oregon, changes in the amount and quality of timber supplied by the forest can also cause profound impacts on the economy of southwestern Oregon.

Estimated Timber Selling Value - (App , page B-56) The Siskiyou s analysis appears to grossly overestimate the value of small diameter timber The table on page B-57 shows that 8 inch DBH trees are expected to have 62 percent of the selling value of 30 inch DBH trees However, current market conditions would probably require a tree to be a minimum of 12 inches DBH to make it profitable to haul it to the mill Therefore, trees less than 12 inches DBH should be expected to have a negative value These assumptions by the forest should be reconsidered

Benefits Used in the Economic Analysis - (App , page B-55) The economic analysis in the Final EIS should document the effect of the alternatives on timber harvest (privilege) taxes, public road use fees and taxes, and property taxes These are major sources of local government incomes and of highway construction and maintenance funds within the Siskiyou s zone of influence

Dependence on Larger Forest Budgets - (DEIS, page II-170) The preferred alternative calls for an annual budget of 21 7 million dollars, which is a 35 percent increase in funding over the 1987 budget of 16 1 million dollars (in 1982 dollars) Most of the other alternatives also require budget increases It may be unrealistic to assume Congress will approve such increases If funding is not approved, the plan provides no information on how the Siskiyou s activities and outputs would be modified

Without the inclusion of a budget constraint in the FORPLAN model, the capability to provide more efficient solutions cannot be explored A full range of possible management intensities may not have been presented Therefore, the tendency under a reduced budget is to cut programs rather than to manage the forest differently

A series of FORPLAN analyses for each DEIS alternative utilizing multiple levels of budget constraints could provide information on such management options These analyses will allow the forest plan to be implementable under a wider range of future conditions Disclosure of such detailed analyses will also help the Siskiyou satisfy NEPA requirements

NEEDED CLARIFICATION OF PLANNING DIRECTION

Salvage of Fire Killed Timber - As a result of this year s wildfires on the Siskiyou a significant amount of valuable timber has been killed or damaged Salvaging this material would reduce future fire danger and the risk of insect epidemics in addition to providing economic benefits by providing a needed supply of wood to local processors

The Department of Forestry supports the prompt salvage of this burned timber where it can be accomplished in an economical and environmentally sound manner However, before any salvage operations begin, more specific information is needed on the extent of the current and potential future damage to timber, soils water quality, and wildlife habitat (particularly spotted owl habitat areas) resulting from these fires

Any road construction for timber salvage access should be part of a long range transportation plan and not one-entry use roads Harvest units should be designed to facilitate future timber management and other resource uses

On a related subject, the Siskiyou should consider rehabilitating the burned lands inside Wilderness areas boundaries as these damaged forest lands could potentially affect resources outside the Wildernesses Increased sediment production, insect damage, and fire danger could all occur if no rehabilitation is done in these areas

Timber Inventory - (DEIS, page IV-93) The discussion of resource tradeoffs among the Siskiyou s proposed alternatives should include information on the long-term effects of these alternatives on the timber resource Data on the relationship between timber inventory harvests and growth, as well as the changes over the planning horizon in the number of working group acres by age class for each alternative should be provided in the Final EIS These reports are readily available from the FORPLAN model (Reports 10 6 and 10 8) and should be constructed to provide this information for suitable, tentatively suitable and-total forested lands

In addition, the Siskiyou s Final EIS should clarify the inventory discrepancies that appear in the planning documents and the FORPLAN reports The number of acres of mature, immature, and total suitable timber lands vary significantly among the Analysis of the Management Situation the DEIS, and FORPLAN reports 10 1, 10 8, and 10 9

Given the fact that inventory gaps may be a limiting factor on the Siskiyou s allowable sale quantity, it is essential that the Siskiyou insure that such gaps are not artificially created According to the Region 6 Task Force Working Paper on planning issues, artificial age gaps could result from inaccurately portraying any of the following factors

1 The number of acres of timber not yet merchantable

2 The volume and growth rates of merchantable stands

3 The time required for presently immature stands to reach 95 percent of culmination of mean annual increment

4 The time required for newly planted stands to reach 95 percent of culmination of mean annual increment

5 Age class assignments in the model

The Final EIS should document that these factors have been modeled accurately and explain how the first period FORPLAN inventory and growth correspond with the most recent empirical yield tables and field inventory plot data The Final EIS should also discuss the statistical validity of breaking the inventory down into individual analysis areas and the affects of this action on FORPLAN outputs

Nonchargeable Salvage Volume - (DEIS, page II-237) Table II-48 indicates that the existing timber management plan provides up to 5 MMBF per year of nonchargeable salvage volume The corresponding volumes under all the DEIS alternatives are unestimated" according to the table The Final EIS should display these volumes if they will be produced by the alternatives

O&C Lands - (DEIS page III-43) The Siskiyou National Forest manages 173,000 acres of Oregon and California Railroad (O&C) lands The lands are particularly important to local governments since 50 percent of the revenue generated by these acres is transferred to the counties for use in funding need services such as road projects and schools and in reducing property taxes Other Forest Service lands contribute only 25 percent of their revenue During the years 1980 to 1986, O&C lands contributed 22 percent of the Siskiyou s payments to counties while comprising only 16 percent of the forest land base

The Final EIS should provide information on the location of these O&C lands on the Siskiyou National Forest, how they are allocated among the alternatives and their contribution to payments to counties Opportunities should be explored to maximize the number of O&C acres retained in the suitable land base The Siskiyou DEIS alternatives currently allocate only as much as 89,000 acres, or 51 percent, of these lands to timber management

Road Management - (LRMP, page IV-50) Although not identified as a planning issue road construction and use is an important public issue on the Siskiyou National Forest The Department of Forestry supports a transportation policy which recognizes the importance of closing unneeded existing roads either seasonally or permanently and designing new roads to the minimum standard necessary to meet management and safety considerations

Benefits of regulated road closures include

1 An increase in the amount of effective big game habitat

2 Improved animal hiding cover effectiveness

3 More opportunities for high quality, semi-primitive hunting experiences

4 Reduced conflict between timber and big game management

5 Reduced road maintenance costs by reducing hunter traffic during wet fall months

6 Reduced potential for adverse effects on water quality from forest road use

Contrary to the discussion on page IV-149 of the DEIS it is the use of roads, not the existence of the roads themselves, which significantly affects big game habitat The Final EIS should emphasize this point and strive to manage road development and wildlife habitat so that both can coexist on the forest

Roads provide vital access on this rugged forest which is valuable in reducing the losses and costs from wildfires This summer s fire experience in southwest Oregon graphically demonstrated that the ability to quickly contain and control forest fires was directly proportional to the amount of road access The DEIS incorrectly assumes that roading only increases fire risk The Final EIS should also discuss the importance of roads in providing access vital to protecting all of the Siskiyou s valuable resources from wildfire

The "No Change Alternative - (DEIS, page II-63) The addition of the No Change alternative by the Forest Service is an attempt to address the concerns raised by the Northwest Forest Resource Council in its appeal of the formulation of the Current Direction" alternative These concerns, many of which are also voiced by this Department, involved the legal adequacy of a "no-action" alternative that included new yield tables a new land suitability analysis and the addition of MMR constraints

The Department appreciates the efforts of the Siskiyou to provide a meaningful alternative which, in our opinion, more adequately satisfies the requirements of NEPA and NFMA The No Change alternative appears to be a compromise approach that presents a more accurate, unaltered historical reference for public review in the DEIS

Research and Information Needs - (LRMP, page II-9) The Forestry Program for Oregon encourages research to improve forest productivity the economics of intensive forest management, and to identify the habitat needs of old growth preferring wildlife The Department of Forestry supports the research program outlined by the Siskiyou In addition to the list provided in the LRMP, we also believe more research is needed to

1 Develop new technology to return some of the 163 362 acres removed from the suitable land base because of regeneration difficulty back to timber management status Utilization of the latest Forestry Intensified Research (FIR) information is a key element of this process

2 Improve the knowledge of the habitat needs of old growth preferring wildlife species

3 Improve the forest s capability to estimate supply and demand relationships for Siskiyou timber

4 Develop a regeneration model for SW ORGANON

5 Develop methods for controlling the spread of Port Orford root rot

Monitoring and Evaluation - (LRMP, Chapter V & Appendix D) The Siskiyou s proposal for monitoring and evaluating the forest plan once it is implemented, is one of the most important sections of the planning documents It appears that the Siskiyou has developed a comprehensive monitoring program which will provide useful information on the performance of the plan Funding for this important program should be given a high priority by the forest

Some areas of the monitoring and evaluation program require revision First, the Siskiyou's use of very broad 'thresholds of concern" for several activities is inappropriate and could result in wide variations in forest outputs For example timber sale volumes would be allowed to be reduced by as much as 45 million board feet (30 percent) for two consecutive years before the forest would consider a plan modification In contrast, recreation and visual management activities use a 5 percent variability standard

It is essential that the Siskiyou recognizes that the cornerstone of the economic health of southwest Oregon is at least as important as the recreational and scenic opportunities on the forest The monitoring program should reflect this point The economic and social disruptions resulting from a 30 percent reduction in allowable sale quantity would be unacceptable and that potential could be avoided if a narrower variability standard of 10 percent was used This same standard should be used for all activities which affect community stability

Second, at least two important economic criteria are missing entirely from the monitoring program Personal income, and returns to counties should be monitored along with job numbers with a variability standard of 10 percent

Third the threshold of concern for timber demand appears to be incorrect Logic would conclude that a plan amendment or revision should be considered when the bid price to advertised price ratio exceeds 1 2 rather than when it is less than 1 2 Timber sales which are purchased at or slightly above the advertised price are entirely appropriate and should not trigger a change in the plan The occurrence of bid prices which exceed a ratio of 1 2 would be a reasonable threshold of concern in the measurement of timber demand

Finally, it is also unacceptable that the decision to amend or revise the plan be based solely on a subjective judgement by the Forest Supervisor For each monitored activity specific actions should be identified which will take place if the threshold of concern is exceeded For example if the appropriated budget for the forest prevents the Siskiyou from providing at least 90 percent of the allowable sale quantity (ASQ) proposed by the plan, the monitoring program should describe the plan amendment or revision process that will be implemented

Please refer to the Department of Forestry s November 6, 1986 correspondence to the Regional planning staff (See Attachment 6) for additional comments on this important issue

SUMMARY

1 Alternative "C is the only DEIS alternative that meets the objectives of the Forestry Program for Oregon The potential exists for the Siskiyou to craft additional alternatives in the Final EIS which fully satisfy the FPFO objectives and provide a balance of resource uses, benefits and values

2 The forest plan should demonstrate closer coordination with Department of Forestry programs, particularly in the areas of fire management smoke management and riparian area protection Specific discussion is needed to explain the potential conflicts that the Forest Service perceives will exist between the administration and enforcement of the Forest Practices Act on private lands and the Siskiyou s policies, standards, and guidelines

3 Planning assumptions and decisions on the subjects of minimum management requirements, snag management, unroaded area allocations, old growth habitat managed yield tables, Wild and Scenic River designations, visual management, harvest scheduling and geotechnical methodology all have a direct effect on timber output levels These assumptions and decisions require additional discussion and potential revision in the Final EIS

4 Factual errors and omissions in the planning documents may lead the public to conclusions that are incorrect Discussions in the Final EIS on the subjects of sediment yields optimum wildlife habitat mix, fixed land allocations, and economic and social background information

5 Shortcomings in the Siskiyou s economic analysis have likely distorted the costs and benefits associated with the DEIS alternatives In particular, the assumptions on timber supply and demand may be underestimating the importance of this output from the Siskiyou National Forest to Oregon's economy

6 Additional information should be provided in the Final EIS in the areas of salvaging fire killed timber, timber inventory, O&C lands, road management, research needs, and the Siskiyou s monitoring and evaluation program

DM GL

Attachments

ATTACHMENT 4

GEOTECHNICAL REVIEW OF THE SISKIYOU NATIONAL FOREST
DRAFT ENVIRONMENTAL IMPACT STATEMENT

Keith Mills, Geotechnical Specialist, P.E
Oregon State Department of Forestry
Forest Practices Program

October 28, 1987

The purpose of this review is to evaluate the geotechnical methodology found in, and used in development of the Siskiyou Proposed Land and Resource Management Plan This methodology includes the description and models of mass and surface erosion, the Best Management Practices for the transportation network and silvicultural harvesting operations, and the cumulative effects model The Siskiyou National Forest has a geology and climate significantly different from other forest lands in Oregon. The complex, highly folded and faulted metamorphic geologic units, and the variable and generally high amounts of precipitation are together unique to the southwest corner of the state This review considers the relevant data and literature available to the forest, and what assumptions the planning team used with this information to prepare those portions of the plan addressing geotechnical problems

Two models and one inventory were used in development of the soils-sediment portions of the plan. The models and inventory are discussed only briefly in the plan itself. Descriptions of the models and inventories were available to OSDF, and were evaluated for this review. The models describe the surface erosion process and cumulative effects. A landslide inventory for the Siskiyou Forest was used for data on mass soil movement

The surface erosion model uses site specific soil resource inventory and geomorphic indices, combined with reported literature values, to determine base surface erosion levels, and effects of forest practices The cumulative effects model consider four factors. The geologic factor is the only one considered here. The geologic factor is based on slope steepness (between 55% and 90%) and rainfall The mass movement inventory was based on a detailed aerial survey of about 10 percent of the forest To calculate total sediment delivery for the various alternatives, the sediment model and landslide inventory were included in FORPLAN Thus, accelerated sediment production was based on anticipated levels of harvesting and road construction

The surface erosion model is based on the best available information I am impressed with the methodology used. The landslide inventory appears rather complete except for two limitations

- An air photo inventory, as used to identify failures, is biased against landslides hidden under forest cover, and
- road failures are based on older practices, and may overestimate failures and sediment production with current Best Management Practices.

It is not clear why slope and rainfall were used in the cumulative effects model Actual sediment delivery could have been calculated for a geologic hazard rating using the sediment model and the mass-movement inventory There

does appear to be some correlation between actual problems and the geologic index However, no correlation data was included in the description of the cumulative effects model

In the plan, the discussion of specific silvicultural systems and their effects is quite complete On the other hand, the impacts of the transportation network are only briefly described Similarly, surface erosion is described in great detail, especially related to burning, yet there is almost no discussion of mass soil movement The plan refers to Best Management Practices (silvicultural nonpoint from section 208), USFS standards and guidelines, and Water Quality Management Guidelines for National Forests in California, for guidance on water quality protection

Because of its rather unique geology, the Siskiyou has a few special needs for certain management practices, especially those associated with roads What location and design factors are considered for roads through land flow, or steeply dissected terrain in folded-faulted metamorphics? The plan states that BMP's will be developed after the plan is final How can they be evaluated unless they are included in the draft plan?

The planning team has a lot of experience on the Siskiyou National Forest, and represent a wide range of professional fields The two soil scientists on the team have a good understanding of erosional processes I talked to Mike Amaranthus, one of the soil scientists, on the phone He answered my questions regarding the models and inventory There was no geotechnical professonal (a person with training and experience in both the field of geology and engineering) on the planning team The plan includes only a minimal discussion of mass soil movement, especially as related to road construction practices, even though the landslide inventory shows a great increase in the rate of mass soil movements associated with roads (over background, or related to harvest unit levels) There is information available on road building practices which mitigate landslide problems, though nothing specific was found in the plan. A geotechnical professional could have helped in this aspect of the plan preparation

Conclusions

1 The surface erosion model appears to be very well designed

2 The use of the landslide inventory to calculate sediment has two limitations

   a. The aerial photo inventory probably did not detect all landslides in forested terrain, as they may have been difficult to see under the trees

   b Road failures based on older practices may over estimate future slides and sediment production using current best management practices

3. Utilizing actual sediment delivery as calculated using the model, inventory, and FORPLAN would probably be more appropriate for assessing geologic hazard, than using slope steepness and rainfall

4 A more complete discussion of best management practices, especially those relating to mass soil movement and the transportation network, is needed in the final EIS

5. It is unclear how the results of the cumulative effects model were used to generate the harvest dispersion factors and riparian prescription in the DEIS alternatives

6 The final EIS should consider other impacts, in addition to sediment delivery to streams For example, mass soil movement may impact the transportation network, in-stream structures, or downstream water users

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Department of Geology and Mineral Industries
ADMINISTRATIVE OFFICE
910 STATE OFFICE BLDG , 1400 SW 5th AVE , PORTLAND, OR 97201-5528 PHONE (5

November 18, 1987

Bob Brown, Director
Oregon Department of Forestry
2600 State Street
Salem, OR 97310

Dear Mr. Brown

The Oregon Department of Geology and Mineral Industries has reviewed the Draft Environmental Impact Statement for the Siskiyou National Forest. From our minerals perspective some very fundamental key issues seem to arise in the Environmental Impact Statement. This letter briefly summarizes the issues in the hopes of enabling the Forest Service to better address the minerals problem.

A major concern is the need to quantify the value of the resource and need to factor the resource value into the various alternatives for land use. In terms of quantification, we find that numerical dollar values for the mining resource are not provided From an economic standpoint, this is particularly troublesome because the per-acre value of mining land greatly exceeds any other per-acre value for other uses. In terms of alternative land uses, we find very little discussion of minerals access or mineral policy direction in the alternatives.

We are concerned that mineral resource potential apparently was not used as a constraint factor in the computer development of alternatives This is a severe and fundamental shortcoming in the analyses.

Thirteen of the fourteen management areas have some negative impact on mineral resource development all the way from minimal, for #13, to complete prevention, as with #1 (Wilderness), #2 (Wild River), #3 (Research Natural Area) and #4 (Bontanical).

Area #5 (unique Interest Area) and Area #6 (Custodial Roadless) are highly restrictive to mineral resource development. Area #7 (Supplemental Resource) allows mining subject to mining regulations and an approved operating plan. In area #8 (Designated Wildlife Habitat) mining could be done where activity is not detrimental to habitat In area #9 (Special Wildlife Site) mining can be conducted; but must insure that activities detrimental to identified special site values be minimized Area #10 (Scenic/Recreation River) is withdrawn from mineral intry In area #11 (Riparian) mining can be done, but operating plans shall include measures to protect or regenerate riparian vegetation, protect water quality, and provide stream bank stability. In area #12 (Retention visual) mining plans need to protect visual objectives. Area #13 (Partial Retention Visual) is the same as 12. Area #14 (General Forest) calls for multiple use retention

Most of the known nickel laterite areas that lie outside the wilderness have been proposed or designated as "Botanical areas" (e.g., Iron Mtn , Red Flat, Snow Camp, Cleopatra, Rough and Ready Flat, Eight Dollar Mtn , and Oregon Mtn). The Hoover Gulch Research Natural area (Page F-147) is an area of known small, but rich gold deposits An active mine being worked (Gold Blanket and Windfall claims on Pocket Knoll in Sec. 14) about 1/4 mile south of the RNA.

If it can be determined that the mineral deposit is clearly of economic importance, (i e., a potentially profitable mining operation) adjustment should be made to allow this mining operation, provided a suitable reclamation plan is developed This is especially true of strategic mineral deposits such as chromite, platinum, and cobalt Economic mineral deposits are rare and unusual occurrences in the earth's crust. Availability should be protected in order to remain open and accessible to the most efficient production methods. The withdrawal of lands from mining access is an economically undesirable solution. Unnecessary encumbrances and restricitons to mineral resource exploration and development should also be avoided whenever possible It is inappropriate to overlook mineral resource values as an analytical factor leading to ratings in the development of alternatives.

A major goal of the Department is to maintain a strong well-planned mineral resource base for the State of Oregon and to see that mined lands are reclaimed This Forest plan makes the attempt to recognize that there are minerals and

mining, but does not adequately consider minerals in designing alternatives or recommendations for land classification The data that are provided are not utilitzed in a meaningful way and do not dispaly the impact of the various alternatives on mineral production.

For Oregonians, the economic productivity of National Forests in Oregon needs to be evaluated in terms of all potential revenue sources, not just timber and recreation Our declining economic yield from forest lands in terms of employment, tax base and Federal revenues is due in part to historical overdependence on timber and recreation values Mineral resource values should be vigorously evaluated in the current U.S Forest Service planning process

Sincerely,

John D. Beaulieu
Deputy State Geologist

JDB ab

CC Norm Johnson, Executive Department
Len Ramp

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STATE OF OREGON INTEROFFICE MEMO

TO K Norman Johnson DATE January 22, 1988
Federal Forest Plan Coordinator

FROM Ann Hanus, State Economist
Executive Department Office of Economic Analysis

SUBJECT Summary of Findings and Recommendations for the Siskiyou National Forest Plan -- FINAL

Overview

I have reviewed the Draft Environmental Impact Statement and Proposed Land and Resource Management Plan for the Siskiyou National Forest The Employment Division provided analyses which have been used in my response

The Siskiyou National Forest is situated in the southwest corner of Oregon and northern California Coos, Curry, Jackson, and Josephine counties rely most heavily on the Forest, particularly for its wood products, fishery resources, tourism and recreation attractions, visual and wildlife amenities, and minerals

The four counties are a study in contrasts While all four counties depend greatly on their lumber and wood industry, they have not enjoyed the same rate of growth In 1986, Coos, Curry, Jackson, and Josephine counties had 73 percent, 89 percent, 65 percent, and 60 percent of their manufacturing workers employed in the lumber and wood industry (Table 1) In comparison, the statewide proportion was 32 5 percent

Coos, Curry, and Josephine counties suffered higher unemployment rates than the statewide average in 1986 Coos and Curry counties have yet to recover to prerecessionary employment levels In 1986, Coos County had only 84 percent of the employment it enjoyed in 1979 Further, since 1980, Coos and Curry counties lost 6 5 percent and 0 8 percent, respectively, of their population

Jackson County, on the other hand, ranks among the fastest growing counties in the state While still heavily dependent upon lumber and wood, its economy is more diversified It surpassed prerecessionary employment levels by 6 5 percent in 1986 -- considerably better than other southern Oregon counties and even better than the state, which just attained prerecessionary levels

Jackson County's population grew by 5 7 percent, more than double the statewide rate Salazar, Schallau, and Lee revealed that immigration of retirees was an important component of population growth in Jackson County (Table 1) Josephine County also demonstrated considerable population growth, expanding by 15 8 percent since 1980

The recession of the early 1980's hit the four counties hard, especially in the wood products industry From the peak of 1979 to 1986, the four counties lost 17 4 percent (2,556) of their wood products jobs and 13 0 percent (54) of their firms (Table 2) Payroll rose a mere 4 3 percent over the same period Coos County suffered the most, losing 30 1 percent or 1,600 workers At the same time Coos County payroll dropped $16 7 million or 17 2 percent

Recently, employment has moved upward in all four counties because of an improving wood products industry The volume harvested in fiscal year 1987 amounted to 194 4 MMBF -- the highest since 1979 (Graph 1) The volume sold hit 203 3 MMBF, the highest since 1976, but this includes buyouts that were reoffered The 10-year average (1978-1987) was 128 8 MMBF, but this figure includes the 1981-83 recession years when only a fraction of the current level was harvested

From 1975 to 1984 timber purchasers bought an average of 193 2 MMBF and cut an average of 144 9 MMBF annually (all products, including sawtimber, salvage, and submerchantable material) The severe recession of the 1980's caused lumber and plywood prices to plummet and resulted in less timber being harvested than sold Many purchasers retained a large volume of high priced timber under contract with the Siskiyou National Forest As a result, timber harvests declined to 39 4 MMBF in 1982 from 202 MMBF in 1979 (Graph 1) Also, purchasers harvested their less expensive timber in order to stay competitive

According to the Forest Service, the average bid price in 1982 for timber in the Forest was $129/MBF (all products), while the average price paid for timber cut on the Forest was $82/MBF (all products) The volume sold in 1985 amounted to -230 0 MMBF because a buy-out adjustment of -412 5 MMBF was made Likewise, the higher numbers shown for volume sold in 1986 and 1987 (197 2 MMBF and 203 3 MMBF) includes reoffered buyouts Since the recession so skewed the volume sold and harvested during this period, they should be viewed with caution

Recreation plays an important role in the region's economy In 1987, 15,800 people rafted the wild section of the Rogue River Commercial operators claimed 7,800 of the rafters On the lower Rogue, 47,000 people journeyed the river in tour boats Another 8,000 covered the same stretch on rafts

The commercial fishing industry also plays an important role, especially the harvesting of anadromous fish Environmental conditions in the forest directly affect the size and quality of commercial harvests Further, recreational fishing also attracts a significant number of tourists

In addition to timber, recreation, and fishing, the Siskiyou contains occurrences of gold, silver, nickel, chrome, cobalt, copper, manganese, molybdenum, mercury, coal, limestone, and other minerals Of these, nickel cobalt, chrome, manganese, and mercury are classified as strategic minerals According to the Forest Service, gold has been the most sought

after mineral in the Forest, with a prospecting and production history (from both placer and lode deposits) dating back to 1850 Exploration has taken place for nickel, cobalt, and chromium, but no mining is taking place

The Forest Service recommends Alternative K as their preferred alternative The Forest Service proposes to harvest 150 MMBF per year that would result in a gain of 380 jobs (compared to 1975-84 historical conditions), $9 0 million increase in personal income, and $12 4 million to counties Most of the job gain is related to the higher harvest level In terms of present net value, Alternative K is ranked ninth among the 13 alternatives

Comments

1 The Forest Service intends to manage 507,000 acres of selected suitable lands for some form of timber outputs at the annual rate of 150 4 MMBF under their preferred Alternative K Compared to the 1975-84 average, employment would rise by 380 while personal income would increase a corresponding $9 0 million Most of the jobs increase (371) is due to a higher timber harvest when viewed against the 1975-84 average of 144 9 MMBF

These time frames must be taken into consideration, however, in evaluating the impact of the plan Current harvest levels compared to the levels proposed by the plan yield different results Harvest levels for 1986 and 1987 were considerably above the 1975-84 average (150 7 MMBF and 194 4 MMBF, respectively) As a result, the estimated job gain of 381 has already been realized Since the proposed harvest is below the 1987 level, job losses might even occur

Compared to the current direction, the proposed allowable sale quantity of 150 MMBF is a reduction of 13 MMBF Again comparing to the current direction level of 163 MMBF, the proposed plan would mean a reduction in the potential number of jobs by 200 (over all activities, but heavily determined by the timber output effect)

The range of employment change over all alternatives and all activities compared to the past decade spans from a decrease of 1,650 jobs (Alternative M) to a gain of 1,230 jobs (Alternative B) The preferred alternative falls somewhat to the positive side of midpoint between those figures It attempts to balance the many conflicting demands made by the many forest resource users

2 The Forest Service should consider the impact of projected falldowns in private industrial harvests occurring during the 1990's through 2020, and try to mitigate the impact of the sharp decline if possible The Forest Service should coordinate and consider the cumulative impact of its timber sale program with other forests and land ownerships

3 In Appendix B, in the sections on employment and income, much of the information and data regarding labor market status, employment, unemployment, income, and county revenues from forest receipts are old and should be updated Most of the latest economic data is from 1983 when the state was still in a deep recession More recent information will paint a very different picture

4 About 230 MMBF of Siskiyou National Forest timber was damaged in the recent forest fires The Forest Service plans to salvage about 175 MMBF beginning within the next year The Forest Service will substitute the salvage for green sales although some green sales will still be made in order to make logical units As a result, the Oregon sales should not be much different from the most recent harvest levels for the next two years California sales, however, will amount to 1,600 MMBF, and this quantity will significantly impact the market since some of the Southern Oregon mills purchase timber from California In order to maintain the value of the timber, it should be salvaged promptly The longer the delay, the more likely that bugs and rot will lower the value of the timber

Further, counties will probably not realize as much revenue from the salvage sales compared to green sales for two reasons First, salvage timber will not command as high stumpage prices, and thus gross revenues will be lower. Second, instead of receiving a share of gross sales as would be the normal situation, counties receive a share of net sales under a salvage sale

5 Most of the effect of this plan will occur in Curry and Josephine counties which have been the main users of the forest's timber supply in the recent past In the last decade, the amount of timber coming to the local mills from the Siskiyou National Forest declined in Curry County from about 75 percent to just over 50 percent, while that for Josephine County remained at just over 25 percent Coos and Jackson counties draw about five percent or less of their timber from the Siskiyou National Forest (DEIS, Table III-45). Lately, with mill openings since this data was gathered, Curry County probably receives a greater share of the timber

6 Recreation, an important segment of tourism, is expected to have no increase or decrease in either jobs or income under the preferred alternative The Forest Service should take care to protect the view shed of the Rogue River which is important for the tourism it attracts Diversification of the economy benefits the region because its dependence on the wood products industry makes it subject to boom/bust cycles

7 The Forest Service uses IMPLAN which relies upon 1977 data for determining linkages between industries Much change has occurred in the structure of the local economies and in the structure of the areas' wood products sectors since that time Much of that change has been driven by the real economic events of declining demand

(especially during the recessionary years for Curry and Josephine counties), technological change, lower average real labor costs, and the rapid cutting of a sizeable portion of private timber land

It would appear that a more realistic mode could be constructed if more up-to-date information were employed The effects of these changes, many of them national in character, on the projected trends in employment, income, payments to local jurisdictions and other economic variables could be considerable, but the most recent data are not part of the model used for this plan

Given the data and time frames used, however, the timber employment response coefficients appear to be sufficient to model relative changes in employment among the alternatives Caution should be added when using them to determine the absolute number of jobs produced by each alternative or for comparing alternatives among forests for several reasons

Different IMPLAN modeling techniques are used by different forests, and it would be inappropriate to add them together In addition, the employment estimates are imprecise Final demand is usually changed at the sawmill and plywood sectors, and transportation beyond the mill is not counted nor is any secondary processing Also not taken into account is the frictional and structural employment which would result as timber harvests are lowered Mills may be reluctant, for example, to lay off workers, they might opt to keep work forces larger than would be optimal

Complicating the situation are mills which would close because of lack of timber, such as cutting mills and mills with marginal operations rather than dimension mills The result would be that the employment effect of lowering harvest levels would be greater than what might have been anticipated if average production functions are used

8 Significant differences exist between alternatives on the amount of O&C land managed for timber production The range varies from Alternative M, which only manages 29,000 O&C acres for timber production to Alternative C which manages 89,000 acres Alternatives NC and C have the most O&C land managed for timber production with Alternatives A, A-departure, B, D, D1, K, and K-departure not far behind (DEIS, p IV-188) Allocation of these acres have a significant effect on counties and induced employment and personal income This is because counties receive 50 percent of O&C receipts versus 25 percent on remaining Forest land The Forest Service should consider maximizing timber production on these lands in order to increase county revenues

9 Relative demand for Siskiyou timber is higher than any other Oregon national forest according to Forest Service appraisals for both the value of Siskiyou timber at the mill and from logging (Graph 2) The reasons could be high timber quality, perceived shortage of

timber in the zone of economic influence, and high value end products Highly valued species such as the Port Orford Cedar, which the Japanese covet, contribute to the high demand figures These figures underscore the value of Siskiyou timber to wood processors in Southwest Oregon The Port Orford Cedar, however, is threatened by fatal root disease The Forest Service may want to review its plan to take highly valued species into account when finalizing their plan

10 The Forest Service should revise their comments about exports to the Pacific Rim counties The Forest Service states that "projections of exports to the Pacific Rim countries show a continuing slow economic growth" (DEIS, p III-145) In light of large export increases over the last year and the falling dollar, export prospects look very bright Further, Japanese housing starts may equal or exceed U S housing starts, thereby keeping the demand for Northwest wood products high

11 The Forest Service should not assume that the demand for timber harvest in the area surrounding the Siskiyou National Forest is infinitely elastic Since the Siskiyou National Forest is a major supplier for many mills, its actions will affect price and market conditions National economic trends play a major role, but the impact of the Siskiyou National Forest plan will be critical to the region

12 The Forest Service should improve their plan for monitoring economic variables In addition to the unemployment rate, employment by major SIC code, personal income, and population should be tracked

13 The Forest Service will be releasing its final guidelines for the Spotted Owl in the near future If its final guidelines significantly change the land allocations and proposed management under the new plan, the regional economy will be affected A lower harvest, due to more habitat needed for the spotted owl, could translate into fewer jobs and lower personal income

14 In addition to revealing the effect on county revenues, the Forest Service should also estimate the effects on timber harvest taxes, public road use fees and taxes, and property taxes These revenues are important sources for local governments and schools Furthermore, a chart of how O&C revenues are distributed by county, and projected National Forest and O&C county revenues should be included

15 Implementing the preferred Alternative K would require an annual budget of $21 7 million -- a 35 percent increase in funding over the 1987 budget of $16 1 million (in 1982 dollars) Given Congress' drive to lower the federal deficit, the Forest Service may face a difficult task to have this higher budget approved

16 Restrictions on land use could adversely affect mining efforts if the restrictions place too high of costs on operators to operate their mines profitably The Forest Service should consider how plans will affect the operations of miners

ANH nm
7476j

cc Fred Miller
Jon Yunker
Don Steward, Employment Division
Jeff Hannum, Employment Division

Department of Human Resources
EMPLOYMENT DIVISION
875 UNION STREET N E SALEM, OREGON 97311

IN REPLY REFER TO
RES JH
R&S 2

December 3, 1987

TO Ann Hanus, State Economist

FROM D R Steward, Ass't Administrator
Address for Research & Statistics

Subject Siskiyou National Forest DFIS

The attached comments from John Anderson, regional economist for Southern Oregon, address the seven issues you identified In addition to these comments, the following points are offered to assist you in responding to the Siskiyou NF Draft Plan

1 In Appendix B on pages 79-80, there is conflicting information on the degree to which Curry County mills are dependent upon Siskiyou NF timber supplies The table on page 80 indicates that Curry's log flow dependency has declined from 73% in 1972, 54% in 1976 and to 25% in 1982 However, the narrative on page 79 states that "Curry County is also the most dependent on the Siskiyou, receiving more than half of its timber supply from this source" Which is correct?

2 In Appendix B in the sections on employment and income much of the information and data regarding labor market status, employment, unemployment, income and county revenues from forest receipts seems to be old and in need of updating For example, on page B-84 the counties' status as "labor surplus" and "economically lagging" areas in 1981 and 1982 are cited, rather than using more current 1986 or 1987 information

3 In 1987, the timber harvest on the Siskiyou NF will be close to 200 mmbf due to very strong market demand for wood products Since this year's level of harvest is well above the average annual levels of the preferred Alternative K, Alternative A, and the past decade, the comparison's relating to employment and income changes between the preferred alternative and the "current direction" (Alternative A) should not be confused with the current year level of economic activity In other words, the 200 job loss shown in the table on page II-170 between the preferred alternative and the "current direction" Alternative A, is likely to be significantly higher if compared to the 1987 level of employment and economic activity

4 The economic impacts from the recent forest fires on the region's economy are still largely uncertain While about 230 mmbf of Siskiyou NF timber was burned, much of this wood is still salvagable, if logged within a couple of years It appears, at present, that Forest Service officials plan to have this timber logged within the existing limits of annual allowable sale quantities so the impact on logging activity in the next few years may not be that much different than if the fires had not occurred The actual level of harvesting which occurs will be determined much more by overall market conditions and demand for wood products One of the biggest impacts, however, in the next couple of years will be in reforestation activity, which is a fairly labor intensive activity

I hope these comments are helpful Please let me know if you have any questions or need additional information

DRS pjg

0009A/29-30

Attachments

copies Anderson
Staten

STATE OF OREGON
EMPLOYMENT DIVISION
DEPARTMENT OF HUMAN RESOURCES

TO Mike Staten, Supervisor — Date November 13, 1987
Address Labor Market Information Unit

FROM John Anderson, Labor Economist — No. R&S 2-18
Address Medford Local Office

Subject Siskiyou National Forest Proposed Land and Natural Resource Plan

In releasing the draft plan for comment, the Siskiyou National Forest planners correctly understand that any plan involves choices among alternatives They correctly state that an increase of any particular forest output requires the reduction of other outputs or outputs no matter which of the alternative outlined in the draft plan are selected As with any carving up of a scarce resource among competing users, tradeoffs will need to be made between and among the various forest products. A posture of "more of everything" is ruled out by reality and the finite nature of the resource base

Most of the effect of this plan will occur in Curry and Josephine counties, which have been the main users of the forest's timber supply in the recent past In the last decade the amount of timber coming to local mills from the Siskiyou National Forest declined in Curry County from about 75% to just over 50%, while that for Josephine County remained at just over 25% Coos and Jackson County draw about 5% or less of their timber from the Siskiyou National Forest (DEIS, Table III-45) The forest plan rightly makes the point that these areas have become not just timber dependent but forest dependent The Siskiyou National Forest must balance a broad range of demands upon all of its resources, not just satisfy the current and future demand for commercial logs

The Siskiyou National Forest currently is in a deficit position in terms of of its timber inventory while it could harvest a maximum of 180 mmbf over the first decade and still maintain a non-declining yield during subsequent decades, it would do so only by meeting only the minimal management required for all other outputs This would prove politically difficult to accomplish

To balance competing uses for forest resources the Siskiyou National Forest plans as its preferred alternative to reduce the annual timber sale quantity to 150 mmbf from the current direction's 163 mmbf (see DEIS, p II-169) This the plan states will allow an increased cut in future decades when young stands have matured to a harvestable size

This means that wood products users and communities may need to become used to having slightly less timber than has been supplied recently from the Siskiyou National Forest in the short run to insure a sustainable non-declining flow in future years

The employment result of the preferred alternative is to reduce the potential number of jobs by 200 (over all activities, but heavily determined by the timber output effect) from the current management direction However, when the preferred alternative results are compared with the actual average harvest of the recent (1975-1984) period, the plan anticipates an actual increase in employment of about 380 The range of employment change over all alternatives and all activities compared to the past decade is from a decrease of 1,650 jobs (Alternative M) to a gain of 1,230 jobs (Alt B) The preferred alternative falls somewhat to the positive side of the midpoint between those figures It attempts to balance the many conflicting demands made by the many forest resource users

In terms of annual income the preferred alternative predicts a reduction of almost $5 0 million when compared with the income generated by the current direction (Alternative A), but an increase of $9 million when compared to the average harvest levels of the 1975-1984 period (see DEIS, p II-170)

The fisheries resource is enhanced and maintained by good water quality Road building and timber cutting can reduce the water quality upon which fish species depend by fostering erosion and sedimentation The preferred alternative has less road construction and timber harvest overall than does the current direction and several other alternatives Increased harvesting in some now-roadless old growth areas may require careful attention to soil stability and to water quality There could be some real tradeoffs in these areas between timber output and fisheries output

Wildlife user days in the first decade are expected to decline from 76,400 under the current direction to 75,400 under the preferred alternative (see DEIS, p II-168)

Recreation, an important segment of tourism, is expected to have no increase or decrease in either jobs or income under the preferred alternative The current direction seems to swap a limited amount of jobs and income from developed recreation to wild and scenic rivers recreation

Of concern to residents in each locale is the amount of governmental service that will be paid for by O & C and other forest receipts The preferred alternative envisions a decrease in the amount of revenue of about $1 million per year when compared to alternative A, the current direction Effected most heavily by this will be Curry and Josephine counties (see DEIS, Table III-42)

The Siskiyou National Forest draft plan uses IMPLAN which relies upon 1977 data for determining linkages between industries Much change has occurred in the structure of the local economies and in the structure of the areas' wood products sectors since that time. Much of that change has been driven by the real economic events of declining demand (especially during recessionary years in Curry and Josephine), technological change lower average real labor costs, and the rapid cutting of a sizeable portion of private timber land It would appear that a more realistic model could be constructed if more up-to-date data were employed The effects of these changes, many of them national in character, on the projected trends in employment, income, payments to local jurisdictions, and other economic variables could be considerable, but the later data are not part of the model as it derives its results

In addition, the plan should not be considered completed unless the management plans of all other sources of timber supply, public and private alike, are taken into account Reductions in cut on Siskiyou National Forest lands will mean increased competition and higher prices for the reduced supply of merchantable timber on the other public and private lands The input/output model and analysis should consider at least all other forest resources within a reasonable region in considering the economic impact of changes in forest management

While the public has been contemplating forest plans, the region has experienced its worst spate of forest fires in recent memory The full impact of the fire on the Siskiyou National Forest and on the economies of the region will not be assertainable until the fires are actually out for one thing For another, an inventory of the areas burned by the fire will need to be done to see how much of the timber is merchantable Decisions will need to be made as to what and how much might be offered for sale, to whom, and how it will be scheduled for harvest

JA

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NEIL GOLDSCHMIDT
Governor

OFFICE OF THE GOVERNOR
STATE CAPITOL
SALEM OREGON 97310 1347

January 13, 1988

TO Norman Johnson
Federal Forest Plan Coordinator

FROM Robert Schumacher, Administrator
Executive Department
Intergovernmental Relations Division

SUBJECT Intergovernmental Relations Division Preliminary Review of the Proposed Siskiyou National Forest Plan Impacts on Community Stability, Local Government and School Financing

Our preliminary review of the proposed Siskiyou National Forest Plan relates principally to the three counties (Coos, Curry and Josephine) and the sixteen public school districts in these counties whose financial structure is directly impacted by the 1,002,522-acre Siskiyou National Forest located within these counties The counties and schools are third and fourth party recipients, respectively of timber sales from these federal forest lands sharing 25 percent of the receipts (75 percent designated to county roads and 25 percent to public schools), with 75 percent going to the federal treasury

The proposed plan contains thirteen different alternative management plans from the one now existing, five of which, including its preferred Alternative K plan, will cause substantial unemployment in the forest products and related industries This is a direct contradiction to Governor Goldschmidt's agenda for economic development and the Economic Development Department's primary goal of developing jobs for Oregonians and assisting in resolving the State's major problem of financing public schools

The resurgence of Oregon's timber-based economy during the past few years following the major recession years in the early 1980's is not reflected in the proposed Siskiyou Plan, nor does the plan consider the contribution of the other federal forest lands in the region which also impact community stability in the counties in which the Siskiyou National Forest is located

In addition, the present financing programs of county government and public schools from federal timber receipts have been again threatened in Congress this past year in a proposal to change the distribution formula from payments to counties and public schools on the present gross receipts basis to payments on a net receipts basis Such a reduction would add further to the existing problem of financing public school support and would be a financial disaster for some counties

The Siskiyou Plan preferred alternative proposed decrease of over 10 percent in the annual sales quantity is a continuation of a steady erosion of the declared annual cut and comes at a time when the future availability of private timber in the same region appears to be headed into a decline The accuracy of timber supply to provide the current level of jobs in this region in the next ten-year period of the proposed plan is seriously questionable

The information upon which the proposed plan is based was outdated by the three major fires in the Siskiyou National Forest in 1987, which burned over 110,000 acres of the federal forest land The impact of timber receipt revenue to local government and public schools is a key element in establishing any position on the presently proposed forest service alternative until final salvage data is available

Another key element requiring more data in responding to the proposed plan is the lack of information in the plan on the direct and indirect economic impact of changes in timber supply on the Coos Bay port, the railroad serving the area, and highway improvements between the valley and coastal regions

This division suggests the State's response at this time recommend that the Siskiyou National Forest respond to the concerns addressed herein and that the State's posture be one of providing a State alternative to the proposed plan which will provide for environmentally sound intensive forest management in cutting practices on the Siskiyou National Forest to assist in forestalling any major downturn in Oregon's timber-based economy, due to shortage of timber supply

It is our understanding that this response will be open-ended so that we can continue to assist in forming the State's alternative

We appreciate the opportunity to participate

RS cb

DEC 14 1987

EXECUTIVE DEPARTMENT

Department of Energy

625 MARION ST. NE, SALEM, OREGON 97310 PHONE 378-4040 TOLL FREE 1-800-22

TO: Norm Johnson, Federal Plans Coordinator

DATE: December 14, 1987

FROM: Mike Byers, Technical Assistance Program

SUBJECT: Siskiyou National Forest Proposed Plan

The Oregon Department of Energy (ODOE) has reviewed the Siskiyou National Forest Proposed Land and Resource Management Plan, DEIS, and Appendices. The comments below are for the coordinated state response.

For the Siskiyou National Forest ODOE is interested in policies and standards for siting large power projects and transmission line corridors. The proposed forest plan and DEIS address both of these interests

Hydroelectric and Wind Resources

The DEIS (pp III 21-24) correctly describes several factors that limit the need for, and development of, hydroelectric and wind resources under current conditions.

Please note, however, that specific information on the proposed Eden Ridge pumped-storage facility (p. III 24) is not correct. The Eden Ridge project size was 90 megawatts, not 4,000,000 kilowatts as described in the DEIS. (A 4,000,000 kilowatt project would be about 2/3rds the size of Grand Coulee Dam.) And, the Eden Ridge project was terminated by FERC notice of January 20, 1984.

The forest plan does not provide guidance or standards for the evaluation and siting of large power generating plants within the forest. Although the possibility of developing such a plant during the next decade or two is low, the plan should still reference federal and state standards for major power projects.

Transmission Lines

Oregon's Energy Facility Siting Council (EFSC) is responsible for the review and approval of electric transmission lines in excess of 230 kilovolts and natural gas lines at least 16 inches in diameter.

ODOE generally agrees with the Forest Wide Standards and Guidelines #9-6 regarding the use of existing corridors for new utility line requests. The Standards further states that:

> "Additional corridors which may be needed by major utilities should be designated through an interagency environmental analysis following procedures set forth in the Regional Plan." (Proposed Land and Resource Management Plan, pp. IV 46,47)

Major transmission lines may cross several political and regulatory boundaries. The development of new utility corridors requires the coordination and action of several agencies.

Standard #9-6 should be made mandatory by using 'shall' in place of the word 'should'. This change would be consistent with the description of the intent of 'shall' and 'should' as described in the Forest Wide Standards and Guidelines .

If you or Bob Brown have questions or need additional information, please call me at 378-2856.

MTB
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OREGON DEPARTMENT OF AGRICULTURE
COMMENTS ON THE SISKIYOU NATIONAL FOREST
PROPOSED LAND & RESOURCE MANAGEMENT PLAN
AND DRAFT ENVIRONMENTAL IMPACT STATEMENT

The Department of Agriculture is impressed with the overall quality of the above-referenced documents. Forest staff are to be commended for the professional manner in which these documents were prepared.

The department is pleased to present the following comments relating to several resource management issues:

Livestock Forage

There is little demand (3,000 AUMs current permitted grazing forestwide) for livestock forage on the Siskiyou. This is due, no doubt, to two primary factors: (1) the small number of large-scale commercial ranches bordering forest lands; and (2) the presence of shrubs, rather than grasses, as the predominant understory ground cover on forest lands.

The forest plan projects no change from current levels of grazing use through the fifth decade of plan implementation. While the department has no serious concern with this projection, a case could be made for planning for a level of grazing increase to correspond with potential population increases and resulting increased demand for livestock products.

In the discussion of range resources in Chapter 4 of the plan, references are made to potential conflicts between livestock grazing and other uses. The plan states "...where conflicts occur, management should favor riparian areas, and deer and elk forage needs and cover requirements." It is strongly recommended that management decisions related to such conflicts seriously consider and accommodate the economic and management needs of permittees whose grazing practices may be adjusted to help resolve these conflicts.

Other Resource Concerns

Additional areas of statutory interest to the Oregon Department of Agriculture include endangered and threatened plant species, riparian habitat, and soil and water values. In each of these areas, the department views the proposed management strategies as adequate to address resource needs. However, the department was disappointed to find no significant treatment of weed control in the plan. Because of our statutory responsibilities for weed control in Oregon and the extensive manner in which our weed control staff cooperates in its efforts with each of Oregon's national forests, we would prefer to see weed control strategies addressed in this plan.

With these exceptions, the Oregon Department of Agriculture views the Siskiyou National Forest Plan as adequately addressing major resource needs.

W. H. Kosesan
Assistant Director
(503) 378-4665

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Department of Land Conservation and Development

1175 COURT STREET NE, SALEM, OREGON 97310-0590 PHONE (503) 378-4926

October 7, 1987

TO: Norm Johnson, Federal Plans Coordinator

FROM: Jim Knight, Special Assistant for Coordination

SUBJECT: Preliminary DLCD Issues on Siskiyou Forest Plan

Our Department's comments on the Siskiyou Forest and DEIS fall under the general heading of comparing the proposed plan with agency goals and state and federal legal requirements.

A preliminary review of the Siskiyou documents reveals a lack of any specific discussion concerning the compatibility of the various forest alternatives, including the proposed plan, with the acknowledged comprehensive plans of Coos, Curry and Josephine Counties and their affected cities.

Also absent is any apparent recognition by the Siskiyou that the forest is located in Oregon's coastal zone and therefore is subject to the requirements of the federal coastal zone management act.

The Siskiyou plan needs to identify LCDC as Oregon's coastal zone agency and our role in administering the requirements of the federal consistency process. Under the federal consistency process all federally conducted or supported activities (including development projects) directly affecting Oregon's coastal zone must be consistent to the maximum extent practicable with the mandatory, enforceable policies of the state's coastal zone program. In Oregon, such policies consist of the adopted statewide planning goals, acknowledged city and county comprehensive plans and the statutory authorities and regulations of relevant state agencies.

Please let me know if you have any questions regarding our comments on the Siskiyou.

JBK
<sac>

cc: James P. Ross, DLCD
Craig Greenleaf, DLCD
Dick Mathews, DLCD
Patricia Snow, DLCD

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SENATE MAJORITY LEADER BILL BRADBURY
OREGON STATE SENATE
SALEM, OREGON
97310-1347

SISKIYOU NAT'L FOREST
GRANTS PASS, OREGON
SEP 14 1987
RECEIVED

September 9, 1987

Ron McCormick
Forest Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Dear Mr. McCormick:

Thank you for the opportunity for me and my staff to become familiar with the details of your Preferred Alternative Forest Management Plan for the Siskiyou National Forest. I applaud your efforts to arrive at a balanced and far-sighted plan for using and conserving the invaluable resources contained within the Siskiyou National Forest.

My particular concern is to see a balance between timber harvest and other natural resource uses, such as the sport and commercial anadromous fisheries which clearly rely on stream water quality for their very existence. Obviously, neither use should be developed at the cost of the other, and your most difficult job is finding the management point which strikes a balance among these and other economic alternatives.

Consequently, after reviewing the Preferred Alternative with Susan Auer, I have several requests to assure protection of the anadromous fisheries resources:

North Fork of Lobster Creek

A portion of the North Fork of Lobster Creek is protected as a Supplemental Resource (7) for much of its length. However, a fairly extensive section right in the middle of the North Fork is designated as General Forest (14) land. Since the upper and lower reaches of the North Fork are designated to protect water quality, fisheries and wildlife, it seems inconsistent to not continue that protection along the full length of the stream.

I would like to see the middle portion of the North Fork of Lobster Creek included in the area designated for Supplemental Resource protection.

North Fork of Smith River

The North Fork of the Smith River is an important spawning area for several species of anadromous fish and I was pleased to see the Supplemental Resource protection for that portion running along the most Southwestern edge of the Kalmiopsis Wilderness. However, I would like to know why the protection afforded is so narrow on the west bank of the North Fork. From the map, it appears approximately a hundred feet of protection separate General Forest land from the stream.

Is it appropriate to broaden the Supplemental Resource protection along the west bank of the North Fork of the Smith River to assure water quality?

I hope these comments and requests are useful in your quest for a forest management plan. Please let me know if you have any questions.

My best,

Bill Bradbury
Oregon State Senator

BB:ska:yt

cc: Pete Brost
Forest Service District Ranger
1225 South Ellenburg
Gold Beach, Oregon 97444

HOME ADDRESS
BILL MARKHAM
RT. 1, GLENBROOK LOOP RD.
RIDDLE, OREGON 97469

DOUGLAS AND
NORTH JOSEPHINE COUNTIES
DISTRICT 48

04399

HOUSE OF REPRESENTATIVES
SALEM, OREGON
97310

December 3, 1987

Ron McCormick
Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Dear Supervisor McCormick:

We, the undersigned Oregon State Legislators, wish to express our solid support for THE EVERGREEN ALTERNATIVE, a forest management proposal for the Siskiyou National Forest, which has been prepared by the Southern Oregon Timber Industries Association in response to the Forest Service's draft forest plan.

Our support for THE EVERGREEN ALTERNATIVE, rather than the Forest Service's Preferred Alternative, is based on the following considerations:

First, the Siskiyou draft plan will trigger the loss of 289 local jobs in our Southwestern Oregon economy. Our many timber dependent communities are just now beginning to recover from the recession of the early 1980's. Economic development in Southwest Oregon is measured one job at a time. We cannot, in good conscience, support a forest plan that will cause the loss of 289 jobs.

Second, it is our belief the Siskiyou National Forest planning team has greatly underestimated this forest's tree growing potential. Our review of THE EVERGREEN ALTERNATIVE has convinced us the Siskiyou is capable of growing substantially more timber for harvest than is reflected in the Forest Service's Preferred Alternative. A more aggressive forest management regimen is necessary. We believe this can be accomplished - over time - with no adverse impact on non-timber resources now protected by law.

Third, we believe THE EVERGREEN ALTERNATIVE projects an excellent conservation ethic - evidence of the forest products industry's willingness to strike a fair balance between timber and non-timber forest values. For this reason, we are calling upon the Forest Service to ensure that the major technical discrepancies addressed in THE EVERGREEN ALTERNATIVE are corrected in the Siskiyou's final forest plan.

Fourth, we are very strongly opposed to any actions or proposals that result in custodial or roadless area management on the Siskiyou National Forest. 21% of the Siskiyou - more than 232,000 acres - is now designated as wilderness. We view the custodial designation for still-to-be-roaded areas as an open invitation to future wilderness designation. The Oregon Wilderness Act of 1984 specifically released all remaining roadless areas on the Siskiyou for multiple use forest management. It is long past time for the Forest Service to implement the terms of this Act. 30% of the Siskiyou's timber sale program for the next 10 years is standing in roadless areas. Systematic and necessary road construction must begin immediately.

Fifth, we are deeply concerned about the cumulative impact of reductions in annual sale quantities on the national forests of Southwest Oregon. Timber harvest receipt revenues account for approximately 50% of the revenues necessary to fund county government in our counties. County funded emergency and social services within our counties are already at minimum levels. If our county governments are unable to provide even the most basic services for their constituents, how can we be expected to remain stable, much less grow stronger in the years to come.

Sixth, in summary, it is our belief that THE EVERGREEN ALTERNATIVE is a thoughtfully prepared, well balanced forest management plan for the Siskiyou National Forest. It ensures an adequate timber supply for our primary industry and a predictable flow of timber receipt revenues for our county governments. These ingredients are fundamental to the stability of our many timber dependent communities.

Sincerely,

Bill Markham
State Representative

Verner Anderson
State Representative

George Trahern
State Representative

Eldon Johnson
State Representative

WALT SCHROEDER
COOS AND CURRY COUNTIES
REPLY TO ADDRESS INDICATED:
☐ House of Representatives
Salem, Oregon 97310-1347
☒ 95102 Rogue River Heights
Gold Beach, Oregon 97444

02305

SISKIYOU NAT'L. FOREST
GRANTS PASS, OREGON
DEC 22 1987
RECEIVED

HOUSE OF REPRESENTATIVES
SALEM, OREGON
97310-1347

December 20, 1987

Mr. Ron McCormick, Forest Supervisor
Siskiyou National Forest Plan
P.O. Box 440
Grants Pass, OR 97526

Comments on National Forest Plan

First, may I express my appreciation for the tremendous amount of work you and your staff have put into the Forest Plan and into soliciting public input.

Second, to let you know where I am "coming from": I have lived on the South Coast adjacent to the Siskiyou for about 28 years.(Coquille from 1949 through 1956 , and Gold Beach from 1967 to the present). During most of those years, while serving as a County Extension Agent, I have been involved in resource management education, conservation of natural resources, and economic development.

As an outdoorsman I spend considerable time hiking and camping in wilderness and non-wilderness areas, float the Wild Rogue as often as I can get a permit and the time, serve as a USFS volunteer maintaining trails, and have covered much of the western portion of the Siskiyou on foot, horseback, trail bike, and rubber raft. And though I have not penetrated much of the North Kalmiopsis roadless area I have traveled the Rogue, and Illinois trails many times from beginning to end, have been to Silver Prairie a number of times and have hiked in the Kalmiopsis Wilderness area many times. I have also participated in several of your information meetings and workshops.

You have a very difficult job trying to satisfy the many varied interest groups as you carry out your assigned responsibilities. Now I'd like to add my "2 cents worth".

My major concerns are the same as those stated in the draft of the State of Oregon's recent response. viz. that these lands be managed in an environmentally sound manner so that future generations have similar* opportunities to enjoy the bounty these lands can provide; and that these lands produce the flow of economic benefits that they have traditionally provided.

* I relaced same with similar as a more appropriate term. The experiences I can enjoy today are not the same I enjoyed even five or ten years ago because of changes in trail designations, roads, new areas opened, etc.

I favor most of the Evergreen Alternative as my first choice. because I believe their suggestions will continue to provide the opportunities I have addressed. There are some exceptions and I will attempt to outline my agreements and disagreements below;

1. Wilderness: I agree with the USFS plan and Evergreen that no additional wilderness areas be designated. Though I might go a step further in relation to the proposal by some that Copper Mountain be added to the "custodial " category. I wholeheartedly support the need to protect the tremendous fishery of Elk River. But I question the premise that the Copper Mountain area needs to be designated as a "de facto wilderness" when careful supplemental resource management can do the job. I am reminded of a conversation I had with Jim Rogers, the person most responsible for having Grassy Knob designated a wilderness area. Jim admitted they got a lot more than they needed or even wanted for the protection of Elk River. If Copper Mtn. is so designated, I would propose that some of the Grassy Knob Wilderness be placed back into the multiple use category. Yes I know, the trap door only works one way!

2. Wild River: In agreement with USFS proposal.

3. Research Natural Areas: Agreement with USFS and Evergreen.

4. Botanical: The USFS plan lists eight sites for designation while Evergreen notes seven. I am not sure which one is left out in Evergreen. I hope that Iron Mountain and Snaketooth Redwood area are both included. I would also like to see a trade with BLM to obtain the Hunter Creek Bog and retain is as a botanical area.

5. Unique interest: I support both USFS and Evergreen.

6. Custodial: RARE I and II studied the area thoroughly.The Wilderness Act of 1984 released the North Kalmiopsis and other areas from further wilderness designation. Yet the roadless designation is a de facto wilderness. I do not favor placing these areas in custodial areas but instead propose the supplemental resource category.

During the well-done information meetings your staff conducted on salvage in the Silver Complex burn, I asked, " What were the reasons the area was not roaded before?" If the reasons were for unstable soils, lack of economic feasibility, or similar reasons, the fire should not dramatically alter that reasoning. However, if the reason was because the working circle had not yet reached the necessity of tapping that area, now is the time to go in there, salvage only the timber that is economically feasible to do so without inordinately damaging the watershed, and put the topic to rest.

7. Supplemental Resources: This is possibly one of the most important parts of the plan. The USFS is doing an excellent job of protecting streamside vegetation and fish habitat. In some areas this may require more than a buffer strip of varied width.

In addition to the USFS proposal, I favor the Evergreen proposal to continue and expand the work being done in the construction of weirs and rearing pools in the salmon and steelhead streams of the Forest.

I also propose special consideration to all tributary streams of Elk River including , but not limited to, Bald Mtn and Rock Creeks, and the South Fork of the Sixes.

8 and 9. Designated wildlife habitat and special wildlife sites: I support the Evergreen alternative. In addition I support the efforts of the USFS to maintain open prairies for wildlife habitat, such as the Adams Ranch along Rogue River, and High Prairie in the Chetco drainage.

10. Scenic/Recreation River: For optimum protection of Elk River, that system could be designated a wild and scenic river.Barring that possibility, the supplemental resource plan should prohibit any logging or road building within one-fourth mile of the north and south forks and the main stem portion within the Siskiyou boundary.

11. Riparian: See No. 7.

12. Retention Visual and 13, Partial visual retention: I agree with the Evergreen alternative. No matter how carefully done, logging operation aftermath is not attractive. Present efforts need to be continued on the major traveled roads such as the Oregon Caves highway, Bear Camp Road, Chetco and Elk, but let's not get carried away beyond the sensible direction USFS is now following. Some of us even believe that young growing timber is extremely attractive.

14. General forest: The major portion of the Siskiyou, not now in wilderness or other special designations, should be managed for multiple use. The Siskiyou is a recreationists delight as well as an economic resource to the surrounding communities. It provides outdoor activities as well as jobs to our people.

I have followed USFS management activities for a number of years. Thinning, fertilization, superior tree selection . etc. are all worthy activities and should increase the amount of product that can be grown in a given period of time. For this reason I support the Evergreen alternative of shortening the cutting cycle for one rotation and increasing the annual allowable cut to 188 mbf.

National Park: Legal requirements may force you to included this as an alternative. But after studying the proposal in view of our local situation as well as the actual happenings in Del Norte county with the Redwood National Park, I am opposed to the designation of a Siskiyou National Park.

Campgrounds and Trails: I support your proposal to develop ten new recreational sites. I urge considerably more attention to trail development and maintenance through additional financing and through involvement of more volunteer groups.

I love the Siskiyou but I also like to eat and see my fellow citizens be able to eat and enjoy their lives in the areas served by the Forest. I pray that through all of this process you will be able to come up with a program that is fair and equitable even though it may not be well received by everyone.

Sincerely,

Walt Schroeder

00190

STATE OF CALIFORNIA — GEORGE DEUKMEJIAN, Governor

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION

1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95401
Phone: (707) 576-2220

November 12, 1987

Norma Wood
State Clearinghouse
1400 Tenth Street, Room 121
Sacramento, CA 95814

Dear Ms. Wood:

Subject: SCH No. 87090104 - Draft Environmental Impact Statement/Land and Resource Management Plan for Siskiyou National Forest

The North Coast Regional Board staff has reviewed the above referenced documents and submit the following comments for the portion of Siskiyou National Forest in California. The North Coast Regional Board has found the USFS 208 Best Management Practices (BMPs) Program to be highly successful in meeting Basin Plan objectives.

1. Page IV-39: The plan recognizes approved 208 BMPs as a means to achieve and maintain water quality goals. The plan should also recognize that the State of California and federal water quality standards are the North Coast Regional Board's Basin Plan water quality objectives and waste discharge prohibitions. BMPs are not a measure of compliance as stated on this page of the plan; rather BMPs are required practices which normally result in meeting water quality standards. Measuring compliance is accomplished through water quality monitoring programs.

2. Page V-12: A Monitoring and Evaluation Program for determining compliance with water quality objectives needs to be established. Using BMPs as a unit of measure is not consistent with the legal BMP definition established by the Court in the GO-Road decision.

3. Page IV-39: The plan states that exceptions to BMPs will be allowed if in conflict with Region policy or direction. This is an apparent deviation from the 1981 Management Agency Agreement between the State Water Resources Control Board and the U.S. Forest Service. We request that this plan's statement be developed and clarified.

4. Intensive, large scale logging activity in single watersheds, and its resulting impacts to water quality beneficial uses, has been a long standing issue. We support the forest's effort to plan individual basin activities over space and time. We assume that the percent watershed disturbance allowed under this plan was derived from a method similar to that now used on other forests in California. The discussion on Page II-8 of the Draft EIS is not clear on the method used.

5. The plan should specify at what step in the process the BMPs for individual Timber Sale Units will be identified and specified. It has been staff experience that this needs to occur in the project level Environmental Assessments to help ensure adequate field implementation.

Thank you for the opportunity to comment.

Sincerely,

[illegible] SIGNED BY

William D. Winchester
Environmental Specialist III

WDW:nkh

cc: Gordon Snow
Forest Supervisor, Siskiyou N.F.
Debra Caldon
Andy Levin

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD—
NORTH COAST REGION
1440 GUERNEVILLE ROAD
SANTA ROSA, CA 95401
Phone: (707) 576-2220

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Thank you for the opportunity to comment.

Sincerely,

William D. Winchester
Environmental Specialist III

WDW:nkh

cc: Gordon Snow
Forest Supervisor, Siskiyou N.F.
Debra Caldon
Andy Levin

State of California 02935

GOVERNOR'S OFFICE
OFFICE OF PLANNING AND RESEARCH
1400 TENTH STREET
SACRAMENTO 95814
916/323-7480

GEORGE DEUKMEJIAN
GOVERNOR

DATE: December 21, 1987

TO: Mr. Ron McCormick
U. S. Forest Service, Siskiyou National Forest
P. O. Box 440
200 NE Greenfield Road
Grants Pass, Oregon 97526

FROM: Office of Planning and Research
State Clearinghouse

RE: Land and Resource Management Plan, Siskiyou National Forest (SCH 87090104)

As the designated California Single Point of Contact, pursuant to Executive Order 12372, the Office of Planning and Research transmits attached comments as the State Process Recommendation.

This recommendation is a consensus; no opposing comments have been received. Initiation of the "accommodate or explain" response by your agency is, therefore, in effect.

Sincerely,

Huston T. Carlyle, Jr.
Director, Office of Planning and Research

Attachment

cc: Applicant

Resources Building
1416 Ninth Street
95814
(916) 445-5656
TDD (916) 324-0804

California Conservation Corps
Department of Boating and Waterways
Department of Conservation
Department of Fish and Game
Department of Forestry
Department of Parks and Recreation
Department of Water Resources

GEORGE DEUKMEJIAN
GOVERNOR OF
CALIFORNIA

THE RESOURCES AGENCY OF CALIFORNIA
SACRAMENTO, CALIFORNIA

Air Resources Board
California Coastal Commission
California Tahoe Conservancy
California Waste Management Board
Colorado River Board
Energy Resources Conservation and Development Commission
San Francisco Bay Conservation and Development Commission
State Coastal Conservancy
State Lands Division
State Reclamation Board
State Water Resources Control Board
Regional Water Quality Control Boards

Mr. Ron McCormick
U. S. Forest Service, Siskiyou National Forest
P. O. Box 440
200 NE Greenfield Road
Grants Pass, Oregon 97526

December 21, 1987

Dear Mr. McCormick:

The State has reviewed the Land and Resource Management Plan, Siskiyou National Forest, submitted through the Office of Planning and Research.

Review was coordinated with the North Coast Regional Water Quality Control Board, and the Departments of Conservation, Fish and Game, Forestry and Fire Protection, Parks and Recreation, and Water Resources.

Attached for your consideration are comments that reviewing departments have prepared.

Thank you for providing an opportunity to review this project.

Sincerely,

Gordon F. Snow, Ph.D
Assistant Secretary for Resources

Attachments

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 87090104)

State of California — THE RESOURCES AGENCY OF CALIFORNIA

Memorandum

To : Dr. Gordon F. Snow
Assistant Secretary for Resources

Ron McCormick
U.S. Forest Service
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Date : NOV 03 1987

Subject: DEIS and Forest Plan for Siskiyou National Forest
SCH #87090104

From : Department of Conservation—Office of the Director

The Department's Division of Mines and Geology (DMG) has reviewed the Draft Environmental Impact Statement (DEIS) and Land and Resource Management Plan (Plan) for the Siskiyou National Forest in the northern Klamath Mountains, California. The DMG review involves both documents and addresses the geology, mineral resources, slope stability and erosion/sedimentation issues. Our specific comments ate as follows:

DRAFT EIS

1. Reorganization of the DEIS would aid reviewers and provide for an improved planning document. Repeated cross-references tend to confuse, rather than clarify key issues. All information regarding the various alternatives should be summarized in one place, rather than spread throughout the document.

2. The discussion of the geology of the Forest, page III-5, et seq., is much too brief to allow a comprehensive analysis or evaluation of current geologic hazards in general, and slope stability problems in particular. A slope stability map or landslide propensity map should be included to fully describe this process and its impact on each land use alternative. The characteristics of each of the geologic units (formations) should be expanded upon and evaluated in terms of weathering products, soil types, slope stability habit, erosion potential, and engineering characteristics. In addition, maps and a general discussion of the seismicity, active faults, and other geologic hazards, e.g., flooding, volcanism, etc. should be included to provide a basic environmental framework for any future plans for Forest land development or utilization. A map, showing the mines and mineral resource locations, should be included to provide a basic understanding of where known or existing mineral resources are found.

3. The DEIS lists many mineral commodities which are found in the Forest, several of which are classified as strategic (page III-24, et seq.). However, in the discussions of Forest Mineral Lands, page III-27, et seq., a mineral potential rating scale of high, moderate, low, and unknown is defined, using only very general, imprecise terms and concepts to the point that a reviewer is not sure just what is being defined or characterized.

In the case of a high rating, evidence used to show that mineralization has taken place should be cited; be it public or private reports and documents, geologic or mining maps, analyzed samples, remote sensing data, or any other reliable data.

A moderate rating is based on evidence of mineralization that is "less clear" or which "has not yet been formed", and a low rating is based on land characteristic that are "unfavorable for resource accumulation." A more rational explanation of the criteria used is essential in order to understand how these ratings were established. We recommend that the Final EIS include, as an integral part of the document, a comprehensive discussion of the data sources, rationale, evaluations, criteria, and analyses that went into this classification system. The discussion should also address the methodology employed to derive the total acreage listed in each category.

Figure III-4, Mineral Potential-1985 Map, shows the entire Forest classified as either "high", "medium", or "low", with no "unknown" lands. The reasons and rationale for this omission should be included in the DEIS. It would be informative to be able to compare the two maps (Potential and Access) used to produce this figure.

The DEIS does not indicate that a comprehensive mineral resource evaluation of the Forest has been made; and it does not adequately document and reference the source of figures, data and facts used in the discussion of mineral lands. We recommend that before any Forest land are excluded from mineral entry that a detailed and comprehensive inventory of their mineral resource characteristics be carried out in a rational manner and based on objective criteria which may be readily comprehended.

4. In the discussion of the resolution of Planning Problem #9, "How should mineral resources of the Forest be developed in coordination with management with other resources?" no information or reference is made to the factors influencing the cost of extraction and processing mineral commodities. The Forest Service policies and practices governing the extraction of minerals, e.g. reclamation, revegetation, road construction, etc. may greatly affect the cost of developing and operating a mine. We recommend, therefore, that the FEIS and Forest Plan include a more thorough discussion of the Forest Service policies and procedures for mineral development in relation to the "socio-economic aspects" of mining vis-a-vis the Gasquet Mountain Project, as well as the exploration, development and extraction of "minerals" in general.

5. The list of mining laws and regulations cited on page III-32 should also include California's Surface Mining and Reclamation Act (SMARA).

FOREST PLAN

Chapter IV, Standards and Guidelines: Minerals, page IV-48, et seq. mentions only briefly the policies, regulations, laws, directions, and guidelines that may influence the prospecting, development and production of mineral resources on Forest lands. In addition the federal regulations cited, the California Surface Mining and Reclamation Act (SMARA) should also be listed among the laws controlling the administration and reclamation of mined land in this state.

If you have any questions regarding these comments, please contact Zoe McCrea, Division of Mines and Geology Environmental Review Officer, at (916) 322-2562.

Sincerely,

Dennis J. O'Bryant
Environmental Program Coordinator

cc: Zoe McCrea, Division of Mines and Geology
Trinda L. Bedrossian, Division of Mines and Geology
Robert Streitz, Division of Mines and Geology

DJO:RS:vw

State of California — The Resources Agency

Memorandum

To: Honorable Gordon K. Van Vleck
Resources Agency
1416 Ninth Street
Sacramento, CA 95814

Attn: Projects Coordinator

Date: December 21, 1987

From: Department of Fish and Game

Subject: SCH 87090104, Land and Resources Management Plan, Siskiyou National Forest

The California Department of Fish and Game (Department) has reviewed the subject documents describing the Siskiyou National Forest's proposed Land Management Plan (Plan) and environmental analysis of various alternatives. The Plan, whatever the final form, will determine land uses and management practices for at least the next 10 years and, probably, for many decades into the future. These land uses and management practices will result in profound habitat changes over thousands of acres. Man's understanding of ecological systems is not sufficient to predict all of the biological consequences of implementing any of the proposed alternatives, but it is obvious that fish and wildlife will be profoundly impacted. It is apparent that, insofar as fish and wildlife resources are concerned, these impacts have not been fully identified nor adequately considered in the selection of alternatives as required under the National Environmental Policy Act (NEPA) and the National Forest Management Act (NFMA).

It is extremely difficult to analyze the material contained in the Plan because it is based on a computer model and the U.S. Forest Service (USFS) has presented very little information regarding the assumptions used in FORPLAN runs. Based on what we see, however, it is obvious that timber management is the driving force in the development of the Plan. In "The Genesis of FORPLAN", a USFS publication, the authors (David C. Iverson and Richard M. Alston) state "that FORPLAN was inherently incapable of modeling forest planning because it was a barely camouflaged enhancement of a functionable model representing the views of Timber Management; and that the specific capability of the model was inadequate to address forest planning problems." They stated further "that being a functional model [FORPLAN] would inevitably prove to be inadequate for the multifunctional, integrated planning required under the NFMA." We believe this inadequacy is clearly demonstrated in the subject plan.

Because FORPLAN was developed as a timber management model, most other resources are dealt with merely as "constraints" limiting the principal management objective of maximizing priced outputs. Rather than according equal weight to each of the forest planning

considerations specified in NFMA regulations (see 36 C.F.R. 219 (1986)), the Plan treats the maximization of Present Net Value (PNV) as the base line to which other possibilities and tradeoffs must be compared. This approach inevitably favors forest uses that produce easily quantifiable economic benefits over uses for which economic benefits have not yet been determined.

Even the "constraints" placed on the dominating timber management activities to protect other natural resources are minimal and couched in terms which allow decision makers to modify or ignore them. For example, the total timber harvest level is modified by regional USFS direction which requires retention of sufficient old-growth habitat to support only the minimum viable population of spotted owls. Only a few threatened, endangered and sensitive species actually receive land allocations as constraints. Most wildlife habitat needs are handled through "Standards and Guidelines." The "Standards and Guidelines" are only mandatory if they contain the word "shall." Those containing the words "should", "where practicable" and "may" are not required to be followed. Constraints for deer and elk habitat, as an example, are permissive rather than mandatory. Based on our past experience with the USFS decision-making process, we can only conclude that these "Standards and Guidelines" will not be followed diligently unless they are mandatory and will, therefore, not provide adequate protection for fish and wildlife resources.

A major part of the problem in the treatment of fish and wildlife resources in the planning process is the regional guidelines which establish minimum standards. Theoretically, forest plan implementation can opt for higher standards but cannot go below the minimum set by the region. This Plan, as well as all the other land management plans prepared by the USFS that we have reviewed, provides only for managing wildlife at minimum levels. Unfortunately, the minimum standards are flawed because they are directed towards maintaining what the USFS calls "viable populations." There is no definition of what constitutes a minimum "viable population" for the more than 270 species found in the Siskiyou National Forest. In fact, there is no biological basis to support the use of the concept of minimum viable populations in this manner. Furthermore, life history information for many of the species in the Forest is insufficient to assess the impacts of Plan implementation.

Management objectives directed only towards maintenance of minimum viable populations are an invitation to disaster. Once populations are at or near minimum viability levels, any further loss due to disease, unfavorable weather conditions or habitat destruction may result in elimination of the species. A clear example of this danger could be seen in the wildfires of 1987. On the Klamath National Forest, adjacent to the Siskiyou National Forest, approximately 250,000 acres burned. This included over 30 percent of the spotted owl management areas, scheduled for retention. The viability of spotted owl populations on the

Klamath Forest may well be in jeopardy since it will take many decades for the necessary old-growth habitat to be regenerated.

The Plan contains very specific management direction and objectives for commodity products. Harvest and silvicultural techniques are covered in great detail. Fish and wildlife, on the other hand, have few quantifiable objectives, other than references to maintaining minimum population viability. If fish and wildlife resources are to be given equal consideration as required by law they must be treated with the same degree of management specificity as timber.

For fish and wildlife, the large-scale clear-cut and shelterwood treatments proposed will have far-reaching impacts. Most of the general forest zone is scheduled to be treated under this even-aged management scheme. The USFS claims that habitat for early-successional species will be improved under their preferred alternative. We believe, however, that the intensity and methods of reforestation will largely negate such beneficial claims. Although some short-term benefits may result for some species, over the long-term most wildlife will be adversely impacted as a consequence of the trend to monotypic forests. The NFMA specifically states that regeneration cutting is to be carried out only where consistent with fish and wildlife protection. It seems to us that the Plan is in conflict with federal law and legislative intent.

Management direction for game species is particularly deficient, and for some species totally absent. Constraints on timber management activities are included only for deer and elk. None of these constraints are mandatory. Bear, band-tailed pigeons, tree squirrels, grouse and quail are not even mentioned. Implementation of the Plan without necessary mandatory constraints will result in severe long-term adverse impacts to most harvestable wildlife species. The conversion of hardwoods, loss of hardwoods in clear-cut blocks of mixed conifer/hardwoods, the encouragement of commercial hardwood sales, and increases in hardwood cutting for fuel are good examples of the problem. Deer, bear, band-tailed pigeons and tree squirrels are dependent upon mast produced by older age-class hardwoods. The Plan would allow up to 7,500 acres of hardwood conversion/harvest per decade. In 50 years this would mean a loss of up to 37,000 acres. Such losses would be expected to cause substantial decreases in the Forest's capability to support mast-dependent species. Neither the Plan nor the Draft Environmental Impact Statement (DEIS) recognizes the importance of hardwoods to wildlife or the consequences of removing them.

Since the protection of fish and wildlife resources is totally dependent on "constraints" placed on the dominant timber production activities, the sufficiency of these "constraints" to accomplish the objectives becomes the critical issue. If the Plan is to work, insofar as fish and wildlife are concerned,

these "constraints" must be very specific, very comprehensive and they must be diligently adhered to. Based on what the Plan proposes, we can only conclude that the "constraints" described will not provide the necessary degree of protection to prevent substantial adverse impacts to wildlife and habitat diversity.

The methods by which the USFS intends to evaluate the success of these "constraints" are also critical. The USFS proposes a system which involves the monitoring of eight so-called indicator species, eight species which are intended to represent the estimated 270 wildlife species that occur on the Siskiyou National Forest. It is assumed by the USFS that these eight species will adequately measure the well-being or "viability" of all Forest wildlife and the diverse habitat conditions they require. This approach is, at best, a gross simplification of an ecosystem that is extremely complex, much more complex than the Plan recognizes.

The monitoring system proposed is simply incapable of doing the job it is designed to do. It cannot measure the status of all species and it cannot guarantee the maintenance of "viable populations". Some of the obvious reasons are:

1. There is no biological basis for establishing what a minimum "viable population" is for any species.

2. The USFS has not defined numerically what the "viable population" objectives are for species other than spotted owls, pileated woodpeckers and pine martens.

3. Minimum "viable population" levels for the three species listed above are subjective judgments made by the USFS and are not supported by biologically sound data.

4. The constraints which are supposed to ensure the viability of all wildlife species have not been tested or validated. For example, the most recent literature on spotted owls indicates that the habitat requirements of a breeding pair will not be met by the minimum standards established by the USFS. The same is true for the goshawk. Recent studies in California by the Department indicate that nesting territories require a 150-acre core protection zone. Minimum standards for "other raptors" provide no such requirement in the Siskiyou Forest LMP.

5. Management plans have not been prepared for most wildlife, including the most important harvestable species. Without plans or objectives there is not much chance that habitat needs will be met, especially when competing timber management is planned in detail with quantifiable production objectives.

6. The assumption that the viability of all wildlife species can be measured by monitoring an indicator species is

biologically unsound. Such an assumption implies an ecosystem of great simplicity which, in this case, is far from accurate. Although groups of species may occupy similar habitat types, each species has developed its own specific needs based on individual habitat components. For example, the pine marten and fisher occupy similar habitat and have similar food habits, but the pine marten occupies elevational ranges above those normally used by fishers. Monitoring pine martens, therefore, does not provide information on fisher populations. The adequacy of habitat to fulfill the needs of 270 species cannot reasonably be measured by monitoring only eight species.

7. Any monitoring program based on maintaining species viability at minimal levels is inadequate. Even the most sophisticated monitoring techniques only measure trends over time. It usually takes several years for such a program to establish a clear population decline. If habitat loss is the causative factor in a population decline, it may well be too late to reverse the trend since the regeneration of habitat requires a great deal of time, particularly if old-growth forest, hardwoods, snags or some other age-dependent component is involved. Also, management for the minimum standards of a supposed population viability level leaves no cushion for unexpected future events, that is, if a given population is, in fact, at minimum viability population levels, any further loss due to disease, weather conditions, fire or other mortality/habitat loss factors may result in the elimination of the species.

8. There is no guarantee that the monitoring program will actually be carried out over time. If the necessary manpower and funding is not provided, the monitoring system will fail and with it the entire fish and wildlife resource management scheme. Full funding and staffing for accomplishing all fish and wildlife activities is absolutely essential.

The general comments presented on the preceding pages demonstrate our very real concerns regarding the adequacy of the USFS preferred alternative to protect and maintain vegetative diversity and fish and wildlife resources. We do not believe the Plan is in conformance with either the Multiple Use Sustained Yield Act or the NFMA insofar as its treatment of fish and wildlife is concerned. The Plan clearly places timber production as the dominant land use without equal consideration for non-commodity product resources. The documentation of environmental impacts which would result from implementation of the preferred alternative (Alternative K) is flawed, both by omission and subjective judgment not supported by facts. The DEIS, as a consequence, does not meet NEPA requirements as a full disclosure document.

Additional comments relative to the details of the Draft Land and Resource Management Plan and DEIS are attached. Only those sections relative to the preferred alternative (Alternative K) are addressed.

The Department believes that the Plan could be improved substantially with the addition of appropriate constraints, modifications of timber harvest and silvicultural techniques, longer rotation cycles, increased allocation of habitat for wildlife and higher Minimum Management Requirement standards. We would be pleased to meet with the USFS with a view toward clarifying and resolving our stated concerns.

Any questions regarding our comments should be directed to Mr. A. E. Naylor, Regional Manager, Region 1, 601 Locust Street, Redding, CA 96001. The telephone number is (916) 225-2363.

Pete Bontadelli
Director

Attachments

ATTACHMENT 1

Siskiyou National Forest Proposed Land
Management Plan and Draft EIS
Specific Comments of the Department of Fish and Game

I. Forest Plan

Page 1, Purpose of Forest Plan

This document does not really provide a plan of management for all forest resources. Basically, it is a timber management plan that addresses most other resources as constraints on the dominant use. There are no positive programs for wildlife management with quantifiable goals, only Minimum Management Requirements (MMR) which are intended to establish the lowest population level to which wildlife species will be allowed to fall from the impacts of timber management. Insofar as wildlife are concerned, it is a plan of population reduction and, perhaps for some species, elimination. Obviously, these losses are fully acceptable to the USFS. We do not believe that the public would agree.

We are not suggesting that the USFS wants to reduce wildlife but rather that they are more concerned with producing timber products and are, consequently, reluctant to reduce production for the sake of other resources.

Page II-1, Preserved Old Growth

The demand for preserving old-growth timber should not be hard to quantify. Several public opinion surveys have been conducted in recent years to determine the public's feelings about wildlife conservation. In each case, including the 1986 study conducted in California by Chico State University, a substantial majority of the people expressed their desire to preserve and protect wildlife, even if this would require higher costs or reductions in the availability of some commodity products.

Page II-2, Wildlife Habitat

The increased demands projected for big game recreation cannot be met under this Plan.

Page II-2, Resource Supply Conditions

We have a great deal of concern with the planning process, its direction, the values used and apparent shortcomings with the primary planning model, FORPLAN.

The goal is to maximize public net benefit (PNB) defined in terms of present net value (PNV). Economic efficiency as determined by the difference between discounted value of all priced outputs and USFS management and investment costs is not the only direction given within the regulations promulgated by NFMA. Those regulations also determine that cost is only one factor that should guide the development of alternatives in forest planning (see 36 C.F.R. 219.1 (b)(13) 1986). Despite these regulations, it is apparent that maximized PNV is the base line from which all tradeoffs and combinations must be compared among alternatives.

Non-timbered outputs are at a large competitive disadvantage for a number of reasons. The Renewable Resources Planning Act (RPA) values used are substantially lower than actual values for outputs such as Wildlife or Fishing User-Days (WFUD) and Recreational Vehicle Days (RVD). The fact that timber is the only commodity that is price-trended for planning creates an even larger competitive disadvantage.

Page II-9, Research and Information Needs

Based on statements made elsewhere in the Plan and DEIS, there is a serious lack of information regarding wildlife habitat requirements and vegetative diversity. The list presented here does not address the identified problems. The LMP should be revised to include the following minimum objectives:

1. Determine the impacts of various timber management activities over time on deer and elk. The objective should be to develop timber management strategies that are less harmful to big game and are capable of increasing habitat quality.

2. Determine adequacy of present spotted owl management areas in view of new information regarding habitat requirements, territory size, number of territories and distribution.

3. Determine habitat needs of the fisher.

4. Determine habitat needs of goshawk.

5. Determine impacts of intensive timber management on black bear.

6. Determine impacts of hardwood reductions on wildlife.

7. Determine potential for re-establishing peregrine falcon nesting on the forest.

Page III-10, How should Wildlife Habitats on the Forest be Managed?

One of the forest's most important wildlife habitat components is just barely mentioned in the Plan: hardwoods. Hardwoods, particularly older-age classes, are of extreme importance. The Plan does not address hardwood management adequately and provides no constraints for hardwood retention. This is a major deficiency in the Plan and DEIS.

Only about 450 acres of habitat restoration per year is prescribed for the forest. This is certainly beneficial and we support it, but habitat improvement at such low levels will produce only very localized benefits and will not have any measurable influence forest wide. This is another indication of the extremely low priority accorded to noncommodity resources. Much more benefits could be provided for wildlife at no direct cost by simply modifying timber harvest methods and silvicultural practices.

Page IV-1, Forest Management Goals

We do not believe this Plan achieves a good balance of resource management, but rather one which is heavily weighted towards commodity products, specifically timber.

We do not believe that high quality wildlife habitats capable of supporting viable populations of all native species will be maintained within the General Forest Zone. We do not believe that the plan will provide high quality and quantity of wildlife habitat to ensure diversified recreational use. A predicted reduction of deer, elk, bear, squirrel and band-tailed pigeon populations ranging from 20 percent to over 50 percent (see other supporting comments) does not indicate the retention of high quality habitat and would not meet anticipated recreational demands.

Page IV-4, The Forest in 2036

The assumption that designated old-growth habitat areas will remain relatively unchanged relies on a further

assumption that such areas will not be impacted by fire or some other destructive force. The large fires in California and Oregon in 1987 provide good evidence that this assumption is incorrect: Approximately 30 percent of the designated old-growth spotted owl territories were lost on the Klamath Forest in a period of about two months. Also, substantial areas of riparian habitat were destroyed. This points out one of the fatal flaws in the Plan, in terms of maintaining wildlife, and that is that management for minimum viable populations leaves no margin for error or natural disaster.

Page IV-11, paragraph 1

The silvicultural systems selected for the majority of the forest are the systems which are also the most destructive *for fish and wildlife. For example,* no harvest should be permitted in the riparian zone unless it is designed specifically to improve stream or wildlife habitat.

Page IV-13, Forest-Wide Standards and Guidelines

Standards and guidelines must be mandatory. The terms "should", where practicable, and "may" are almost useless in assuring compliance. Our experience has shown that unless constraints are mandatory they will usually not be adhered to.

Page IV-20, Fish, Wildlife and Sensitive Plants

The assumption that the monitoring of eight indicator species will be adequate to measure population status and trends for 270 species is totally invalid. There is no biologically sound basis for making this assumption. This approach is, at best, a gross simplification of an ecosystem that is extremely complex, much more complex than the Plan and DEIS recognize.

Page IV-23

We do not believe that the number, size, or dispersal of spotted owl territories proposed by the USFS to meet MMR are sufficient to assure species viability. In addition, the Plan does not provide sufficient levels of habitat to allow for losses to fire or other unforeseen factors.

Page IV-25, Other Raptors

No special provisions are made in the Plan for managing goshawk habitat. Based on studies conducted by the Department, goshawk populations are declining significantly as a direct result of intensive timber management. All existing goshawk nesting territories should be identified and allocations made for the retention of sufficient habitat to assure population maintenance. Each territory must contain at least a 150-acre protected core area around the nest site. A larger secondary zone around the core area should be managed to ensure suitable habitat will be available over time to maintain territory viability. (The Status of the Northern Goshawk in California, CDFG Administrative Report 85-1).

Page IV-25, Deer and Elk Habitat

Since constraints are not mandatory we suspect deer and elk will not benefit from this Plan. This is unfortunate because the intensive timber management program will have significant adverse impacts on big game. It is also unfortunate because timber management, if modified and with proper constraints, has great potential for increasing deer and elk carrying capacities.

Page IV-28, Dead and Down Woody Vegetation

The Plan should allow for the retention of large logs and snag trees. For example, studies of the black bear in northern California show that cavities at the base of large live or dead trees, and large down logs are the primary denning sites. The elimination of larger trees and snags over time in the General Forest Zone will reduce denning habitat.

Page IV-28, Hardwood Habitat

Contrary to what is stated, it is well known that hardwoods provide a significant and seasonally crucial part of the food for deer, bear, turkeys, band-tailed pigeons, tree squirrels, and many other wildlife species. One of the most serious problems in habitat quality recognized in California is the loss of older-age class hardwoods. Not only is the problem serious on private land, but also on public lands. The Six Rivers National Forest LMP allows the elimination of 90 percent of the hardwoods on the General Forest Zone. Although the Siskiyou LMP does not quantify the total loss over time, we expect it will amount to about the same since timber management intensities are

alike. This will have substantial adverse impacts on wildlife and those impacts are not fully disclosed in the DEIS.

Mandatory constraints which provide for retention of older-age class hardwoods and recruitment over time must be initiated on all timber sites. Hardwood conversions should not be permitted unless it can be substantiated that such conversion will not adversely impact wildlife. The USFS should prepare a hardwood management plan which ensures that hardwood resources would be managed to meet wildlife habitat requirements.

Page IV-29, Timber Management

Timber management practices are based entirely on economic (FNV) considerations and not on the compatibility of the practice with other resource values. The preferred methods in Alternative K are the most damaging to fish and wildlife. The constraints are not sufficient to protect fish and wildlife resources. If fish and wildlife were given equal consideration in forest management as required by law we would expect to see a mixture of harvest techniques, including selective cutting, and a variation in cutting rotations that provide for more diversity in timber age classes above 100 years.

Page IV-33 (6-9)

This section provides for 60 acre maximum even-aged clear-cuts. The National forests in the Pacific Southwest Region (Region 5) are directed to utilize a 60 acre maximum on douglas fir stands only. All other conifer species are to be clear-cut to a maximum of 40 acres.

Page IV-33, paragraph 2

Often this competing vegetation is the forage which provides the benefits to early successional stage species and is claimed as a plus for wildlife. Control (elimination, reduction, suppression, whatever the term) means negating or drastically reducing any benefits which resulted from timber harvest.

Page IV-34 paragraph 6

This provision allows for and, in effect, encourages the establishment of large areas of monotypic habitat. An entire drainage could be in dense stands of young trees

with little or no understory for many years. This does not increase diversity; it reduces it.

Page IV-36, paragraph 1

See previous comments on value of hardwoods and environmental impacts. Such conversions should not be considered except in very special circumstances. Before conversions are permitted the USFS should prepare a hardwood management plan that provides for retention and recruitment of older-age class hardwoods over time.

Page IV-38, Riparian Ecosystems

No logging should be permitted in riparian zones unless it is specifically done to improve fish or wildlife habitat. Removal of older-age class trees reduces the fish and wildlife values in streamside areas. Sufficient old-age class trees should be left along stream borders to provide large woody debris for recruitment into the stream channel. This will allow natural maintenance of stream channel diversity including catchment of spawning gravel and establishment of pools and cover. These older conifers will also become increasingly important for cavity nesters, raptors and other wildlife when adjacent General Forest Zone forests are cut and placed in even-age management.

Page IV-52, paragraph 1

Road closures must be required to meet wildlife needs. Open road densities should not exceed 1 mile per square mile.

Page IV-57, Integrated Pest Management

Chemical control of vegetation should not be used for reforestation except in special circumstances. This kind of treatment reduces big game forage, eliminates hardwoods and reduces diversity.

No toxic materials which are hazardous to nontarget wildlife species should be permitted.

Page IV-85 (Table IV-7), Spotted Owl

Spotted owl needs should be adjusted to reflect the final recommendations of the Spotted Owl Supplemental Environmental Impact Statement.

Page IV-86, Spotted Owl

Recent information on spotted owl habitat requirements indicate the prescriptions listed here are not sufficient to maintain the species.

The number of territories preserved are not sufficient to ensure continued population viability (see other comments, i.e., loss of 30 percent of Spotted Owl Management Areas on Klamath N.F. from fire in 1987).

Page IV-87, Pine Marten

There is no guarantee that these prescriptions will ensure maintenance of population viability. It is better to err on the side of too much habitat rather than too little. We urge that the USFS allocate additional habitat until more precise information on pine marten population dynamics and habitat requirements are available.

Also, preservation of pine marten habitat does not necessarily assure maintenance of fisher. Although both species occupy similar habitat, they do so at different elevational ranges. The Six Rivers National Forest funded a study of fisher habitat needs and impacts of timber management. The study included recommendations for their protection and management. These prescriptions should be included in the Plan if fishers are still found on the forest.

Page IV-89, Special Wildlife Site

Goshawk management areas should be identified and protected as per "The Status of the Northern Goshawk in California, CDFG Administrative Report 85-1".

We recommend meadow buffer strips be at least 300 feet. No logging should be permitted in this buffer except to prevent meadow encroachment by conifers.

Page IV-100, Timber

No logging should be permitted in riparian areas unless it is needed to improve habitat for fish and wildlife. (See our previous comments for page IV-38)

Page V-4, Budget Proposals

The assurances for the protection of fish and wildlife included in the plan cannot be fulfilled unless all scheduled fish and wildlife programs are fully funded. There is no guarantee that this will be the case. Implementation for other aspects of the Plan should, therefore, be conditioned on carrying out fish and wildlife programs.

11. Draft Environmental Impact Statement

Page IV-2, paragraph 1

Assumption that even-aged timber management and predominant use of clear-cut harvest illustrates a bias towards commodity production. Such management is the most environmentally damaging alternative available, and it is also contrary to NFMA which states that regeneration cutting is to be carried out only where it is consistent with fish and wildlife protection.

Page IV-93, paragraph 4

Conversion of hardwood stands and the continued loss of older-age class hardwoods to clear-cut logging, commercial hardwood harvest, and fuel-wood cutting will result in substantial adverse impacts to wildlife. The Plan allows 7,500 acres per decade in conversion projects alone. Deer, bear, band-tailed pigeons, tree squirrels, and a host of nongame species are dependent on hardwoods for mast or den trees. Since many hardwoods do not produce high yields of mast or become good den trees until they are quite old, the short cutting rotation cycles will drastically alter long-term habitat capability. Impacts will be highly significant and will be forestwide in nature, contrary to what is stated in this paragraph. Effects will also be cumulative.

Page IV-105, paragraph 1

The assumption that 17 percent of the forest remaining at decade 10 is sufficient to meet MMR goals may be true. Whether or not it is sufficient to maintain viable populations of all species is not known. USFS assurance that it is sufficient is based on subjective judgement, not biological fact.

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Page IV-149, paragraph 2

Recreation can have major impacts on wildlife resources. Vehicular traffic, for example, is known to adversely impact deer, elk, and other wildlife especially when road densities are greater than 1 mile per section. ORV use can have major impacts, both directly from disturbance and indirectly through habitat degradation.

Page IV-149, paragraph 3

Timber management could improve food resources for black-tail deer, Roosevelt elk, and some other species under proper prescriptions. The timber harvest and silvicultural programs proposed, however, are not likely to result in the benefits claimed. Wildlife dependent on younger seral stages will not necessarily benefit as a result of land disturbance and vegetative management. How they respond will not depend so much on how much early seral stage acreage is produced, but on the quality of habitat created and what has been lost to create it. For example, the serious loss of older-age class hardwoods and the mast crops upon which deer (and other wildlife as well) are seasonally dependent may offset any benefits produced. Likewise, the intensive silvicultural practices used to reduce vegetative competition and accelerate conifer canopy closure may well negate claimed benefits, particularly over the long term. The proposed timber management will, eventually result in the establishment of large tracts of dense, young, closed canopy conifers with little or no understory. This habitat is one of the least productive types, insofar as wildlife are concerned.

Mountain quail may benefit, but grouse, band-tailed pigeons, and tree squirrels will be adversely impacted from habitat simplification, loss of hardwoods, and other mast-producing vegetation.

Timber management will not just limit the habitat of many wildlife species, but will substantially reduce their populations forestwide as well.

Page IV-149, paragraph 4

Wildlife tree guidelines are not mandatory and, therefore, will not ensure maintenance of 20 to 60 percent of woodpecker species populations. Maintenance of 20 to 60 percent implies a loss of 40 to 80 percent of the populations. Is this magnitude of loss acceptable to the USFS in view of their mandate to give equal consideration to all resources?

-11-

Page IV-149, paragraph 6

Increased vehicular access has long-term detrimental effects on all species. Increased traffic means increased road mortality, illegal killing, heavier legal hunting pressure and loss of habitat.

Page IV-149, paragraph 7

There is nothing in the Plan (mandatory constraints) to assure roads will be closed to protect wildlife, nor is there any assurance that they will be seeded. If these claims are made as mitigation for adverse impacts as part of the DEIS, they must be substantiated through inclusion of mandatory standards and guidelines. As a minimum, not more than 1 mile of open road should be permitted per section.

Page IV-150, paragraph 4

There is no biological basis for claiming that the land allocations made for wildlife will, in fact, assure maintenance of viable populations. On the contrary, recent studies of spotted owl and goshawk habitat requirements clearly indicate that MMR standards are not sufficient. For many other species, we just don't know enough about them to be certain of anything.

Page IV-150, paragraph 6

As previously stated, there is no guarantee that MMR will ensure viable populations because there is no biological basis for what minimum population viability is and because most constraints on timber management are not mandatory or sufficient to adequately protect wildlife.

Page IV-151, paragraph 5

We cannot understand why the USFS continues to equate higher timber harvest directly with higher deer numbers. Under this assumption, the greatest number of deer could be produced by cutting all the forest. This just simply isn't true. Northwest California forests have experienced a reduction of deer numbers of over 50 percent in the past 20 years. It is interesting to note that this decline took place during the years of greatest timber management intensity on these forests.

aside for spotted owls, pileated woodpeckers, goshawks, pine marten, etc., is not sufficient to sustain minimum viable populations of any given species, that species is irretrievable.

Forage reserved for wildlife within grazing allotments is not an irretrievable loss to permittees, since it is still there and can be reallocated at any time.

03339

ASSOCIATION OF O & C COUNTIES

COMM. DALE D. SCHROCK, PRES.
BENTON COUNTY COURTHOUSE
CORVALLIS, OREGON 97330
PHONE 503-757-6800

COMM. WILLIAM F. FORD, V. PRES.
JOSEPHINE COUNTY COURTHOUSE
GRANTS PASS, OREGON 97526
PHONE 503-474-5221

COMM. ROCKY McVAY, SEC.-TREAS.
CURRY COUNTY COURTHOUSE
GOLD BEACH, OREGON 97444
PHONE 503-247-7015

RAY E. DOERNER, EXEC.
486 HEYDON R
ROSEBURG, OREGON 9
PHONE 503-673-

DAVID G. BARROWS, COUN
SUITE 200, CENTURY TOI
1201 S. W. 12th AVE
PORTLAND, OREGON 9
PHONE 503-227-

JOSEPH S. MILLER, PUB. F
19 3rd STREET, F
WASHINGTON, D.C. 20
PHONE 202-546-8

January 22, 1988

Mr. Ron McCormick, Supervisor
Siskiyou National Forest
P. O. Box 440
Grants Pass, OR 97526

Dear Mr. McCormick:

We welcome the opportunity to provide our thoughts and comments on the Draft Environmental Impact Statement (DEIS) and the Proposed Land and Resource Management Plan (LRMP) for the Siskiyou National Forest.

By way of explanation, the Association of O & C Counties is an organization whose membership includes all 18 Oregon counties in which the O & C lands are located. Some 173,000 acres of O&C lands are in the Siskiyou National Forest and are subject to this planning effort. While the primary interest of the Association is with the management of O & C lands, the Association has a near equal interest in the management of national forest lands located in Western Oregon.

Many goods and benefits flow from the O & C and national forest lands. Principal among these goods and benefits is timber production which provides a major source of raw material for the lumber and woods products industry. In Coos, Curry, Josephine and Jackson Counties', this industry provides the majority of manufacturing employment.

Another important benefit is the annual payment to the counties of a percentage share of receipts generated from these lands. Most of the receipts come from the sale of timber. In the case of O & C lands, 50% of the gross receipts are distributed to and shared by all 18 counties; in the case of the national forest lands, 25% of the forest receipts are distributed to the counties in which the lands are located. In combination, these annual payments are a vital and sustaining part of the various counties' operating budgets. Any disruption in timber availability has serious ramifications to local communities and industry.

If deer are to increase as a result of timber management as claimed, why have they declined drastically under 20 years of the kind of management proposed in the LMP? We agree that timber harvest can increase deer forage, under the right circumstances. However, the combination of hardwood removal, elimination of competing vegetation, shortening of successional stages and other high yield forestry practices negate many of the potential benefits. Large acreages of young, closed canopy plantations with little or no understory do not produce much forage for deer.

Page IV-151, paragraph 6

Where a loss of WFUD is the result of a decline in habitat capability for deer or elk, hunter acceptance of lower success rates is not mitigation for environmental impacts and should not be claimed as such.

Page IV-151, paragraph 7

Standards and guidelines do not provide necessary provisions to mitigate any major adverse consequence of the alternatives. These Standards and guidelines only limit the magnitude of loss, they do not mitigate for the loss. Based on information in the Plan and on estimates made by the adjacent Six Rivers National Forest in their LMP under similar alternatives we could expect the following losses in wildlife populations in 100 years:

Old-growth species	- 57 percent
Deer	- 20 percent
Woodpeckers	- 40 percent
Band-tailed pigeon	- 51 percent*
Goshawk	- 26 percent*
Western gray squirrel	- 51 percent*
Black bear	- 42 percent*

*Six Rivers National Forest estimates of population reductions in similar habitat with comparable management alternatives.

The average magnitude of loss for the seven species and species groups is 41 percent. If this average is applied to all forest wildlife the overall wildlife population loss can be expected to be at least 41 percent of present levels. This is a very significant impact, especially when it is considered that the same magnitude of losses will occur on other northwestern forests. Adequate mitigation for these losses is not provided.

Page IV-164, paragraph 2

We do not agree that this alternative does a good job of providing habitat diversity; rather, under the proposed management it simply reduces the percentage of old-growth forest and increases the percentage of younger-age class forest. In the process, even-age timber management, short harvest rotation cycles, type conversions, reduction of hardwoods, suppression of competing vegetation, compaction of successional stages and acceleration of conifer canopy closure will actually tend to reduce diversity. The more monotypic young age classes of conifers with little understory are not going to provide much vegetative diversity and consequently will be less productive for wildlife.

Page IV-164, paragraph 3

Significant habitat diversity is not likely to be provided as indicated in the preceding comment. We do not see how wildlife habitat improvement projects will result in increased carrying capacity for many species. From what is presented in the DEIS, the indicator species, which are supposed to be representative of all 270 species of wildlife on the forest, are all going to decline in numbers substantially. As an example of the problem, the improvement of 400 acres of deer habitat a year for 10-years results in 4,000 acres. During this same 10-year period over 7,000 acres of hardwoods will be converted to conifers. This may equate to a net loss in carrying capacity for deer.

Page IV-165, paragraph 4

The cumulative impacts are understated. The rotating supply of habitat for early successional stage species will not be as productive as the USFS predicts (see many comments on intensive timber management/habitat problems previously stated). This, along with the admitted 57 percent loss of old-growth species, will result in significant wildlife losses over time. Land allocations and standards and guidelines are not sufficient to guarantee that wildlife objectives will be met nor do they provide adequate mitigation for losses.

Page IV-241, Wildlife

Because old-growth habitat, once harvested, cannot be replaced over the planning horizon (150 years), obviously if the number, size and dispersal of old-growth blocks set

We find the DEIS and the LRMP an imposing set of documents. Those responsible are to be commended for the time and effort devoted to the documentation of this planning effort. It is not our purpose to provide a page by page critique of the documents; rather it is our purpose to relate our concerns with regard to the Preferred Alternative as described in the DEIS and LRMP; to comment on the land allocation process; and to provide suggestions for the design of a new alternative.

The Preferred Alternative - No Endorsement

The Association is concerned with the direction that the Preferred Alternative is taking with regard to the management of the Siskiyou National Forest. Because of these concerns, the Association is unwilling to endorse the Preferred Alternative.

We are concerned that the Selected Suitable Timber acreage available for timber production under the Preferred Alternative is the least amount of such acreage for any of the commodity oriented alternatives. Of some 624,240 acres of land classed as tentatively suitable for timber production, only 349,000 acres is available for unconstrained timber production while another 180,000 is available on a limited production basis.

We are concerned that the Annual Sale Quantity (ASQ) under the Preferred Alternative represents a 10% reduction from the current ASQ level. We are concerned that the ASQ for the preferred Alternative fails to meet the Forest and Rangeland Renewable Resources Planning Act by 24%. We feel that the Preferred Alternative fails to reckon with the importance of federal timber supply to the economic well being of dependent industries and communities.

We are concerned that in a period of federal budget belt-tightening a curtailment of funds for intensive timber management practices will negate the benefits of the allowable cut effect and require corresponding reductions in the ASQ.

We are concerned that the Preferred Alternative projects a loss of some 200 jobs -- a very untimely trade-off for the Coos, Curry, Josephine and Jackson County area as these communities struggle to recover from the recent period of economic adversity.

We are concerned that payments to the counties of their shares of receipts are projected to decline.

Finally, we are concerned that five of the six national forests in Western Oregon have selected as the Preferred Alternative in the land use planning process an alternative which requires a substantial reduction in the ASQ. The cummulative impact of such reductions is certain to have an adverse effect on those areas of Western Oregon dependent upon Federal timber to sustain a primary industry. We feel that the Preferred Alternative fails to take into consideration the cummulative effects of reductions in the ASQ and Long Term Sustained Yield on a Western Oregon-wide basis.

Land Allocation Process

The key issue with the Preferred Alternative (and all other alternatives for that matter) goes directly to the land allocation process which assigns each and every acre of land managed by the Siskiyou National Forest to one of 14 management areas. As we read the DEIS and studied the land allocation process we are left with the definite impression that all management catagories, other than the General Forest Catagory, have a preference right to the land which is superior to the General Forest catagory. And that when all preference rights have been satisfied, that land which remains is assigned to General Forest.

We understand that some of these preference rights are driven by law as in the case of Wilderness and Wild Rivers. We understand that some of these preference rights are driven by the need to meet Minimum Management Requirements (MMR"s) for other management areas. We also understand that the process permits the exercise of differing levels of preference under different alternatives. But the net result of the process is the same -- after the preference rights have been satisfied, the land remaining is assigned to General Forest.

It occurs to us that what is missing in this process is an MMR for timber production in order to put timber on an equal footing (Wilderness and Wild Rivers excepted) with other resource values. Taking this a step further, we recommend a MMR for timber production which specifies a ASQ equal to current production levels without the benefit of intensive management practices.

Land use planning is a matter of trade-off between competing resources. Land use planning requires a knowledgeable blending of uses. But it does appear that the land allocation process used in this planning effort treats timber as trading stock.

Suggested New Alternative

Since the Association is unable to endorse any of the alternatives presented in the DEIS, it is incumbent upon the Association to suggest a new alternative embodying the Association's objectives for management of the Siskiyou National Forest.

It is suggested that the Siskiyou National Forest design a new alternative which seeks to maximize the availability of selected suitable acreage for timber production while providing for allocation of acreage to the various management areas sufficient to meet minimum management requirements. As we understand the DEIS, all alternatives except "No Change" meet the MMR's. Thus there must be considerable flexability in acreage assignments to meet MMR's.

In designing the alternative, we suggest that acreages by management area approximate the following:

- For management Areas 1, 2, 3, 4, 5, 10 and 11 as per the Preferred Alternative
- For Management Areas 6,8, and 9 as per Alternative A
- For Management Area 7 as per Alternative C.
- For Management Areas 12 and 13 as per Alternative B

When the land allocation process has been completed in accordance with the alternative design described above, the following computations should be made:

1. ASQ and Long Term Sustained Yield (LTSY) calculated with benefit of intensive management practices, including fertilization.
2. ASQ and LTSY calculated without benefit of intensive management practices.
3. ASQ and LTSY calculated under a scenario which permits departure from nondeclining yield for the next 2-3 decades when federal timber supply takes on increased importance.
4. ASQ and LTSY calculated using the "minimum harvest size" concept adopted by the Bureau of Land Management in Oregon for use in timber management plans approved in the early 1930's.

We believe that an alternative such as this will go a long way towards maintaining the economic benefits from timber production while at the same time providing for the amenity values.

Summary

The Association of O & C Counties is unwilling to endorse the Preferred Alternative because of concerns relative to diminishing economic benefits.

The Association believes that the land allocation process is faulty and that the timber resource needs to be placed on an equal footing with other resources.

The Association has proposed a design for a new alternative which seeks to maximize the base acreage for intensive timber management purposes while still providing for minimum management requirements for other resources.

The Association requests your written response to our comments prior to proceeding with development of the Final Environmental Impact Statement.

Respectfully submitted,

Ray E. Doerner

Ray E. Doerner, Exec. Dir.

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COOS COUNTY COURTHOUSE
Coquille, Oregon 97423
Phone: (503) 396-3121
Ext. 224, 225

January 20, 1988

County of Coos

BOARD OF COMMISSIONERS

Doc Stevenson
Jack L. Beebe, Sr.
Gordon Ross

Ronald McCormick
Forest Supervisor
Siskiyou National Forest
200 N.E. Greenfield Road
P.O. Box 440
Grants Pass, OR 97526

Dear Mr. McCormick:

This is our preliminary response to the Proposed Land and Resource Management Plan of the Siskiyou National Forest contained in four bound volumes published in August 1987, some of which data has since been outdated by changes resulting from the major forest fires beginning on August 30, 1987, which burned over 110,000 acres, or some ten percent, of the entire Siskiyou National Forest.

The sharp and long lasting reduction in private industrial timber supply projected for Coos, Curry and Douglas Counties, beginning in 1990 and continuing for forty years to the year 2030 as indicated in preliminary information made available recently by the U.S. Forest Service Research Station, contradicts the proposed plan comments which do not indicate such a decline in private timber supply.

The major changes in the forest resulting from fire damage, and the omission of more current and correct data on the potential of private timber supply, coupled with the proposed plan's lack of recognition and discussion of the cumulative impact of upcoming changes in timber supply from other National Forests that directly affect the economy of Coos County, make impracticable a quality public input at this time.

The forest products industry is the mainstay of the economy of Coos County and the revenues from timber sales from the Siskiyou National Forest constitute a significant part of the county budget. These receipts also provide financial support for public schools in the county.

The timber supply from the Siskiyou National Forest provides a large number of jobs in logging and trucking in the county, and in manufacturing in the Bandon area. There are also substantial volumes of manufactured forest products from Siskiyou National Forest timber that originate outside Coos County and move through the regional port at Coos Bay.

The major regional port at Coos Bay and its economic impact on the region, and the State of Oregon's recent investment in this port, was not addressed in the Proposed Siskiyou National Forest Plan. More forest products move through the port at Coos Bay than through any other port in the world.

The Proposed Siskiyou National Forest Plan alternatives, including the preferred Alternative K plan, that would reduce timber supply and jobs in forest products manufacturing, transportation and port related jobs, runs counter to new Oregon law enacted by the Sixty-fourth Oregon Legislative Assembly in 1987 to improve the economy of the state, including its forest--based economy. House Bill 3011, relating to the "Oregon Comeback", is the Regional Economic Development Act that led to the establishment of the Oregon Economic Development Department Regional Strategy Program, and specifically to the Coos County Regional Strategy with substantial state and local emphasis on improvement of the port at Coos Bay to sustain and expand facilities for the export of forest products.

The 1987 Legislature provided further support of the regional port at Coos Bay by enacting Senate Bill 962, which elevated the International Port of Coos Bay to a semi-quasi state agency placing it somewhat on a governmental par with the State's Port of Portland.

The Proposed Siskiyou National Forest Plan also fails to properly reflect one of the most important issues in the plan, which is the volume and location of identifiable acreages of old-growth timber as it relates to timber sales in the future. The Siskiyou National Forest is basically an old-growth forest, with 8.6 billion board feet, or eighty-one percent of the standing timber in the forest being old-growth timber.

Instead of a reduction in the commercial forest land base and restriction in harvest of old-growth timber the Siskiyou National Forest should be accelerating the harvest of old-growth to make room for new-growth and to forestall any pressure on the harvest of immature trees now in re-growth on lands other than on National Forest lands to meet market demands for wood products.

An artificial shortage of timber supply caused by unsubstantiated reductions in National Forest annual sales quantities combined with a harvesting of re-growth from other forest lands, will contribute to a major recession in the forest based economy in the Southwestern Oregon counties of Coos, Curry and Douglas, in the long term, and in losses of financial support of local government and public schools of major proportion.

The shrinkage of the forest land base, annual sales quantity and jobs that would result from the Siskiyou National Forest's proposed Alternative K management plan at a time when the forest products industry and its facilities, compels Coos County to oppose the preferred Alternative K management plan and all alternatives that reduce the forest land base, annual sales quantity and employment. Our opposition is also based, in part, on the fact that the maximum potential of the timber producing lands in the Siskiyou National Forest not legally withdrawn from timber production are not being managed as

intensively as they should be, and as a consequence do not provide the maximum harvest potential of these lands.

Our opposition is further based on the fact that the major forest fires in 1987, substantially changed the commercial timber supply and other resources and that such changed conditions were not considered or addressed in formulating the plans now before us for comment.

Contrary to the reductions in the proposed Siskiyou National Forest Plan we feel that the Forest Service should outline a major departure timber cut policy from its present even-flow policy of annual timber supply (without it exceeding the long-term sustained yield capacity of a forest) to increase the annual sales quantity to the maximum harvest potential and in an environmentally sound manner to assist in alleviating the impending short fall of private industrial timber supply and its impact on employment, the economy and support of public schools.

Enclosed is a copy of a December report on the "The Impact of Forest Resources on the Economy of Coos and Curry Counties, Oregon" for the South Coast Business Employment Corp., Coos Bay, Oregon, which was instigated by us and can be used as a reference in connection with our comments at this time.

Sincerely,

COOS COUNTY BOARD OF COMMISSIONERS

Chairman

Commissioner

Commissioner

00005



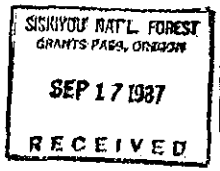
COOS COUNTY COURTHOUSE
Coquille, Oregon 97423
Phone: (503) 396-3121
Ext. 224, 225

County of Coos

BOARD OF COMMISSIONERS

Doc Stevenson
Jack L. Beebe, Sr.
Gordon Ross

September 15, 1987



Forest Supervisor
Siskiyou National Forest
200 NE Greenfield Rd.
P.O. Box 440
Grants Pass, OR 97526

Dear Gentlemen:

The Board of Commissioners of Coos County wishes to express our thanks for the fine presentation and explanation of the Proposed Land and Resource Management Plan of the Siskiyou National Forest.

We are pleased to offer the following comments on the Proposed Land and Resource Management Plan:

On page IV-1 and 2 you state your goals. Goal #1 states that you will maintain a healthy Forest ecosystem, and help to supply local, Regional and National social and economic needs. In looking at the charts on pages III-2 through III-12, it appears that over 48% of the Siskiyou National Forest has been taken out of timber production and used for some type of preservation. Approximately 13,691 acres of this is what is termed as custodial (roadless). This area seems to be the bone of contention. Its inclusion into preservation instead of production has caused the allowable cut to be reduced in the preferred alternative. When nearly one-half of the forest is already taken out of production for nearly every reason imaginable, it seems unreasonable to include the Custodial area also.

Goal #2 states you will provide a sustained yield of resource outputs that will promote the stability of local communities and provide for Regional and National needs. You have fallen short of this goal already with the withdrawals made in the past for such things as Wilderness areas, Supplemental Resource, Designated Wildlife, Riparian, etc. To include the Custodial area also would be a greater deviation from the goals. You would no longer have a balance in your management process, adding insult to injury so to speak.

Goal #3 states that you will maintain a healthy, diversified, visually pleasing forest. This cannot be done in Roadless areas because of the lack of ability to reduce fire hazards, fight fires and to control soil erosion, diseases, and infestation problems. It does not take an expert to know that diseased, infested, or charred forests are not visually pleasing. The result of the last few weeks should be proof enough of that. Besides, the birds, bugs,

Forest Supervisor
September 10, 1987
Page Two

animals nor humans will get any use out of what was lost in the recent fire. Had it been harvested and resceded, there would not have been as much fuel for the fire and you could have gotten in to fight the fires much easier. Knowing this, it is hard to understand why you would want to jeopardize even more of our timber base in this way.

In Goal #6 you talk of maintaining viable populations of native species. This could be at the expense of humanity - an expense we cannot afford. That in itself raises questions about your priorities. To then make the statement - "and desirable introduced species" is going way too far. It is bad enough to sacrifice for these species already here. You have no right to ask us to import more to sacrifice for.

Nearly 80% of your goals are geared to preservation, some repetitive, and many in direct opposition to timber production. You need to reevaluate your priorities, as it appears you are beginning to place the human species below the animals and birds and plants.

We urge you not to further unbalance the process by adding more Roadless areas.

Because of the things we have pointed out to you, plus many not mentioned, we would urge you to adopt alternative D and reject alternative K.

We thank you for the opportunity to comment and hope our comments are considered.

Very truly yours,

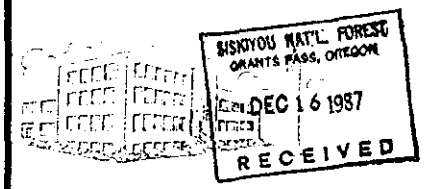
BOARD OF COMMISSIONERS

Chairman

Commissioner

Commissioner

00963



County of Coos

Planning Department
Courthouse Annex
Coquille, Oregon 97423
Ph. 396-3121, ext. 210
Bill Grile, AICP
Planning Director

December 14, 1987

U. S. Forest Service
Siskiyou National Forest
P. O. Box 440
Grants Pass, Oregon 97526

RE: SISKIYOU NATIONAL FOREST PLAN

Gentlemen:

Coos County has historically supported a balanced approach to managing our National Forests. These forests provide jobs, recreational opportunities and scenic amenities for all people. In addition, proper forest management is a key component to insuring community stability. This is especially true for the timber dependent communities of Southern Oregon.

The Southern Oregon Resources Alliance recently offered a series of recommendations regarding the Siskiyou National Forest Plan. Specifically, the organization recommends a continuation of current road building activities, continued multiple use management that promotes both jobs and recreation and the immediate completion of fire salvage studies and rehabilitation of recently fire-damaged areas. In addition, the organization recommends that no plan be adopted until all questions and concerns are addressed.

We support this reasonable and pragmatic approach to a complex problem, and urge the Siskiyou National Forest to adopt the recommendations as the basis for future forest planning.

Traditionally, the National Forests have supported a multiple use approach to forest management thereby benefiting everyone. The Resource Alliance proposal maintains this tradition.

More detailed comments from the Coos County Board of Commissioners will follow.

Sincerely,

COOS COUNTY PLANNING DEPARTMENT

Bill Grile

Bill Grile, Planning Director
BG/WJW/lg
cc: Coos County Board of Commissioners
File

07035

CURRY COUNTY OREGON BOARD OF COMMISSIONERS

Thomas M. McKenzie Rocky McVay T.V. Skinner



BOX 746 GOLD BEACH, OREGON 97444 (503) 247-7011

January 22, 1988

Ronald McCormick
Forest Supervisor
Siskiyou National Forest
200 N.E. Greenfield Road
P.O. Box 440
Grants Pass, OR 97526

Dear Mr. McCormick:

This is our preliminary response to the proposed land and resource management plan of the Siskiyou National Forest contained in four bound volumes published in August 1987.

The data in the proposed plan are outdated on timber supply from the Siskiyou National Forest and on the projections on the availability of private industrial timber supply in Southwestern Oregon, including Curry, Josephine, Coos and Douglas Counties.

The changes in timber supply from the national forest resulting from the major forest fires beginning on August 30, 1987, after the plan was published, and which burned over 110,000 acres, or some ten percent of the forest, are not addressed in the plan.

The potential of private industrial timber supply is overstated in the plan according to the preliminary results of the U.S. Forest Service Pacific Northwest Research Station data made public in October 1987, which indicates a severe and long-lasting drop in private industrial timber supply beginning in 1990 and continuing for forty years to the year 2030.

Another, and most important subject not adequately discussed in the proposed plan, is the impact and need of the receipts from timber sales from the Siskiyou National Forest to county government, and the eight public school districts in Curry County.

The eight public school districts in Curry County have been the principal recipients of the share of timber sale receipts from the Siskiyou National Forest over the past three year period.

The total receipts from timber sales from the Siskiyou National Forest are divided 75 percent to the federal treasury and 25 percent for county roads and public schools. The 25 percent for roads and schools is divided 75 percent for roads and 25 percent for schools. During the most recent three years the average of the 25 percent share of national forest timber receipts for county roads has been $2,224,397, of which $1,766,986, or 79%, has been turned over for the support of public schools. This is in addition to the percentage of the national forest timber receipts directly mandated for public school support.

Examples of the importance of national forest timber receipts for the support of public schools is reflected in the operating budget of two school districts in Curry County. During the past three years, an average of 18.2 percent of the operating budget of the Brookings School District (District 17-C), with a pupil population of 1453 and 74 faculty members, was from national forest timber sale receipts. During the same period, 10.4 percent of the operating budget of the Agness School District (District 4), with a school population of nine and one faculty member, was from national forest timber sale receipts.

The closure of one school in Curry County and eleven elections at which voters opposed increased property tax levies, and a failure to pass a new tax base in two elections, during the past three year period make timber sale receipts from national forest lands more important than ever.

Fifty-five percent of the acreage of the Siskiyou National Forest is located in Curry County, and three major forest products manufacturing plants, two of which are located in Brookings and one in Gold Beach are, for all practical purposes, almost totally dependent on timber supply from the Siskiyou National Forest. These three mills provide most of the manufacturing jobs in the county, and their property taxes, and those of their employees and others from which materials and services are obtained, including retail establishments, constitute a substantial portion of the property tax base which support the public schools in the county.

The lack of current and correct data in the proposed plan before us for comment, coupled with the proposed plan's lack of recognition and discussion of the cumulative impact of upcoming changes in timber supply from other national forests in Oregon and Northern California that effect the economy of Curry County, make impracticable a quality public input at this time.

The proposed Siskiyou National Forest plan alternatives, including the preferred Alternative K management plan that would reduce the commercial timberlands base, reduce the annual sales quantity by ten percent, and cause a direct loss of over two hundred jobs, would unquestionably undermine support of public

schools and cause a negative impact on the economy and stability of all communities in the county.

The Proposed Siskiyou National Forest Plan also fails to properly reflect one of the most important issues in the plan, which is the volume and location of identifiable acreages of old-growth timber as it relates to timber sales in the future. The Siskiyou National Forest is basically an old-growth forest, with 8.6 billion board feet, or eighty-one percent of the standing timber in the general forest being old-growth timber.

Instead of a reduction in the commercial forest land base and restriction in harvest of old-growth timber the Siskiyou National Forest should be accelerating the harvest of old-growth to make room for new-growth and to forestall any pressure on the harvest of immature trees now in re-growth on lands other than on national forest lands to meet market demands for wood products.

An artificial shortage of timber supply caused by unsubstantiated reductions in national forest annual sales quantities will contribute to a major recession in the forest based economy in the Southwestern Oregon counties of Curry, Josephine, Coos and Douglas, in the long term, and in losses of financial support of local government and public schools of major proportion.

The shrinkage of the forest land base, annual sales quantity and jobs that would result from the Siskiyou National Forest's proposed Alternative K management plan at a time when state and local governments are moving to sustain and improve the forest products industry and its facilities, compels Curry County to oppose the preferred Alternative K management plan and all other alternatives in the proposed plan that reduce the forest land base, annual sales quantity and employment.

Our opposition is also based, in part, on the fact that the maximum potential of the timber producing lands in the Siskiyou National Forest not legally withdrawn from timber production are not being managed as intensively as they should be, and as a consequence do not provide the maximum harvest potential of these lands.

Our opposition is further based on the fact that the major fires in 1987, substantially changed the commercial timber supply and other resources and that such changed conditions were not considered or addressed in formulating the plans now before us for comment.

Contrary to the reductions in the proposed Siskiyou National Forest Plan we feel that the Forest Service should outline a major departure timber cut policy from its present even-flow policy of annual timber supply (without it exceeding

the long-term sustained yield capacity of a forest) to increase the annual sales quantity to the maximum harvest potential and in an environmentally sound manner to assist in alleviating the impending short fall of private industrial timber supply and its impact on employment, community stability and support of public schools.

Enclosed is a copy of a December 1987 report on the "The Impact of Forest Resources on the Economy of Coos and Curry Counties, Oregon" for the South Coast Business Employment Corp., Coos Bay, Oregon, which was instigated by us and can be used as a reference in connection with our comments at this time.

Sincerely,

CURRY COUNTY BOARD OF COMMISSIONERS

T. V. Skinner, Chairman

Thomas M. McKenzie, Commissioner

Rocky McVay, Commissioner

U7034

JOINT RESOLUTION

BY THE BOARDS OF COMMISSIONERS OF

CURRY, JOSEPHINE, COOS AND DOUGLAS COUNTIES, OREGON

IN THE MATTER OF CURRY, JOSEPHINE, COOS AND DOUGLAS COUNTIES, OREGON, OPPOSING THE SISKIYOU NATIONAL FOREST PROPOSED PREFERRED ALTERNATIVE K PLAN FOR MANAGEMENT OF THE NATIONAL FOREST FOR THE NEXT TEN TO FIFTEEN-YEAR PERIOD.

RESOLUTION

WHEREAS, the Siskiyou National Forest is located in Curry, Josephine and Coos Counties, Oregon, and the annual timber supply from this national forest supports jobs in the forest products and related industries in Curry, Josephine, Coos and Douglas Counties and provides substantial revenues to counties and public schools from the receipts of timber sales in Curry, Josephine, and Coos Counties, and

WHEREAS, the current Timber Management Plan of the Siskiyou National Forest is effective until September 30, 1988, and

WHEREAS, the Siskiyou National Forest has expended more than two million dollars over the past eight years in developing a new forest management plan which includes thirteen alternative plans for management of the forest for the next ten to fifteen-year period, and

WHEREAS, the Siskiyou National Forest proposed preferred alternative management plan designated as Alternative K would reduce the commercial forest land base; reduce the annual sales quantity of timber; reduce employment in the wood products and related industries and cause a substantial detrimental effect on community stability and a profound impact on the financing of county government and public schools in Curry, Josephine and, Coos Counties.

LET IT THEREFORE BE RESOLVED, THE BOARD OF COMMISSIONERS OF CURRY, JOSEPHINE, COOS AND DOUGLAS COUNTIES, oppose the Siskiyou National Forest proposed preferred Alternative K management plan and support a forest management plan that will maximize multiple use and intensive forest management to provide a level of timber harvest from the Siskiyou National Forest that will sustain and

SISKIYOU NATIONAL FOREST RECEIPTS, ROAD AND SCHOOLS

YEAR	ROAD 75%	(25% OF GROSS) SCHOOL 25%	TO SCHOOLS FROM ROAD 25%	TOTAL TO SCHOOLS
1977-1978	2,584,084.76	863,361.59	992,046.00	1,855,408.00
1978-1979	3,469,600.00	1,163,200.00	787,829.00	1,951,029.00
1979-1980	4,708,939.18	1,569,646.39	1,721,967.31	3,286,058.95
1980-1981	2,895,383.34	965,127.78	2,539,033.00	3,498,423.79
1981-1982	2,284,318.74	761,439.58	1,750,000.00	2,509,967.90
1982-1983	757,088.57	252,362.86	600,000.00	846,836.56
1983-1984	1,279,795.03	462,598.35	0	413,717.77
1984-1985	1,537,345.23	512,448.41	376,700.00	881,407.98
1985-1986	2,510,921.50	836,973.83	394,670.00	1,219,263.94
1986-1987	2,624,924.41	874,974.81	2,516,700.00	3,200,284.96
1987-1988	2,467,240.07	822,413.35	527,918.00	1,452,610.70

enhance community stability and stabilize revenues from these federal lands for financing county government and services and public schools in Curry, Josephine and Coos Counties.

ADOPTED BY THE BOARDS OF COMMISSIONERS OF CURRY, JOSEPHINE, COOS AND DOUGLAS COUNTIES, OREGON THIS 22nd DAY OF JANUARY, 1988.

BOARD OF COMMISSIONERS
CURRY COUNTY

Chairman

Commissioner

Commissioner

BOARD OF COMMISSIONERS
JOSEPHINE COUNTY
Josephine County Resolution No. 88-8

Chairman

Commissioner

Commissioner

BOARD OF COMMISSIONERS
COOS COUNTY

Chairman

Commissioner

Commissioner

BOARD OF COMMISSIONERS
DOUGLAS COUNTY

Chairman

Commissioner

Commissioner

PAGE 2 - JOINT RESOLUTION OF CURRY, JOSEPHINE, COOS AND DOUGLAS COUNTIES, OREGON

JOSEPHINE COUNTY OREGON

07553

)474-5221



COURTHOUSE GRANTS PASS, OREGON 97526

Board of Commissioners
WILLIAM F. FORD
HAROLD L. HAUGEN
BRUCE M. McGREGOR
James H. Boldt, Legal Counsel

January 25, 1988

Ron McCormick
Siskiyou National Forest
200 NE Greenfield Road
Grants Pass, Oregon 97526

Dear Ron:

Re: Response to the Proposed Land and Resource Management Plan for the Siskiyou National Forest

This letter will constitute the official response of Josephine County to the draft Ten-Year Management Plan for Siskiyou National Forest.

The management of the national forests is of major concern to the citizens of Josephine County as well as the various taxing distticts and governing bodies within the County. We would like to express our appreciation to the staff resources that have made time available to the County in helping us understand the contents of the proposed Plan and the impact of the resultant Land and Management Resource Plan on the local communities. It would be a difficult, if not an impossible task to review and provide meaningful comment without the involvement of those who were instrumental in the preparation of the proposal.

OVERVIEW:

The paramount concern of the community and this Board is the volume of timber that would be available for processing as a result of the land allocations and the management techniques utilized on the forest. After reviewing the inventories, allocations and allocation criteria, we feel that the amount of fiber available is higher than identified in the Preferred Alternative. Understanding the range of resources that must be managed, we believe that the MMR's can be met, unique interest and botanical sites protected, while maintaining the Annual Sale Quantity at or above the existing levels.

As reflected in your Goals 2, 3 and 4 we fully support the concept of consistency and the resultant community stability. For local businessmen to feel comfortable in investing meaningful capital in primary, secondary and tertiary wood processing facilities, they need reasonable assurance that the raw materials will be available to justify this expenditure. Understanding the increasing demands upon the Siskiyou National Forest by a range of interests locally and nationally, we would hope and expect that each one of these pressures would be held up against your proposed Goals in the Standards and Guidelines. Additionally, the revenue from the responsible management of the forest is of major importance to the local schools and transportation systems. This fact must be one of the major considerations in the determination of a response to these pressures.

Your Goal 2, to "provide a sustained yield of resource outputs at a level that will promote the stability of local communities and provide for regional and national needs..." is the key statement in the document. It is our expectation that once a ten-year management plan is adopted the volume of raw materials produced from the forest would be held at that committed level. Should additional demands be placed upon meeting other newly identified needs or issues, be it new allocations, adjusted inventories, or changes in management techniques, it is our feeling that those needs should be met in a fashion that would allow for the continuance of the committed level as determined in meeting Goal #2. In 1985 our mills were producing 1,419,600 board feet of timber each day. Understanding that economics and the market will affect this operating level, our workers and mill operators need assurance that an adequate volume of logs will be available on a sustained basis to maintain this operating level. As the Plan notes, this is absolutely necessary for community stability and to serve as a basis for future plans.

Noting your proposed Goal 3: "to maintain a healthy diversified and visually pleasing forest setting that enhances local tourism, provides an attractive visual backdrop to surrounding communities." Again we support the this proposed Goal. As you are aware, the Governor of the State of Oregon has instituted a program that encourages counties to work as a region in economic development and the implementation of a strategy that would serve as a basis for future plans and growth. Josephine County, as one of these jurisdictions, has determined that tourism will be our primary focus to augment lumber manufac[illegible]ng. Thus, we support the proposed capital expenditures, the land allocations and the other components of your plan that recognizes the importance of tourism and the role that the forest will serve in that effort.

Departures

For three of the alternatives offered in the Plan, departure timber harvests have been proposed. Although we have grave concerns about the availability of timber in the second and third decades, it is our view that maintaining a consistent harvest, especially during the next twenty year period, is the more desirable approach. Economic factors are impacting the private sector at this point in time and higher than normal cuts are occurring on private lands. The percentages of privately owned timber currently being processed in Josephine County is less than 6% of the logs consumed by local mills while the timber supply provided by the Siskiyou is roughly 30%. Therefore the consistency of your production is of paramount importance.

Monitoring

Because of the high percentage of timber from the Siskiyou that is processed in the County and the dependency we have on that supply, we fully support the proposals to establish a range of monitoring devices to insure that the Allowable Sale Quantity is maintained. Understanding the importance of the other resources managed by Siskiyou and the role of those resources on the various sectors and the forest itself, we would encourage that special consideration be given to the monitoring program to insure that, on a yearly basis, the volume of timber being provided to the community is such that the ability for timber to justify for capital investments is recognized and supported. From that perspective we encourage that a further refinement of the proposed monitoring methodologies and the resultant course correction activities be spelled out in the Standards and Guidelines. We also feel that methodologies need to be implemented to allow for adjustments in cuts to offset the effects of appeals and held up timber sales.

Rotation Periods:

Reviewing the proposal that has been made regarding the utilization of a shorter rotation period as a management technique on appropriate lands, we find no problem with this concept. Recognizing the need for the use of sound timber management activities that would result in a sustained yield, we would encourage the use of all tools and techniques available for competent silvicultural management. From this perspective we would encourage a review of the administrative determination to not harvest before 95% of the culmination of the mean annual increment. Upon

reviewing management techniques used by both private and other public sectors, it would appear that adhering to the 95% rule is an unnecessary administrative constraint when applied to the entire forest, especially on a one time basis. We would support a review, and change, of this policy at whatever levels would be appropriate, and for a shorter rotation to be used on existing plantations.

Basin Harvest Constraints:

As we understand it, the current management for the forest has a 20% limitation on timber removal per any basin for the planning period. The preferred alternative reduces this percentage downward to a range of 9 to 12 percent. Upon review of the Plan, we are finding inadequate justification for this proposal and would encourage that the harvest constraint for the basins be increased back up to 14 to 16 percent. We feel that the impact on the other resources identified in the Plan would be minimal and as a management technique this would be an appropriate level of harvest on a forest wide basis. We do recognize the sensitivity of specific areas and/or the political realities of those areas interfaced with various levels of private ownerships, but these issues can be dealt with through the allocation and/or other components of the Standards and Guidelines and should not be adopted as an artificial constraint in timber management on a forest wide basis.

Old Growth:

In 1985 old growth (as defined as timber that is 100 years and older by Howard) constituted approximately 3/4 of the logs consumed by sawmills in Josephine County. Because of the wide range of definitions that are being utilized for "old growth", we would encourage that a clear articulation of the role that old growth timber plays in a healthy forest be provided in general, and the Siskiyou National Forest specifically. Beyond the wilderness what percentage of the forest should be managed for old growth? Understanding that there is a considerable amount "old growth" timber in existence in the Kalmiopsis Wilderness area we would request that further determination be made as to the necessary amount and resultant location of "old growth" provided in other parts of the forest be identified in the final plan. We disagree with the concept of custodial as a land allocation and will make further comment of this in our critique. We feel that if it is responsible to be growing "old growth" it's location can and should identified. Because of the emotive nature of this resource any determinations as to the

role of old growth timber must be clearly articulated in the final product and propose the possibility that it be identified as a specific allocation, or at least a clear component of the land allocations, and a precise policy made as to how much, where, and at what point, are lands going to be managed as "old growth".

Inventory:

The Allowable Sale Quantity will depend upon the land allocations within the various management areas based upon the assumptions that:

A. Inventories are correct,

B. Full funding will be available, and

C. The full range of management tools will be available and utilized in the development and care of the forest.

In general we feel that all three of the assumptions are questionable and specifically we have grave concerns as to the completeness and accuracy of the inventories. We would request that sufficient resources be allocated to acquire the necessary inventories which can be used as a basis for Plan updates.

In the context of silvicultural techniques, we continue to support aggressive, effective reforestation that ensures that future generations of Oregonians will enjoy those resources that we do today. We fully expect this reforesting effort to incorporate good management support techniques such as:

A. Effective and economical vegetative management of plantations,

B. Use of genetically improved planting stock,

C. Pre-commercial and commercial thinnings,

D. Forest fertilization, and

E. protection from fire and other destructive forest pests.

In October 1978, the FIR Program (Forestry Intensified Research) was established with its base for operations being located in Medford, Oregon. FIR's primary purpose was to solve regeneration problems associated with harsh sites in Southwest Oregon. To this end, a tremendous amount of technical information has been

developed that suggests regeneration is possible on these sites within 5 years. We feel that with this information, the Forest Service should be re-examining those areas identified as having potential regeneration problems, and were subsequently withdrawn from the timber base. Any appropriate areas in which the research would provide for successful reforesting should be put back into the base and be included for calculating Allowable Sale Quantity.

Additionally, we would request that any decrease in timber output that results from adjustments of inventory, yield tables, or shortfalls in funding be made up by adjustments in management policies and or land allocations so that timber volumes available to the community are not revised downward. As per the proposed Goal 2 this consistency is of paramount importance to the citizens of Josephine County. Also, we would request that modeling be conducted in which:

A. A less optimistic view of inventories is taken;

B. A reduction in funding is anticipated; and

C. The assumption that a prohibition on the use of herbicides is made.

The resultant allowable cut and impact on the community should be the basis for the analysis.

Special Needs:

As we noted earlier, tourism, as well as the use of the forest by the local community members, is an important aspect of the forest. Because of this view we are fully supportive and encourage even greater efforts towards the identification and resultant development of recreational sites. We feel that the proposal for trail and recreational site development, as well as visitor centers would greatly benefit the forest, all those who use it, we would also request serious consideration be given the Rogue-Illinois Scenic River Special Initiative funding proposal. We think that this Special Initiative should be incorporated directly into the plan proposal and the necessary budget requests be made for allocations to implement this proposal.

Siskiyou National Park Proposal:

We are exceedingly concerned regarding the possibility that the Park Proposal should be considered as part of the development of the Land and Resource Management Plan. It is our strong view that any discussions,

should they occur, are extraordinary and are totally outside the purview of this planning effort. The procedural steps for analyzing and considering merits and impacts of the formation of a Park are completely separate and distinct from the activity that you are currently engaged in and any effort to integrate the two would be completely inappropriate if not illegal.

OVERLAY:

Ater reviewing the proposed Management Areas we have come to the conclusion that a more exact land use tool needs to be utilized. This view is based on the exceedingly diverse geologic formations and resultant ecosystems, the limitation of a comprehensive site specific inventories, and the topographic and climatic extremes that exist on this forest.

There is a concept in land use planning that is termed an "overlay". An overlay is an area within a land or management allocation in which the resultant standards or activities may be greater or less than is prescribed for that particular allocation. This deviation from the prescription may occur when:

A. Specific types of physical characteristics are pre-identified, e.g. rock outcroppings, bodies of water, etc.;

B. specific criteria are met, e.g. nesting areas, marshes, unstable soils, etc. are identified in the field;

C. Time certain, e.g. at the time of the ten-year plan review;

D. Activity certain occurs e.g. a final EIS or spotted owl is adopted.

The primary benefit of this tool is that it:

A. Insures that specific attributes will be protected even before being physically located on the ground.

B. That the exact physical area meeting the overlay criteria can be identified thus eliminating the inclusion of lands that do not contain the attributes desired.

In our judgment, those areas included in an overlay should not be calculated in the Allowable Cut Determination.

REVIEW OF MANAGEMENT AREAS:

General Forest:

The General Forest is the essence of what the Siskiyou National Forest is about. It is this Management Area that provides the meaning and substance to the full range of forest uses for the local communities and citizens who enjoy the forest. It is our position that the full range of management techniques and resultant benefits be utilized on as large an area as possible. It is our proposal that when insufficient inventories exist, lands be placed in this allocation but the overlay concept be utilized to protect valuable resources. Thus, the allocation is made but site specific delineation and resultant management techniques can wait until on-the-ground surveys can be accomplished. When an area is surveyed for a harvest the criteria will be reviewed to insure protection of resources and appropriate actions can be taken.

Custodial:

As a result of the efforts of the Rare I and Rare II analysis, Congress, in 1984, determined that those areas outside of the Wilderness in the Siskiyou National Forest need to be managed for multiple use. Understanding the definition of resources offered in the Plan, it is our sincere belief that consideration needs to be made on the entire forest for some form of balanced, active management of the timber resource as well as all other identified resources. It is from this perspective that we object to the use of the Custodial (Roadless) Management Area as a land use allocation. Upon reviewing the stated goals for the proposed Custodial Management Area, we believe that the stated objectives of providing an area in a natural state has already been met by the Wilderness and the Wild Rivers Management Areas. Additionally we believe that the stated need to protect and preserve riparian environments has already been met by the Riparian Allocation as well as the Supplement Resource as identified in its stated purpose. We understand the dynamics that have led to this allocation but we feel, considering the history of the review that went into the Planning effort regarding the multiple use concept and the possible designation of additional wilderness area, that this is not an appropriate allocation. As an alternative to this allocation we would recommend the use of the overlay concept.

We would recommend that those lands placed in the Custodial allocation in the preferred alternative be reviewed and, in general, be placed in the General

Forest allocation with certain sub-areas being placed in an overlay zone as appropriate for the resources needing protection.

Some specific recommendations for re-allocation of those lands in Proposed Alternative K Custodial would be the following:

1. Identification of those areas being studied for spotted owl as an indicator species and place an overlay on those study areas. This would serve as a reserve until the issue is resolved through appropriate channels. Once a final determination is made then change the overlay to the designation that would allow whatever level of resource management came out of the final decision.

2. For the North Kalmiopsis area, identify those areas of the Lower Illinois River that are either in the viewscape or are of such questionable quality from a timber management point of view as to raise concerns as to them being managed at any level and place a overlay on those that would preclude the harvest techniques allowed in the General Forest.

3. For those areas proposed for Custodial east of the Kalmiopsis Wilderness review to determine if some form of overlay, above and beyond what is identified under the General Forest management area, is necessary.

Should additional concerns regarding Custodial areas of the North Kalmiopsis become a paramount factor in the final adoption, the overlay concept can be utilized to place a temporary site specific management region on whatever resource is an issue in these areas, but then identify a time or action specific when that overlay will be removed. This time can be at the termination of this planning period or until whatever additional study is determined necessary is completed.

Supplemental Resource:

Upon reviewing the description and management goals of the supplemental resource allocation, we find that there are some lands that have been placed in this designation that do not appear to meet the management goals of the enhancing key fish and wildlife habitats. We request a review of the allocations in relation to the criteria for Management Area 7 and suggest that some of the areas may be better designated utilizing the overlay concept proposed under General Forest. An example of some areas for reconsideration are:

1. Lower Rogue. This area could be placed in the General Forest but have an overlay on those lands in which the criteria would preclude any clear cutting of lands visible from the river or access roads.

2. Other areas are Mislatnah and possibly Emily Creek.

Visuals (Retention and Partial Retention:

Retention:

Generally we agree with the concern with the maintenance of some visual quality on the more highly used roads within the forest. We agree with the concern around the Bear Camp Road and the other proposed use of this allocation throughout the forest. We feel that the proposed timber management as well as management for other resources reflected in the Standards and Guidelines for this allocation is appropriate.

Partial:

After closely reviewing this management area it is our recommendation that it be completely deleted. Those lands under this allocation that are unsuitable for the production of timber management could and should be placed in the full retention status. For those lands that have timber value, it is our recommendation that they be placed into the General Forest Management Area and resultant land allocations and utilizing an overlay for protection of the visual values on a site specific basis. This will be determined on the ground at the time that lands are reviewed for proposed management programs.

Although the Board is aware of the need for some level of visual buffering for major travel routes, rivers and high public recreational use areas we are not in agreement that they need to be protected to the extent that the timber management is completely subordinate to the character of the landscape, thus limiting the timber production potential. Rather, those acres allocated within these partial retention visual management areas should be managed more intensively for the production of timber. Concern over forest openings created by management activities should be de-emphasized in the adopted alternative. In this light, we would encourage the use of

vegetative buffers to help screen management areas and incorporate "feather-edging" where appropriate. Partial cutting should be increased along with the use of clear cuts. Rotation ages over culmination, as general rule, should not be encouraged. Final harvest decisions should be governed by sound timber management principles that emphasize growth, and not to provide for near natural conditions. It is our belief and position that timber management does not necessarily disrupt the attractiveness of the scenery nor spoil the visitors visit. Young, healthy stands of regenerated conifers have a singular beauty of their own and provide for esthetically pleasing contrasts to larger stands of conifers and natural openings. Should the causal forest user desire a more natural encounter, then certainly that need has been provided for in other management areas of the forest.

Riparian Habitat:

We feel that the fisheries are an important resource to all levels of interest. On reviewing the allocations and the proposed management of these areas, we believe that a very responsible effort has been made and the results of this effort would be beneficial to all concerned. Because of this importance we would fully support the capital expenditures proposed for the improvement of this resource. Again, though, we would ask that only those areas that meet the allocation criteria be placed in this designation.

Botanical:

We understand and fully support the need and the importance of the protection of those unique botanical areas on the Siskiyou National Forest. We do have a concern about the fact that a lot of the botanical species also has a symbiontic relationship with valuable mineral deposits. We believe that, depending on the politics of the world market, there may be increased demands placed on the minerals in the forest in years to come. Because of this concern we would encourage additional consideration be given as to the method and resultant administrative process utilized on gaining access to the mineral resources, the protective limitation measures to be utilized, and the standards that will employed to ensure resource protections.

MINERALS ASSESSMENT

The Board views the proposed Forest Service direction concerning mineral exploration and development as one in

which minerals are being relegated to a subordinate importance to all other resources and concerns. As you are aware, the Siskiyou Forest contains some of the most unique concentrations of mineral deposits in Oregon. These deposits are, as noted in the DEIS, very important nationally as many are classified a having strategic value.

In reviewing the information provided in the DEIS, it appeared that the preferred direction adopts an all inclusive approach in the allocation of lands for sensitive, rare plant species protection, maintenance, and enhancement over that of potential mineral resource. In depth, detailed documentation and discussion is encountered in the DEIS and related documents concerning sensitive plants, where as that portion devoted to minerals is cursory in content and always considered subordinate in value.

We are considerably distressed to note that the level of mineral exploration and development restrictions, by management area, has increased by a significant percentage over what the current direction is - as modified by minimum management requirements. Total acres in "low restrictions" are decreasing from 608,168 to 451,440. This represents 156,728 acres that are being assigned to a higher level of restrictions. The high restriction category is changing from 20,256 acres to 15,259, or a 4,997 acre decrease, but the withdrawn category is increasing from 267,692 to 272,751 acres.

These changes are going to effectively restrict mining activities and in our view does not appear to facilitate mineral exploration and development. Much of the mineralized land, of which a large proportion has a moderate to high mineral potential, has been allocated into management areas that require the Forest Service to administratively review impacts on plants and other resources. This increases the uncertainty of investments rather than facilitating exploration.

The decision to further restrict the Siskiyou Forest exploration and mineral development is not in the best interest of our local mining interests and those at a national level. It is our request that the Forest Service reconsider the whole issue surrounding minerals, and develop a policy that is equitable to all resources. Within the scope of this reassessment of the problem, we encourage the Forest Service to:

A. generate an economic analysis of the mineral importance in our region,

B. devote new effort to further exploration, inventorying and mapping of the forests mineral resources,

C. develop a transpiring mineral events monitoring program that provides a written record of all mineral events, but one that would also aid in determining any changes needed to meet proposed standards and guidelines, and

D. utilize registered mining professionals to conduct the inventories and participate in the assessments that determine balanced resource management.

Unique Interest:

We believe the Siskiyou National Forest is an important resource to the community, State and the nation. Since there are so many unique features, this allocation is appropriate and we would fully encourage that appropriate management techniques and preservation of the sites be aggressively followed. We would anticipate that information packets be developed to let the community and its visitors know the special attributes of the forest. For both the research natural areas and the botanical areas, informational access needs to be provided so that all can benefit from these special areas.

In summary, we would like to express our appreciation for the thorough and sensitive job that you and your staff has done on the development of a Plan and the Preferred Alternative. We think the direction/intent shows an awareness and concern of the management of the forest and the role of that the forest plays in the communities surrounding it. We hope that our comments will prove beneficial and would like to offer any assistance that may be necessary in gaining the adoption of a final plan in as expeditious manner as possible so that we can get on with the business of managing our forest lands.

JOSEPHINE COUNTY
BOARD OF COUNTY COMMISSIONERS

William F. Ford, Chairman

Harold L. Haugen, Vice Chairman

Bruce H. McGregor, Commissioner

WBB/VH/vb

LINN COUNTY BOARD OF COMMISSIONERS

VERNON SCHROCK, Commissioner
RICHARD STACH, Commissioner
LARRY J. JOHNSON, Commissioner

Linn County Courthouse
P.O. Box 100, Albany, Oregon 97321
(503) 967-3825

WILLIAM I [illegible]
Administrative Officer

03467

December 21, 1987

Ron McCormick, Supervisor
Siskiyou National Forest
P. O. Box 440
Grants Pass, OR 97526

Dear Supervisor McCormick:

It becomes increasingly evident, after reviewing the Proposed Siskiyou National Forest Plan, that there appears to be a definite and direct battle being waged between groups and people of two different views.

The next question would be, "Should or will there be a middle ground or a compromise reached that would be reasonable to both sides of the issue?" Following this and one step further, "Should there be a middle ground or compromise?"

There are never any easy answers to hard questions but there are always ways and means to successfully resolve problems. One successful way is to lay the pros and cons of a particular argument out and weigh each one on its own merit. Another method is through public input into a specific issue. Whatever method is used, the process will require a group of selected officials to sit down to determine what course of action to take.

As with any decision-making process, there is an easy way and a hard way. One way that will "ruffle the least feathers" and one that will subject you to tremendous heat from groups and individuals of both persuasion. Somewhere into this process you must interject just plain old common sense and maintain the ability to make a conclusion based just on facts, cutting out all the hoopla, threats and rhetoric.

The main reasoning for reducing the allowable cut always seem to fall on environmental concerns. If this were 40 years ago, this could be understood but logging practices have changed considerably over the years. With the current logging practices being exercised at this time and the strict reforestation laws being enforced, it is really hard to understand the position that a small group of individuals holds to.

It is our hope and wish that you will sit down, take a careful and full look at what effect any decision reducing the allowable cut would have on the economy in your affected area and decide to allow the current practices to remain as they are. Please realize what effects your decision will have on all the residents (the average taxpayer, busineses and schools).

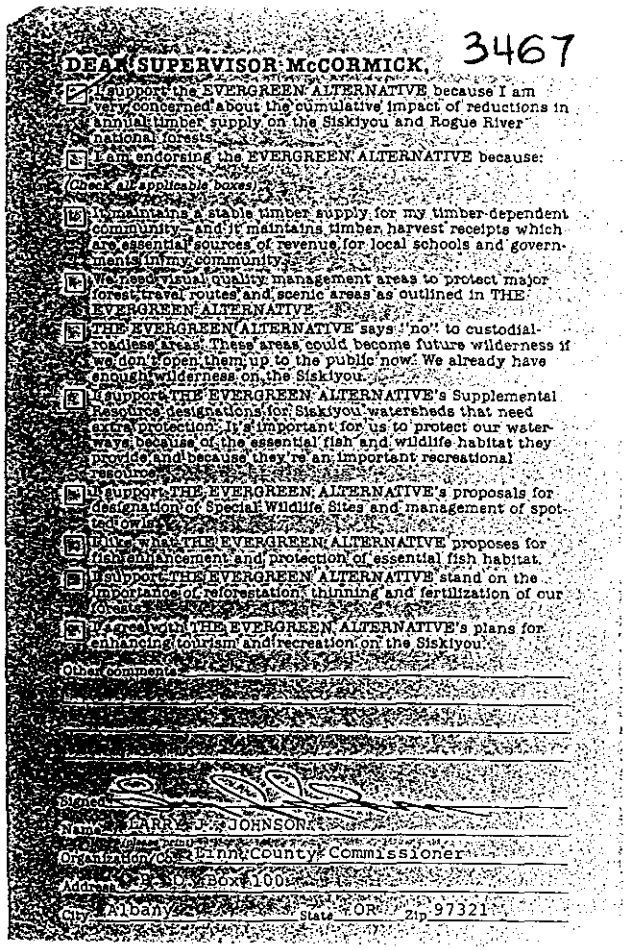
One thing must be remembered about our woods and forests in Western Oregon. We do the best and grow the finest timber, a renewable resource. Regardless of what else is said, the one thing that we do the best is your trees.

History has a funny way of analyzing our deeds and thoughts. Years down the road, let our future generations say of us that we saw the problem, took a stand and decided that it was time that we started to utilize our natural resources for the total benefit of all.

Sincerely,

Larry J. Johnson
Linn County Commissioner

3467



DEAR SUPERVISOR McCORMICK,

- [ ] I support the EVERGREEN ALTERNATIVE because I am very concerned about the cumulative impact of reductions in annual timber supply on the Siskiyou and Rogue River national forests.
- [x] I am endorsing the EVERGREEN ALTERNATIVE because:

(Check all applicable boxes)

- [x] It maintains a stable timber supply for my timber-dependent community -- and it maintains timber harvest receipts which are essential sources of revenue for local schools and governments in my community.
- [x] We need visual quality management areas to protect major forest travel routes and scenic areas as outlined in THE EVERGREEN ALTERNATIVE.
- [x] THE EVERGREEN ALTERNATIVE says "no" to custodial-roadless areas. These areas could become future wilderness if we don't open them up to the public now. We already have enough wilderness on the Siskiyou.
- [x] I support THE EVERGREEN ALTERNATIVE's Supplemental Resource designations for Siskiyou watersheds that need extra protection. It's important for us to protect our waterways because of the essential fish and wildlife habitat they provide and because they're an important recreational resource.
- [x] I support THE EVERGREEN ALTERNATIVE's proposals for designation of Special Wildlife Sites and management of spotted owl habitat.
- [x] I like what THE EVERGREEN ALTERNATIVE proposes for fish enhancement and protection of essential fish habitat.
- [x] I support THE EVERGREEN ALTERNATIVE stand on the importance of reforestation, thinning and fertilization of our forests.
- [x] I agree with THE EVERGREEN ALTERNATIVE's plans for enhancing tourism and recreation on the Siskiyou.

Other comments:

Signed:

Name: LARRY J. JOHNSON

Organization: Linn County Commissioner

Address: P.O. Box 100

City: Albany State: OR Zip: 97321

03490

BOARD OF SUPERVISORS
COUNTY OF DEL NORTE
STATE OF CALIFORNIA

RESOLUTION NO. 87-123

A RESOLUTION IN OPPOSITION TO THE
FOREST SERVICE PREFERRED ALTERNATIVE
AND IN SUPPORT OF THE EVERGREEN ALTERNATIVE

WHEREAS, the Del Norte County Board of Supervisors is concerned about the economic and social well being of Del Norte County; and

WHEREAS, the Del Norte County Board of Supervisors supports diversification of the Southern Oregon and Northern California economy, including the continued development of the tourism industry; and

WHEREAS, the Del Norte County Board of Supervisors believes the retention and expansion of existing businesses is necessary to achieve further economic diversification; and

WHEREAS, our community is significantly dependent upon a steady supply of timber from National Forests, including the Siskiyou National Forest, to provide the base for employment, incomes, and county funding for schools and roads; and

WHEREAS, this County has reviewed the Forest Service Preferred Alternative for managing the Siskiyou National Forest; and

WHEREAS, the Preferred Alternative proposes to reduce employment by approximately 290 jobs; and

WHEREAS, the Preferred Alternative proposes to reduce timber receipts to county governments by $1.4 million annually; and

WHEREAS, the Preferred Alternative proposes preserving 1,000 acres per pair of spotted owls, prior to the completion of critical research to determine the habitat needs of spotted owls; and

WHEREAS, the Preferred Alternative proposes to preserve 14,000 acres as inaccessible "Custodial/Roadless" management areas, in addition to the 232,000 acres of existing Wilderness on the Siskiyou National Fores; and

WHEREAS, this County has also reviewed the Evergreen Alternative, a framework for managing the Siskiyou National Forest; and

BOOK PAGE

WHEREAS, the Evergreen Alternative proposes to increase the annual Siskiyou National Forest timber supply, through the use of scientifically sound, aggressive forest management, by 21 million board feet; and

WHEREAS, the Evergreen Alternative proposes to increase jobs by approximately 360; and

WHEREAS, the Evergreen Alternative proposes to increase timber receipts to county governments by $1.7 million annually; and

WHEREAS, the Evergreen Alternative proposes maintaining options for spotted owl management until critical research on the owl's habitat needs have been completed and a sound management decision can be made; and

WHEREAS, the Evergreen Alternative, like the Forest Service Preferred Alternative, proposes protection for the Rogue River corridor, which is the focus of 25% of all recreation use in the Siskiyou National Forest; and

WHEREAS, the Evergreen Alternative proposes to allocate the management of 19.6 thousand MORE acres of the Siskiyou National Forest to Visual Management Areas than does the Preferred Alternative; and

WHEREAS, the Evergreen Alternative rejects the concept of "Custodial/Roadless" management areas because 21% of the Siskiyou National Forest is currently designated as Wilderness and receives only 3% of the total recreational use; and

WHEREAS, this County supports the immediate harvest of fire damaged and killed timber in the Siskiyou National Forest.

NOW, THEREFORE, BE IT RESOLVED, that the Board of Supervisors, County of Del Norte, State of California, goes on record in OPPOSITION to the Forest Service Preferred Alternative, and in SUPPORT of the Evergreen Alternative for managing the Siskiyou National Forest. The Del Norte County Board of Supervisors urges the Forest Service to work with supporters of the Evergreen Alternative to fully develop it before a final Siskiyou forest plan is implemented.

PASSED AND ADOPTED this 14th day of December, 1987, by the following polled vote:

AYES: Supervisors Burns, Bennett, Smedley, Mellett and Crockett

NOES: NONE

ABSENT: NONE

Joyce Crockett

J. JOYCE CROCKETT, Chairman
Board of Supervisors

ATTEST:

JOHN D. ALEXANDER, County Clerk-Recorder and ex-officio Clerk of the Board of Supervisors, County of Del Norte, State of California

By: Ellen P. Brown
Deputy

I hereby certify the foregoing to be a true and correct copy of the original on file in this office.

Dated: DEC 16 1987

ATTEST:

JOHN D. ALEXANDER

County Clerk and ex-officio Clerk of the Board of Supervisors, County of Del Norte, State of California

By Ellen P. Brown
Deputy

02822

RESOLUTION NO. 402-87

BE IT ORDAINED by the Common Council of Port Orford that it hereby approves and adopts the following resolution.

"A RESOLUTION IN SUPPORT OF THE EVERGREEN ALTERNATIVE"

and:

WHEAREAS, City of Port Orford is concerned about the economic and social well being of Curry County, and

WHEREAS, City of Port Orford supports diversification of the Southern Oregon economy, including the continued development of the tourism, industry, and,

WHEREAS, City of Port Orford believes the retention and expansion of existing businesses is necessary to achieve further economic diversification, and,

WHEREAS, our community is significantly dependent upon a steady supply of timber from National Forests, including the Siskiyou National Forest, to provide the base for employment, incomes, and county funding for schools and roads, and,

WHEREAS, this organization has reviewed the Forest Service Preferred Alternative for managing the Siskiyou National Forest, and,

WHEREAS, the Preferred Alternative proposes to reduce the annual timber supply of the Siskiyou National Forest by 17 million board feet, and,

WHEREAS, the Preferred Alternative proposes to reduce employment by approximately 290 jobs, and,

WHEREAS, the Preferred Alternative proposes to reduce timber receipts to county governments (principally Josephine and Curry) by $1.4 million annually, and,

WHEREAS, the Preferred Alternative proposes preserving 1000 acres per pair of spotted owls, prior to the completion of critical research to determine the habitat needs of spotted owls, and,

WHEREAS, the Preferred Alternative proposes to preserve 14,000 acres as inaccessible "Custodial/Roadless" management areas, in addition to the 232,000 acres of existing Wilderness on the Siskiyou National Forest, and,

WHEREAS, the communites and industry of southern Oregon have developed an "Evergreen Alternative" that meets the economic and environmental needs of the area, and;

BE IT HEREBY RESOLVED that the Common Council of Port Orford that, the Siskiyou National Forest fully develop and adopt the "Evergreen Alternative" as purposed for final implementation. WE feel this alternative uniquely balances economic and environmental tradeoffs, while maintaining a stable raw materials base for our forest products industry, therefore maintaining and ultimately increasing employment and economic stability in the region.

The foregoing resolution was fully approved at the regular session held on the 14th day of December, 1987.

Gary Culley
Acting Mayor, Gary Culley

ATTEST:

Madine Kalina
Clerk-Recorder

01220

Phone (503) 469-2163
CITY OF BROOKINGS
898 Elk Drive
Brookings, Oregon 97415
The Home of Winter Flowers

December 18, 1987

Ron McCormick, Forest Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526

Dear Mr. McCormick:

The City Council of the City of Brookings, Oregon, by unanimous vote at its regular meeting on December 14, 1987, instructed that a letter be written to the Forest Service, U.S. Department of Agriculture, urging adoption of the "Evergreen Alternative" plan for the future management of the Siskiyou National Forest. This alternative more reasonably matches the Siskiyou National Forest potential with the needs of the local communities which support it.

The City of Brookings is also deeply concerned that while the Preferred Alternative generally admits the importance of preserving high quality water resources for downstream water users there is no requirement whatsoever to ensure that recommended management practices will protect domestic water resources. Both the City of Brookings and the Harbor community, aggregating some 10,000 people, are totally dependent on the Chetco River for municipal water supplies. We insist that this critical resource be identified and that specific protection policies together with effective implementation measures be included in the Land and Resource Management Plan.

We offer our assistance to you in any reasonable manner to identify and protect this additional critical forest resource.

Sincerely,

Roy G. Rainey
City Manager

RGR/dmvn

cc: Senator Bob Packwood
Senator Mark Hatfield
Representative Peter Defazio
Governor Neil Goldschmidt
Jim Peterson
Harbor Water District
Regional Forester, Portland, Oregon

03166

City of Cave Junction

P. O. BOX F
CAVE JUNCTION, OREGON 97523

RESOLUTION NO. 319

SISKIYOU NATIONAL FOREST PROPOSED LAND AND RESOURCE MANAGEMENT PLAN

A RESOLUTION IN OPPOSITION TO THE FOREST SERVICE PREFERRED ALTERNATIVE, AND, IN SUPPORT OF THE EVERGREEN ALTERNATIVE.

WHEREAS, The City of Cave Junction, is concerned about the economic and social well being of Cave Junction, and,

WHEREAS, The City of Cave Junction supports diversification of the Southern Oregon economy, including the continued development of the tourism industry, and,

WHEREAS, The City of Cave Junction believes the retention and expansion of existing businesses is necessary to achieve further economic diversification, and,

WHEREAS, our community is significantly dependent upon a steady supply of timber from National Forests, including the Siskiyou National Forest, to provide the base for employment, incomes, and county funding for schools and roads, and,

WHEREAS, this organization has reviewed the Forest Service Preferred Alternative for managing the Siskiyou National Forest, and,

WHEREAS, the Preferred Alternative proposes to reduce the annual timber supply of the Siskiyou National Forest by 17 million board feet, and,

WHEREAS, the Preferred Alternative proposes to reduce employment by approximately 290 jobs, and,

WHEREAS, the Preferred Alternative proposes to reduce timber receipts to county governments (principally Josephine and Curry) by $1.4 million annually, and,

WHEREAS, the Preferred Alternative proposes preserving 1000 acres per pair of spotted owls, prior to the completion of critical research to determine the habitat needs of spotted owls, and,

WHEREAS, the Preferred Alternative proposes to preserve 14,000 acres as inaccessible "Custodial/Roadless" management areas, in addition to the 232,000 acres of existing Wilderness on the Siskiyou National Forest, and,

WHEREAS, this organization has also reviewed the EVERGREEN ALTERNATIVE, a framework for managing the Siskiyou National Forest, and,

WHEREAS, the EVERGREEN ALTERNATIVE proposes to increase the annual Siskiyou National Forest timber supply, through the use of scientifically sound, aggressive forest management by 21 million board feet, and,

WHEREAS, the EVERGREEN ALTERNATIVE proposes to increase jobs by approximately 360, and,

WHEREAS, the EVERGREEN ALTERNATIVE proposes to increase timber receipts to county governments (principally Josephine and Curry) by $1.7 million annually, and,

WHEREAS, the EVERGREEN ALTERNATIVE proposes maintaining options for spotted owl management until critical research on the owl's habitat needs has been completed and a sound management decision can be made, and,

WHEREAS, the EVERGREEN ALTERNATIVE, like the Forest Service Preferred Alternative, proposes protection for the Rogue River corridor, which is the focus of 25% of all recreation use on the Siskiyou National Forest, and,

WHEREAS, the EVERGREEN ALTERNATIVE proposes to allocate the management of 19.6 thousand more acres of the Siskiyou National Forest to Visual Management Areas than does the Preferred Alternative, and,

WHEREAS, the EVERGREEN ALTERNATIVE rejects the concept of "Custodial/Roadless" management areas because 21% of the Siskiyou National Forest is currently designated as Wilderness and receives only 3% of the total recreation use.

BE IT RESOLVED that the City of Cave Junction goes on record in opposition to the Forest Service Preferred Alternative, and in support of the EVERGREEN ALTERNATIVE for managing the Siskiyou National Forest. The City of Cave Junction urges the Forest Service to work with supporters of the EVERGREEN ALTERNATIVE to fully develop it before a final Siskiyou forest plan is implemented.

Passed by the Common Council of the City of Cave Junction this 11th day of January, 1988.

Submitted to and approved by the Mayor of the City of Cave Junction this 11th day of January, 1988.

Irvin R. Whiting
Irvin r. Whiting, Mayor

Attest: Suzanne Kirby
Suzanne Kirby, Recorder

03354

City of Glendale

P.O. BOX 361 • GLENDALE, OREGON 97442 • PHONE (503) 832-2106

January 21, 1988

Forest Supervisor
Siskiyou National Forest
P. O. Box 440
Grants Pass, OR 97526

RE: GREGORY ALTERNATIVE FOR MANAGEMENT OF THE SISKIYOU NATIONAL FOREST

The City of Glendale is a small community located at the southern tip of Douglas County and is almost solely dependent upon the operation of its two local mills. The management of the Siskiyou National Forest is of major concern to all citizens in the area. Therefore, the City Council has reviewed the Draft Forest Plan.

Based upon that review the Council would like to endorse the Gregory Alternative through a vote of confidence. The basis for our support of this alternative is briefly highlighted:

..Community stability and additional jobs
..Increased O&C and NFF receipts of $15.4 million to counties
..Encouragement of prompt salvage and rehabilitation of fire areas
..Promotion of tourism

While our major concern is for the economy of the area it is also important to address the recreational and aesthetic needs. Gregory's Alternative does this by recommending the following:

..Addition of North Fork Smith River and Chetco River to the National Wild and Scenic Status
..Increasing wildlife user days to 81,700 days annually
..Promotes fish enhancement improvements
..Proposes development of trails and campsites

The reduction in annual timber supply recommended by the Draft Forest Plan would have a significant impact and place an even greater economic

Forest Supervisor
Page 2

burden on the communities of Southern Oregon. We are asking that you comment again on the Siskiyou draft forest plan and support the Gregory Alternative which was developed in response to the Siskiyou Draft Plan.

Your consideration in this matter is greatly appreciated.

Sincerely,

CITY OF GLENDALE

David J. Malinoff, Jr.
Mayor

sp

cc: Gregory Forest Products, Inc.

06904

CITY OF GOLD BEACH
310 S. Ellensburg Ave., Gold Beach, Oregon 97444

GOLD BEACH

RESOLUTION R-8788-14

A RESOLUTION ADDRESSING THE SISKIYOU NATIONAL FOREST PREFERRED ALTERNATIVE "K" PLAN AND EVERGREEN ALTERNATIVE PLAN FOR MANAGEMENT OF THE SISKIYOU NATIONAL FOREST FOR THE NEXT TEN TO FIFTEEN YEAR PERIOD.

WHEREAS, The City Council of the City of Gold Beach is concerned about the economic and social well being of Southwestern Oregon, and,

WHEREAS, The City Council supports diversification of the Southern Oregon economy, including the continued development of the tourism, industry, and,

WHEREAS, The City Council believes the retention and expansion of existing businesses is necessary to achieve further economic diversification, and,

WHEREAS, Our community is significantly dependent upon a steady supply of timber from National Forests, including the Siskiyou National Forest, to provide the base for employment, incomes, and county funding for schools and,

WHEREAS, This City Council has reviewed the Forest Service Preferred Alternative for managing the Siskiyou National Forest, and,

WHEREAS, The Preferred Alternative proposes to reduce the annual timber supply of the Siskiyou National Forest by 17 million board feet, and,

WHEREAS, The Preferred Alternative proposes to reduce employment, and,

WHEREAS, The Preferred Alternative proposes to reduce timber receipts to county governments (principally Josephine and Curry), and,

WHEREAS, The Preferred Alternative proposes to preserve 14,000 acres as inaccessible "Custodial/Roadless" management areas, in addition to the 232,000 acres of existing Wilderness on the Siskiyou National Forest, and,

WHEREAS, This City Council has also reviewed the EVERGREEN ALTERNATIVE, a framework for managing the Siskiyou National Forest, and,

Resolution R-8788-14 Page 2 of 3

WHEREAS, The EVERGREEN ALTERNATIVE proposes to increase the annual Siskiyou National Forest timber supply, through the use of scientifically sound, aggressive forest management, and,

WHEREAS, The EVERGREEN ALTERNATIVE proposes to increase jobs, and,

WHEREAS, The EVERGREEN ALTERNATIVE proposes to increase timber receipts to county governments (principally Josephine and Curry), and,

WHEREAS, The EVERGREEN ALTERNATIVE proposes maintaining options for spotted owl management until critical research on the owl's habitat needs has been completed and a sound management decision can be made, and,

WHEREAS, The EVERGREEN ALTERNATIVE, like the Forest Service Preferred Alternative, proposes protection for the Rogue River corridor, which is the focus of 25% of all recreation use on the Siskiyou National Forest, and,

WHEREAS, The EVERGREEN ALTERNATIVE proposes to allocate the management of 19.6 thousand more acres of the Siskiyou National Forest to Visual Management Areas than does the Preferred Alternative, and,

WHEREAS, The EVERGREEN ALTERNATIVE rejects the concept of "Custodial/Roadless" management areas because 21% of the Siskiyou National Forest is currently designated as Wilderness and receives only 3% of the total recreation use, and,

WHEREAS, This City Council has revieved forest management alternatives from both a timber and tourist oriented economy, and,

WHEREAS, This City Council supports a "mean annual increment of 95 years", and,

WHEREAS, This City Council supports preserving the scenic, visual and wildlife corridor of the Rogue River, and,

WHEREAS, This City Council supports increase in the Botanical areas, and,

WHEREAS, This City Council supports the Evergreen alternative to increase investments to enhance fisheries and protect watersheds, and,

Resolution R-8788-14 Page 3 of 3

WHEREAS, This City Council supports the recommendations of the Curry County Commissioners, particularly the harvesting of old growth timber.

NOW THEREFORE BE IT RESOLVED, The City Council of The City of Gold Beach, goes on record in support of the EVERGREEN ALTERNATIVE for managing the Siskiyou National Forest with the suggestions noted above. The City Council of the City of Gold Beach, urges the Forest Service to work with supporters of the EVERGREEN ALTERNATIVE to fully develop it before a final Siskiyou forest plan is implemented.

Passed by the City Council of The City of Gold Beach, County of Curry, State of Oregon, this 21 day of January, 1988.

Approved by:

Sam D. Wilson

Sam D. Wilson, Mayor

ATTEST:

Robert A. Gray

Robert A. Gray
City Administrator

03301

GRANTS PASS
ALL AMERICA CITY

January 25, 1988

Ronald J. McCormick
Forest Supervisor
Siskiyou National Forest
P.O. Box 440
Grants Pass, Oregon 97526-0242

Dear Mr. McCormick:

Thank you for the opportunity to review and comment on the Siskiyou National Forest Land and Resource Management Plan.

At its meeting on January 20, 1988, the Grants Pass Council voted unanimously to support the "Evergreen Alternative" developed by the Southern Oregon Timber Industries Association and to ask you to provide the community with an analysis of that alternative, using the technical resources in computer capability and staff which you have available to you.

Thank you for the opportunity to comment.

Sincerely,

Jane Reyneke

Jane Reyneke
Mayor

JR/jc

cc. Councilors
J. Michael Casey, City Manager
SORA
CF #88-014

City of Grants Pass • 101 N.W. "A" Street • Grants Pass, Oregon 97526

4255

CITY OF MEDFORD
OREGON

OFFICE OF THE MAYOR

CITY OF MEDFORD
MEDFORD, OREGON 97501

MEDFORD'S SISTER CITY
ALBA, ITALY

January 8, 1988

Ron McCormick, Supervisor
Siskiyou National Forest
P. O. Box 440
Grants Pass, OR 97526

Re: Siskiyou National Forest Management Plan

Dear Mr. McCormick:

The Medford City Council has requested me to communicate to you its opposition to the proposed Forest Service plan and its support for the EVERGREEN ALTERNATIVE proposed by Southern Oregon Timber Industries Association (SOTIA). Enclosed is a certified copy of a resolution setting forth the Council's position.

The Council is concerned about the disastrous loss of jobs and local government revenue which would result if the Forest Service's preferred alternative harvest level is implemented. On the other hand, the EVERGREEN ALTERNATIVE would increase local employment by 357 jobs and increase timber receipt payments by about $1.7 million annually while preserving vital resource areas, fisheries and wildlife habitat. The EVERGREEN ALTERNATIVE supports more intensive forest management practices such as reforestation with genetically superior seedlings, thinning stagnant timber stands, fertilization for faster growth and clearing of hardwood species to make way for timber crops. Such practices are vital to insure the economic health of our region.

We strongly urge the Forest Service to work with SOTIA and other interested groups so that the EVERGREEN ALTERNATIVE can become a reality.

Sincerely yours,

Jerry Lausmann
Mayor

Encl.

RESOLUTION NO. 6047

A RESOLUTION supporting the Evergreen Alternative.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF MEDFORD, OREGON that the City Council hereby expresses its support for the Evergreen Alternative proposed by Southern Oregon Timber Industries Association.

PASSED by the Council and signed by me in open session in authentication of its passage this 7th day of January, 1988.

ATTEST: Kathleen Ishiara
City Recorder

Mayor

STATE OF OREGON)
) ss.
COUNTY OF JACKSON)

I, Kathleen Ishiara, City Recorder of the City of Medford, do hereby certify that I have prepared the foregoing copy of Resolution No. 6047, have carefully compared the same with the original thereof on file in my office, and that it is correct, true and complete transcript therefrom and of the whole thereof.

Dated at Medford, Oregon, this 8th day of January, 1988.

Kathleen Ishiara
City Recorder

Resolution No. 6047

03082

City of North Bend

POST OFFICE BOX B / NORTH BEND, OREGON 97459-0014
(503) 756-0405

January 18, 1988

Ron McCormick
Siskiyou National Forest
P. O. Box 440
Grants Pass, Oregon 97526

Re: Evergreen Alternative

Please find enclosed a copy of Resolution No. 2695 which was adopted and passed by the North Bend City Council at their regular meeting of January 12, 1988 in support of the "Evergreen Alternative".

Thank you for the opportunity to comment on this issue which is so very important to our community.

CITY OF NORTH BEND

Joseph Mulloy
City Administrator

a
Enclosure

RESOLUTION NO. 2695

BE IT RESOLVED BY THE COUNCIL OF THE CITY OF NORTH BEND AS FOLLOWS:

1. Coos County is economically dependent on the forest products industry for a financial foundation and well being.

2. The raw materials for this industry are obtained almost exclusively from Bureau of Land Management and Forest Service lands in Douglas, Lane, Coos, Curry, Jackson, and Josephine counties.

3. The practice of sound forest management principals that mainatin a constant flow of timber from all available commercial forest land is important to the industry and economy.

4. We believe that a forest management plan should be based on the principals of multiple-use which allows for many different uses on the same acre and minimizes the trade-offs between timber harvest and other uses.

5. The proposed Siskiyou National Forest Land Management Plan would reduce the allowable harvest level by 11 percent or 17 million board feet per year.

6. The proposed reduction in allowable harvest would result in approximately 300 forest products jobs being lost, many of these in Coos County.

7. Several well respected forest scientists and consultants including Mason, Bruce, and Girard of Portland have examined the technical aspects of the Siskiyou National Forest Land Management Plan and have determined that the allowable harvest should be raised 33 million board feet above the forest service proposed harvest level, without environmental degradation.

8. The ability to increase the allowable harvest level would produce approximately 400 new jobs in the forest products industry, therefore being consistent with Governor Neil Goldschmidts "Oregon Comeback".

9. The communities and industry of southern Oregon have developed an "Evergreen Alternative" that meets the economic and environmental needs of the area.

BE IT HEREBY RESOLVED BY THE North Bend City Council that the Siskiyou National Forest fully develop and adopt the "Evergreen Alternative" as proposed for final implementation. We feel this alternative uniquely balances economic and environmental tradeoffs, while maintaining a stable raw materials base for our forest products industry, therefore maintaining and ultimately increasing employment and economic stability in the region.

Passed and adopted by the Council of the City of North Bend this 12th day of January, 1988.

Mayor

ATTEST:

Recorder

RESOLUTION NO. 2695

03569

POSITION STATEMENT FOR THE EVERGREEN ALTERNATIVE
ON THE
SISKIYOU NATIONAL FOREST LAND MANAGEMENT PLAN

WHEREAS, the City of Powers is economically dependent on the forest products industry for a financial foundation and well being, and;

WHEREAS, the raw materials for this industry are obtained almost exclusively from Bureau of Land Management and Forest Service lands in Douglas, Lane, Coos, Curry, Jackson, and Josephine counties, and;

WHEREAS, the practice of sound forest management principals that maintain a constant flow of timber from all available commercial forest land is important to the industry and economy, and;

WHEREAS, we believe that a forest management plan should be based on the principals of multiple-use which allows for many different uses on the same acre and minimizes the trade-offs between timber harvest and other uses, and;

WHEREAS, the purposed Siskiyou National Forest Land Management Plan would reduce the allowable harvest level by 11 percent or *17 million board feet, and;*

WHEREAS, the purposed reduction is equal to enough lumber to build approxiamtely 2000 three bedroom homes, and;

WHEREAS, the purposed reduction in allowable harvest would result in approximately 300 forest products jobs being lost, many of these in Powers, and; surrounding area's.

WHEREAS, several well respected forest scientists and consultants including Mason, Bruce, and Girard of Portland have exmained the technical aspects of the Siskiyou National Forest Land Management Plan and have determined that the allowable harvest could be raised 33 million board feet above the forest service purposed harvest level, without environmental degradation, and;

WHEREAS, the ability to increase the allowable harvest level would produce approximately 400 new jobs in the forest products industry, therefore being consistant with Governor Neil Goldschmidits "Oregon Comeback", and;

WHEREAS, the communities and industry of southern Oregon have developed an "Evergreen Alternative" that meets the economic and environmental needs of the area, and;

BE IT HEREBY RESOLVED BY THE COUNCIL OF THE CITY OF POWERS THAT, the Siskiyou National Forest fully develop and adopt the "Evergreen Alternative" as purposed for final implementation. We feel this alternative uniquely balances economic and environmental tradeoffs, while maintaining a stable raw materials base for our forest products industry, therefore mainataing and ultimately increasing employment and economic stability in the region.

BE IT FURTHER RESOLVED THAT, this resolution be sent to all members of the Oregon Congressional Delegation, Chief of the Forest Service, Forest Service Region Six Regional Forester, and Supervisor of the Siskiyou National Forest.

ATR 11-30-87

02061

Illinois Valley Soil and Water Conservation District
Cave Junction, Oregon 97523 · Phone (503) 592-3731

December 14, 1987

Mr. Ron McCormick
Siskiyou National Forest Supervisor
Grants Pass, Oregon 97526

Re: Siskiyou National Forest Plan Draft.

Dear Mr. McCormick:

First, to explain our entity; our Soil & Water Conservation District in Illinois Valley was established by state law in 1949, governed by a seven man, publicly elected, Board of Directors. The primary objectives of the district is to help educate youth and the general public in ways to conserve and maintain the natural resources. We offer technical asssistance from Soil Conservation Service (SCS), for developing conservation plans that include a proper balance for production and economy of the area.

Aside from agricultural lands, timber management has been one of our primary concerns.

We have reviewed both the Siskiyou National Forest's proposed Land Resource Management Plan, and the Evergreen Alternative. Some members have actively attended hearings on this subject.

After considerable discussion at our Dec. 9, 1987 Board meeting, we concluded that the community needs a certainty of maintaining the present level of our economy that is so dependent on timber industry receipts, which substantuates the local property tax offset, and provides jobs in compatibility with tourism.

Since there are so many conflicting view points, we also agree that the 10-15 year Forest Plan must be in keeping with Congressional mandate with careful forethought of intrusion that would jeopardize the watershed's natural environment, to retard potentials for turbidity and pollution.

Our final concensus is: That the "Evergreen" management alternative best sums up the need for a sensible balance between economic and environmental considerations.

Sincerely,

Walter B. Freeman
Board Chairman

jw

CONSERVATION · DEVELOPMENT · SELF-GOVERNMENT

04559

POSITION STATEMENT FOR THE Port of Bandon
ON THE
SISKIYOU NATIONAL FOREST LAND MANAGEMENT PLAN

WHEREAS, Port of Bandon is economically dependent on the forest products industry for a financial foundation and well being, and;

WHEREAS, the raw materials for this industry are obtained almost exclusively from Bureau of Land Management and Forest Service lands in Douglas, Lane, Coos, Curry, Jackson, and Josephine counties, and;

WHEREAS, the practice of sound forest management principals that maintain a constant flow of timber from all available commercial forest land is important to the industry and economy, and;

WHEREAS, we believe that a forest management plan should be based on the principals of multiple-use which allows for many different uses on the same acre and minimizes the trade-offs between timber harvest and other uses, and;

WHEREAS, the purposed Siskiyou National Forest Land Management Plan would reduce the allowable harvest level by 11 percent or 17 million board feet, and;

WHEREAS, the purposed reduction is equal to enough lumber to build approxiamtely 2000 three bedroom homes, and;

WHEREAS, the purposed reduction in allowable harvest would result in approximately 300 forest products jobs being lost, many of these in Coos County, and;

WHEREAS, several well respected forest scientists and consultants including Mason, Bruce, and Girard of Portland have exmained the technical aspects of the Siskiyou National Forest Land Management Plan and have determined that the allowable harvest could be raised 33 million board feet above the forest service purposed harvest level, without environmental degradation, and;

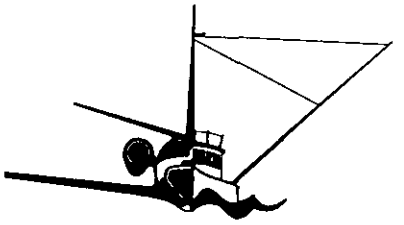
WHEREAS, the ability to increase the allowable harvest level would produce approximately 400 new jobs in the forest products industry, therefore being consistant with Governor Neil Goldschmidits "Oregon Comeback", and;

WHEREAS, the communities and industry of southern Oregon have developed an "Evergreen Alternative" that meets the economic and environmental needs of the area, and;

BE IT HEREBY RESOLVED BY THE Port of Bandon
THAT, the Siskiyou National Forest fully develop and adopt the "Evergreen Alternative" as purposed for final implementation. We feel this alternative uniquely balances economic and environmental tradeoffs, while maintaining a stable raw materials base for our forest products industry, therefore mainataing and ultimately increasing employment and economic stability in the region.

BE IT FURTHER RESOLVED THAT, this resolution be sent to all members of the Oregon Congressional Delegation, Chief of the Forest Service, Forest Service Region Six Regional Forester, and Supervisor of the Siskiyou National Forest.

ATR 11-30-87



U4562

PORT OF GOLD BEACH

BOX 1126 247-6269

GOLD BEACH, OREGON 97444

A RESOLUTION IN OPPOSITION
TO THE FOREST SERVICE PREFERRED ALTERNATIVE, AND,
IN SUPPORT OF
THE EVERGREEN ALTERNATIVE

WHEREAS, Port of Gold Beach is concerned about the economic and social well being of Port District of Gold Beach, and,

WHEREAS, Port of Gold Beach supports diversification of the Southern Oregon economy, including the continued development of the tourism, industry, and,

WHEREAS, Port of Gold Beach believes the retention and expansion of existing businesses is necessary to achieve further economic diversification, and,

WHEREAS, our community is significantly dependent upon a steady supply of timber from National Forests, including the Siskiyou National Forest, to provide the base for employment, incomes, and county funding for schools and roads, and,

WHEREAS, this organization has reviewed the Forest Service Preferred Alternative for managing the Siskiyou National Forest, and,

WHEREAS, the Preferred Alternative proposes to reduce the annual timber supply of the Siskiyou National Forest by 17 million board feet, and,

WHEREAS, the Preferred Alternative proposes to reduce employment by approximately 290 jobs, and,

WHEREAS, the Preferred Alternative proposes to reduce timber receipts to county governments, (principally Josephine and Curry) by $1.4 million annually, and,

WHEREAS, the Preferred Alternative proposes preserving 1000 acres per pair of spotted owls, prior to the completion of critical research to determine the habitat needs of spotted owls, and,

WHEREAS, the Preferred Alternative proposes to preserve 14,000 acres as inaccessible "Custodial/Roadless" management areas, in addition to the 232,000 acres of existing Wilderness on the Siskiyou National Forest, and,

Resolution 88-11

Position Statement for the City of Myrtle Point
on the
Siskiyou National Forest Land Management Plan

Whereas, Myrtle Point is economically dependent on the forest products industry for financial foundation and well being; and,

Whereas, the raw materials for this industry are obtained almost exclusively from Bureau of Land Management and Forest Service lands in Douglas, Lane, Coos, Curry, Jackson and Josephine counties; and,

Whereas, the practice of sound forest management principles that maintain a constant flow of timber from all available commercial forest land is important to the industry and economy; and,

Whereas, we believe that a forest management plan should be based on the principles of multiple-use which allow for many different uses on the same acre and minimize the tradeoffs between timber harvest and other uses; and,

Whereas, the proposed Siskiyou National Forest Land Management Plan would reduce the allowable harvest level by 11 percent (17 million board feet); and,

Whereas, the proposed reduction is equal to enough lumber to build approximately 2000 three bedroom homes; and,

Whereas, the proposed reduction in allowable harvest would result in approximately 300 forest products jobs being lost; and,

Whereas, several well respected forest scientists and consultants, including Mason, Bruce and Girard of Portland, have examined the technical aspects of the Siskiyou National Forest Land Mangement Plan and have determined that the allowable harvest could be increased 33 million board feet above the Forest Service proposed harvest level (without environmental degradation); and,

Whereas, the ability to increase the allowable harvest level would produce approximately 400 new jobs in the forest products industry, therefore being consistent with Governor Neil Goldschmidt's "Oregon Comeback"; and,

Whereas, the communities and industry of southern Oregon have developed an "Evergreen Alternative" that meets the economic and environmental needs of the area;

Now, therefore, be it resolved by the Myrtle Point City Council that the Siskiyou National Forest fully develop and adopt the "Evergreen Alternative" as proposed for final implementation. We believe this alternative uniquely balances economic and environmental tradeoffs while maintaining a stable raw materials base for our forest products industry, therefore maintaining and ultimately increasing employment and economic stability in the region.

Be it further resolved that a copy of this resolution be sent to all members of the Oregon Congressional Delegation, Chief of the Forest Service, Forest Service Region Six Regional Forester and Supervisor of the Siskiyou National Forest.

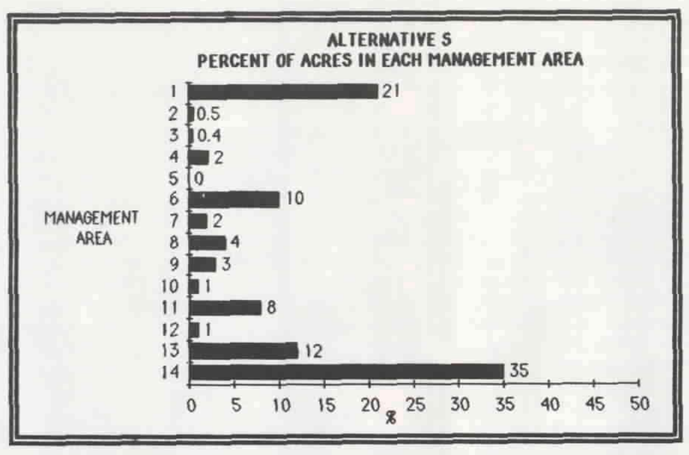
The foregoing resolution was duly adopted this 21st day of December 1987.

Edward Cook
Edward Cook, Mayor

Attest:

Larry G. McClanahan
Larry G. McClanahan
Administrative Services Director

☆ U.S. GOVERNMENT PRINTING OFFICE: 1989—691-059/89,002 REGION NO. 10



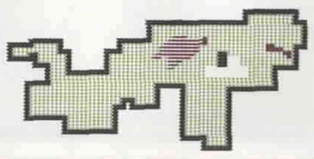
SISKIYOU NATIONAL FOREST

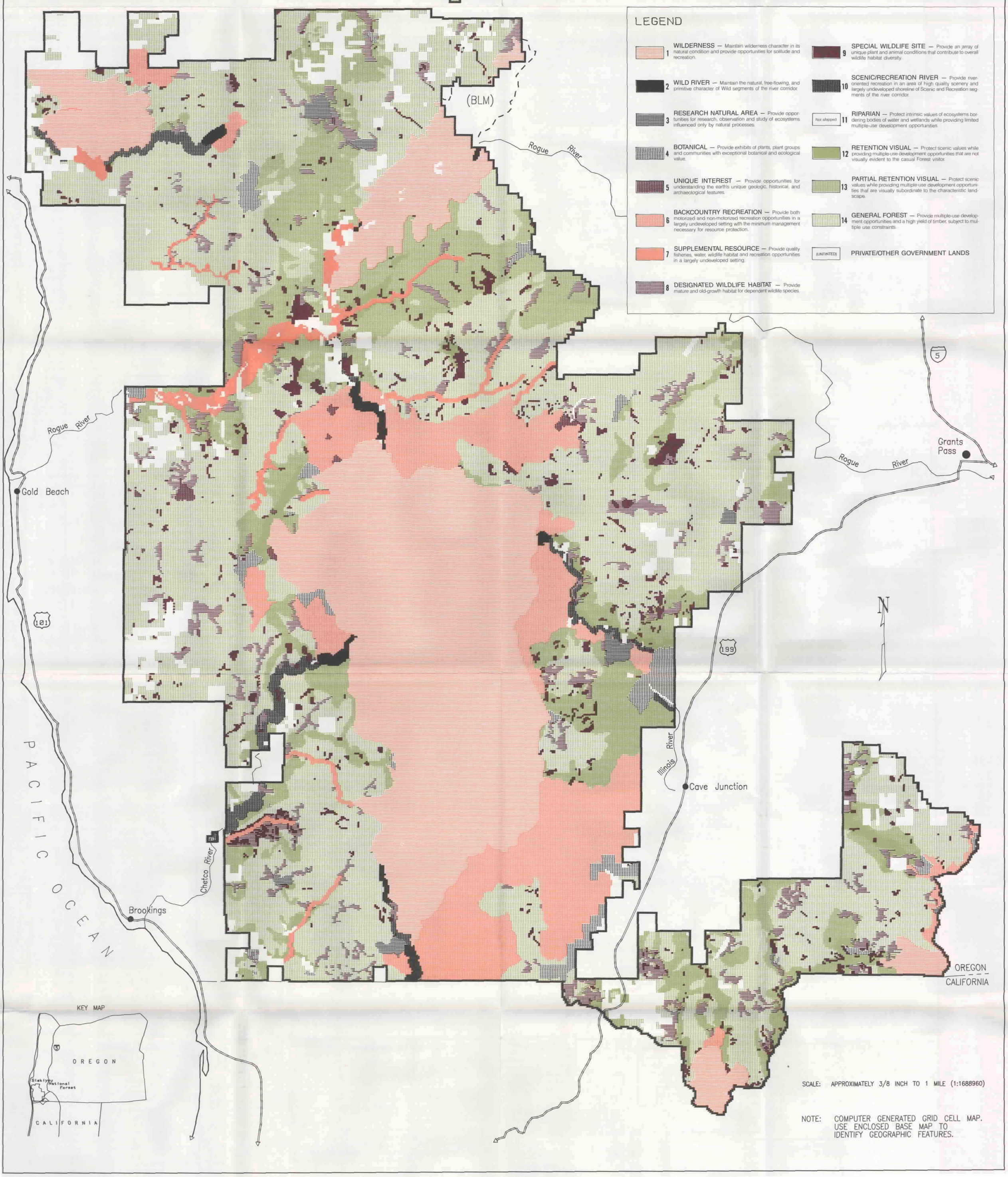
Land and Resource Management Plan
December 1988



ALTERNATIVE S

● Powers





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United States
Department of
Agriculture

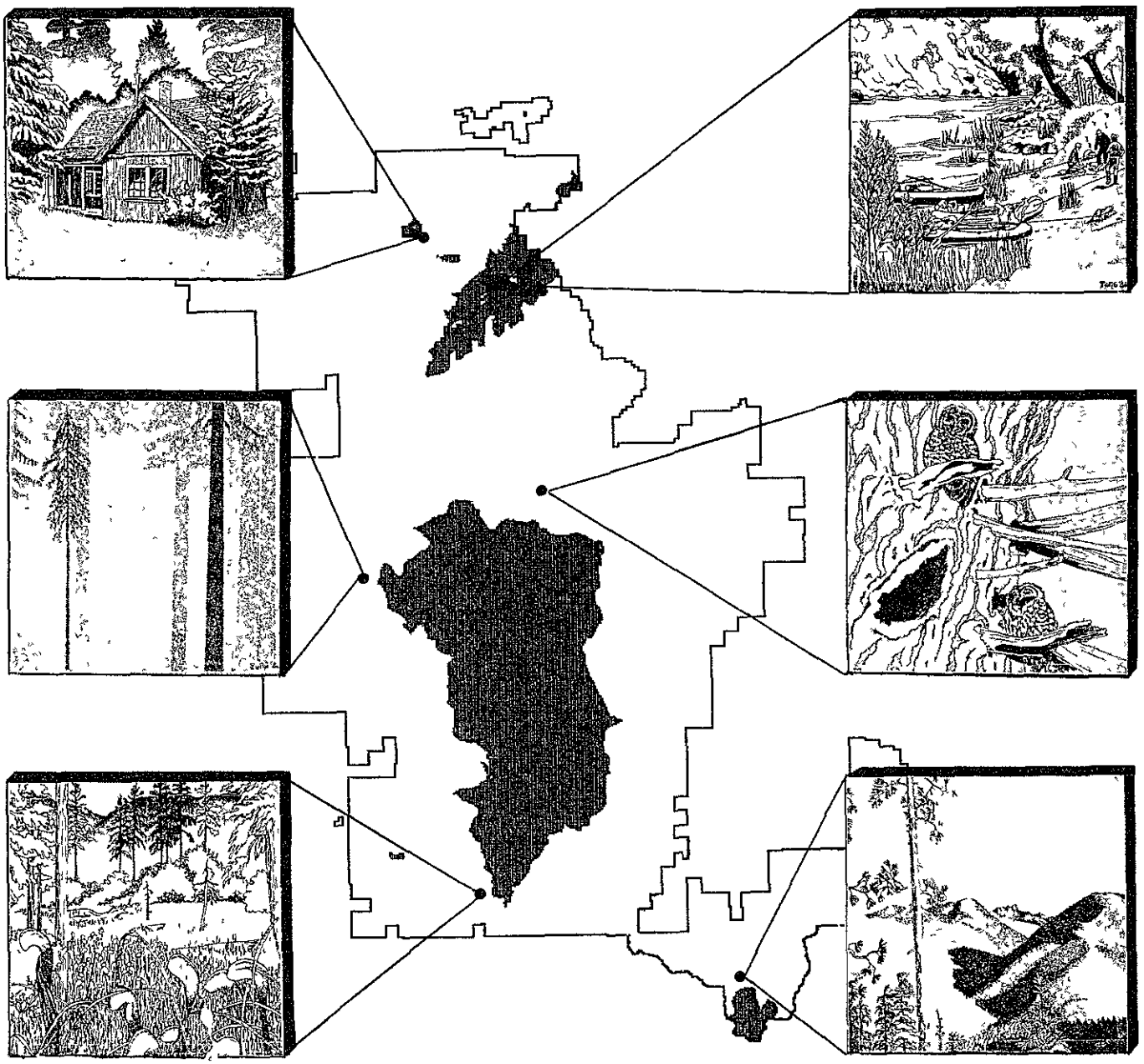
Forest Service

**Pacific
Northwest
Region**

1989

Land and Resource Management Plan

Siskiyou National Forest



PREFACE

This National Forest Land and Resource Management Plan (Forest Plan) is developed to direct the management of the Siskiyou National Forest The goal of the Forest Plan is to provide a management program reflective of a mixture of management activities that allow use and protection of the Forest resources; fulfill legislative requirements, and address local, regional and national issues and concerns. To accomplish this, the Forest Plan

Establishes the management direction and associated long-range goals and objectives for the Forest for the next 10 to 15 years,

specifies the Standards and Guidelines and the approx.mate timing and vicinity of the practices necessary to achieve that direction, and

establishes the monitoring and evaluation requirements needed to ensure that the direction is carried out and to determine how well outputs and effects were predicted.

The Forest Plan will be reviewed (and updated if necessary) at least every 5 years It will ordinarily be revised on a 10-year cycle, or at least every 15 years

Preparation of the Forest Plan is required by the Forest and Rangeland Renewable Resources Planning Act (RPA) as amended by the National Forest Management Act (NFMA) Assessment of its environmental impacts is required by the National Environmental Policy Act (NEPA) and the implementing regulations of NFMA (36 CFR 219) The Forest Plan replaces previous resource management plans prepared for the Siskiyou National Forest Upon approval of the Forest Plan, subsequent activities affecting the Forest must be in compliance with the Forest Plan In addition, permits, contracts and other instruments for the use and occupancy of National Forest System lands must be in conformance with the Forest Plan

If any particular provision of this Forest Plan, or the application thereof to any person or circumstances, is held invalid, the remainder of the Forest Plan and the application of such provision to other persons or circumstances shall not be affected thereby

For further information, contact:

Ronald J McCormick, Forest Supervisor
Siskiyou National Forest
200 N.E. Greenfield Rd
P.O. Box 440
Grants Pass, OR 97526-0242
(503) 479-5301

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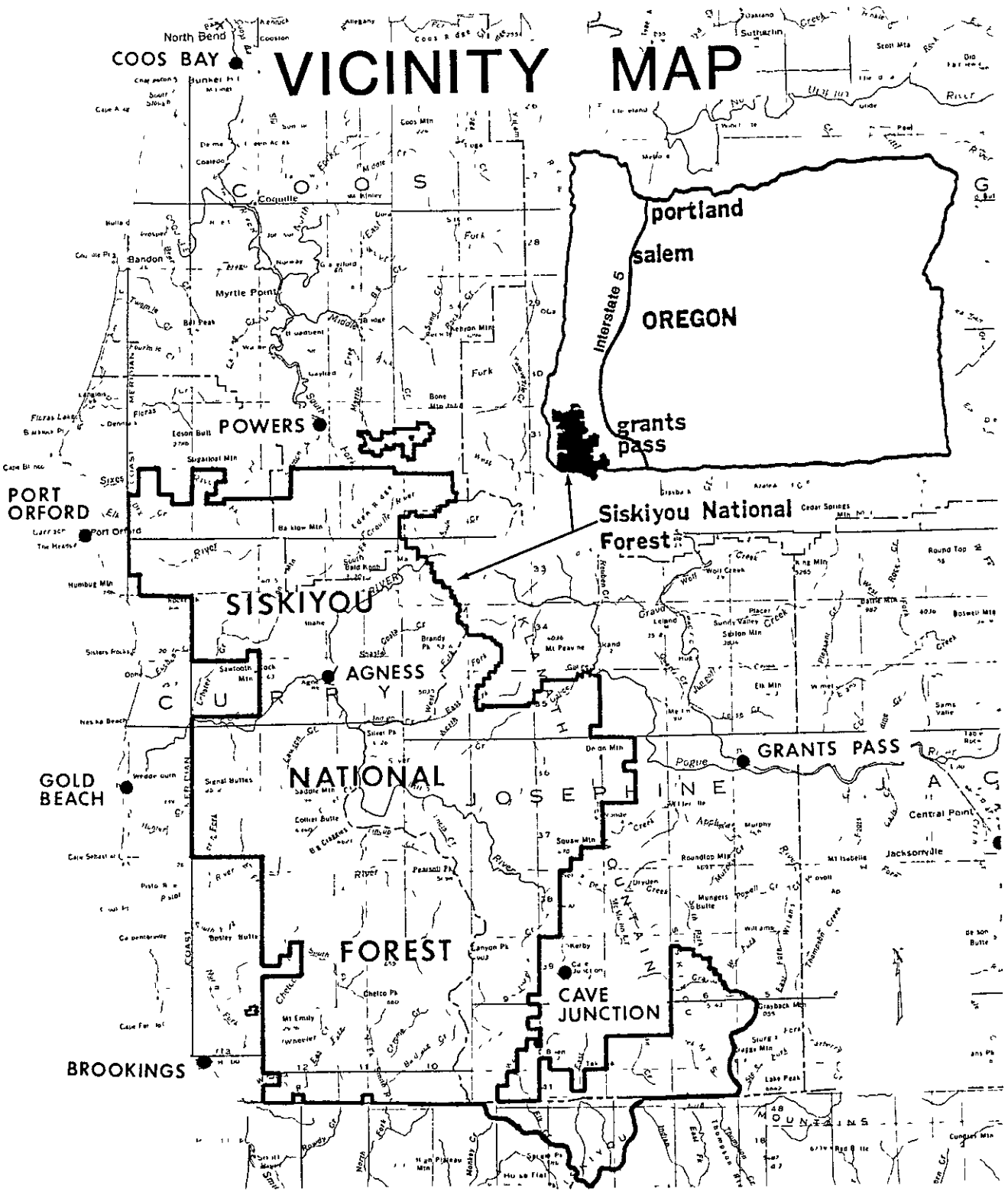
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CHAPTER I

INTRODUCTION TO THE FOREST PLAN



Siskiyou National Forest Vicinity Map

Chapter I

INTRODUCTION TO THE FOREST PLAN

PURPOSE OF FOREST PLAN

The Land and Resource Management Plan (LRMP or the Forest Plan) establishes the direction for the Siskiyou National Forest for the next decade It guides all natural resource management activities and establishes a dynamic management system for future decisionmaking It establishes goals and objectives for forest management, and Standards and Guidelines for the Siskiyou National Forest The Forest Plan establishes Management Area direction including prescriptions as well as Standards and Guidelines specific to each Management Area It describes the availability and suitability of lands for resource management, levels of resource production and management, and monitoring and evaluation requirements

The Forest Plan embodies the provisions of the National Forest Management Act of 1976 (NFMA), the implementing regulations, and other guiding documents Land use determinations, prescriptions, and Standards and Guidelines are a statement of the plan's management direction, however, the projected outputs, services, and rates of implementation are dependent on the annual budgeting process

The Forest Plan will ordinarily be revised on a 10-year cycle, or at least every 15 years It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Plan have changed significantly or when changes in Resource Planning Act policies, goals, or objectives would have a significant effect on Forest level programs The Forest Supervisor will review the conditions on the land covered by the Plan and the demand of the public at least every 5 years to determine whether either has changed significantly

RELATIONSHIP OF THE FOREST PLAN TO OTHER DOCUMENTS

This Forest Plan sets forth the direction for managing the resources of the Siskiyou National Forest The Forest Plan results from extensive analysis of 12 alternatives which are considered in the accompanying Final Environmental Impact Statement (FEIS) and Record of Decision It is based on Alternative S as presented in the FEIS and as modified in the Record of Decision Many aspects of the Forest Plan reflect numerous suggestions from the public in response to the Draft Environmental Impact Statement and accompanying Proposed Land and Resource Management Plan The planning process, including the analytic procedures that were used to develop this Plan, are described or referenced in the FEIS The FEIS also describes and analyzes the other alternatives considered in the planning process Information in the Forest Plan incorporates inventory adjustments for the 1987 fires and timber land suitability in the Silver Fire Recovery Project area as described in Chapters II and III of the FEIS

The Forest Plan establishes rules for making future decisions about the management of the national forest but it does not make most of these decisions Activities and projects will be planned and implemented to carry out the direction in this Plan The Forest will perform environmental analyses on these projects and activities Project-level environmental analysis will use the data and evaluations in this Plan and FEIS as its basis Documentation of project-level analysis will be tiered to the FEIS

REGIONAL GUIDE

The Regional Guide for the Pacific Northwest Region (FEIS, 1984) and the Final Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide (Spotted Owl Guidelines, Final SEIS, 1988) provide direction for National Forest Plans and develop standards and guidelines addressing major issues and management concerns considered at the Regional level to facilitate Forest planning

SPECIAL AREA PLANS

The regulations (36 CFR 219 2 (b)) guiding the development of Forest Plans state that "(if), in a particular case, special area authorities require the preparation of a separate special area plan, the direction in any such plan may be incorporated without modification " For this reason the Rogue National Wild and Scenic River Management Plan (1972) and the Illinois Wild and Scenic River Management Plan (1985) will be incorporated unchanged in the Forest Plan

RELATIONSHIP TO OTHER PLANS

The Forest Plan serves as the single land management plan for the Siskiyou National Forest All other management plans are replaced by the direction in this Forest Plan (see Chapter V for a list of existing plans that this Forest Plan supersedes) The management direction provided by this Forest Plan comprises the framework within which site-specific project planning and activities take place

PLAN STRUCTURE AND ORGANIZATION

The Forest Plan document is composed of five chapters, literature cited, acronyms and glossary, and six appendices Chapter I is the introduction which describes the purpose of the Forest Plan, summarizes the content, describes the Forest's geographic location, and discusses the Plan's relationship to other documents

Chapter II is a summary of the Analysis of the Management Situation Included are summaries of the current management situation for each resource, a brief socioeconomic overview of the Forest and related communities and counties, potential supply for various resource goods and services, and a brief look at demand Chapter II also includes a list of further research and information needs for the Forest

Chapter III summarizes the public issues and management concerns identified and briefly explains how each was treated in the Forest Plan

Chapter IV is the heart of the Plan and contains the multiple-use resource goals which the Forest has established for the planning period Accompanying this are the projected resource outputs and activities necessary to achieve the goals The outputs and activities are the objectives the Forest should meet to implement the Plan; they are based on available inventory data and assumptions, subject to the annual budget

Chapter IV contains the Standards and Guidelines for Plan implementation They apply to the everyday on-the-ground projects and cover a wide range of resources Some are specific and others provide procedures to follow There are Forest-wide Standards and Guidelines in addition to Standards and Guidelines specific to Management Areas Also in Chapter IV are Management Area Prescriptions which describe the Management Areas and define the types of activities that can occur in those areas The specific locations of the various Management Areas within the Forest are shown on the map labeled "Land and Resource Management Plan"

Chapter V contains the implementation direction, a plan for monitoring and evaluating Forest Plan implementation, and a description of the process for Plan amendment and revision Project-level planning and schedules are discussed As the Forest Plan is implemented, it will be monitored to determine whether the outputs and Standards and Guidelines in Chapter IV are being met and whether the Standards and Guidelines are effective in achieving the desired results

Following Chapter V is a list of literature cited as well as abbreviations and terms used in this document The appendices provide Wilderness Plans, activity schedules for the projected budget, Ten-year Timber

Sale Action Plan, background information on the development of the Monitoring and Evaluation Plan, Off-Road Vehicle Plan, and Best Management Practices The activity schedules are flexible and subject to on-going change

FOREST DESCRIPTION

The Siskiyou National Forest is located in southwestern Oregon, with a small portion in extreme northwestern California The Forest lies within 50 miles of the Pacific Ocean Its boundaries embrace both the Klamath Mountains and Coast Range geologic provinces The largest part of the Forest lies within Curry County on the coastal side and Josephine County on the east The California portion is in Del Norte County Coos County covers a northern area Net acreage of the Siskiyou National Forest is 1,092,302 acres Other ownerships occupy only three percent, or 69,728 acres, of the total area within the National Forest Boundary

The larger service centers are in the cities of Grants Pass, Medford, and Coos Bay Smaller communities in close proximity to the Forest and with close socioeconomic ties are Cave Junction, Brookings, Gold Beach, Port Orford, and Powers The Forest Headquarters is in Grants Pass, Oregon Ranger District Offices are located in Grants Pass (Galice), Cave Junction (Illinois Valley), Brookings (Chetco), Gold Beach, and Powers



CHAPTER II

SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

Chapter II

SUMMARY OF THE ANALYSIS OF THE MANAGEMENT SITUATION

INTRODUCTION

This chapter briefly summarizes the user demands and resource potentials and conditions for the Siskiyou National Forest. Included are demand projections, resource and economic supply potentials, and development opportunities. The major questions at issue are timber production, old-growth preservation, fish habitat and watershed condition, sensitive plant areas, scenic values, wildlife habitat, recreation opportunities, and mineral development. Consequently, potential, current, and planned outputs of significant goods and services are presented along with projected demands by users of the Forest Also included in this chapter are further information needs for the Siskiyou National Forest

RESOURCE DEMAND PROJECTIONS

The discussion of demand is essential to making an informed decision on allocation of the Forest resources and productive capacity.

DEMAND FOR TIMBER HARVEST

The total amount of wood processed within the six county area of Coos, Curry, Del Norte, Douglas, Jackson, and Josephine for 1972 and 1976 was 3,419 MMBF and 2,885 MMBF, respectively. The latest (1984) figure for the same area is 2,455 MMBF. The 350 or so firms that process wood produce a variety of products including sawtimber, plywood, shakes, pulp, arrows, and other miscellaneous products. Douglas-fir is the species most often bought, although pine, hemlock, red-cedar, and Port-Orford-cedar are also utilized The demands for timber harvest are most affected by regional and National economics as well as costs from other markets including foreign markets, while the demand for Port-Orford-cedar is affected by its use in Japan.

OLD GROWTH

The demand for preservation of old-growth timber is significant but difficult to quantify. The demand for retention of old growth for wildlife habitat, aesthetics, biological diversity, and its perceived intrinsic value will intensify as old-growth stands are harvested and development takes place. With increasing public awareness, the demand for preservation will also increase

FISH HABITAT, WATER QUALITY, AND SOIL PRODUCTIVITY

While each of these resources are unique, they are also highly interrelated. For example, a reduction in soil productivity is commonly the result of soil and organic matter loss Soil loss affects water quality and can result in an effect on fish habitat. Consequently, the demand for fish indicates a demand for water quality and soil productivity.

The demand for the fisheries resource has grown steadily A regional projection of a 1.6 percent annual growth results in demand for an additional 16,900 fish user days by the year 2000. As people have more leisure time, the recreational demand for fisheries is increased. In addition, as the competition for the offshore fishery increases, so does the demand for smolt habitat.

The greatest demands on recreation are the result of more people having more leisure time, the awareness of the Forest's opportunities (particularly rivers), and the local governments' desires to promote tourism

SENSITIVE PLANTS

The demand for preservation of sensitive plants has been expressed. Anticipated concern is assumed to be increasing The demand will rise as development encroaches on sensitive plant habitat and as public awareness increases.

VISUALS

Increased harvest and development will bring increased concern for visual management An increase in the number of people having the perception that a forest should have an unmanaged, undisturbed appearance is also increasing the demand The present demand level is assumed to increase as additional landscapes are modified by timber harvest and more people use the Forest

WILDLIFE HABITAT

Many people are interested in wildlife habitat The concerns include maintaining habitat for viable populations of old-growth species (displayed as part of the preservation of old growth habitat), adequate wildlife tree habitat (snags and culls), and suitable areas for big-game habitat

The demand for big-game-associated recreation is assumed to increase at 1.3 percent per year as projected throughout the Northwest region The recreation demand associated with non-game wildlife is predicted to increase at one-half of one percent per year. The demands are most affected by the increasing numbers of recreationists and the publics awareness of the part the habitat plays in wildlife numbers Future demand for wildlife will exceed supply

MINERAL RESOURCES

The demand for mineral resources is difficult to anticipate Demand will be determined by future conditions in world markets. Gold, silver, nickel, cobalt, chromite, copper, and coal are the minerals most likely to be affected on the Forest.

RESOURCE SUPPLY CONDITIONS

Table II-1, "Benchmark Outputs and Effects", displays the maximum supply of various resources constrained by legal requirements for managing National Forest land, such as those relating to the habitat needs for viable wildlife populations and multiple use requirements Timber production is also constrained to meet the nondeclining flow policy These benchmarks help to define the range of potential outputs the Forest could produce to respond to the above demands

These benchmarks developed in the Analysis of the Management Situation are

1 Current Direction - Estimates the outputs and effects of maintaining direction found plans and policies existing prior to development of this Forest PLan

2 Present Net Value - Estimates the maximum PNV that might be attained by maximizing the net value of priced outputs under a nondeclining flow policy. This benchmark serves as a basis for an economic comparison between benchmarks and alternatives, as well as a basis for determining the effects of various constraints on outputs and costs.

The benchmarks developed in the Analysis of the Management Situation are:

1. Current Direction - Estimates the outputs and effects of maintaining direction found plans and policies existing prior to development of this Forest Plan

2 Present Net Value - Estimates the maximum PNV that might be attained by maximizing the net value of priced outputs under a nondeclining flow policy This benchmark serves as a basis for an economic comparison between benchmarks and alternatives, as well as a basis for determining the effects of various constraints on outputs and costs

3 Recreation - Determines the Forests ability to satisfy recreational demand.

4. Visuals - Estimates the outputs and effects of allocating the maximum amount of Retention Visual and Partial Retention Visual Management Areas.

5. *Unroaded - Determines the outputs and effects of allocating all unroaded areas to minimum* maintenance management.

6 Watershed/Fisheries - Determines the Forest outputs with the most improved fisheries habitat and watershed conditions.

7. Wildlife - Estimates the effects and outputs of a land allocation designed to optimize wildlife habitat diversity and maintain the viability of all species

8. Timber - Determines the highest level of timber production possible with a policy of nondeclining flow, subject to Management Requirements (MR's).

9. Minimum Level - Determines the minimum costs of maintaining Forest lands in federal ownership which are necessary to protect life, health, and safety of incidental users.

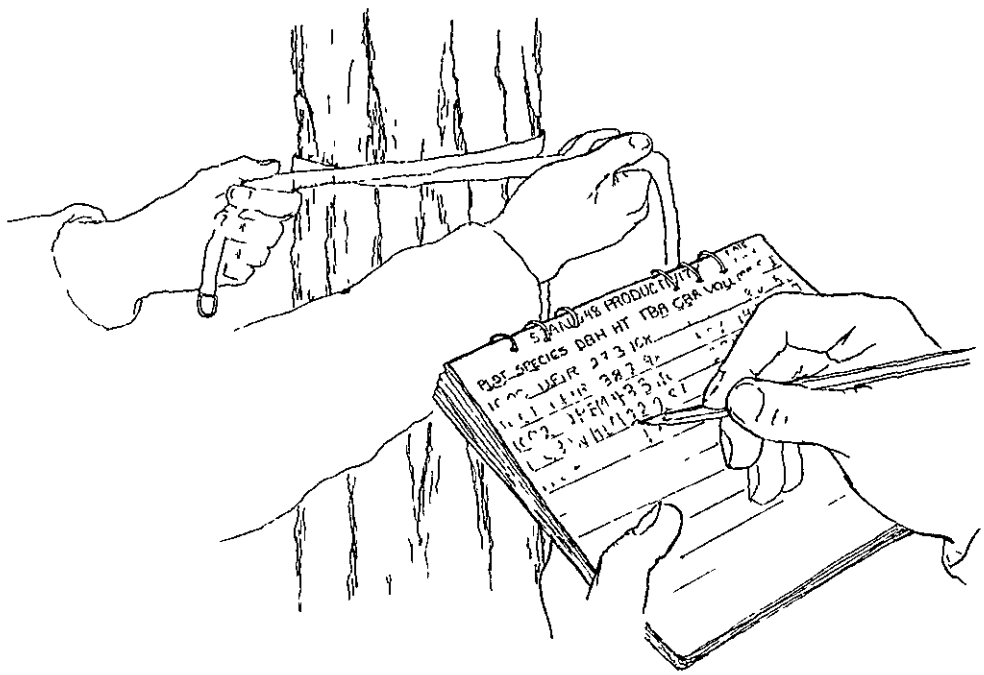


Table II-1. Benchmark Outputs and Effects

Output/Effect	Current 1/ Direction	Maximum PNV	Benchmark: Recreation	Visuals	Unroaded	Watershed/ Fisheries	Wildlife	Timber	Minimum Level
Discounted Benefits (MM $)									
Non-wilderness Recreation	175	175	175	175	175	175	175	175	NE2/
Wilderness Recreation	10	10	10	10	10	10	10	10	NE
Fisheries	83	75	83	83	83	88	83	83	NE
Wildlife	50	48	44	51	45	52	48	59	NE
Timber	1,536	1,716	1,178	1,582	1,221	1,562	1,354	1,732	NE
Range & Misc.	3	3	3	3	3	3	3	3	NE
Discounted Costs (MM $)	688	728	575	699	583	681	633	786	NE
Present Net Value (MM $)	1,170	1,300	918	1,205	954	1,209	1,040	1,276	5
Harvest Levels									
1st Decade Annual Sale Quantity (MMCF)	30	32	22	31	23	29	26	33	0
Long-term Sustained Yield (MMCF)	51	52	39	53	40	50	44	59	0
Old-Growth Habitat (M acres)									
Total Dedicated Area	175	164	270	164	263	173	236	164	425
Soil, Water, and Fisheries									
Sediment (M Tons)	690	702	671	691	674	696	686	737	623
Visitor Days (M WFUD's)	69	65	69	69	69	71	69	69	NE
Commercial Fish (M lbs.)	934	880	934	934	934	958	934	934	NE
Sensitive Plants (M acres) 3/									
Botanical Areas	4.2								39.5
Research Natural Areas	2.0								4.7
Visual Resources (acres)									
Allocated Visual Quality Objectives	370	9	9	370	9	9	9	9	N/A

Table II-1. Benchmark Outputs and Effects (Continued)

Output/Effect	Benchmark: Current 1/ Direction	Max. PNV	Recreation	Visuals	Unroaded	Watershed/ Fisheries	Wildlife	Timber	Minimum Level
Wildlife Habitat									
Dead and Defective Tree Habitat (percent of Capacity - Decade 5)	63	61	67	63	67	63	77	59	NE
Habitat Capability for Blacktail Deer --(percent change from present in Decade 1)	0	-1	-17	-5	-16	-5	-10	26	NE
--(percent change from present in Decade 5)	12	32	4	17	7	6	20	31	NE
Recreation									
Visitor Days (M RVD's)	1,430	1,430	1,440	1,430	1,420	1,430	1,420	1,430	NE
Unroaded and Wilderness (M acres)	233	233	547	233	547	233	366	233	547
Wild and Scenic Rivers Area (M acres)	12	12	21	12	12	12	12	12	NE
Minerals (M acres)									
Restricted Areas	<----------				246	----------			----->

1/ "Current direction" estimates the outputs and effects of maintaining direction found plans and policies existing prior to development of this Forest Plan.
2/ NE - Not Estimated
3/ Benchmark values were calculated for current direction and maximum amounts only

For the benchmark analysis, timber revenues account for approximately 80 percent of the total revenues generated by the Forest After timber, nonwilderness recreation and fisheries values generate the greatest amount of revenue (approximately 10 percent and 5 percent respectively)

The outputs for soil, water, fisheries, wildlife, minerals, and sensitive plants are shown for each benchmark to illustrate interactions with the maximum production capacity of the Forest One example of such interaction is the increase in old-growth habitat with decreased harvest of timber Trade-offs between unroaded areas, old-growth habitat areas, visual areas, and timber outputs account for the major differences between the benchmarks

Though the potential supply of the Forest is important, it is meaningless by itself until the planned outputs of the Forest and demands of forest users and consumers are considered (Table II-2) This process involves the resolution of more than one question at a time.

TIMBER

The maximum amount of timber that could be offered in the first decade without a departure is 34.1 MMCF. That is less than the RPA target of 36 8 MMCF The Forest Plan provides less timber at 28 4 MMCF for the first decade, but gradually increases to the long-term sustained-yield of 48 MMCF in the 12th decade

OLD GROWTH PRESERVATION

The maximum amount of mature and old growth that exists during the planning period is 393,000 acres (minimum level benchmark) The plan gradually converts old-growth stands until 209,000 acres remain in the fifth decade

FISH HABITAT AND WATERSHED CONDITION

The maximum amount of fish produced as reflected by fishing user days (in WFUD's) is 73,000 WFUD's per year as determined by the benchmark analysis However, new information on the role of large woody material in stream courses provided new investment opportunities for increasing fish production Consequently, the planned output is an estimated 72,000 WFUD's per year, increasing to 87,000 WFUD's in the second decade The increased outputs are due to increased capital investments. There is an opportunity to look for and develop habitat and improve conditions using Knutson-Vandenberg Act and Capital Investment funds

RECREATION

The demand for recreation is less than the maximum and planned capacity for all forms of recreation The maximum capacity of Primitive (including Wilderness) and Semi-primitive recreation is in excess of the projected use However, the demand for unroaded recreation could exceed capacity in the future in areas outside of designated Wildernesses There are about 20 undeveloped recreation sites that could be developed in the future

SENSITIVE PLANTS

The maximum area of reserves for sensitive plants are 40,071 acres The Forest Plan provides 23,870 acres of Botanical areas and Research Natural Areas, which is over three times as much as the direction prior to the Forest Plan (6,432 acres)

VISUALS

The direction prior to the Forest Plan for visual management has nearly as many acres in retention and partial retention as the maximum visuals benchmark (307,000 versus 330,000 acres). The Forest Plan provides fewer acres (231,000) for visual management

WILDLIFE HABITAT

The maximum supply of habitat for spotted owls as provided by the wildlife benchmark is 371,000 acres for the first decade, then decreases to 214,000 acres in the fifth decade The Forest Plan provides 371,000 acres in first decade and 196,000 acres in the fifth decade This is a 42 percent decrease from the *benchmark*

As the anticipated demand for big game habitat increases with time, the Forest capacity to supply that habitat decreases. In the first decade, a 28 percent decrease in habitat capability occurs with the wildlife benchmark. However, that capacity increases in the fifth decade to a 4 percent increase. The plan has a 20 percent decrease in the first decade, but the habitat level remains at 16 percent below the level prior to the Forest Plan in the fifth decade. There is an opportunity to look for and develop habitat using funds from the Knutson-Vandenberg Act and capital investments appropriations.

MINERALS

There are insignificant differences between the maximum amount of acres available for mineral extraction prior to implementation and after the Forest Plan

The need to change direction from conditions prior to Forest Plan implementation is due to demands for timber production, fish production, old-growth habitat and sensitive plants The future increases in public demand for all Forest uses project a need for informed and innovative management. Such management requires some questions to be asked and answered for better resolution of emerging issues, concerns, and opportunities

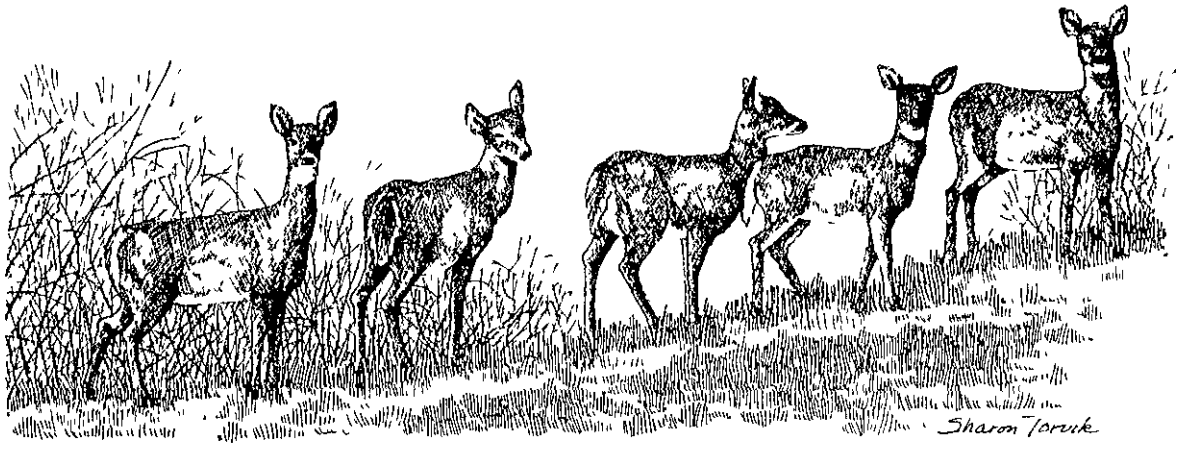


Table II-2. Summary of Projected Supply and Anticipated Demand

Outputs and Effects (Units of Measure)	Decade 1	2	3	4	5
Timber					
Sawtimber					
Projected Supply (MMCF)					
Current Direction 1/	<----------		30.1	----------	>
Maximum Timber Benchmark	<----------		34.1	----------	>
Forest Plan	<----------		28.4	----------	>
Anticipated Demand	Exceeds Supply.				
Old Growth					
Projected Supply (M acres)					
Current Direction 1/	393	343	283	229	193
Minimum Level Benchmark	<----------		393	----------	>
Forest Plan	371	327	271	221	194
Anticipated Demand	Exceeds Supply. of old growth.		Concern will increase with harvest		
Fisheries					
Anadromous Sport Fisheries (M WFUDS)					
Current Direction 1/	67	67	67	67	67
Maximum Fish Benchmark	65	71	73	73	73
Forest Plan	72	87	89	89	89
Anticipated Demand	67	78	92	108	126
Developed Recreational Capacity (1000 RVD's)					
Current Direction 1/	163	163	163	164	172
Maximum Roaded	163	163	163	164	172
Forest Plan	163	163	163	164	172
Anticipated Demand (Use)	122	128	134	141	148
Dispersed Recreational Capacity (1000 RVD's)					
Roaded (Roaded Natural and Semiprimitive Motorized)					
Current Direction 1/	785	785	1,256	1,256	1,256
Maximum Timber Benchmark	804	1,273	1,273	1,273	1,273
Forest Plan	804	1,276	1,276	1,276	1,276
Anticipated Demand (Use)	438	461	484	509	540
Unroaded (Semi-primitive Non-motorized and Primitive)					
Current Direction 1/	65	65	48	48	48
Maximum Unroaded Benchmark	66	53	53	53	53
Forest Plan	66	75	75	75	75
Anticipated Demand (Use)	34	36	38	40	42

Table II-2. Summary of Projected Supply and Anticipated Demand (Continued)

Outputs and Effects (Units of Measure)	Decade 1	2	3	4	5
Dispersed Recreational Capacity (cont.)					
Wild and Scenic Rivers					
Current Direction 1/	<----------		416	---------->	
Maximum Recreation	<----------		416	---------->	
Forest Plan	<----------		416	---------->	
Anticipated Demand (Use)	151	159	167	175	183
Sensitive Plant Preservation (acres of plant reserves)					
Current Direction 1/	<----------		6,432	---------->	
Minimum Level Benchmark	<----------		46,148	---------->	
Forest Plan	<----------		24,230	---------->	
Anticipated Demand	Increased concern as development infringes habitat.				
Scenic Vistas (M acres meeting or exceeding Partial Retention)					
Current Direction 1/	<----------		668	---------->	
Maximum Visuals Management Benchmark	<----------		668	---------->	
Forest Plan	<----------		653 2/	---------->	
Anticipated Demand	Increased concern as areas not managed for visual quality are cut.				
Wildlife Habitat					
Old-Growth Habitat Suitable for Spotted Owls (M acres)					
Current Direction 1/	371	329	269	215	179
Maximum Wildlife Benchmark	371	339	295	243	214
Forest Plan	371	327	271	221	194
Anticipated Demand	Concern will increase as old-growth stands are harvested.				
Habitat Capability for Blacktail Deer (percent change from present)					
Current Direction 1/	0	4	8	11	12
Maximum Wildlife Benchmark	-10	-11	-3	11	20
Forest Plan	-1	0	1	2	2
Anticipated Demand	1.3% annual increase				
Mineral Resources: Accessible Area with Low or Moderate Restriction (M acres)					
Current Direction 1/	<----------		787	---------->	
Maximum Minerals Benchmark	<----------		825	---------->	
Forest Plan	<----------		748	---------->	
Anticipated Demand	Not Available				

1/ "Current direction" estimates the outputs and effects of maintaining direction found plans and policies existing prior to development of this Forest Plan
2/ Includes 48 M acres of Administrative Study Areas in General Forest.

INFORMATION NEEDS

This section lists the information, inventory, and research needs that have been identified for the Siskiyou National Forest. This recognizes gaps in data or scientific knowledge that would be desirable to fill prior to preparation of the next Siskiyou National Forest Land and Resource Management Plan The concept used to organize and develop these needs recognizes that biological, physical, and social ecosystems are the foundation for the planning process. This list may expand if additional needs are identified through monitoring and evaluation (see Chapter V and Appendix D).

FOREST NEEDS·

1. Develop timber growth and yield functions specific to the Siskiyou National Forest or within the local physiographic area.

2 Obtain up-to-date reliable information on the application of uneven-aged management under local conditions.

3. Explore better methods of controlling the spread of Port-Orford-cedar root disease (*Phytophthora lateralis*) and other diseases which could threaten the viability of tree species

4. Expand acceptable methods of managing lands now classified as unsuitable due to potential for irreversible resource damage.

5. Derive successful methods to reforest land now classified as not reforestable within five years.

6. Improve understanding of interaction of soil, seedlings, and environment as it affects reforestation and site productivity.

7. Define more clearly the plant associations.

8. Determine the desired amount and distribution of seral stages to be maintained within each of the Forest's plant associations. Determine how the Forest should manage for biological diversity Use *Research Natural Areas for baseline information and monitoring*

9. Better determine wildlife use of and needs for snags and large woody material for the Siskiyou National Forest (includes territorial needs of woodpeckers and their snag requirements per unit area)

10. Derive on-Forest rates of woody material accumulation and decay, and better establish how that should influence our management

11 Document the spatial and temporal pattern of wildfire intensity as influenced by management activities

12 Record the influence of previous stand history, disturbance frequency and intensity, and rehabilitation efforts on rates and direction of succession

13 Explore and document mechanisms for managing soil organisms and the importance of these organisms to ecosystem development and stability, and long-term productivity

14 Determine the effect of current road construction and timber harvest practices on the rate of landslides

15. Determine the effect of landslides on long-term conifer growth, water quality, channel and riparian condition, fish habitat, and off-site cumulative effects

16. Complete better documentation of response of fish populations to activities.

17 Re-analyze fishery economics for southwestern Oregon

18 Determine over-wintering requirements for juvenile anadromous salmonids, what are important components of habitat, and what happens to distribution during high flows

19 Obtain better on-Forest and downstream information on baseline channel condition, water quality, and fish habitat Continue to obtain long-term trends in channel condition, water quality, and fish populations

20. Inventory key aquatic habitats for invertebrate species composition Special attention needs to be directed toward local caddisflies listed as candidate species for endangered and threatened status by the U.S. Fish and Wildlife Service Initiate research on insect species associated with endemic plant species, especially serpentine endemics

21 Develop additional and innovative monitoring methods which are sensitive and efficient for sampling wildlife populations, water quality, fish production, and site productivity (including concept analysis of featured wildlife species versus species richness).

22 Accurately assess the recreation demand for and use of non-game wildlife on the Siskiyou National Forest

23 More specifically determine the limiting factor(s) for black-tail deer and Roosevelt elk populations (include analysis of impacts of timber management activities)

24 More precisely determine habitat requirements (localized for the Siskiyou National Forest) of management indicator species which depend on direct land allocations pileated woodpeckers, pine marten, and spotted owls. Habitat area required per breeding unit needs to be better determined, habitat suitability indexes need to be developed

25. Determine the habitat requirements of wildlife species which may be used as indicator species in future planning cycles, may require direct land allocation, or may need special management (includes marbled murrelet, goshawk, black bear, fisher, and water ouzel)

26. Inventory endangered, threatened, unique, and sensitive animals, e.g., bald eagles, peregrine falcons, wolverines, Townsend's big-eared bat, Siskiyou Mountain salamander, western pond turtle, white-footed vole, western spotted frog, and Gold Beach and Pistol River pocket gophers.

27. Inventory and better define the habitat, environmental, and propogational requirements of sensitive plants.

28. Complete more thorough inventory of Botanical Areas

29 Study the function and more thoroughly understand the value of hardwood, serpentine, and riparian areas to the Siskiyou National Forest ecosystem. Develop logical management indicator species for each of the three habitat types

30 Obtain additional inexpensive techniques for measuring and monitoring the Forest, including satellite and shuttle technology.

REGIONAL NEEDS:

1 Increase understanding of biological diversity and how the Siskiyou National Forest functions as a part of the whole.

2 Better comprehend the importance of old-growth ecosystems on the biological diversity of the Pacific Northwest

3 More thoroughly understand the effects of forest management and wood residue management on long-term site productivity and nutrient cycling for tree growth, wildlife populations, and fish populations

4. More appropriately quantify the economics of fire fighting, fuel hazards, and risks commensurate with resource values

5. Derive methods to quantify smoke emissions more accurately

6 Obtain and/or consolidate additional data on the effectiveness of Best Management Practices

7. Obtain more information about utilizing wood as a substitute for non-renewable resources now used in construction and energy production



CHAPTER III

RESPONSE TO ISSUES, CONCERNS, AND OPPORTUNITIES

Chapter III

RESPONSES TO ISSUES, CONCERNS, AND OPPORTUNITIES

INTRODUCTION

This Chapter presents the response of the Forest Plan to the Planning Problems developed in the scoping process. A major step in the development of this plan was the identification of issues, concerns, and opportunities (ICO's) related to management of the Siskiyou National Forest. These ICO's were identified through citizen participation including public meetings, interagency coordination, personal contacts with individuals and groups, and the comments to the DEIS and Proposed Forest Plan. Appendix A of the FEIS describes the process used to summarize the original issues, concerns and opportunities into Planning Problems Chapter I of the FEIS describes how the Planning Problems have evolved since the publication of the DEIS.

Taken individually, complete resolution of a Planning Problem (within the physical limits of the Forest) is not particularly challenging. The physical capability of the Forest to resolve each Planning Problem was presented in the previous chapter. Collectively, however, complete resolution of all Planning Problems simultaneously is impossible. Tradeoffs and compromises must be made to remain in compliance with the Multiple-Use, Sustained-Yield Act of 1960 which provides that equal consideration be given to all competing resources

The complexity of resolving the often conflicting, sometimes mutually exclusive resource needs inherent to the Planning Problems, can best be understood by reviewing several chapters and appendices in the FEIS Chapter I and Appendix A present the identification of issues, concerns, and opportunities leading to the development of Planning Problems Existing physical conditions of the various environmental components are described in Chapter III of the FEIS, which also includes a discussion concerning the demands on those resources and the Forest's ability to satisfy demands. Changes as a result of the 1987 fires and the Silver Fire Recovery Project are also summarized in the FEIS. Information in the Forest Plan incorporates these changes. Chapter IV of the FEIS displays the environmental consequences for each alternative.

The response for each Planning Problem reflects the recommendations associated with Alternative S as presented in the accompanying FEIS and as modified in the Record of Decision A number of "tools" are utilized in resolution, including land allocations, capital investments and Standards and Guidelines The Forest is allocated to 14 Management Areas having specific requirements for each resource program Expenditures of money for capital improvements increase the physical capacity of a limited land base. Standards and Guidelines (both Forest-wide and specific to Management Areas) give direction to practices for protection of resources and are described in Chapter IV of this document Monitoring, the mechanism for ensuring compliance with the management direction, is described in Chapter V.

RESPONSE TO PLANNING PROBLEMS

1 How Much Timber Should the Forest Produce?

The Forest will be managed to provide an average of 28.4 MMCF plus a one percent estimate of salvable dead for a total of 28 7 MMCF (160 0 MMBF) of chargeable timber volume per year during the first decade Governed by a policy of nondeclining flow, average annual sale offerings will gradually increase in subsequent decades to reach the long-term sustained yield level of 48 8 MMCF Harvest should generally occur when timber stands reach culmination of mean annual increment (average age of 100 years on this Forest)

Timber production is supported by a land base of 510,000 acres (selected suitable), which includes 34,624 acres of standing hardwood Hardwood conversion is limited to no more than 7,500 acres per decade, subject to marketability Table III-1 displays the management areas that provide timber management opportunities

Table III-1 Acreage Selected as Suitable for Timber Production by Management Area

	Acres (1988 Inventory)	
Management Area Name	Management Area	Selected Suitable
Wilderness	232,495	0
Wild River	5,029	0
Research Natural Area	4,608	0
Botanical	16,275	0
Unique Interest	2,015	0
Backcountry Recreation	40,871	0
Supplemental Resource	26,921	0
Designated Wildlife Habitat	50,287	0
Special Wildlife Site	28,762	0
Scenic/Recreation River	10,317	8,000
Riparian	96,623	70,000
Prescription B - 11 Basins	(43,308)	
Prescription C - 7 Basins	(26,778)	
Minimum Level	(26,537)	
Retention Visual	9,861	7,000
Partial Retention Visual	133,931	105,000
General Forest	434,307	320,000
TOTAL	1,092,302	510,000

Projections from the FORPLAN model indicate that at least 212 miles of new road construction and 1,353 miles of reconstruction is needed to support the timber program in this next decade The pattern projected by the model generally underestimates the miles of road needed in the first two or three decades and over estimates the miles needed in subsequent decades (see discussion in Appendix B of the FEIS) Actual miles of road to be constructed and reconstructed in this first decade may be greater than the projection above

Appendix C lists the timber sales expected to occur during the first decade Probable location, timing, harvest method, and road construction requirements are listed for each sale area, but these may change as site-specific information is collected.

2. How Much Old-Growth Forest Should be Preserved?

The Forest will be managed to reserve 179,700 acres having mature and old-growth forest characteristics With the exception of the reserved areas, existing mature and old growth will be metered out to accommodate the harvest sale schedule The old-growth and mature inventory updated from 1984 to include reduction due to the 1987 Fires and Silver Recovery Project is about 418,000 acres Special groves of old growth, especially redwood, have been set aside to preserve some unique and magnificent examples for recreational and aesthetic enjoyment These old-growth groves total 1,321 acres The most significant of these areas are the 720 acres of redwood groves

Anticipated harvest activity during the first decade will reduce the amount to approximately 371,000 acres Except for isolated tracks, riparian, and other areas, most unprotected mature and old growth will be removed by the year 2089 (10th decade) Figure III-1 depicts the protected and non-protected mature and old-growth forest Table III-2 shows the Management Areas that preserve old-growth characteristics Management direction for land allocations beneficial to old-growth preservation is described in Chapter IV

Table III-2 Protected Acres with Old-Growth Timber Characteristics by Management Area (Includes Mature Stands)

	Acres (1988 Inventory)	
Management Area Name	Management Area	Protected Old Growth
Wilderness	232,495	83,726
Wild River	5,029	1,915
Research Natural Area	4,608	2,757
Botanical	16,275	3,563
Unique Interest	2,015	624
Backcountry Recreation	40,871	13,141
Supplemental Resource	26,921	14,879
Designated Wildlife Habitat	50,287	41,566
Special Wildlife Site	28,762	12,122
Scenic/Recreation River	10,317	169 1/
Riparian	96,623	41 1/
Retention Visual	9,861	64 1/
Partial Retention Visual	133,931	964 1/
General Forest	434,307	4,206 1/
TOTAL	1,092,302	179,737

1/ Old-Growth Stands Unsuitable for Timber Management

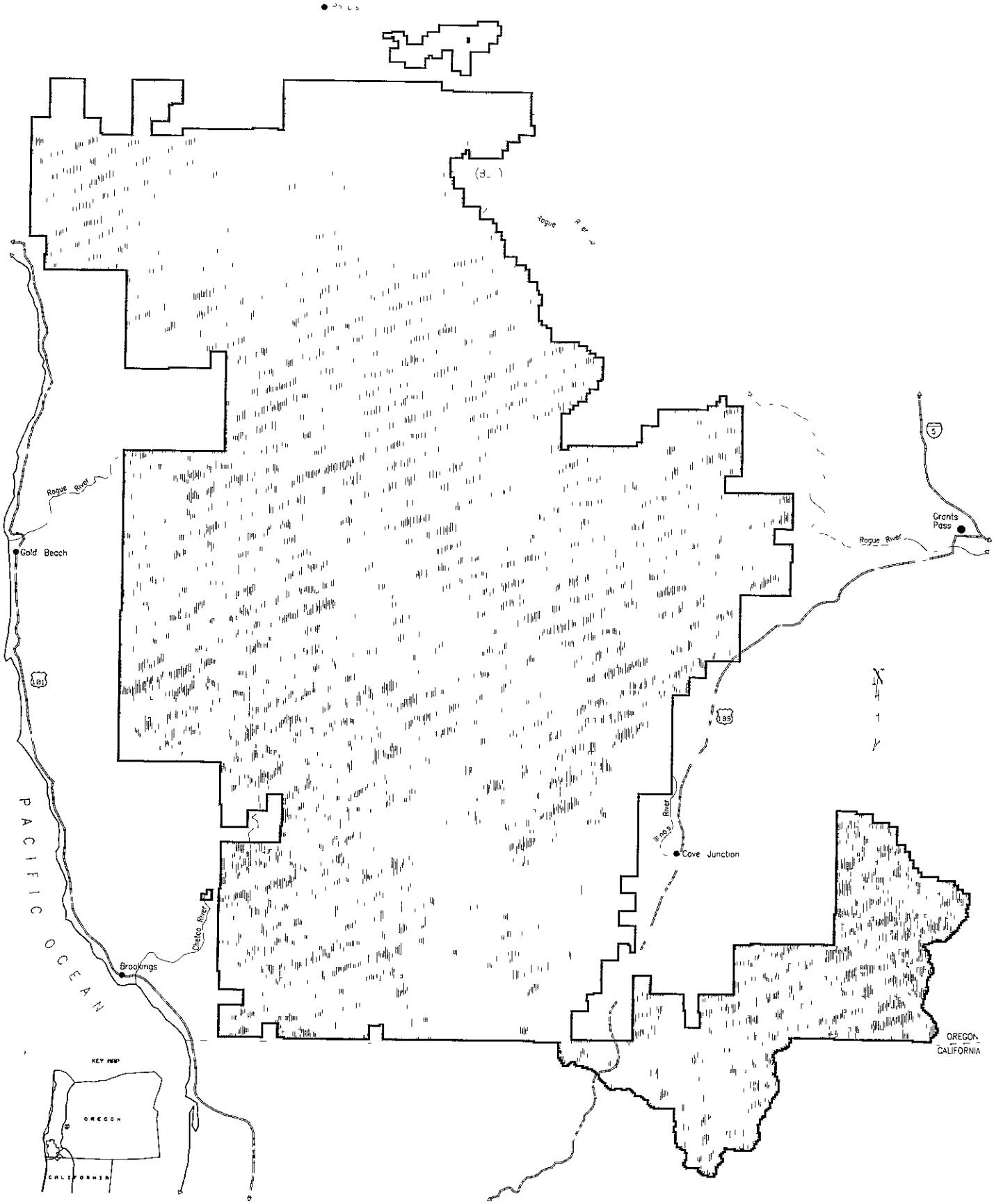


Figure III-1. Protected and Non-protected Mature and Old-growth Forest

3. How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?

Protection is given to fish habitat, water quality, and soil productivity by allocating 407,263 acres (37 percent of the Forest) to Management Areas 1-9 which limit site-disturbing activity and preclude programmed timber harvest. The balance of the Forest will be managed under the Standards and Guidelines which reflect a sensitivity to the maintenance of a healthy ecosystem

Potential impacts of timber harvest are mitigated by distributing activities through time and space. This is represented in the alternative design by limiting timber harvest in the model with constraints ranging from 7 to 17 percent per decade specific to each Planning Basin

Salmonid fish habitat is improved through (1) land allocations that minimize soil disturbance and maintain summer water temperatures, (2) riparian prescriptions which protect streamside areas, and (3) fish habitat improvement projects. Watershed conditions are improved in areas presently degraded. Watersheds currently in good condition will be maintained in good condition.

Riparian vegetation will be managed to maintain or improve water quality and fishery habitat. Vegetative disturbance within riparian areas suitable for the production of timber are controlled by either Riparian Prescriptions B or C. Prescription C is applied on the Elk/Sixes, Lobster, Lower Rogue, Indigo, Silver, Pistol, and Lower Chetco basins, and is designed to produce a two-degree decrease in summer water temperature by the third decade. Riparian Prescription B, designed to maintain existing water temperatures, is applied in the remaining basins Table III-3 shows how riparian habitat is affected by various Management Area designations.

A high level of capital investment is proposed Approximately $581,000 per year will be spent on fish habitat and watershed improvement projects

Standards and Guidelines (Forest Plan, Chapter IV) and accompanying Best Management Practices (Forest Plan, Appendix F) are specifically designed to maintain or protect water quality, site productivity, and fisheries. Areas which have active landslides or risk irreversible soil loss are designated unsuitable and have no programmed timber harvest. Many additional inner gorge areas which have high watershed sensitivity and Supplemental Resource Management Areas also have no programmed timber harvest.

Table III-3. Protected and Managed Riparian Vegetation by Management Area

	Acres (1988 Inventory)		
Management Area Name	Management Area	Riparian Protected	Vegetation Managed
Wilderness	232,495	39,271	0
Wild River	5,029	1,450	0
Research Natural Area	4,608	760	0
Botanical	16,275	2,088	0
Unique Interest	2,015	200	0
Backcountry Recreation	40,871	6,220	0
Supplemental Resource	26,921	8,690	0
Designated Wildlife Habitat	50,287	12,705	0
Special Wildlife Site	28,762	4,882	0
Scenic/Recreation River	10,317	0	2,604
Riparian	96,623	26,537	70,086
Prescription B - 11 Basins	(43,308)		
Prescription C - 7 Basin	(26,778)		
Minimum Level	(26,537)		
Retention Visual	9,861	0	0
Partial Retention Visual	133,931	0	0
General Forest	434,307	0	0
TOTAL	1,092,302	102,803	72,690

4. How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve and Enhance Wild and Scenic River Attributes?

A variety of Management Areas are designed to protect Wild and Scenic River attributes The existing Wild and Scenic Rivers (the Rogue, Illinois, North Fork Smith, Chetco and Elk Rivers) have their respective sections assigned to either Wild River or Recreation and Scenic Management Areas. Often these rivers corridors are overlapped by another Management Area with a more protective status, such as Wilderness. All viewsheds surrounding the rivers have a natural or near-natural appearance as lands are managed to meet their inventoried VQO's.

Both the North Fork Smith and Chetco Rivers have a 2-mile segment designated "Scenic," but these segments are carried as inventoried "Wild " In each case, the Forest reviewed classification and concluded that the areas meet "Wild" status. This Plan protects their inventoried values in the interim until further analysis or River Management Plans dictate another course of action. Table III-4 shows the number of acres within each Management Area which directly contribute to preservation and enhancement of Wild and Scenic River values.

Table III-4. Management Areas Directly Affecting Wild and Scenic River Attributes in Designated River Corridors

	Acres		
		Contributing to Wild and Scenic River Values	
Management Area Name	Management Area	Rogue/ Illinois	Chetco/Elk/ NF Smith
Wilderness	232,495	0	0
Wild River	5,029	1,894	2,379
Research Natural Area	4,608	1,291	1,153
Botanical	16,275	4,271	1,226
Unique Interest	2,015	160	53
Backcountry Recreation	40,871	16,975	4,907
Supplemental Resource	26,921	10,502	2,054
Designated Wildlife Habitat	50,287	4,230	7,706
Special Wildlife Site	28,762	5,308	3,087
Scenic/Recreation River	10,317	1,878	4,797
Riparian	96,623	7,623	14,178
Retention Visual	9,861	4,352	609
Partial Retention Visual	133,931	39,615	13,727
General Forest	434,307	7,183	53,567
TOTAL	1,092,302	105,282	109,443

5. How Should Sensitive Plant Resources be Managed?

The variety of sensitive plants on the Forest are managed through a number of land allocations designed with specific protection standards Each Management Area has Standards and Guidelines (in addition to Forest-wide Standards and Guidelines) designed to protect sensitive plants endemic to the Forest (Forest Plan, Chapter IV). Research Natural Areas and Botanical Management Areas provide special emphasis to the preservation of ecotypes and sensitive plants Four new Research Natural Areas, added to the three existing areas (for a total of 4,608 acres), result in the preservation of 25 ecotypes Nineteen new Botanical areas, combined with the three existing sites, total 19,632 acres (3,357 of these acres are overlapped by Management Areas 1 through 3, for a total of 16,275 acres in Management Area 4).

Table III-5. Sensitive Plant Distributions by Management Area

	Acres	Percent
Management Area Name	Management Area	Sensitive Plant Habitat
Wilderness	232,495	65
Wild River	5,029	75
Research Natural Area	4,608	65
Botanical	16,275	95
Unique Interest	2,015	65
Backcountry Recreation	40,871	50
Supplemental Resource	26,921	20
Designated Wildlife Habitat	50,287	5
Special Wildlife Site	28,762	15
Scenic/Recreation River	10,317	75
Riparian	96,623	35
Retention Visual	9,861	35
Partial Retention Visual	133,931	35
General Forest	434,307	35
TOTAL	1,092,302	--

6. How, and to What Extent, Should Forest Scenic Values be Protected through Visual Resource Management?

Visual management objectives are achieved by designing to meet VQO's on 658,502 acres. Twelve viewsheds (of 44 total) are governed by their respective inventoried VQO's, four of which encompass heavily used recreation travel corridors. Management of Forest scenic values are designed to complement high recreation use travel corridors and viewsheds. Seven high priority viewsheds (of the 12) managed to meet or exceed their respective inventoried VQO's are: the Upper Illinois, Rogue-Illinois, Oregon Caves, Highway 199, Game Lake, Bolan Lake, and Rough and Ready.

Table III-6 shows the number of acres in each VQO category by Management Area. Approximately 433,800 acres have an unmodified appearance (Preservation). While management activities are evident but visually subordinate (Partial Retention) on 150,168 acres, another 21,373 acres are managed where activities are not evident to the casual Forest visitor (Retention). The remaining area (486,961 acres) is assigned Modification where management activities may dominate the characteristic landscape, but resemble *naturally occurring patterns when viewed in the background.*

Table III-6. Visual Management Objectives by Management Area

	Acres				
Management Area Name	Management Area	Preservation	Retention	Partial Retention	Moderate/ Maximum Moderate
Wilderness	232,495	232,495	0	0	0
Wild River	5,029	5,029	0	0	0
Research Natural Area	4,608	4,608	0	0	0
Botanical	16,275	16,275	0	0	0
Unique Interest	2,015	2,015	0	0	0
Backcountry Recreation	40,871	40,871	0	0	0
Supplemental Resource	26,921	26,921	0	0	0
Designated Wildlife Habitat	50,287	50,287	0	0	0
Special Wildlife Site	28,762	28,762	0	0	0
Scenic/Recreation River	10,317	0	10,317	0	0
Riparian	96,623	26,537 1/	1,195	16,237	52,654
Prescription B - 11	(43,308)				
Prescription C - 7	(26,778)				
Minimum Level - 1	(26,537)				
Retention Visual	9,861	0	9,861	0	0
Partial Retention Visual	133,931	0	0	133,931	0
General Forest	434,307	0	0	0	434,307
TOTAL	1,092,302	433,800	21,373	150,168	486,961

1/ These areas do not have Preservation VQO's They are managed to preserve the natural character until facilities such as roads or campgrounds are constructed.

7 How Should Wildlife Habitats on the Forest be Managed?

The combination of assigned Management Areas and capital expenditures prescribed provide a wide range of effective habitat conditions capable of sustaining viable populations of all native and desired non-native vertebrate species Designated Wildlife Habitat Management Areas meet MR's for wildlife inhabiting mature and old-growth forest Special Wildlife Sites (Management Area 9), include approximately 15,000 acres of mature and old-growth forest habitat, which are not suitable for timber management They do serve, however, as "stepping stones" between a number of Designated Wildlife Habitat areas. In total, 179,737 acres of mature and old-growth forest wildlife habitat are maintained through the tenth decade.

The Forest will provide habitat for the following species

	Number of Habitat Areas (Decades)	
	2nd	5th
Spotted Owl	139	97
Pileated Woodpecker	604	384
Pine Marten	2,380	1,552

Table III-7 shows a variety of Management Areas that contribute to overall wildlife habitat diversity Standing dead trees (snags) in areas managed for timber provide habitat capable of sustaining at least 60 percent of the maximum population of cavity-nesting birds Approximately 53,995 acres of prime bald eagle and osprey habitat are provided along rivers and streams that have a protected status Approximately 46 percent of the Forest provides an adequate combination of cover and forage for deer to sustain an average herd of 28,500 animals for the first five decades

Capital investments for wildlife habitat improvements should result in higher carrying capacity for many species Approximately $364,000 per year are prescribed to complete an average of 328 structural improvements and treat about 1614 acres

Table III-7 Management Area Contributions to Selected Wildlife Habitat Conditions

	Acres (1988 Inventory)				Percent
Management Area Name	Management Area	Managed Deer/Elk Forage	Inventory Mature and Old-Growth Wildlife Habitat	Protect Suitable Bald Eagle /Osprey	Habitat Capability Woodpecker
Wilderness	232,495	0	83,726	34,165	100
Wild River	5,029	0	1,915	2,043	100
Research Natural Area	4,608	0	2,757	411	100
Botanical	16,275	0	3,563	1,125	100
Unique Interest	2,015	0	624	0	100
Backcountry Recreation	40,871	0	13,141	1,627	100
Supplemental Resource	26,921	0	14,879	6,191	100
Designated Wildlife Habitat	50,287	0	41,566	719	100
Special Wildlife Site	28,762	0	12,122	618	100
Scenic/Recreation River	10,317	8,000	169 1/	7,096	80
Riparian	96,623	70,000	41 1/	0	70
Retention Visual	9,861	7,000	64 1/	0	80
Partial Retention	133,931	105,000	964 1/	0	70
General Forest	434,307	320,000	4,206 1/	0	60
TOTAL	1,092,302	510,000	179,737	53,995	77

1/ Old-Growth Stands Unsuitable for Timber Management

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

Non-motorized Primitive and Semi-primitive recreation opportunities are provided principally through Backcountry Recreation and Wilderness Management Areas. Backcountry Recreation includes (1) Primitive and Semi-primitive recreation opportunities in non-motorized areas, and (2) Semi-primitive recreation opportunities in areas with some designated motorized use (4-wheel drive roads and motorbike trails).

Primitive and Semi-primitive recreational capacity are increased in the Backcountry Recreation and Wilderness by constructing 70 miles ($484,000) and reconstructing 24 miles ($110,000) of trail during the first decade Overall, 293,500 acres of unroaded Primitive and Semi-primitive recreation opportunities are provided Table III-8 shows the number of acres in each Management Area that provide unroaded Primitive and Semi-primitive recreational opportunities.

Table III-8. Acres of Primitive and Semi-primitive Unroaded Recreation Opportunities by Management Area

	Acres	
Management Area Name	Management Management Area	Unroaded Primitive/Semi-Primitive
Wilderness	232,495	232,495
Wild River	5,029	1,956
Research Natural Area	4,608	869
Botanical	16,275	0
Unique Interest	2,015	0
Backcountry Recreation	40,871	25,960
Supplemental Resource	26,921	3,700
Designated Wildlife Habitat	50,287	0
Special Wildlife Site	28,762	0
Scenic/Recreation River	10,317	0
Riparian	96,623	0
Retention Visual	9,861	0
Partial Retention Visual	133,931	0
General Forest	434,307	28,520
TOTAL	1,092,302	293,500

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Mineral exploration and development are facilitated by retaining 75 percent of the Forest (822,994 acres) in an accessible category. Approximately 91 percent of accessible acres (747,843 acres) have low to moderate restrictions which do not limit mining activities Approximately 9 percent (75,151 acres) have access restrictions in the high category that make many types of mining activity uneconomical. Appendix I, Table I-87 (S) displays the level of restriction affecting acres within each Management Area. Specific Standards and Guidelines affecting mineral exploration and development are defined in Chapter IV of the Forest Plan for each Management Area.

Table III-9. Level of Mineral Exploration/Development Restriction by Management Area

	Level of Restriction (Acres/1988 Inventory)				
Management Area Name	Management Area	Withdrawn	High	Moderate	Low
Wilderness	232,495	232,495	0	0	0
Wild River	5,029	5,029	0	0	0
Research Natural Area	4,608	2,000	2,608	0	0
Botanical	16,275	3,009	13,266	0	0
Unique Interest	2,015	128	1,887	0	0
Backcountry Recreation	40,871	4,312	0	26,421	10,138
Supplemental Resource	26,921	4,590	22,331	0	0
Designated Wildlife Habitat	50,287	2,127	0	48,160	0
Special Wildlife Site	28,762	1,378	27,384	0	0
Scenic/Recreation River	10,317	2,642	7,675	0	0
Riparian	96,623	0	0	96,623	0
Retention Visual	9,861	1,858	0	8,003	0
Partial Retention Visual	133,931	2,573	0	0	131,358
General Forest	434,307	7,167	0	0	427,140
TOTAL	1,092,302	269,308	75,151	179,207	568,636

CHAPTER IV

FOREST MANAGEMENT DIRECTION

Chapter IV

FOREST MANAGEMENT DIRECTION

INTRODUCTION

This chapter describes the long-range management direction for the Forest. This direction will guide the process for program development and budgeting so that the goals and objectives of the Plan can be realized. This chapter is divided into three sections The first includes a list of the Forest's goals, followed by a description of the desired future condition of the Forest, and the outputs and activities necessary to achieve the goals The second contains the Forest-wide management requirements which set the conditions that must be maintained as the goals are accomplished Last is the management area direction which indicates the management practices or prescriptions that will be applied to specific land areas

FOREST MANAGEMENT GOALS

The Forest Plan is designed to achieve the following Forest-wide goals The management objectives and direction in the subsequent sections are aimed toward achieving these goals.

The goals for the Siskiyou National Forest are to:

1. Provide a balance of resource management that will maintain a healthy Forest ecosystem, and help to supply local, regional and National social and economic needs.

2 Provide a sustained yield of resource outputs at a level that will promote the stability of local communities.

3 Maintain a healthy, diversified, and visually pleasing forest setting that enhances local tourism and provides an attractive visual backdrop to surrounding communities.

4. Fully implement the National Recreation Strategy through the development of partnerships with other local and federal agencies (e g , counties and states), and other groups and individuals Support local economic development strategies that focus on increased recreation and tourism

5. Recognize special areas and resources for their unique values and manage them to protect and perpetuate those values.

6. Provide diverse, high quality water and fish habitat capable of maintaining or enhancing populations of game fish species with emphasis on anadromous fish habitat

7. Maintain viable populations of existing native animal and plant species. Maintain or improve all existing seral stages of terrestrial and aquatic plant associations in a distribution and abundance to accomplish this goal.

8. Provide habitat to contribute to the recovery of threatened and endangered plant and animal species in accordance with approved recovery plans.

9 Recognize and promote the intrinsic ecological, social, and economic value of wildlife and wildlife habitat Provide sufficient quantity and quality of wildlife habitat to ensure diversified recreational use and public satisfaction.

10 Offer a wide range of dispersed recreation opportunities by providing recreational settings, access, facilities, and education necessary to meet public demand.

11 Protect and enhance identified, outstandingly remarkable values and free flowing condition of Wild and Scenic Rivers.

12. Protect the values and character of designated Wildernesses.

13 Provide firewood for personal use in a fair and equitable manner

14 Inventory and interpret significant prehistoric and historic cultural resources.

15 Plan, design, operate, and maintain a safe and economic transportation system to provide efficient access for the movement of people and materials involved in the use and protection of National Forest Lands.

16 Protect and enhance resource values through cost-effective fire and fuels management programs, emphasizing fuel treatment through the utilization of prescribed fire

17 Protect resource values through the practice of integrated pest management.

18. Facilitate mineral exploration and development while protecting surface resources and environmental quality

19. Meet or exceed state and Federal requirements which provide protection to the air, water, and cultural resources of the Forest.

20. Provide water of sufficient quality and quantity for local and downstream beneficial uses.

21. Maintain health and function of riparian ecosystems (including stream channel stability) for the protection or enhancement of riparian-dependent resources

22. Provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce.

23. Provide for biological diversity and long-term productivity by maintaining ecosystem function, maintaining large woody material, and minimizing adverse impacts to the soil resource.

24. Perpetuate Port-Orford-cedar as a functioning part of the Forest vegetation throughout its natural range and maintain it for economic and noneconomic uses.

DESIRED FUTURE CONDITION OF THE FOREST

The present condition of the Forest is detailed in Chapter III of the FEIS. As the Forest Plan is implemented, the condition of the Forest will change over time. This section summarizes the physical changes which are anticipated to result from carrying out planned management practices at two points in time: at the end of 10 years and at the end of 50 years (the RPA planning horizon).

THE FOREST IN 10 YEARS

At the end of the first decade, there will be a perceivable change in the overall character of the landscape within the Forest boundary. The landscape in the parts of the Forest managed for commodity production will be modified by new roads and harvest units. Sensitive viewsheds will be in a natural or near natural visual condition. By the end of the first 10 years, many of the unroaded areas allocated to General Forest objectives would be entered.

Areas with no timber harvest, such as Wilderness, Research Natural Areas, Botanical Areas, Supplemental Resource Areas, and dedicated habitats will remain essentially unchanged, modified only by natural processes.

Areas in those viewsheds undergoing identified rehabilitation work will be approximately 50 percent recovered.

The Project Opportunity Analysis system will be fully implemented for timber planning Areas with programmed timber harvest will have new harvest units distributed through the mature forest Existing harvest units and plantations will continue to develop through sapling and pole stages with some stands reaching large pole to small sawtimber size. Trees will be somewhat uniformly spaced and the species present will be representative of the natural diversity in the local areas

Opportunities for roaded recreation will increase. Recreational capacity will keep pace with demand as some new sites are developed and others are expanded. The National Recreation Strategy will be fully implemented, and the Forest will actively seek partnerships to accomplish a variety of recreation projects Access to wilderness areas will be enhanced by the construction and maintenance of several access trails.

Habitat to support threatened and endangered species will be protected in accordance with recovery plans Designated mature and old-growth habitat areas will remain essentially unchanged. Seral stages of terrestrial and aquatic plant associations will be provided in a distribution to maintain native and desired non-native plant and animal species and communities. Habitat for species favoring early seral stages will begin to be distributed through areas where timber harvest is programmed. New harvest units will continue to provide high quality forage for deer and elk. Riparian ecosystems in harvest areas would have been managed to maintain water quality and a diverse vegetative condition for the rich variety of wildlife utilizing riparian and aquatic areas.

Habitat for species utilizing dead or downed trees will be provided throughout the Forest. Snags and trees for replacement snags will be left in areas where timber harvest is occurring. Dead logs will be left on the ground for species utilizing such material as habitat and to provide woody material for nutrient cycling.

Salmonid rearing, spawning, and migration habitat capability will improve Forest wide. Streamside management prescriptions will maintain or lower summer water temperatures, with additional protection of the fisheries habitat occurring in designated Special Fisheries and Wildlife Habitat areas. Habitat improvement projects will increase habitat diversity and maintain stream channel stability.

Forest soil productivity will have been maintained. Water yield and quality will not be substantially altered.

Mineral development on the Forest in 10 years will increase. The most active mining activity will probably continue to be for gold, although interest in nickel-laterites and chromite areas may be increasing. Physical and biological impacts will have been minimized; however, short-term effects on water quality will continue to be a concern. New discoveries of minerals will bring additional demands for access into the unroaded portions of the Forest.

The principal access roads will be readily identifiable. They have paved or gravel surfaces and look suitable for passenger car use. Signs will assist travelers in finding their destination. Some roads will appear less inviting for use. These less inviting roads will look rough or primitive, but most will be available for use by the more experienced traveler in vehicles with high ground clearances. Continued road system development and improvement will be taking place in areas where resource development activities are planned. Some roads will be closed.

THE FOREST IN 50 YEARS

By the end of the fifth decade, there will be a very apparent change in the overall character of the landscape within the Forest boundary. The majority of roads needed for resource management will have been constructed The landscape in parts of the Forest managed for commodity production will have a heavily altered appearance. Sensitive viewsheds will have a natural or near natural appearance. Rehabilitation objectives in some areas of the viewsheds will have been realized and these areas will have returned to a more natural condition.

Areas with no timber harvest, such as Wilderness, Research Natural Areas, and Botanical Areas, would still remain essentially unchanged except for the effects of fire and the slow process of natural succession. Management activities will maintain or restore meadow areas and avert the encroachment by trees and shrubs.

Areas with programmed timber harvest will be a mosaic of stands of various sizes and ages Some mature stands would remain, but the majority would now be managed young stands ranging from freshly harvested units to plantations that have reached sawtimber size. The desired condition is a regulated forest where the stands exist in age and size class proportions and grow at rates such that a high level of yield can be sustained Trees will be somewhat uniformly spaced and the species present will be representative of the natural diversity in the local areas

Habitat to support threatened and endangered species will be protected in accordance with recovery plans Designated mature and old-growth habitat areas will remain essentially unchanged, although some substitution of areas may have occurred Contiguous mature and old-growth forests will generally be limited to Wilderness, Research Natural Areas, Botanical Areas, Supplemental Resource Areas, Backcountry Recreation Management Areas, Wild River Corridors, Unique Interest Areas, Designated Wildlife Sites, and Designated Wildlife Habitats

Habitat for species favoring early seral stages will be distributed throughout areas where timber harvest is programmed. Deer and elk habitat will be approaching a more balanced state as harvest units are distributed through time and space. Riparian ecosystems in harvest areas would have been managed to maintain water quality and a diverse vegetative condition for the rich variety of wildlife utilizing riparian areas.

Habitat for species utilizing dead or downed trees will be provided throughout the Forest. Snags and trees for replacement snags will be left in areas where timber harvesting has occurred. Dead logs will be found on the ground in various stages of decay providing habitat for species utilizing such material as woody debris for nutrient cycling

Salmonid rearing, spawning, and migration habitat capability will be maintained at a fairly constant level after the second decade Habitat improvement work will be done primarily to replace failing structures and maintain the gains achieved in earlier decades.

Forest soil productivity will have been maintained. Water yield and quality will not be substantially altered.

Mining for gold will continue to be important in 50 years with increased activity in nickel-laterites and chromite areas Protection or reclamation of surface resources will continue to be important. Biological impacts will be kept to acceptable levels through improved mining and reclamation technology and competent administration of the activity. Major access requirements needed for the development of minerals on the Forest will have been completed

The principal access roads will be readily identifiable. They have paved or gravel surfaces and look suitable for passenger car use. A few roads may have State Highway designations Signs will assist travelers in

finding their destination. More roads appear less inviting for use. These less inviting roads will look rough or primitive, but most will be available for use by the more experienced traveler in vehicles with high ground clearances. Road system development will be nearly complete. Continued improvements will be taking place in areas where resource development activities are planned. More roads will be closed.

By the end of the fifth decade, nearly 90 percent of the planned Forest development road system will be in place and providing efficient travel into and through the Forest. All of the arterial and collector road system will be complete, while some local roads will be needed to complete the overall system. The majority of the 1,000 miles of new Forest development roads built during the last five decades to utilize the timber resource will have been classified as local road facilities.

Because of the continuing need to protect watershed conditions, provide for wildlife needs, and control costs, a portion of the road system will be managed in a self-maintaining state with no vehicle traffic planned. Some of these self-maintaining roads will be in the process of being opened to accommodate future cycles of timber management activities

FOREST MANAGEMENT OBJECTIVES

PROPOSED OUTPUTS

This section projects the future outputs and resource activities expected to meet the previously stated goals and desired future conditions.

The projected Forest outputs (Table IV-1) are average values for a year's activities. Actual outputs for individual years may vary from the projected outputs due to fluctuations in conditions, funding, personnel, and priorities.



Table IV-1. Average Annual Forest Outputs

Output	Activity Code	Units	Decade 1st	Decade 2nd	Decade 5th
RECREATION					
Developed Recreation Use	AN122	M RVD's	122 0	128 0	148 0
Dispersed Recreation Use	AN122-1	M RVD's	473 9	499 0	583 1
Wilderness Use	AW1	M RVD's	22 7	23 6	27 4
Developed Site Construction	AN22	Sites/Decade	9 0	8 0	3 0
Trail Construction	AT22	Miles	22 8	4 1	0 0
Trail Maintenance	AT23	Miles	250 0	280 0	290 0
WILDLIFE AND FISH					
Wildlife Structural Improvement	CW221	Structures	328 0	328 0	328 0
Wildlife Nonstructural Improvement	CW222	Acres	1,614 0	1,614 0	1,614 0
Fish Structural Improvement	CF221	Structures	480 0	480 0	480 0
Fish Nonstructural Improvement	CF222	Acres	60 0	60 0	60 0
Wildlife Use	CW1	M WFUD's	96 9	99 6	107 1
Fish Use	CF1	M WFUD's	72 3	86 8	88 7
Anadromous Fish Commercial Harvest	CF121	M Pounds	1,044 0	1,222 0	1,249 0
T&E, Sensitive Wildlife & Plants					
Structural Improvement	CT221	Structures	16 0	16 0	16 0
Nonstructural Improvement	CT222	Acres	1,160 0	1,160 0	1,160 0
RANGE					
Range Resource Operations	DN1	M AUM's	3 0	3 0	3 0
Noxious Weed Control	DN24	Acres	50 0	50 0	50 0
TIMBER					
Sawtimber (Green)	ET114	MMBF	158 4	N/A	N/A
		MMCF	28 4	28 4	28 4
Salvage (Dead)	ET114	MMBF	1 6	N/A	N/A
		MMCF	0 3	0 3	0 3
Allowable Sale Quantity (ASQ)	ET114	MMBF	160 0	N/A	N/A
		MMCF	28 7	28 7	28 7
Timber Sale Program Quantity (TSPQ)		MMBF	175 9	N/A	N/A
		MMCF	31.5	31 5	31 5
Final Harvest	ET1	Acres	4,719 0	4,729 0	4,208 0
Commercial Thinning	ET12	Acres	0 0	61 0	5184.0
		MMCF	0 0	0 1	6 9
Fuelwood	ET123/4	M Cords	47 6	46 5	33 8
Reforestation	ET24	Acres	6,222 0	6,594 0	6,795 0
Timber Stand Improvement	ET25	Acres	5,357 0	7,723 0	10,177 0
SOIL AND WATER					
Watershed Improvement	FW22	Acres	479 0	483 0	502 0
MINERALS					
Proposals, Leases and Applications	GM114-2	Cases	335 0	335 0	335 0
TRANSPORTATION FACILITIES					
Road Construction	LT222	Miles	21 7	21 1	19 7
Road Reconstruction	LT223	Miles	134 6	135 5	137 1
Road Maintenance	LT23	Miles	2,753 0	2,968 0	3,580 0
FIRE MANAGEMENT					
Natural Fuels Treatment	PF24	Acres	400 0	400 0	400 0
Activity Fuels Treatment	PF25	Acres	3,539 0	3,571 0	5,230 0

RESOURCE ACTIVITIES

This section summarizes the various resource programs which are integrated into an overall Forest management program by this plan. The narratives describe the activities necessary to produce the outputs displayed in Table IV-1. These planned activities (listed in detail in Appendix B) will be the foundation for developing the Forest's annual budget proposal and program of work

RECREATION

The Siskiyou National Forest has the ability to provide recreation experiences across the range of the Recreation Opportunity Spectrum. The Forest received considerable comment on all aspects of recreation after the publication of the Draft Forest Plan. Increased emphasis has been placed on the Recreation program, the focus of which will be toward meeting the needs of the recreating public (primarily through facilities construction) and toward working with four Southern Oregon Counties to assist them in developing their Economic development goals. These goals are based on the development of the Recreation/Tourism industry. The Forest program will emphasize the development of the National Recreation Strategy, Developed Recreation, Dispersed Recreation, Wilderness, and Wild and Scenic Rivers. Expected outputs for Developed, Dispersed and Wilderness recreation are summarized in Table IV-1.

The recreation capital investment schedule for the first five years (shown in Appendix B) includes:

1. Construction, reconstruction, or rehabilitation of 17 developed recreation sites.
2. Construction or reconstruction of approximately 114 miles of trails, trailheads, and bridges in the existing wilderness, backcountry recreation, and other areas of the Forest
3. Maintenance of the existing (453 miles) trail system and additional funding required as additions to the system are added.
4. Development of Management Plans for the Elk, Chetco, and North Fork Smith Wild and Scenic Rivers.

The Recreation Information Management (RIM) inventory will be updated annually to monitor levels and types of recreation use on all areas of the Siskiyou National Forest All sources of information will be used to gather data for the RIM report, including: trailhead registration boxes; river registration; permits; and employee or public observation. Monitoring in all areas of the Recreation program will insure maintenance of the recreation settings that are necessary for the high quality recreation opportunities offered in all areas of the Forest.

National Recreation Strategy

This program focuses on the establishment of partnerships in developing the Recreation Resource. Toward this end the Forest has developed a partnership involving four Southern Oregon Counties (Josephine, Jackson, Curry, and Douglas), the State of Oregon, four National Forests (Siskiyou, Rogue, Umpqua, and Winema), and two Bureau of Land Management Districts (Medford and Roseburg). The partnership has embarked on the initial phase of the program which involves marketing Southern Oregon recreation opportunities through the development of an interactive video system and subregional recreation map. Subsequent phases will focus on project development at various levels.

Developed Sites

Public comments centered on the continued availability of developed recreation sites. The developed sites capital investment program has been increased over that identified in the Draft Forest Plan. The program will emphasize the rehabilitation or upgrade of existing sites to modern standards and the construction of nine new recreation sites within the first decade of the planning period. In addition, maintenance funding

has been increased so that all sites will be maintained a full level Additional new developed sites can be constructed as the need arises in the future.

Dispersed Recreation

Motorized Recreation opportunities are expected to increase over current levels as new roads are built There will also be an increase in Semi-Primitive (Motorized and Non-motorized) recreation opportunities due primarily to allocations to Backcountry Recreation Management (108,000 acres). Portions of the area will be open to motorized uses (primarily ORV's) while the remainder would be closed to motorized uses and be accessible only by foot, horse, or mechanized vehicles (mountain bicycles) Increased emphasis is being given to the construction of facilities near local communities Briggs Valley equestrian trails and the Page Mountain Sno Park are examples

Wilderness

The Forest contains two Wildernesses, the Kalmiopsis and Grassy Knob, and portions of the Wild Rogue, Red Buttes, and Siskiyou. The five designated Wildernesses total 232,495 acres of National Forest Land No additions to the Forest Wilderness system are proposed in this plan.

Goals for Wilderness management include the implementation of Management Plans that emphasize the nondegradation of the Wilderness resource while providing for Primitive and Semi-primitive recreation opportunities. Development within the Wildernesses includes a modest level of trail construction and reconstruction in the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses Trail construction will focus on the development of loop systems to provide access, disperse recreation use, and add diversity to Wilderness recreation experience Existing trail systems will be fully maintained every other year (one-half the system will be maintained each year). Trailheads will be upgraded to modern standards and signing will be provided to insure public safety.

Wilderness management direction is described under Management Area 1. Management Plans for the Kalmiopsis, Wild Rogue, and Grassy Knob Wildernesses are located in Appendix A.

Wild and Scenic Rivers

The Forest is best known for its Wild and Scenic River System. The Rogue Wild and Scenic River was one of the original eight rivers designated in 1968. The Illinois Wild and Scenic River was designated in 1984. Existing Management Plans for these rivers will not be affected by the implementation of this Forest Plan Recently (October, 1988), the Elk, Chetco, and North Fork Smith Rivers were designated as Wild and Scenic. Management Plans will be developed for these rivers during the planning period. The management plan for the Rogue Wild and Scenic River is scheduled for review (and possible revision) upon completion of the Forest Plan.

Management of the designated Wild and Scenic Rivers will emphasize the maintenance of the natural/near natural character of the river corridors and the continued availability of a high quality recreation experience that is described in the goals and objectives identified in each of the river management plans.

Trails

Trail Management Objectives will be developed for all trails included in the Forest Trail System These Management Objectives will be used to identify the maintenance level required for each of the Forest system trails. The goal will be to fully maintain one-half of the Forest Trail System annually to the standards identified. Annual inspections of all trails will identify trail maintenance needs

VISUAL RESOURCES

The Forest will implement a program of Visual Resource Management that will emphasize the maintenance of the natural or near natural character of the landscape within the viewsheds adjacent to heavily recreation travel routes or use areas All National Forest lands are assigned a Visual Quality Objective ranging from Preservation (no programmed harvest) to Modification (General Forest). Forest lands within sensitive viewsheds are managed under the Retention and Partial Retention Visual objectives which provide for timber harvest at constrained levels and emphasize the maintenance of the existing character of the Forest landscape. In addition, the existing character of the landscape will be retained on approximately 407,000 acres allocated to Management Areas 1 through 9 which are managed under the Preservation Visual Objective. Visual allocations include:

Preservation	433,800 acres
Retention	21,373 acres
Partial Retention	150,168 acres
General Forest (Modification)	486,961 acres

CULTURAL RESOURCES

The cultural resource program will be fully integrated with other resource management activities. Cultural resource surveys will precede all ground-disturbing projects. All sites located during these surveys will be documented in accordance with Regional standards. The impacts to all significant cultural resources will be mitigated, as set forth in the National Historic Preservation Act of 1966.

Over the next decade, the Forest plans to inventory an average of 26,500 acres annually in support of the timber program and approximately 3,750 acres for landownership adjustments, recreation, minerals, wildlife, range, fire, engineering, watershed, and special cultural resource projects Areas not impacted by resource projects (Wildernesses, withdrawals, and General Forest areas not subjected to disturbance) require inventory for completion of the Forest data base. These inventories will be conducted according to the following priorities.

1. Areas which are being impacted by natural processes or intensive public use.
2. Areas with reported but unverified sites.
3. High probability areas which are currently undisturbed and are unlikely to be disturbed in the near future.

Formal site evaluations will also be carried out for potentially National Register eligible sites located outside project areas. These will continue at a rate of approximately five sites annually.

Data recovery projects, undertaken as mitigation procedures for adverse impacts to prehistoric sites are expected to average one per year (the current average) during the planning period Approximately three documentation projects, serving as mitigation measures for adverse impacts to historic sites will be carried out over the next decade.

Enhancement projects will be undertaken at a rate of approximately seven per year. Some of these projects will be funded through the cultural resources capital investment program (Appendix B, Table B-9). Others may be funded through partnerships with states, counties, and the private sector The increase in the number of these projects is a result of stronger Agency emphasis on the enhancement and interpretation of cultural resources.

Protection activities (including stabilization, restoration of resource damage, and law enforcement) are expected to increase as the site data base grows. Cultural resource plans prepared for enhancement, research, protection, and interpretation will average five per year The Forest cultural resource overview and the inventory plan will be updated approximately once every five years, to incorporate new data

FISH, WILDLIFE, AND SENSITIVE PLANTS

Habitat needed to support viable populations of various fish and wildlife species, including threatened, endangered and sensitive species, is discussed in the following narrative. Forest-wide Standards and Guidelines and land allocations for fish, wildlife, and sensitive plants are listed later in this chapter.

Fish Habitats

The Forest's fisheries program focuses on both administrative and improvement goals. There are currently two Basin Plans (Chetco and Winchuck Rivers) in effect which guide management activities Priority is being given to writing such plans for the rest of the Forest's streams. Central to this effort will be the completion of detailed habitat and population assessments using survey methods adopted for the Region (Hankin and Reeves 1986). The Forest will coordinate its efforts with the Oregon Department of Fish and Wildlife, who is also in the process of generating fisheries basin plans

Maintenance of present fish habitat capability focuses on protecting existing high quality salmonid habitat by minimizing adverse impacts from proposed management activities or mitigating effects from past activities. Habitat capability information is utilized in planning road construction, timber harvest, and other projects in order to reduce the potential impacts from excess sedimentation, or water temperature increases. A key factor in the maintenance of Forest salmonid resources is management of riparian areas to benefit fish. Coordinating with other Forest resource uses will continue to be a priority for Siskiyou fish biologists Management direction supporting the maintenance of fish habitat is contained in the Soil and Water section of the Standards and Guidelines, and in Management Areas 7 and 11.

An aggressive fish habitat improvement program is in response to public desires and realization that National fishing demand is expected to nearly double in the next five decades. Increased National, Regional and Forest emphasis on the fisheries program was realized in 1987 with development of the "Rise to the Future Fisheries Program." Through this program a strengthening of partnerships with States, other Federal agencies, Tribal governments, conservation groups and publics is occurring in fish habitat management.

Fish habitat improvement project work will continue with construction of approximately 480 instream structures per year. Most of the work will be performed in areas where access is available, hydrological conditions are favorable, and preliminary surveys have identified good potential for enhancement benefits Few or no structures will be installed in areas that have minimal anticipated benefits (because of excellent pre-existing habitat conditions, or poor water quality condition from off-Forest activities). This work should result in an overall net increase in adult fish available for both sport and commercial harvest, an anticipated increase of 13,360 Wildlife/Fish User Days (WFUD's) and 164,000 commercial pounds annually.

The prime emphasis for fish habitat will continue to be good land management practices that will not degrade from existing fish habitat capability. The monitoring requirements for fish habitat are outlined in Chapter V and Appendix D

Wildlife Habitats

Forest management efforts consider all native vertebrate species. Several groups of species have special management needs These groups include: (1) species dependent on specialized habitat conditions; (2) species requiring early, mature, or old-growth forest conditions for optimum habitat; (3) popular game species; and (4) endangered, threatened, or sensitive species.

Seven forest wildlife species, and one group, have been selected as management indicator species. An indicator species represents all other wildlife which utilize the same habitat type. Indicator species act as barometers for the health of various habitats and will be monitored to quantify habitat changes predicted by implementation of this Plan.

Management Indicator Species - Wildlife

Species	Habitat Represented
Bald eagle	Habitat corridors along major rivers
Osprey	Habitat corridors along large rivers
Spotted owl	Old growth forest
Pileated woodpecker	Mature forest
Pine marten	Mature forest
Black-tailed deer	Early successional forest stages
Roosevelt elk	Early successional forest stages
Woodpeckers	Wildlife trees (snags)

Habitat necessary for maintenance of viable populations of the three indicator species dependent on mature and old-growth forest habitat is protected under Management Area 8, Designated Wildlife Habitat. This Management Area defines the minimum habitat requirements for each of these species. During the planning period (first decade), the Forest will maintain habitat capability for 139 pairs of spotted owls, 604 pairs of pileated woodpeckers, and 2,380 reproductive units of pine martens

A Forest-wide management plan for Roosevelt elk and black-tail deer will be prepared within three years after implementation of the Forest Plan. The management plan will identify where deer and elk management is the primary focus; provide guidance for third to fourth order watersheds, and be developed in cooperation with state fish and wildlife agencies Further details are described in Forest-wide Standard and Guideline 4-11.

Monitoring of indicator species populations is detailed in Appendix D (a summary appears in Chapter V). Monitoring for deer and elk will determine whether suggested State wildlife objectives are being met Inventories are planned for sensitive animals and plants (see Resource Element CT121(A) in Appendix D, and Capital Investments for CT and CW in Appendix B).

Special wildlife habitat sites and botanical sites which are important components of overall habitat diversity are addressed under Management Area 9. These sites include meadows, dispersed old growth sites, springs and swamps, lakes and ponds, hardwood sites, rock sites, botanical sites, areas with special values for wildlife, and important habitats for elk, osprey, and band-tailed pigeon. Direction for inventory of new special sites is listed under Forest-wide Standards and Guidelines. The unique characteristics of these habitats will be protected or enhanced

Threatened, Endangered, and Sensitive Species

The bald eagle is the only Federally-listed Threatened species on the Forest. The eagle is listed as Endangered on the California portions of the Forest, but no occupied habitat has been identified there. Annual inventories for eagle habitat and occupancy are conducted in cooperation with Oregon Department of Fish and Wildlife and the National Wildlife Federation. Identified eagle habitat will be protected and managed in accordance with the Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986).

The American peregrine falcon is the only Federally-listed endangered species on the Forest. Falcon use has been confirmed at several sites since publication of the draft Forest Plan. Habitat for peregrines will be managed according to the Pacific Coast Recovery Plan for the American Peregrine Falcon (USDI Fish and Wildlife Service 1982). Two management plans have been written to better define management goals and methods. During the planning period, a comprehensive Forest-wide habitat inventory for peregrine falcons will be completed and a management plan will be written.

Sensitive wildlife species in Oregon include: the northern spotted owl (discussed above under indicator species); Siskiyou mountain salamander; Western pond turtle; white-footed vole; California wolverine; and Townsend's big-eared bat Sensitive species in California, in addition to the spotted owl and wolverine,

include northern goshawk; willow flycatcher, fisher; and pine marten. Guidelines for management of sensitive wildlife are included in the Forest-wide Standards and Guidelines.

There are 64 sensitive plant species on the Forest. Thirty of these species have not been located on the forest but may occur here. Another ten species are candidates for listing as sensitive (nine of these are known to be on the Forest). Habitat is managed to ensure that the species do not become threatened or endangered because of management activities. Protection of known or potential populations of sensitive plants is accomplished through Forest-wide Standards and Guidelines and land allocation Land allocations include Research Natural Areas and Botanical Areas described under Management Areas 3 and 4, respectively

All proposed projects that involve significant ground disturbance and have the potential to alter habitat of sensitive wildlife or plant species will be evaluated to determine if any sensitive species are present, in conformance with direction in FSM 2770, Threatened, Endangered and Sensitive Plants and Animals. Where such species are present, field evaluation data will be used to determine mitigation measures consistent with Forest program goals. A Forest-wide inventory for sensitive plants will be initiated during the planning period to provide baseline data for management activity planning.

RANGE

The Forest currently administers 11 cattle allotments totaling 3,246 AUM's, of which 1,613 AUM's are actually grazed Three of the allotments are inactive. In the future, the range program will center on administration of existing permits and allotments, with all Allotment Management Plans to be updated during the first decade

Concern over the spread of noxious weeds surfaced in 1984 when State, Federal, County, and private agencies and individuals entered into a formal Cooperative Resource Management Program (CRMP) agreement to deal with the spread of noxious weeds. The Forest's response to that agreement was preparation of a Noxious Weed Management Plan (1986) which guides the program on the Siskiyou. Goals include prevention or control of spread of noxious weeds, with gorse, tansy ragwort, and knapweeds receiving priority. Control projects utilizing biological or mechanical methods presently affect about 50 acres annually on the Forest. Concern over noxious weeds is expected to grow in the future and will demand increasing allocation of Forest resources to meet obligations under the terms of the CRMP agreement

TIMBER

Information necessary for timber planning implementation includes land suitability, allowable sale quantity, and planned sale and harvest methods Net acreage of the Forest is 1,092,302 acres. With implementation, the Plan will manage 510,000 acres of selected suitable lands for some form of timber outputs (see Table IV-2).

Timber harvest is scheduled from the selected suitable lands at the rate of 28.4 MMCF (158.4 MMBF) per year. This quantity was calculated by using the FORPLAN model. The Siskiyou National Forest is characterized as a "deficit" inventory Forest when examining the scheduling of potential timber harvest. The amount of existing mature and old-growth timber volume is insufficient to begin harvesting at the long-term sustained yield level and maintain that level To follow a nondeclining-flow schedule, the existing inventory in mature stands must be metered out until regenerated stands become available for harvest

The Allowable Sale Quantity (ASQ) is 28 7 MMCF for the first eight decades This includes a one percent estimate for chargeable salvage volume. As younger stands become merchantable, the amount of commercial thinnings increase, and the growth levels exceed harvest levels (Figure IV-1). The ASQ increases to 30 0 MMCF for the ninth decade and reaches the long-term sustained yield of 47.5 MMCF in

yield of 47.5 MMCF in decade 10. In general, existing mature and over-mature stands are scheduled for harvest over the first seven decades, or until the regenerated stands reach rotation age

The ASQ to be harvested within the first decade is allocated among the General Forest, Riparian, Retention Visual, Partial Retention Visual Management Areas (Table IV-3). The amount programmed for harvest in the Scenic/Recreation River Management Area is incidental and not included in Table IV-3. A more detailed presentation of the planned timber harvest can be found in Appendix C. The listed acreages and volumes are yearly averages for the decade. Individual years may vary considerably from the average due to adjustments based on field reconnaissance and individual sale conditions. Timber outputs will be monitored and any significant deviations from those projected will trigger an analysis to determine whether a change is needed.

Two categories of land have potential to contribute to ASQ that were not utilized by FORPLAN; the separate suitability component (SSC) lands, and those lands currently stocked with hardwood species The Forest Plan contains the flexibility to manage these lands under changing market conditions without amendment or revision. The SSC lands do not have programmed timber harvest, but site specific opportunities may be scheduled in accordance with Forest-wide Standard and Guideline 6-2 (7) There is considerable variation in the vegetation conditions existing on these sites. The individual site evaluation will provide the flexibility to take advantage of opportunities such as overstory removal harvests that require low investment

Lands currently stocked with noncommercial species or hardwoods have a negligible contribution to ASQ in the FORPLAN model, but are included in the suitable land base. Bringing these lands into production through the harvest of hardwood stands and replanting with conifers does have the potential to increase future timber outputs, and supply fuelwood or other products in the short term. Any actual treatment on these acres will depend on site-specific conditions and market demand for hardwoods (see Forest-wide Standard and Guideline 6-13).

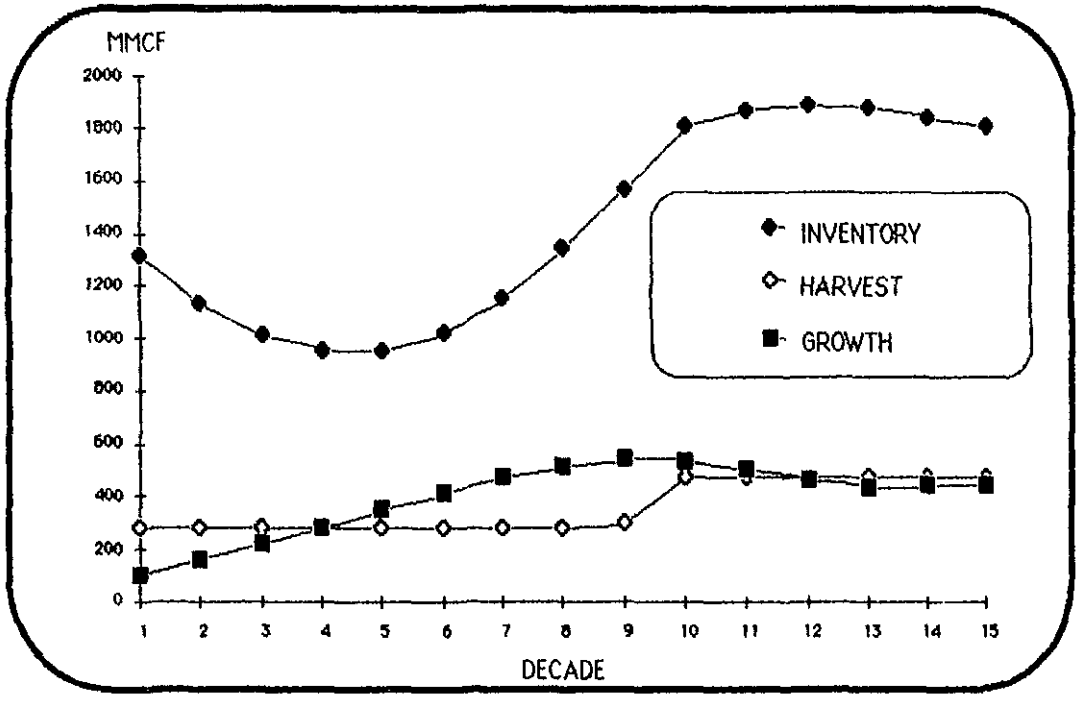


Figure IV-1. Timber Harvest Schedule

Table IV-2 Land Availability and Suitability Summary

Land Category	Acres			
	Withdrawn 1/ or Physically Unsuitable	Tentatively Suitable for Timber Management	Suitable for Timber Management	Total
LAND STATUS				
TOTAL NATIONAL FOREST AREA				1,162,030
Other Ownerships	69,728			
NET NATIONAL FOREST AREA				1,092,302
LAND SUITABILITY				
Non-Forest Land				
Water	1,570			
Administrative Sites/Roads	15,367			
Less than 10% Tree Cover	38,217			
Forested Lands				
Withdrawn from Timber Production 1/	240,548			
Irreversible Soil Damage	25,639			
Regeneration Difficulty	155,251			
Tentatively Suitable Forested Land		615,710		
Separate Suitability Component (Growing <20 Cu Ft /Acre/Year)		(18,336)		
TOTAL	476,592	615,710		1,092,302
LAND ALLOCATIONS IN THIS FOREST PLAN				
MANAGEMENT AREA (MA) LAND ALLOCATIONS				
1 - Wilderness	232,495			232,495
2 - Wild River	5,029			5,029
3 - Research Natural Area	3,172	1,436		4,608
4 - Botanical	11,461	4,814		16,275
5 - Unique Interest	1,112	903		2,015
6 - Backcountry Recreation	24,428	16,443		40,871
7 - Supplemental Resource	9,983	16,938		26,921
8 - Designated Wildlife Habitat	20,843	29,444		50,287
9 - Special Wildlife Site	19,057	9,705		28,762
10 - Scenic/Recreation River	2,703	7,614	(8,000)	10,317
11 - Riparian	18,244	78,379	(70,000)	96,623
12 - Retention Visual	1,978	7,883	(7,000)	9,861
13 - Partial Retention Visual	27,760	106,171	(105,000)	133,931
14 - General Forest	98,327	335,980	(320,000)	434,307
TOTAL	476,592	615,710	(510,000)	1,092,302
Tentatively Suitable Land Allocated to Other Resource Management (MA 1-9)		79,683		
Tentatively Suitable Land Not Selected due to Cost Efficiency (MA 10-14)		26,027		

1/ Withdrawn from Timber Production under existing (1989) Congressional or Administrative designations (Wilderness, Wild River, Research Natural and Botanical Areas)

Table IV-3 Proposed and Probable Harvests and Stand Treatments

Management Area (MA)	Unit of Measure	Decade 1 (Proposed)	Decade 2 (Probable)
Riparian (MA 11)			
Selection Harvest	MMCF	1 4	1 6
Retention Visual (MA 12) 1/			
Commercial Thinning	MCF	--	0 1
Regeneration Harvest	Acres	28 0	28 0
Partial Retention Visual (MA 13) 1/			
Commercial Thinning	MMCF	--	0 4
Regeneration Harvest	Acres	786 0	786 0
General Forest (MA 14) 1/			
Commercial Thinning	MMCF	0 8	1 7
Regeneration Harvest	Acres	3,700 0	3,600 0
Practices Not Projected by Specific Area			
Precommercial Thinning	Acres	2,397 0	2,397 0
Vegetation Release	Acres	4,469 0	4,874 0

1/ 25 6 MMCF of Regeneration Harvest will occur in Retention Visual, Partial Retention Visual, and General Forest Management Areas

A range of silvicultural systems will be used depending on the specific site conditions and management direction. Methods may include clearcutting, shelterwood, seed-tree, group selection, and individual tree selection (see Appendix G of the FEIS for descriptions of systems). The even-aged systems of clearcutting, shelterwood, and seed-tree will be the most common for the General Forest and Visual Management Areas. Selection harvest will be the dominant harvest system within the Riparian Management Areas, while salvage harvest may occur in all Management Areas with programmed timber harvest.

The General Forest Management Area includes allocation "overlays", or subparts, designating some lands for extensive management, and some lands as administrative study areas. The extensive management areas are distinctive in that they lack the operability to gain reasonable road access for intensive timber management and will be managed under a less intensive schedule with little or no roading. The administrative study areas are in two locations; one is the Silver Fire Recovery Area which was burned in 1987 and is still recovering from the effects of the fire, the other is known as the South Kalmiopsis which is a large area of very poor soils and generally sparse vegetation.

Reforestation activities include site preparation, planting, control of animal damage, and vegetation management (release). Vegetation management activities may include thinning or the use of herbicides as a means of reducing competitive vegetation to selected crop trees. Because of the public concern regarding herbicide use, the Pacific Northwest Region's EIS for Managing Competing and Unwanted Vegetation (USDA 1988c.) has been prepared. Any proposals to utilize herbicides in vegetation management would require preparation of a Forest site-specific environmental analysis tiered to the Region's vegetation management EIS.

Coordination between the timber program and other resource programs is essential if Forest management goals are to be met. Acres proposed for harvest or road construction, plus additional acres which require an assessment of cumulative effects, must be examined to determine resource values and opportunities. The major resource areas are visual resources (25,000 acres examined annually), watershed (23,000 acres), wildlife and fisheries (23,000 acres), and cultural resources (20,000 acres). The major Management Areas where examinations will occur are: Riparian, Retention Visual, Partial Retention Visual, and General Forest.

The Forest provides fuelwood for both personal and commercial use The Forest will continue to provide opportunities for fuelwood cutting by placing nonmerchantable material in piles at designated locations. Fuelwood availability is not expected to change dramatically during this planning period

Inventory is planned and implemented at least every ten years. The process for future planning is being developed now. Managed stand survey and vegetation mapping contracts will be awarded for the first time in spring 1989. The Managed stand survey will measure young stands on the Forest to validate predicted timber yields The vegetation mapping will map and describe the vegetation as it currently exists. The Forest will also be ecotyped to series or groups of plant associations. A Forest resource inventory will measure timber growth on all mature stands and gather basic information for all forest resources. An old growth inventory will also be conducted to describe and characterize this component of the forest. These maps and inventories will collectively serve as the foundation for the next round of timber planning.

SOIL AND WATER (WATERSHED MANAGEMENT)

Soil and water resources are managed to protect and enhance long-term productivity of the forest, water quality and associated beneficial uses, and aquatic ecosystems. These goals will continue under the implemented Forest Plan All management activities will be subject to the Forest-wide Standards and Guidelines which deal with site productivity, water quality, physical and biological changes in the soil, erosion and mass movement, and riparian ecosystems. Public interest in the management of soil and water resources is expected to continue at a high level.

Soil is a fundamental, largely nonrenewable resource that is the basis for high-level sustained yields of all other resources. The primary goal for management is maintenance of long-term productivity Program emphasis has centered on mitigating the impacts of management activities and rehabilitating soils that have been impacted by management and natural events This emphasis is expected to continue through the planning period

Current Soil Resource Inventory (SRI) information will be refined and updated as suitable lands are managed for resource activities. Lands classified unsuitable for timber production due to marginal reforestation and potential for irreversible damage will continue to be identified and removed from the timber base. Inventories are scheduled for soil, e.g , Curry County Soil Survey, and for geology and landslides. Assessments of the cumulative effects of all activities by site, watershed, and basin on the soil and water resource will be provided.

Watershed specialists identify watershed improvement needs which are included on the Forest's Watershed Improvement Needs Inventory (WIN), and help design and implement watershed improvement treatments based on project priority. Barring the occurrence of catastrophic events such as wildfire and flood, an estimated 480 acres per year of watershed improvement work will be completed under the Forest Plan. This includes projects covered under timber sale activity (KV; approximately 60 percent) and normal appropriated funds.

All resource management activities will be designed to enable compliance with State requirements in accordance with the Clean Water Act for the protection of waters of the states of Oregon and California Best Management Practices (BMP's - Appendix F) will be applied in planning, implementation and maintenance of all Forest activities Forest resource management personnel will receive BMP implementation training

Assessments of the cumulative effects of all activities by site, watershed, and basin on the soil and water resource will be provided. Cumulative watershed effects will be analyzed on a basin level for management planning purposes For Plan implementation, the Forest's 18 major Planning Basins will have been divided into Watershed Analysis Areas of from 600 to 2,500 acres in size to accommodate more detailed cumulative effects analyses on a project basis.

Riparian areas will continue to receive special attention Riparian-dependent resources (fish, water quality, wildlife habitat) will receive preferential consideration when conflicts occur among land use activities. The various riparian management prescriptions have been designed to maintain or, in some cases, reduce water temperatures.

Monitoring will be accomplished to assess the effectiveness of BMP implementation with special attention to turbidity, sediment, and chemical parameters Monitoring is scheduled to determine if soil productivity is being maintained. Landslide monitoring of selected sites will also continue for the primary purposes of improving interpretations, recommendations for reducing the risk of failures in projects, and to increase reliability of preventative measures in project design.

AIR QUALITY

The Forest currently maintains a visibility monitoring program in the Class I area associated with the Kalmiopsis Wilderness Emissions reporting is accomplished through the Oregon Department of Forestry Smoke Management Program for prescribed burning activities on the Forest. Implementation of the Forest-wide Standards and Guidelines should ensure maintenance of air quality at a level adequate for the protection and use of National Forest resources, and which meets or exceeds applicable Federal and State standards.

LANDS

Approximately 67 percent of the Forest's boundaries are surveyed, marked and posted to standard Landline location activities for the planning period will concentrate on property lines adjacent to timber harvest or other activities with the potential to impact adjacent private property.

Landownership may be adjusted, as opportunities arise, through purchase, exchange, or other methods of acquisition as appropriate. Reasons for adjustments include consolidation of National Forest Lands, reduction of landline location work, reduction of administration costs, needed rights-of-way, and to protect scenic qualities of Wild and Scenic Rivers. Land acquisition priorities are reflected in the land allocations of this Plan, and described in the Land Acquisition program outlined in the Forest-wide Standards and Guidelines.

MINERALS

Interest in mineral deposits on the forest is concentrated on gold, with numerous other minerals represented. Placer dredging is the most common form of mining, with some activity on lode claims. Currently, the Forest receives about 100 to 125 operating plans each year, and a large number of Notices of Intent for small operations Additionally, the Forest is host to numerous unpermitted "recreational miners", who enjoy gold panning or other nondisturbing mining activities Without new major discoveries, technological improvements, or substantial changes in the demand for minerals, the number of new mining claims is expected to remain constant for the planning period.

There are no coal or energy-related leases on the forest There has been some demand for building stone (25,000 tons in 1984) and it is expected that this use will continue and possibly increase in the future.

A total of 268,800 acres on the Forest have been withdrawn from mineral entry, primarily in Wilderness Although additional withdrawals along the three newly designated Wild and Scenic Rivers are anticipated, there are no proposals for such withdrawals at this time.

During the next decade the Forest minerals program will emphasize administration of operating plans and validation of claims located within Wilderness

FIRE AND PEST MANAGEMENT

The Forest Fire Management program has responsibility for wildland fire suppression and fuels management. Operational specifics for the program can be found in the Fire Management Action Plan. As management activities have expanded, the role of fire management in reduction of activity-generated fuels has increased Currently, the Forest plans to treat approximately 100 acres of natural fuels and approximately 5,000 additional acres of activity-generated fuels annually Exact acreages depend on the extent of timber harvest activities. Under the implemented Forest Plan, natural fuel management activities are expected to increase to 400 acres per year, and treatment of activity-generated fuels is expected to drop slightly to approximately 3,500 to 4,000 acres per year for the duration of the planning period.

The integrated pest management program requires special emphasis because of the high level of interest and concern by both the agency and the public. Insect and disease levels are continually monitored so that prevention is the mode of action rather than correction. Of special concern to this Forest is Port-Orford-cedar root rot disease, *Phytophthora lateralis*. The disease is always fatal in Port-Orford-cedar. Special practices and monitoring are being implemented to maintain the viability of Port-Orford-cedar in the forest for genetic diversity, as well as economic and noneconomic uses. Future management for this species will be governed by the Region 5 and Region 6 cooperative Port-Orford-Cedar Root Disease Action Plan established in June 1988. Management is intended to be site specific, consistent, and visible

FACILITIES

Transportation System

Continued need to respond to resource management objectives will require the development, maintenance, and management of the Forest development road system Many road-related activities will occur in support of the timber management program, with additional activities undertaken to facilitate recreational use, Forest administration, and resource protection.

Road development activities include, but are not limited to· transportation planning; route location; route survey; road design; contracting; and road construction and inspection Road maintenance activities include the use of personnel, equipment, and contracts to provide a roadway that meets established road management objectives. Road management activities include the establishment and maintenance of a Road Development Plan and a Road Management Plan which support implementation of this Land and Resource Management Plan. Other management activities include planning, organizing, and controlling application of actions to develop and maintain the Forest road system, and the organizational management of people, equipment, and funds

Timber sale activities will be primary impetus and funding source for the construction and reconstruction of accompanying (ancillary) roads. When available and desirable, capital investments could be used to support construction and reconstruction of needed roads. Funding needs to sustain transportation system activities are shown in Appendix B. Unforeseen conditions, such as damage from storms, may require additional project funding.

The projected operational status of the forest development road system is shown in Table IV-4. This projection is based on FORPLAN modeling, which does not have the spatial resolution to exactly portray the roading program needed to support the timber harvest scheduled in any particular decade (see discussion in Appendix B of the Final Environmental Impact Statement). This is due to the variability in the mix of harvest areas scheduled requiring new roads versus those that are accessed by existing roads, and to the situations where initial entry into an area may require more road per acre harvested than subsequent entries when units may be harvested along previously constructed roads The model generally underestimates the miles of road needed in the first two or three decades and over estimates the miles needed in subsequent decades. The actual mileages will vary depending upon site-specific decisions for timber sale planning, road location, and management needs.

Table IV-4 Projected Operational Status of Roads (Miles and Percent of Total Mileage) 1/ 2/

At End of Decade	Open and Maintained For: Passenger Cars Miles	Percent	High Clearance Vehicles Miles	Percent	Long Term Road Closure Miles	Percent	Total Forest Mileage
First	1,308	46	898	31	656	23	2,862
Second	1,370	45	923	30	780	25	3,073

1/ Based on FORPLAN projections
2/ Miles and Percent of Total Mileage

Administrative Sites

Development, maintenance, and management of administrative sites and facilities will be needed to support this Land and Resource Management Plan Administrative site development activities include, but are not limited to: site survey; contracting; site construction; and inspection. Site maintenance activities include those actions necessary to be able to occupy the site in a safe and orderly manner Site management activities include the establishment and maintenance of Site Development Plans for each site, and the prioritized compilation of projects found in these development plans into a Facilities Master Plan. The Master Plan will support implementation of this Land and Resource Management Plan. Other management activities include planning, organizing, and controlling application of actions to develop and maintain administrative sites, and the organizational management of people, structures, equipment, and funds. The funds necessary to provide adequate administrative facilities are shown in Appendix B.



FOREST-WIDE STANDARDS AND GUIDELINES

The following Standards and Guidelines state the bounds or constraints within which all practices will be carried out in achieving the planned objectives of the Forest The management of the Forest is subject to all applicable laws and regulations; particular reference is made to the management requirements of 36 CFR 219.27 The Standards and Guidelines are intended to help the manager achieve the goals and objectives, while staying within the constraints prescribed by law, along with the constraints designed to provide environmental safeguards The nature and design of the Standards and Guidelines are intended to mitigate effects, to cause an action to become less harsh or severe. Mitigation is extremely important in the design and implementation of all projects The monitoring prescribed in Chapter V will be required to assure that the Standards and Guidelines are followed and that the anticipated results are achieved

Two categories of Standards and Guidelines are applied to management of the Forest Forest-wide Standards and Guidelines apply to all Management Areas, unless specifically excepted by direction for an individual Management Area The Standards and Guidelines specific to the Management Areas are presented in the following section of this chapter, Management Prescriptions

The type of direction and degree of restriction are identified by the terminology in the Standards and Guidelines To understand the intent of the direction, the interpretations of the terms used are critical.

> The first intent is conveyed by the word **"shall "** With this degree of restriction the action is mandatory in all cases.
>
> The second is conveyed by the word **"should."** With this degree of restriction, action is required, unless justifiable reason exists for not taking action This direction is intended to require a practice unless it entails unacceptable hardship or expense. Exceptions to "should" restrictions are expected to occur infrequently
>
> The third type of direction uses the word **"practicable"** and acknowledges that a given practice is not always feasible and practical in every situation It is intended to encourage, but not require, a practice
>
> The fourth uses the word **"may"** and has to do with activities which may or may not be appropriate, depending on circumstances For example, grazing may be consistent with the objectives of certain Management Areas, but specific sites may or may not contain suitable forage. This direction is intended to allow for taking advantage of compatible opportunities, or to provide for exceptions when objectives of a particular standard can be met through alternate methods

Levels of resource management prescribed in the Standards and Guidelines must be met. Consistent with the goals of each Management Area, however, land managers will employ all available inventory information to maximize enhancement and minimize impairment of every resource value involved.

The Standards and Guidelines describe what will and will not occur in a particular area to achieve the desired goal Because of the great variety of resources and circumstances, however, provision has been made for unusual and unforeseen implementation problems. Some of these problems will be the result of insufficient or inaccurate inventory data. The NEPA process will guide project planning and Forest Plan implementation, and must be followed to make a departure from the Standards and Guidelines. This could result in an amendment to the Forest Plan. A situation must be fully described, alternatives developed, and costs evaluated. Mitigation measures will be employed to produce a result as close as possible to that called for. The long-term goal for a particular Management Area will not change.

The river management plans and wilderness management plans remain in force upon approval of the Forest Plan. All other planning documents, except for contingency plans responding to special

circumstances, are superseded by the Forest Plan Other operational plans and policy statements which do not provide resource management direction will remain in force but are not tied in writing to the Forest Plan.

As an aid to the user, the direction statements are in bold type so they can be quickly discerned from the explanatory information and examples that are present in some sections.

RECREATION

1-1 **Management of the Forest shall provide a broad range of recreation opportunities in a dispersed and developed setting, including Primitive, Semi-primitive Non-motorized, Semi-primitive Motorized, Roaded Natural, and Roaded Modified Recreation Opportunity Spectrum (ROS) and Wilderness Recreation Spectrum (WRS) classes.**

DEVELOPED RECREATION

1-2 **As management activities are programmed in areas adjacent to identified potential development sites, they shall be protected in order to maintain their character until scheduled for construction. The level of development shall be compatible with the ROS class inventoried for each site.**

Level of Development	ROS Class
1	Primitive
1 or 2	Semi-primitive Non-motorized
1 or 2	Semi-primitive Motorized
3 or 4	Roaded Natural/Roaded Modified

1-3 **The potential and existing developed recreation sites shall be designed to minimize annual maintenance and operating costs. The design should discourage vandalism to the extent that is possible to avoid a high level of surveillance and operating requirements. Recreation facilities should be developed only where private facilities cannot fill the need for the recreational service or facility. Competition with private enterprise should be avoided.**

Developed Sites

1-4 **The Forest Service should provide for developed recreation opportunities throughout the Forest commensurate with projected need.**

The Forest Service should manage use of existing facilities to protect resources and areas that would otherwise become degraded as a result of use.

Service Level

1-5 **The levels of service for administration, operation and maintenance of developed sites shall be based on site capacity, site protection needs, and seasonal demands for public use. Selected sites should be open for public use during the managed use season, at the minimum level of service as specified below:**

1. **Administration. Administration of public use at developed recreation sites shall include inspection for public health and safety and for prevention of resource damage.**
2. **Operations. Cleanup and sanitation of facilities at developed sites should occur to accommodate public use. This activity shall include testing of potable water when provided.**

3. **Maintenance. Site facilities shall be maintained in a condition to meet standards for public health and safety. Facilities should be maintained to a Recreation Information Management (RIM) Condition Class I or II level.**
4. **Resource Management Treatment. Other resource management treatments should be accomplished for public safety and site protection (e.g., vegetation management, rehabilitation, etc.).**

DISPERSED RECREATION

1-6 **Enhance dispersed recreation opportunities where practicable as other management activities are planned.** For example, access can be provided to recreation attractions or wilderness entrance points from timber sale road development; conversely roads can be closed to public access in order to protect the quality of non-motorized recreation opportunities.

1-7 **Recreation users should be educated about the proper disposal of human waste and to the principles of no-trace camping (pack it in - pack it out). This should be accomplished through the use of public contact, brochures, and media.**

1-8 **Displacement of Forest system trails by new roads should be avoided. Where displacement occurs, and recreation use warrants, new trails should be constructed to replace those sections lost in order to protect the integrity of the system and to insure the quality of recreation experiences.**

1-9 **The Forest Service should provide for use of the existing trail system that serves the needs of recreationists, and satisfies demand levels in a condition that protects the resource and meets minimum requirements for health and safety. Trails should be managed to accommodate both motorized and non-motorized uses, depending on location and Management Area goals.**

Trail Management Objectives shall be developed for all trails included in the Forest Trail System. Management objectives should be used for the identification of the maintenance level required for each of the Forest system trails.

All trails included in the Forest Trail System should be inspected annually to identify trail maintenance needs. Sufficient maintenance shall be provided to protect soil and water resources.

Management activities along Forest System Trails shall be implemented with sensitivity to the experience of recreation users. Appropriate techniques to mitigate effects or avoid management conflicts should be identified in the individual trail management objectives. Measures to mitigate the effects of activities could include: vegetative screening, re-routing of a portion of the trail for a period of time, temporary closure notification; or interpretive signs in appropriate locations

RECREATION MANAGEMENT

1-10 Public information is integral to the management of the Recreation resource. **The public should be informed on a continual basis using the media outlined below. Maps should be reviewed, and updated if needed, at intervals not to exceed five years for recreation maps and ten years for wilderness maps.**

Forest Recreation Maps
Wilderness Brochures
Wild and Scenic River Brochures and Maps
Trail Pamphlets
Radio & TV Spots and Videos
News Releases
Coordination with Individuals, private organizations and other agencies

1-11 **Project environmental analysis should consider the potential impact that the proposed activity would have on ROS classification and the recreation use capacity of the area. Potential developed recreation sites should not be bisected by through roads, and the vegetation of the site should be managed to enhance the potential recreational values of the site. *Programmed timber harvest shall not be scheduled from identified potential or* developed recreation sites, but opportunities to manage the vegetation at the site and to improve safety and aesthetics should be taken.**

The Recreation Information Management (RIM) inventory shall be updated annually to monitor levels and types of recreation use on all areas of the Siskiyou National Forest. All sources of information should be used to gather data for the RIM report including trailhead *registration boxes, river registration, permits, employee or public observation, etc.*

CHANGED ENVIRONMENTAL CONDITIONS

1-12 Recreational settings, facilities or opportunity may be affected by unforeseen changes in environmental conditions. Changed conditions may result from events, such as catastrophic fire, or by projects that are allowable under law, regulation or approved management direction, such as minerals development

When changed conditions occur, environmental analysis shall be conducted to determine the effects of the changed conditions on recreational opportunity, and to re-evaluate and consider modification of existing recreational management objectives.

VISUAL RESOURCES

2-1 **Management activities shall be designed to achieve the allocated Visual Quality Objective (VQO) for the area (Agriculture Handbook 462, Visual Management System, USDA 1974).** Allocations may be different than the inventoried VQO's Land allocated to achieve the VQO's of Retention or Partial Retention, not overlapped by a more restrictive allocation, are in Management Areas 12 and 13 respectively. Modification and Maximum Modification areas, not overlapped by a more restrictive allocation, are in Management Area 14, General Forest.

2-2 Few resource inventories are static upon completion and the process for change is invaluable to successful resource management **If field analysis identifies a need to correct the inventory**

of VQO's, the correction should be recorded in environmental analysis documents and approved by the Forest Supervisor, whereupon the Forest Inventory will be updated.

Conditions that could warrant a change in inventoried visual objectives are:

1. Discrepancies in Landscape Variety classification
2. Changes in Viewer Sensitivity level.
3. Discrepancies in Seen Area mapping.

2-3 **Mitigation treatments for impacts to the visual resource shall be completed within one year after the completion of the project (Agriculture Handbooks 462 and 559, USDA 1974).**

CULTURAL RESOURCES

The following standards comply with all applicable legal requirements for management of cultural resources, including the National Historic Preservation Act of 1966, the National Environmental Policy Act of 1969, the American Indian Religious Freedom Act of 1978 and the Archaeological Resources Protection Act Standards for each aspect of the cultural resources program are provided to ensure that procedural requirements are satisfied These cultural resource management procedures apply to all Federal undertakings, Federally-funded undertakings, and undertakings requiring Federal permits Appendix B displays the schedule of cultural resource management activities on the Forest for the current planning period

OVERVIEW

3-1 **A cultural resource overview of the Forest shall be completed and maintained.** The overview will summarize all previously recorded cultural resource information for the Forest, provide a framework for evaluating cultural resources identified through the inventory process, develop a preliminary research design to guide future surveys, inventories, and scientific investigations, and identify opportunities for interpretation of a range of cultural properties.

IDENTIFICATION

3-2 **A cultural resource inventory program shall be conducted under the leadership of an Archaeologist on a project-specific level for major ground-disturbing activities in compliance with applicable Federal historic preservation legislation (Forest Service Manual 2360; Kaiser and others 1983).** The results of project-level cultural resource inventories will be documented in the Cultural Resource report.

The Forest's cultural resource inventory strategy, the Sample Survey Design, shall guide the inventory of all National Forest lands to identify all reasonably located cultural resources. The Sample Survey Design should be reviewed annually and updated as needed to reflect advances or changes in the site inventory data base, management objectives, legislation and Regional or Forest research designs.

EVALUATION AND ASSESSMENT

3-3 **The significance of inventoried sites shall be evaluated by applying the criteria for eligibility to the National Register of Historic Places.** Sites can be treated as individual properties, thematic groups, or historic districts. Priority will be given to those properties that may be affected by project activities. **A plan should be developed to evaluate all other cultural resources through cost effective means as the Forest-wide inventory nears completion.**

Cultural resources that meet the appropriate criteria for eligibility to the National Register of Historic Places shall be nominated. Nominations will be scheduled incidentally until completion of the Forest-wide inventory of cultural resources.

The effects of all Forest Service undertakings on significant cultural resources shall be considered, and measures shall be developed to avoid or mitigate any adverse effects.

PROTECTION AND ENHANCEMENT

3-4 **Measures shall be developed in consultation with the Oregon State Historic Preservation Officer (SHPO), or the State Historic Preservation Office of California and, if necessary, the National Advisory Council, to protect significant sites from adverse effects due to ground-disturbing activities.** In Oregon, the National Forests have a Programmatic Memorandum of Agreement with the SHPO to simplify and expedite the review process A small part of the Forest is in California and cultural resource reports are reviewed and given comment on a case-specific basis. Measures developed to protect specific values range from complete avoidance of the site and corresponding protection of its environmental setting to mitigation procedures which conserve the historic values of the resources. Examples of the latter include: data recovery through excavation of subsurface cultural resources, photo documentation of surface features and standing structures, and in some cases, site restoration

3-5 **Eligible cultural resources should be protected from degradation due to vandalism or unauthorized public use.** Protection plans could include, but are not limited to, scientific study and collection, the use of fences and barriers, proper use or removal of signs, stabilization techniques, closure orders, patrol and site monitoring, maintaining site anonymity, and gaining public understanding and support through education programs. Cultural resources determined eligible to the National Register of Historic Places should be monitored by means of a recurring inventory to determine whether their condition has been affected by vandalism or unauthorized use.

3-6 **Eligible cultural resources should be protected from degradation due to natural deterioration such as that caused by fire, flood, earthquake, precipitation, or wind.** Cultural resources evaluated as having National Register significance should be monitored by means of a recurring inventory to assess whether their condition has been affected by environmental factors

3-7 **Opportunities may be provided for scholarly/scientific use of designated prehistoric sites after coordinating selection of appropriate sites with the relevant Native American groups.** This could require "banking" of sites for future use, and processing of antiquities' permits for testing and excavation of sites by qualified professionals.

MAINTENANCE OF HISTORIC SITES AND TRAILS

3-8 **Eligible historic sites and historic trails shall be maintained or adverse effects shall be mitigated. Stabilization or rehabilitation may be carried out for significant sites which have been damaged.** Decisions on the maintenance level for eligible historic structures should be based on an analysis of utility, interpretive value, public interest, existing site or area allocation, funding sources, existing agreements, and other relevant considerations. Historic trails require inventory, evaluation, and preservation either in place or through documentation.

INTERPRETATION

3-9 **Suitable cultural resource properties may be interpreted for the recreational use and educational benefit of the general public. The measure of suitability should be based on**

accessibility to the public, feasibility for protection, condition of the property, compatibility with other resource management activities within or adjacent to the area, thematic representation, and value to public groups. Interpretive services and facilities should be compatible with the nature, qualities, and integrity of the cultural sites selected for enhancement. Preferred methods include brochures, signs, displays, interpretive trails, tours and video or slide programs.

MITIGATION

3-10 **Mitigation measures established during the environmental analysis of a given project shall be monitored to ensure all stipulations are being met.** Current records are necessary to indicate compliance with legal mandates. Tracking of the mitigation plan is necessary during and following ground-disturbing activities where cultural resources are present.

MANAGEMENT

3-11 **The long-term management of cultural resources shall be coordinated with the State Historic Preservation Office and others as necessary. Cultural resources shall be assigned to appropriate management categories for present and future uses such as interpretation, scientific investigation, adaptive uses, and preservation in place for developing future scientific needs. A data redundancy category should be developed in the future when inventory and excavation data become sufficient to make such a judgment.**

The following are management priorities for Cultural Resources

1. Preservation in-place of cultural resources for future scientific study.
2. Controlled data recovery by means of professional excavation, mapping, photo documentation and reporting to answer questions about prehistoric/historic use and development.
3. Adaptive use of historical structures; for example, administrative sites, residences, interpretive centers, etc
4. Interpretive use, such as directing public attention to a site for educational/entertainment purposes.

3-12 **Management of traditional religious sites shall be coordinated with American Indian groups. Information about planned project activities shall be presented to American Indian groups for coordination concerning effect on traditional religious sites.**

FISH, WILDLIFE, AND SENSITIVE PLANTS

4-1 **Fish and wildlife habitat resources on the Siskiyou, in particular the habitat of management indicator species, shall be managed in cooperation with State and Federal Fish and Wildlife agencies. At the Forest level, fish and wildlife habitat shall be managed to maintain viable populations of all existing native and desired non-native plant and animal species. Distribution of habitat shall provide for species viability and maintenance of populations throughout their existing range on the Forest.** Monitoring and inventory plans have been developed for indicator species and others (see Chapter V).

The Forest will adhere to all pertinent state statutes and laws. This includes ORS 496.012, which deals with providing for optimum levels of all species of fish and wildlife and preventing the serious depletion of any indigenous species. Also included are the Oregon Endangered Species Act (Oregon Revised Statutes 496.004, 498 026, and 564.040), the California Endangered Species Act (1984 Amendments), and California Native Plant Protection Act (1977)

ENDANGERED, THREATENED, OR SENSITIVE SPECIES - GENERAL

4-2 **Endangered, threatened and sensitive species shall be identified and managed in cooperation with the USDI Fish and Wildlife Service, Oregon Department of Fish and Wildlife (animals), and Oregon Department of Agriculture (plants), and California Department of Fish and Game (animals and plants). Legal and biological requirements for the conservation of endangered, threatened and proposed plants and animals shall be met.**

Habitat for existing Federally-classified threatened and endangered species shall be managed to achieve objectives of recovery plans.

Biological evaluations shall be prepared for each project authorized, funded, or conducted on National Forest land to determine the possible effects the proposed activity will have on endangered, threatened, proposed, or sensitive species (FSM 2672.4, including R-6 Supplement 41). For sensitive plant species, it may be helpful to consult with local knowledgeable and interested botanical authorities. The biological evaluation consists of five steps

1. Pre-field review of existing information.
2. *Field reconnaissance of the project area*
3 Determination of whether local populations of endangered, threatened, proposed, or sensitive species will be affected by a project (consult with USDI Fish and Wildlife Service if endangered, threatened, or proposed species are found)
4 *Analysis of the significance of project effects on local and total populations of sensitive* species.
5. If Step 4 cannot be completed due to lack of information, a biological or botanical investigation is completed to complete the analysis of significance.

If endangered, threatened, or proposed species are found in a project area, consultation requirements with the USDI Fish and Wildlife Service shall be met in accordance with the Endangered Species Act (Public Law 93-205) and FSM 2671.45. Before a project can be carried out, protection or mitigation requirements shall be specified (NFMA, 36 CFR 219.27(a)(8)). Four interrelated factors determine the type of review and consultation procedures to follow in determining effects on listed or proposed species They include: presence of listed or proposed species; Forest Service determination of effect in the biological evaluation, type of project (construction or not); and extent of environmental impact. See FSM 2671 4 for detailed consultation procedures.

Species management guides should be prepared to address the effects of land management activities on local populations of sensitive species at a broader scale, and to identify opportunities to enhance and develop habitat.

Lists of endangered, threatened and sensitive plant and animal species shall be maintained and updated periodically as new information is collected. Pertinent information will be submitted to the Regional Office for updating the Regional Forester's Sensitive Species Lists, and to the appropriate agencies for inclusion in State-wide data bases.

Forest personnel shall not identify (to the public) specific location information that could jeopardize the welfare of an endangered, threatened, proposed, or sensitive species (FSM 2671.2).

Standards and Guidelines 4-3 through 4-8 contain direction specific to the Threatened, Endangered, and Sensitive Species of the Siskiyou National Forest.

BALD EAGLE HABITAT (THREATENED SPECIES)

4-3 **Bald eagles and their habitat shall be protected and managed in accordance with the** *Pacific Bald Eagle Recovery Plan* (USDI Fish and Wildlife Service 1986) **The suitability of sites in key areas shall be maintained or enhanced.** As part of the recovery plan, the Rogue River is designated as a key area (current wintering population of 10; two existing territories, plus four target territories) Other key areas include the Sixes, Chetco, Illinois, and Coquille Rivers, each with one "target recovery territory". Although the "key areas" apply to all ownerships within a drainage basin, five sites on the Forest (four on the Rogue River, one on the Illinois River) have been identified as potential nesting sites, as per coordination requirements of the recovery plan.

Within two years after implementation of the Forest Plan, a management plan should be prepared for known nest sites and potential bald eagle habitat (including wintering habitat) on the Siskiyou National Forest. Consult the *Pacific Bald Eagle Recovery Plan* (USDI Fish and Wildlife Service 1986), Brown (1985), the *Bald Eagle Management Guidelines for Oregon and Washington* (USDI Fish and Wildlife Service 1981) and FSM 2670 for specific management guidelines.

Occupied Bald eagle habitat will be monitored to determine the effectiveness of planned action and recovery efforts.

4-4 **Prior to development of the management plan, interim requirements for management of bald eagle habitat shall include the following standards (interim management plans for individual active sites shall be prepared as necessary):**

Nesting Sites

Bald eagle nest sites shall be protected, including existing active and inactive nest sites, and designated recovery (potential) sites. Manage each area under the territory zone concept (Brown 1985). **Primary and secondary zones should be established by actual use observations and site-specific information. Secondary zones should also reflect local physiographic conditions.**

Primary Zone. Not less than 330 feet from the nest, with actual size and shape of zone adjusted to include all the area near the nest tree that is actually utilized. Zone size can vary, reflecting local topography, potential for blowdown, and location of important habitat components There will be no timber harvesting in the primary zone unless designed to enhance stand characteristics for the benefit of nesting eagles Human activities in the primary zone will be controlled year-round to insure that the site remains suitable as nesting habitat.

Secondary Zone The secondary zone extends from 330 feet out to a minimum of 660 feet from the nest, it minimizes disturbance and protects the primary zone Zones need not be circular, but will reflect local physiographic conditions and the tolerance of the nesting pair to disturbance factors (Brown 1985) The width of the zone could be considerably wider, depending on the degree to which vegetation or topography screens the nest from potential disturbance. The zone will contain important roosting sites, perching sites, and alternate nest sites. Timber may be harvested in the secondary zone, provided eagle habitat requirements take precedence. Management steps may be taken in the secondary zone during the period when the birds are present, normally between January 1 and August 31.

Feeding and Roosting Sites

Regularly used feeding and roost sites (including wintering habitat) shall be protected. Human activities will be controlled if they adversely affect the eagles' use of a feeding area Only those Forest practices that maintain the suitability of the area for eagle roosting will be used. The area encompassed will have at least a 330-foot radius, and possibly up to one-fourth mile Wildfires will be controlled.

Maintenance of Potential Nesting Habitat

Forest land within one mile of the Rogue River is potential bald eagle nesting habitat; they have historically nested here and a food base exists. **For every 1,280 acres within one mile of the *Rogue River, a 30-acre stand with an open view of and clear flight path to water should be* managed as a potential nest site.** Habitat provided at potential nest sites must be in mature or old-growth forest and possess characteristics outlined in Brown (1985). In general, this 30-acre *area would be managed to provide a large number of trees per acre greater than 11 inches DBH*; of which 18-21 trees per acre would be 75-125 feet high and 14-16 would be more than 125 feet high (USDI Fish and Wildlife Service 1981).

PEREGRINE FALCON HABITAT (ENDANGERED SPECIES)

4-5 Peregrine falcons are known to nest on the Forest. **Sufficient existing nesting and feeding habitat shall be protected to meet the objectives of the Pacific Coast Recovery Plan for the American Peregrine Falcon (USDI Fish and Wildlife Service 1982). All existing nest sites and any new nests shall be protected. Feeding areas may be enhanced.**

Within three years after implementation of the Forest Plan, an inventory should be completed which catalogues Siskiyou habitat suitable for peregrine falcon. Within one year after finishing the inventory, the Forest should complete a habitat management plan or nest site management plans for peregrine falcons.

NORTHERN SPOTTED OWL HABITAT (SENSITIVE SPECIES)

4-6 **Spotted owl habitat shall be managed in accordance with direction specified in the Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide** (USDA 1988).

The Forest shall assist the Regional Office in meeting the terms of the 1988 Interagency Agreement on spotted owl *The four agencies* (USDA Forest Service, USDI Fish and Wildlife Service, Bureau of Land Management, and National Park Service) have agreed to cooperate in an effort to maintain population viability for spotted owls.

Nest sites and important (heavily-used) roost sites outside of Management Area 8 (mature and old-growth habitat for wildlife) shall be protected As needed, develop an individual prescription for each nesting or important roosting site found in areas suitable and available for timber harvest (a 300-foot buffer zone around the site would provide minimum protection - the actual zone configuration would depend on the location of other nearby harvest units, location of riparian corridor, topography, etc.). The prescription would include the size and shape of the protection zone, any restrictions on human use of the site (e g., seasonal closures, road management), and monitoring. Heavily-used roost sites are often near nest sites. The need to protect spotted owl nest or principal roost sites which occur outside designated habitat areas is discussed in Forsman and others (1984)

Areas proposed for harvest which contain habitat suitable for spotted owls should be surveyed according to standard inventory protocols. Perform ground surveys of each sale unit once during daylight (optional); **if no owls are found, all units of the sale should be surveyed at night at least twice before discontinuing survey efforts. Night surveys should be scheduled at least two weeks apart.** Maintain survey results in the Ranger District resource inventory and forward to the Forest Coordinator annually. Data gathered from these surveys will be important in assessing adequacy of Management Requirements for spotted owls.

WOLVERINE HABITAT (SENSITIVE SPECIES)

4-7 **Reported sightings shall continue to be evaluated. In cooperation with State Fish and Wildlife agencies, attempts should be made to verify the presence and distribution of the species. Direction for occupied essential habitat shall be provided through a species management guide or plan if the species is determined to occur on the Forest.**

OTHER SENSITIVE ANIMALS

4-8 Other sensitive species on the Siskiyou National Forest include:

In Oregon	In California
Siskiyou Mountain salamander	Fisher
Western spotted frog	Pine marten
Western pond turtle	Northern goshawk
Townsend's western big-eared bat	Willow flycatcher
White-footed vole	

The standard below applies to all these species, except pine marten, for a description of Management Requirements for marten, see Designated Habitat (MA-8). The marbled murrelet is not currently listed as sensitive by the Forest Service. See Appendix D for a discussion of inventory efforts proposed for the murrelet

Habitat use of the Siskiyou by these species shall be evaluated. In cooperation with State Fish and Wildlife agencies, attempts should be made to verify the presence of these species on the Siskiyou National Forest. Occupied essential habitat shall be provided through a species management guide, or plan. Each plan will cover only the area (state) where the species is classified as sensitive.

OSPREY HABITAT

4-9 **Osprey nesting and feeding habitat on the Forest should be maintained. Three overlapping habitat zones should be established on the Rogue River** (the most restrictive guideline takes precedence). **Along the Illinois, Chetco and South Fork Coquille Rivers, only the first two standards should apply.** The areas of consideration will be: the Rogue and Illinois within the Forest boundaries, the Chetco upstream to the Kalmiopsis Wilderness boundary, and the South Fork Coquille upstream to Coquille River Falls Osprey habitat needs will be incorporated into the next revision of the Siskiyou Wildlife Tree (Snag) Guidelines.

1. **No timber harvest should be programmed within 200 feet of the river** (Jackman and Scott 1975) Trees may be cut to meet safety needs and to meet other necessary management needs, such as road crossings.
2. **Up to 1,320 feet from the river, a minimum of two dominant live trees and two large snags (at least 45 inches DBH and 80 feet tall) should be retained per acre** (Zarn 1974).

3. **Up to three miles from the Rogue River, or the nearest major ridge line (whichever is closer), one potential nest site should be maintained in each quarter-section** (160 acres). In each quarter-section, a circle 600 feet in diameter will contain all of the separate habitat components needed for each potential nest site. Components are at least one usable nest tree, one or more snags or snag-top perch trees, and five or more other large trees (mature) that will be available for use as nest or perch trees in the future

Active nests anywhere on the Forest should be protected during the nesting season. Human activities that would disturb nesting osprey should be restricted from March 1 to August 31 within a 1,320 feet radius (depending on specific conditions at the site, the distance could vary - boating and rafting activities generally do not disturb nesting osprey). The most critical period during the nesting season is May through June, when there are eggs or very young chicks in the nest.

Nest trees should be protected until they are no longer usable A no-cut zone should be established around all Forest nest sites Size and shape of the zone will depend on topography, vegetation, and other relevant factors; include any nearby perch trees. Where appropriate, nest sites may be created.

OTHER RAPTORS (BIRDS OF PREY), AND COLONIAL NESTING BIRDS

4-10 **Active roost and nest sites (including rookeries) should be protected.** Depending on the individual situation, timber harvest may be foregone in a primary zone extending up to 500 feet from the nest or roost site. **At some sites it may be necessary to establish a secondary Restricted Activity Zone outside the primary zone; timber management and road building activities may be prohibited or curtailed during the nesting season.** This secondary zone could range up to 1,000 feet or more from the nest or roost site, depending on the individual situation (in most cases the distance would probably be less).

DEER AND ELK HABITAT

4-11 **The publication "Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington" (Brown 1985), Chapter 11, Deer and Elk, should be used as the basic guideline for management of deer and elk habitat on the Siskiyou National Forest.** This publication is the basis for the following general guidelines

Where deer and elk are a primary focus of management (Management Areas 10-14):

1. Lay out timber harvest units so that all portions of the unit are within 600 feet of hiding cover.
2. Blocks of hiding cover should be at least 600 feet wide; areas of thermal and optimal thermal cover are adequate if at least 30 to 60 acres in size and from 400 to 1,200 feet wide.
3. Manage riparian vegetation to provide hiding cover, thermal cover, and travel corridors along Class I, II, and III streams.
4. Develop plans for habitat improvements, especially forage enhancement.

Timber harvests should be distributed to individual Watershed Analysis Areas (see Standard and Guideline 7-15) to achieve objectives for deer, elk, or other species. Timber sales should be planned to accommodate ODFW (1985) cover criteria for deer and elk: maintain 50 percent of a subbasin in well distributed thermal cover stands (of which at least 25 percent is optimal thermal cover) and 20 percent in forage areas.

Big game habitat capability models (such as developed by Wisdom and others 1986) should be used in project planning to provide the quality, quantity, and distribution of cover and forage needed to reach management objectives for the Forest.

A Forest-wide Management plan for Roosevelt elk and black-tail deer should be prepared no later than three years after implementation of the Forest Plan. The management plan will identify where deer and elk management is the primary focus The plan will provide guidance for third to fourth order watersheds. The plan will be developed in cooperation with state Fish and Wildlife agencies.

For Roosevelt elk, the management plan will evaluate capable, suitable, and available habitat, to determine extent of transplanting or reintroduction. **Roosevelt elk herds may be reestablished in areas they historically occupied.**

The plan should address the following variables common to both species:

1. *Habitat.* Address forage and cover (hiding, thermal, optimal thermal) needs, including relative proportions of each type (forage/cover ratio) and juxtaposition. Evaluate habitat types used by elk and deer. Identify calving and fawning areas, migration routes and corridors, and other special use areas. Identify minimum and optimum width for travel corridors.
2. *Seasonal Use.* Analyze the appropriateness of allocating timber harvest units and habitat improvement projects by winter range zone, using existing computer-generated maps as a base (maps depict primary winter range, secondary winter range, and non-winter range; see discussion in Chapter III, FEIS).
3. *Herd Size.* Establish habitat capability (population) goals for deer and elk herds.
4. *Habitat Improvement.* Analyze the costs and benefits of potential habitat improvement projects; fully explore the opportunities to use K-V funds for mitigation and improvement projects Assess the effectiveness of forage seeding and fertilizing.
5. *Hunting.* Include the effects of hunting regulations; analyze recreation (hunting) demand projections
6. *Disturbance.* Design management activities to reduce risk of disturbing deer and elk in important habitat areas such as winter ranges, thermal cover areas, known elk breeding areas, riparian areas, and dedicated old-growth stands.
7. *Timber Management.* Assess interrelationships with timber management and silviculture. Incorporate standards and guidelines into thinning prescriptions and other vegetation management activities Address competition between tree seedlings and forage plantings.
8. *Road Access.* Design road management objectives to protect fish and wildlife habitat values, minimize disturbance of fish and wildlife, and promote increased quality of fish- and wildlife-related recreational experiences. Address impacts of roads as related to overall habitat effectiveness evaluations for deer and elk (also see Standards and Guidelines under Facilities: Transportation Systems).

SALMONID AND AQUATIC HABITAT

4-12 Salmonid indicator species selected for evaluating habitat in this plan include fall chinook salmon, winter and summer steelhead, and resident trout. **Streams shall be managed to maintain or improve the present level of salmonid habitat capability. Stream inventories shall be maintained and updated to: (a) assess habitat capability; (b) monitor changes due to natural or management-related events; and (c) identify opportunities for rehabilitation or enhancement.** Use of the Hankin and Reeves (1986) inventory procedures would provide a comparable estimate of habitat and fish population over the survey area

Fisheries habitat enhancement shall be conducted according to Forest basin priorities. Basin plans should be prepared in cooperation with the Oregon Department of Fish and Wildlife and will evaluate the current condition of habitat, fish populations, opportunities for enhancement, and the associated costs and benefits. Enhancement projects should be monitored to evaluate effectiveness. Emphasis will be placed on maintenance or improvement of salmonid spawning, rearing, and migration habitats. The major components of these habitats are.

1. Rearing. Water temperatures, pool depths, overhead and instream cover, instream woody debris and low-gradient habitats (e g side channels, glides and overwintering areas).
2 Spawning. Gravel quantity, quality and stability; instream cover for adults in the form of pools and woody debris.
3. Migration. Upstream and downstream passage for both juvenile and adult salmonids.

The quality of these components is related directly to management of the watersheds Supporting management standards and guidelines are addressed under Soil and Water in this section, and in the prescriptions for Management Areas 7 and 11.

The desired conditions of salmonid habitat are.

1. Summer water temperatures at or below present levels.
2. Sufficient quantities of instream large woody material to support the functions of nutrient cycling, hiding cover, channel stabilization, pool formation, and collection of spawning gravels.
3 Existing or enhanced pool/riffle condition with summer pool depths greater than 3 feet
4. Existing or enhanced stability of low gradient spawning and rearing areas.

WILDLIFE TREE (SNAG) HABITAT

4-13a **Habitat capability for woodpeckers (indicators for cavity-nesting species) should be continually maintained throughout the Forest at not less than 60 percent of potential population levels.** ("throughout the Forest" covers all timber sale areas, including salvage sales). This will result in maintenance of self-sustaining populations of cavity nesting species. **The Siskiyou Wildlife Tree (snag) Policy and Guidelines and District supplements should be followed for all project activities.** Existing direction is supplemented by the following Guidelines.

Designated wildlife trees should be protected from woodcutting and Forest management activities.

Older timber sale units (pre late-1970's) often contain low numbers of wildlife trees. **In new sale areas, additional wildlife trees may be left to offset lower numbers in older units in the vicinity.** In these situations the objective is to maintain an average 60 percent habitat level within as small an area as feasible (such as a small drainage basin).

Wildlife tree management standards established for Forests in Region 6 shall be followed (1920/2600 letter from Regional Forester dated September 9, 1988). **Within one year after approval of the Forest Plan, the Siskiyou Wildlife Tree (snag) Guidelines shall be revised to incorporate this new Regional Direction.** This direction provides, in part, that snag densities needed to meet Management Requirement direction for cavity excavators must be provided within land areas that are generally no larger than normal unit size (not more than 60 acres) *These densities will be maintained through the full rotation on these areas by providing for green* replacement trees that will become snags of adequate size when existing snags fall.

Wildlife trees may be clumped where this technique is practicable, feasible, and meets the 60 percent standard

Tables IV-5 through IV-10 below should be used to meet the 60 percent habitat capability level. Wildlife tree habitat needs for woodpeckers on the Siskiyou vary depending on the woodpecker species present (Brown 1985). Five habitat groupings represented by different woodpecker species occur on the Forest; the snag needs for each area are listed in the tables below (these tables supplement the Siskiyou's existing guidelines). The proper table to use in a given timber sale area will depend on the woodpecker species and seral stage(s) present

In Tables IV-5 through IV-9, the habitat capability level for woodpeckers is set at 60 percent. Requirements are for conifer snags per 100 acres; snags should be present in these numbers at all times during a rotation. The relative numbers of hard and soft snags in various size classes are listed as a guide to habitat needs of the different woodpecker species. Personnel laying out timber sales *are not* expected to keep detailed records of soft and hard snags in the various height classes; personnel *will* strive to meet the objectives for total snags per acre.

It is assumed that natural mortality will provide suitable snags during the last 30 to 35 years of a managed rotation (100 years). An assumption is also made that the average snag will last 30 to 35 years before falling. This means that during harvest operations, enough wildlife trees must be designated to serve through the first two-thirds of a rotation. Consequently, to calculate how many wildlife trees must actually be left standing after harvest operations cease, the snag numbers listed in Tables IV-5 through IV-9 should generally be doubled (see Brown 1985 for specific data on snag longevity).

Snags with the largest DBH last longer and make the best wildlife habitat, and should be selected whenever possible, however, wildlife trees which will continue to grow for another 30 to 35 years before becoming snags may be of smaller diameter than those which must die at the beginning of a rotation. Snags with diameters (DBH) over 20 inches meet the Standard and Guideline for Large Woody Material (7-8). Wildlife trees designated in riparian areas may be counted towards snag objectives only if they are excess to those needed to provide shade in stream corridors (essential shade trees cannot be killed to provide snag habitat, see prescription for Management Area 11).

Table IV-5. Snag requirements per 100 acres in FORESTED HABITAT for the five most common woodpeckers on the Siskiyou National Forest.

Snag Diameter Class (in, dbh)	Snag Decay Stage		Total Snags by Diameter Class
	Hard, Stage 2-3	Soft, Stage 4-5	
11+	–	10 Downy Woodpecker	10
15+	27 Red-breasted Sapsucker	115 Hairy Woodpecker	142
17+	–	29 Northern Flicker	29
25+	4 Pileated Woodpecker	–	4
Total Snags	31	154	185

Table IV-6. Snag requirements per 100 acres in FORESTED HABITAT for the five most common woodpeckers on the Siskiyou National Forest, *plus* the acorn woodpecker

Snag Diameter Class (in, dbh)	Snag Decay Stage		Total Snags by Diameter Class
	Hard, Stage 2-3	Soft, Stage 4-5	
11+	–	10 Downy Woodpecker	10
15+	27 Red-breasted Sapsucker	115 Hairy Woodpecker	142
17+	42 Acorn Woodpecker	29 Northern Flicker	71
25+	4 Pileated Woodpecker	–	4
Total Snags	73	154	227

Table IV-7. Snag requirements per 100 acres in FORESTED HABITAT for the five most common woodpeckers on the Siskiyou National Forest, *plus* the white-headed woodpecker.

Snag Diameter Class (in, dbh)	Snag Decay Stage		Total Snags by Diameter Class
	Hard, Stage 2-3	Soft, Stage 4-5	
11+	–	10 Downy Woodpecker	10
15+	27 Red-breasted Sapsucker	115 Hairy Woodpecker 36 White-headed Woodpecker	178
17+	–	29 Northern Flicker	29
25+	4 Pileated Woodpecker	–	4
Total Snags	31	190	221

Table IV-8. Snag requirements per 100 acres on the Siskiyou National Forest for the three most common woodpecker species inhabiting SHRUB/OPEN SAPLING-POLE HABITATS.

Snag Diameter Class (in, dbh)	Snag Decay Stage		Total Snags by Diameter Class
	Hard, Stage 2-3	Soft, Stage 4-5	
11+	–	–	–
15+	7 Red-breasted Sapsucker	79 Hairy Woodpecker	86
17+	–	29 Northern Flicker	29
25+	–	–	–
Total Snags	7	108	115

Table IV-9. Snag requirements per 100 acres on the Siskiyou National Forest for the three most common woodpecker species inhabiting SHRUB/OPEN SAPLING-POLE HABITATS, *plus* the acorn woodpecker.

Snag Diameter Class (in, dbh)	Snag Decay Stage		Total Snags by Diameter Class
	Hard, Stage 2-3	Soft, Stage 4-5	
11+	–	–	–
15+	7 Red-breasted Sapsucker	79 Hairy Woodpecker	86
17+	120 Acorn Woodpecker	29 Northern Flicker	149
25+	–	–	–
Total Snags	127	108	235

Table IV-10 Minimum tree diameters (inches DBH) and heights (feet) acceptable to various woodpecker species (Brown 1985)

Species	DBH (Inches)	Height (Feet)
Downy woodpecker	11	10
Red-breasted woodpecker	15	20
White-headed woodpecker	15	10
Acorn woodpecker	17	30
Northern flicker	17	10
Pileated woodpecker	25	40

DEAD AND DOWN WOODY MATERIAL

4-13b Wildlife habitat requirements for dead and down woody material correspond closely to needs identified for long-term productivity in terrestrial and aquatic ecosystems. See Standard and Guideline 7-8, Large Woody Material, and Standard and Guideline 7-10, Riparian Ecosystems.

Charring of down material should be minimized in prescribed burning where practicable. The suitability of logs as vertebrate and invertebrate habitat is reduced by charring.

Project planners should consider leaving live or dead standing trees as substitutes when Class I and II logs are not available on the ground.

CLIFFS, CAVES, AND TALUS HABITAT

4-14 **Individual Projects should be designed to protect the value of cliffs, caves, and talus habitat for wildlife. Rock quarries should be located at sites exhibiting the least desirable characteristics as wildlife habitat.** These standards refer to sites not included in Management Area 9.

HARDWOOD HABITAT

4-15 Hardwood and mixed hardwood with conifer stands on the Siskiyou make a substantial contribution to biological diversity. **The wildlife habitat values of hardwood and mixed stands should be considered as part of the environmental analysis for individual harvest or stand conversion projects. The same standards governing unit size and placement of conifer harvest sites should be applied to hardwood stands considered for harvest or conversion (see Standard and Guideline 6-9).**

The habitat values of hardwood stands to wildlife are just beginning to be understood, and the importance and partition of the acorn crop among wildlife consumers on the Siskiyou has yet to be determined (Werschkul and Swisher 1983). Not more than 7,500 acres would be harvested or converted during the next decade. The interrelationship of wildlife and hardwood stands has been identified as a research need (Chapter II). A few specific hardwood stands are allocated as special wildlife habitat under Management Area 9.

MEADOWS

4-16 **Small openings should be maintained, and may be created, as a forest habitat component (created openings may be incorporated into regeneration and thinning prescriptions).** Small meadows and openings less than one acre in size contribute to vegetative diversity, and are important to many wildlife species; they provide small forage sites for deer and elk within optimal thermal cover areas, and are especially important during severe weather (Brown 1985) **In many**

cases, a buffer of shrub or tree vegetation may need to be preserved on the perimeter of the opening; this need will be addressed during the environmental analysis process for specific management activities Meadows one acre or larger are addressed in Management Area 9

MISCELLANEOUS WILDLIFE SITES

4-17 During the life of this Forest Plan, habitat sites will be found which have special value for wildlife or botanical resources and are not otherwise addressed in the Standards and Guidelines (see Management Area 9). **Management of these sites should be dealt with individually as part of the environmental analysis process for specific management activities. Each Ranger District shall maintain a list of sites to be considered for allocation as Special Wildlife Sites at the next revision of the Forest Plan.**

PLANT COLLECTING (INCLUDING SENSITIVE SPECIES)

4-18 Federally listed Threatened and Endangered species are protected by the Federal Endangered Species Act (1982 amendments). The Forest Service *cannot* issue permits to collect these species for any purpose. This authority is granted only to the U.S. Fish and Wildlife Service

Collecting for scientific or educational purposes (FSM 2673.2). **The Forest Supervisor may issue permits to collect Sensitive or Restricted plants or plant parts for legitimate scientific or educational purposes.** Such collection must not jeopardize the continued vigor or existence of a plant population. **Sensitive or Restricted plants shall not be collected for commercial or personal use.**

Collecting of plants or plant parts in Management Areas 1 through 4 (Wilderness, Wild River, Research Natural Area, and Botanical) shall not be allowed except by permit issued by the Forest Supervisor for scientific or educational purposes.

Commercial Collecting (FSM 2431 42, including R-6 Supplement 383 and 390). Collecting of plants or plant parts for any commercial purpose requires a commercial use permit issued by the Ranger District where the collecting activity is proposed. **District Rangers shall issue or deny commercial permits after review of a proposal presented by the collecting party. When evaluating applications for commercial collecting permits, consideration should be given to the impacts on all forest resources, including biological diversity.**

General Botanical Collections. **Botanical collection permits may be issued by the Forest Supervisor to authorize collection of species other than endangered, threatened, sensitive, or restricted (FSM 2673.2(3), R-6 Supplement 41). Miscellaneous forest products, including some plant materials, may generally be collected for personal use without a permit.** For specific rules, see FSM 2467.16, including R-6 Supplement 380.

Restricted plants are determined by the Forest Supervisor to be in jeopardy due to their limited abundance, fragile habitat or potential for over collection Restricted plants include such plants as orchids and insectivorous species. Current lists of Threatened, Endangered, Sensitive and Restricted plants are available at the Forest Supervisor's office.

The above Standards and Guidelines do *not* apply to the harvest of trees for timber and firewood

RANGE

5-1 **Where opportunities exist, the range resource may be managed for range benefits. Range management practices are generally compatible with wildlife needs, but where conflicts occur, management shall favor protection of riparian areas and should favor deer and elk forage needs and cover requirements.**

Opportunities exist for transitory range within timber harvest units **Livestock use of recently harvested areas should not be allowed to impair seedling survival or growth. Livestock should not be permitted to graze in developed recreation areas.**

Allotment plans, including transitory range, shall be prepared in coordination with other resources as directed by FSM 2210. In allotment plans, livestock use should be evaluated for its effect on biological diversity, specifically sensitive plants. Coordination should be done during the planning of any resource management activity. Allotment plans shall contain utilization standards designed to maintain healthy riparian plant communities for the protection of soils, water quality, fish, and wildlife habitats.

Transportation systems in range allotments should be designed and constructed with consideration of livestock objectives and established grazing systems.

Improvement and development of the range resource should be consistent with public needs and environmental requirements.

Maximum acceptable annual utilization levels for meadow sites are included in Special Wildlife Sites (Management Area 9).

TIMBER MANAGEMENT

6-1 **The following timber management practices may apply on all lands selected for timber production, including reduced-yield areas, according to the land allocation:**

1. **Site Preparation, including the treatment of the residual logging slash, using all site-appropriate methods.**
2. **Genetic improvement of tree stock.**
3. **Reforestation using genetically improved seedlings as rapidly as they become available consistent with the need to manage biological and genetic diversity.**
4. **Animal damage control using all site-appropriate methods.**
5. **Release using site-appropriate methods as determined through separate environmental analyses (Regional FEIS) and subsequent tiered analyses, or as superseded by future NEPA documents.**
6. **Precommercial thinning.**
7. **Commercial thinning as defined under Standards and Guidelines for individual management areas.**
8. **Fertilization in managed plantations and natural stands.**
9. **Salvage**
10. **Final Harvest**

6-2 **Harvest activities shall occur only on lands classified as suited for timber production, except timber cutting may occur on other lands for the following purposes:**

1. **To remove timber from road locations needed for the harvest of timber from selected suitable lands or for other management purposes.**

2 **Construction or protection of capital improvements such as campgrounds, buildings, fuelbreaks, and dispersed recreation sites; or to accomplish projects designed to enhance other resource values.**
3. **Removal of hazards to human life and health.**
4. **Removal of timber killed by catastrophic events, such as fire, windthrow, drought, insects or disease (36 CFR 219.27 (c)(1)). The decision to salvage-harvest an area shall be based on an analysis of existing conditions following the disturbance, and shall include consideration of the economic, social and environmental consequences.**
5 **Where small inclusions in harvest units that otherwise are suitable will allow use of more logical management units and road locations resulting in less resource impacts.** Reduced impacts might be achieved by reducing landing or road construction, by enabling construction away from unstable soil, or by reducing soil and vegetation disturbance caused by dragging logs.
6 **As part of a research study to test the feasibility of silvicultural and harvesting practices that could be successful on these lands.** This could provide useful information for the 10-year re-evaluation of these lands
7 **In the case of Separate Suitability Component (SSC) lands, timber harvesting may occur where a site-specific analysis shows timber management to be economically efficient and consistent with established goals and objectives.** This recognizes the variability in this land class and provides the flexibility to take advantage of opportunities such as overstory removal harvests that require low investment.

6-3 **If field analysis during project planning identifies a need to correct the inventory of suitable lands, the following process shall be followed:**

1. **Boundary adjustments to refine mapping lines shall be documented in the project records and maintained in the Ranger District resource inventory.**
2 **Where changes in classification are indicated, the analysis and rationale for the needed change shall be documented and retained at the Ranger District as an interim record until monitoring, as defined in the Monitoring Plan, indicates the need to consider adjustment at the Forest level.**

The inventory of suitable lands is reviewed periodically. The review will focus on documentation of changes in classification, consistency of evaluation of suitability, and new information or technology that may affect the capability to manage the land.

6-4 **An environmental analysis shall be conducted for areas considered for harvest according to the procedures found in Forest Service Manual 1950, Environmental Policies and Procedures. An economic analysis shall be included when areas have alternatives with substantial roading and harvesting, and choices that maximize net public benefits are not obvious from environmental and resource considerations.** Present Net Value or Least Cost are appropriate measures of economic efficiency to use for this analysis. Appropriate analytical techniques are described in the Timber Sale Economic Analysis Guide (Kramer and Owen, n d.).

6-5 **Timber stands shall not be scheduled for final harvest before stand age has reached or surpassed the age of 95 percent of culmination of mean annual increment in cubic feet. Exceptions may be made where special resource considerations require earlier harvest, or where small inclusions of young stands in harvest units that otherwise meet this requirement will result in more logical management units allowing greater efficiency or less resource impacts. The age of 95 percent of culmination shall be taken from the managed yield table used in the planning analysis (Craig 1984) for the appropriate prescription and intensity unless site-specific yield projections are made as part of the silvicultural prescription; in which case the more specific data may be used for this determination.**

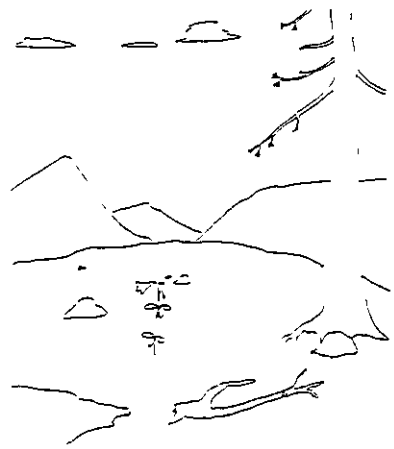
6-6 **The final selection of harvest cutting method shall be made for specific areas in silvicultural prescriptions or environmental assessments. Clearcut, shelterwood, seed-tree, group selection, or single-tree selection may each be used on specific sites where appropriate for the combination of site conditions and management objectives. The method selected should best meet the resource and vegetation management objectives of the management area, including objectives for biological diversity and long-term site productivity.** The systems that are generally most appropriate for given conditions are displayed in Figure IV-2. (Discussion of the selection of systems may be found in Appendix G of the FEIS) The final selection of harvest methods will be based on site-specific environmental analysis. Even-aged management with regeneration harvests by clearcutting, or shelterwood will be the most commonly used methods Clearcutting will only be used where it is the optimum method Uneven-aged management may be used on specific sites where analysis indicates it will meet resource objectives Examples of where this could be appropriate are: to meet objectives for streamside, visual management, or biological diversity to provide for slope stability, or for timber management where the natural stand has an uneven-aged structure.

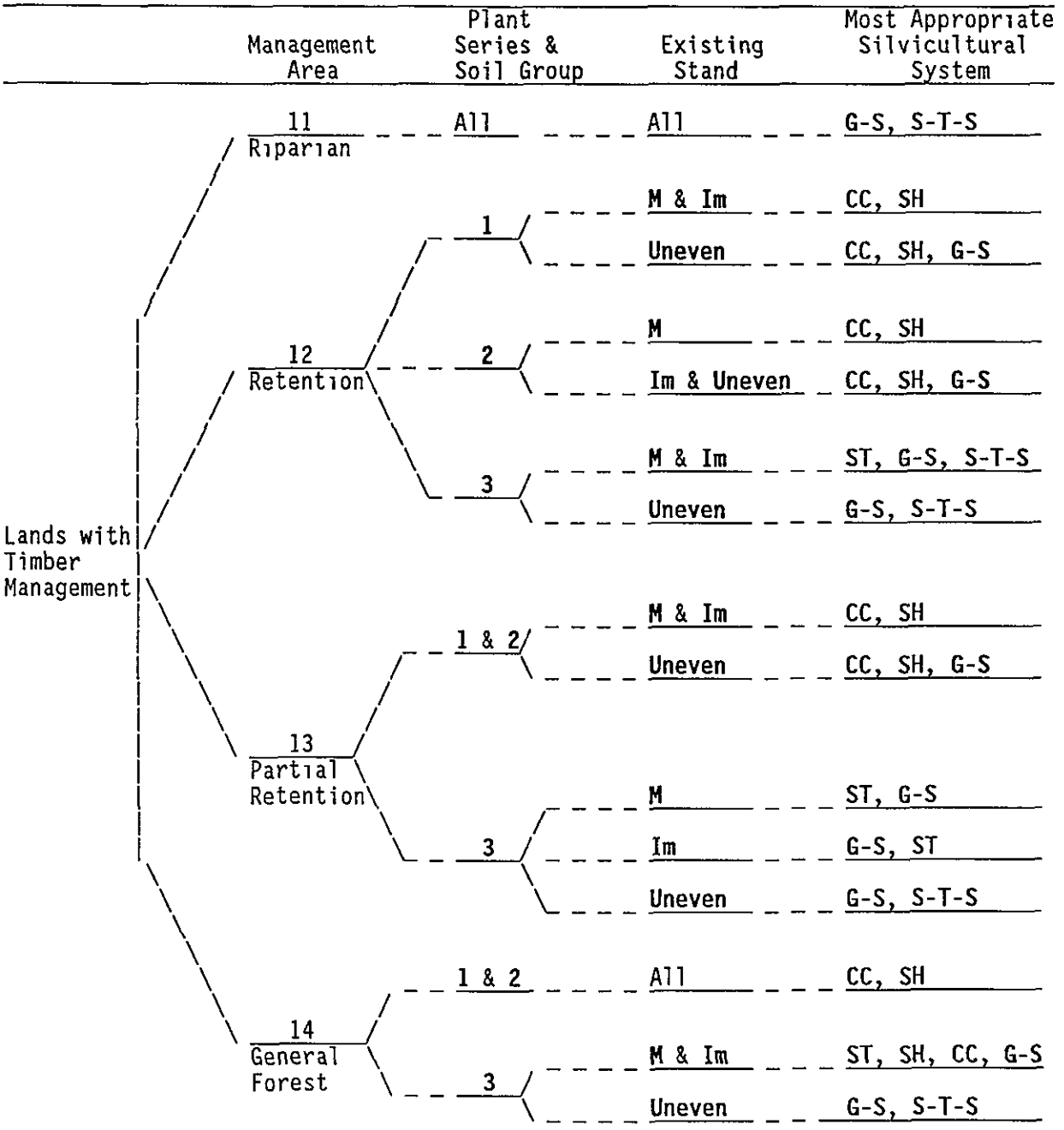
6-7 **Timber harvesting shall be done in such a way that there is assurance that each area can be adequately restocked within 5 years after final harvest (36 CFR 219.27(c)(3)).** Five years after final harvest means 5 years after either clearcutting, final overstory removal, seed tree removal, or selection cutting. **Exceptions may be made for specific sites where environmental analysis and silvicultural prescription indicate a restocking period of more than 5 years would produce a more desirable combination of net public benefits.** This does not allow harvest of sites where regeneration could not be achieved within 5 years if that were the objective

Competing vegetation should be controlled where there is no assurance that timber harvest areas can be reforested within a 5-year period without vegetation control.

Where heavy animal damage may prevent reforestation of timber harvest areas within 5 years, animal control or methods of protecting plantations from unacceptable damage should be used.

6-8 **Appropriate species mix for regeneration shall be included in the silvicultural prescription prepared during the environmental analysis for harvesting the area. The prescription should consider natural regeneration potential and advanced regeneration as part of this analysis. Consideration should be given to regenerating and maintaining minor species, where appropriate for the site, as viable components of future stands, and for enhancement of vegetative diversity.** Special consideration will be made for Port-Orford-cedar, as outlined under Integrated Pest Management





Symbols Used: SH = Shelterwood, CC = Clearcut, ST = Seed-tree, G-S = Group Selection, Uneven = Uneven-aged, S-T-S = Single-tree Selection, M = Mature Stand, Im = Immature Stand

Plant Series and Soil Groups: 1 = High Vegetative Competition - Balanced Soils
2 = Moderate Competition - Balanced Soils
3 = Lower Competition - Ultrabasic Soils

Figure IV-2 Silvicultural Systems Analysis

6-9 **Forest openings created by even-aged silviculture shall not exceed 60 acres.** (This is a maximum, the average may well be less than 30 acres.) **The openings should be shaped or blended with the natural terrain to achieve aesthetic, biological diversity, and wildlife habitat objectives to the extent practicable. Exceptions are permitted for catastrophic events (such as fires, windstorms, or insect and disease attacks) or on an individual basis after a 60-day public notice period and review by the Regional Forester. In addition, the 60-acre limit may be exceeded by as much as 50 percent without necessitating review by the Regional Forester *or a 60-day public notice when exceeding the limit will produce a more desirable* combination of net public benefits and when any one of the following criteria is met:**

1 **When a larger created opening will enable the use of an economically feasible logging system that will lessen the disturbance to soil, water, fish, riparian resources, or residual vegetation.** Such lessening might be achieved by reducing landing or road construction, by enabling construction away from unstable soil, or by reducing soil and vegetation disturbance caused by dragging logs
2 **When created openings meeting this size limit cannot be centered around groups of trees infected with dwarf mistletoe or root disease and therefore need to be expanded *to include these trees in order to avoid infection of susceptible adjacent conifers.***
3 **When VQO's require openings to be shaped and blended to fit the landform.**
4. **When larger openings are needed to achieve regeneration objectives in harvest areas being cut by the shelterwood method and when destruction of the newly-created stand would occur as a result of delayed removal of shelter trees. This exception applies only to existing shelterwood units and to shelterwood units under contract prior to approval of the Forest Plan. Newly-planned shelterwood units should not exceed the opening size limitations.**

6-10 **The following limits on scheduling and distribution shall be met by all regeneration harvest *activities. Exceptions are permitted for catastrophic events (such as fires, windstorms, or* insect and disease attacks), or where more stringent standards are required for specific resource values (visual, wildlife, riparian) as specified in the applicable management area standards and guidelines.** Contiguous harvest units are not precluded, but will be considered as a single opening subject to the standards defined for created openings

1. **Created openings shall be separated by areas not classed as a created opening. The areas between created openings shall contain one or more logical harvest units.**
2. **A harvested area of commercial forest shall no longer be considered a created opening when stocking surveys carried out in accordance with instructions in the Reforestation Handbook (FSH 2409.26b R6) indicate that crop trees are at prescribed stocking levels and are at or above 4-1/2 feet in height and free to grow.** See Management Prescriptions for Management areas 12 and 13 for standards for visually perceived created openings.

Crop trees per acre (TPA) required to meet minimum acceptable stocking levels are indicated below. (These are not objectives and would not provide sufficient stocking to attain timber production goals if a large proportion of acres are carried at these minimum levels.)

Type	Minimum TPA	Minimum Spacing Between Crop Trees (Feet)
DF Site Class III and Better	150	6
All Others	125	6

6-11 Minimum utilization standards to be used in timber harvest operations for the next decade are specific to. mature and young-growth (commercial thinning) stands **The standards in the following table apply where practicable.** Where individual market areas or specific products present opportunities for utilizing a higher proportion of the tree, the following standards could be exceeded. **In some cases, other resource objectives may require leaving a higher proportion of woody material on site.** These utilization standards do not apply to materials left to meet fish and wildlife and soil management objectives, or to unmerchantable species

Stand Type	Minimum DBH (Inch)	Minimum Top DIB (Inch)
Mature	9	6
Young-growth (Commercial Thin)	7	4

6-12 **Maximum utilization of products created during timber harvesting and other management activities should be encouraged to the extent practicable and consistent with all resource objectives including objectives for biological diversity. Utilization of residue may be encouraged by the following:**

1. **The placement of nonmerchantable material in piles at designated locations both on or off the Forest for woodcutters, chip manufacturers, energy conversions, or other users.**
2. **The sale of minor products, such as commercial wood contracts, chip logs, etc., and the issuance of firewood permits.**

6-13 **Lands classified as suitable for timber production and currently not stocked with conifers may be programmed for conversion to site-appropriate conifer species where a site-specific environmental analysis considering the effects on other resources, including wildlife habitat and vegetative diversity, shows the project to be cost-effective and without significant adverse impacts that cannot be mitigated. Such projects are also be subject to the following limitations:**

1. **Not more than 7,500 acres should be programmed for treatment during the next decade.**
2. **Conversion of hardwood stands should only be done where it can be accomplished through commercial harvest.** (Stands containing substantial potentially usable volume will not be slashed and burned.)
3. **Management activities in hardwood stands shall comply with all standards and guidelines applicable to timber management activities, e.g., unit size, dispersion, etc.**

6-14 **Stand treatment in managed commercial forests shall provide for species diversity. Tree species used in planting harvest units should be based on the potential of the site as indicated by plant associations. Thinning, commercial and precommercial, should retain a diversity of species based on site potential. Vegetation management activities and hardwood management prescriptions should allow for all natural species to function. None should be eliminated from the site.**

SOIL AND WATER

7-1 **Land management activities shall be planned and conducted to maintain soil productivity and stability.**

Forest management activities shall meet or exceed the stated objectives in the Organic Administration Act of 1897, the Multiple Use-Sustained Yield Act of 1960, NFMA of 1976, FSM 2550, FSM 2520 R-6 Supplement 50, and FSM 2550.3 Siskiyou Supplement 2. The few wetlands and floodplains that exist on the Forest shall be managed according to Executive Order 11988, Floodplain Management, and Executive Order 11990, Protection of Wetlands.

DETRIMENTAL SOIL CONDITIONS

7-2 Detrimental soil conditions include compaction, displacement, puddling, and severely burned soil conditions **The total area of detrimental soil conditions should not exceed 15 percent of the total acreage within the activity area, including roads and landings.**

Detrimental conditions occur when one or more of the following criteria are exceeded: (See FSM 2520, R-6 Supplement 50, for a complete definition of detrimental conditions)

Compaction. Leave a minimum of 85 percent of an activity area in a condition of acceptable productivity, measured by an increase in soil bulk density of 15 percent or more and by a reduction of macro-pore space of 50 percent over the undisturbed soil

Puddling. Leave a minimum of 85 percent of an activity area in a non-puddled condition Soil puddling is a physical change in soil properties due to shearing forces that destroy soil structure and reduce porosity

Displacement Leave a minimum of 85 percent of an activity area unaffected by detrimental soil displacement Detrimental displacement is the removal of more than 50 percent of the topsoil or humus enriched A1 or AC horizons from an area of 100 square feet or more which is at least 5 feet in width.

Severely burned. Leave a minimum of 85 percent of the soils of an activity area unaffected by severely burned condition. Soils are considered to be severely burned when the top layer of mineral soil has been been significantly changed in color, usually to red, and the next 1/2 inch blackened from organic matter charring by heat conducted through the top layer.

7-3 **Area used as temporary roads shall be rehabilitated to productive condition for timber or wildlife. Temporary roads left from past activities should be evaluated as they are encountered during project environmental analysis. These areas should be rehabilitated where practicable.**

SOIL EROSION

7-4 **Management activities, except permanent facilities, shall be planned to retain the soil duff and litter. Mineral soil exposure (loss of duff and litter) should not exceed the following limits (*Boyer and Dell 1980*):**

1. **Forty percent mineral soil exposed on soils classed low-to-moderate erosion hazard, as defined in the Siskiyou National Forest Soil Resource Inventory (Meyer and Amaranthus 1979).**

2. **Thirty percent exposure on high erosion hazard soils.**
3. **Fifteen percent exposure on very high erosion hazard soils.**

7-5 **Permanent facilities (roads and landings) shall be managed to expose a minimum of mineral soil.**

Cut and fill slopes should be protected from erosion. Plan for natural vegetation to stabilize cut and fill slopes where practicable.

Landings and temporary roads should be restored and placed in condition to minimize the erosion potential.

Drainage for all roads and landings should be developed and maintained.

7-6 **Where the above standards for soil erosion cannot be met because of specific site conditions, appropriate mitigation measures shall be developed in the project environmental analysis, documented in the project record, and implemented prior to fall rains.**

MASS MOVEMENT

7-7 **The scheduling of timber harvest and road building shall consider the increased potential for mass movement. When management activities would increase potential for mass movements, an alternative prescription should be developed and evaluated considering the environmental impacts and management costs over the life cycle of the project. Qualitative landslide hazard maps and risk assessment should be used for planning of timber harvest activities.**

LARGE WOODY MATERIAL

7-8 **Management activities shall be planned to maintain enough large woody material (dead and down) to maintain a healthy forest ecosystem. Site-specific needs shall be considered in environmental analyses. Five to twenty pieces of large woody material per acre should remain on each site where management activities take place. Material should be from a range of decomposition classes; each piece should be at least 20 inches in diameter at the large end and contain at least 40 cubic feet volume.** Considerations for achieving desired results are:

1. Leave all class III, IV, and V logs
2. 10-20% of the pieces should be class I or II (most special and utility culls meet the definition of decomposition classes I or II)
3. Conifer logs are preferable, but where unavailable, hardwood logs can be substituted
4. 20 inch diameter or larger pieces are preferred; if not available, leave pieces as close to 20 inches diameter as possible.

SOIL AND WATER RESOURCE IMPROVEMENTS

7-9 **Programs of work shall be initiated to reduce sedimentation, to improve water quality and to stabilize peak flows. High priority projects should be those that increase channel stability, improve effective stream shading, reduce sedimentation and stabilize areas of mass failure.** Annual adjustments in project priority will reflect targets, available funding, severity of problem, site conditions, benefits, values at risk, and effectiveness of treatment control.

RIPARIAN ECOSYSTEMS

7-10 **Riparian habitat management shall emphasize the role of riparian ecosystems in landscape ecology, vegetative diversity, slope and channel stability, fisheries, wildlife, and water quality.**

No management practices causing detrimental changes in water temperature or chemical composition, blockages of water courses, or deposits of sediment shall be permitted within riparian areas which seriously and adversely affect water conditions or fish habitat (36 CFR 219.27(e)).

Present and future sources of large woody material should be provided. Existing instream material should be maintained or enhanced.

Management activities shall be planned and conducted to limit impacts on streams and water quality. Standards and Guidelines for the management of Class I, II, and III streams are found under Management Area 11. Additional direction is found in Siskiyou Riparian Ecosystems Management Policy (FSM 2520 3 Siskiyou Supplement 1).

7-11 **Class IV streams shall be managed to minimize adverse downstream impacts on Class I, II, and III streams that could result from movement of soil, debris, or chemicals into perennial stream courses:**

1. **The bank and channel stability of Class IV stream courses should be protected. The minimum area of consideration should be 25 feet horizontal distance on each side of the stream channel.** Stream course protection needs will often be met by retaining selected hardwoods or conifer trees directly adjacent to the stream channels
2. **Burning prescriptions should plan to protect streamside vegetation and maintain stream channel stability.** In most instances, minimal or no burning would be prescribed within 25 feet horizontal distance on either side of stream channels
3. **Activity created debris should be cleared from stream channels except for large woody material keyed into stream banks that contribute to water quality, stream channel and bank stability, and fish habitat. Clearing should be accomplished prior to fall rains.**
4. **Efforts should be made to yard away from stream channels. Logs yarded over Class IV streams should be fully suspended where practicable.**

Where the above measures cannot be implemented, appropriate mitigation measures shall be developed in the project environmental analysis, documented in the project record, and implemented prior to fall rains.

7-12 **Where domestic water uses occur within small watersheds subject to management activity, an indepth field evaluation and determination of water quality protection needs should accompany any reclassification of stream Classes I-IV for each tributary. Management prescriptions for the riparian corridor should be tied to site-specific conditions relative to the type and extent of proposed activity and expected impact on water quality.**

INSTREAM FLOW

7-13 **Instream flow on National Forest System Lands should be protected through environmental analysis of proposed water uses, diversions, transmission applications, and renewal of permits. Protection of instream flow needs may be achieved through filing protests with states where applications are made that adversely affect National Forest resources,**

asserting claims for this water under Federal or State laws where applicable, inserting protection measures into special use permits, or reaching formal agreements over use. Purchase of water rights and impoundments are other means for reducing these impacts

BEST MANAGEMENT PRACTICES

7-14 **State requirements shall be complied with in accordance with the Clean Water Act for protection of waters of the State of Oregon (Oregon Administrative Rules, Chapter 340-41) and the State of California (Porter-Cologne Water Quality Control Act, Division 7) through planning, application, and monitoring of Best Management Practices (BMP's) in conformance with the Clean Water Act, regulations, and Federal guidance issued thereto.**

In cooperation with the States of Oregon and California, the Forest shall use the following process:

1. **Select and design BMP's based on site-specific conditions, technical, economic, and institutional feasibility, and the water quality standards for those waters potentially impacted.**
2. **Implement and enforce BMP's.**
3. **Monitor to ensure that practices are correctly applied as designed.**
4. **Monitor to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.**
5. **Evaluate monitoring results and mitigate where necessary to minimize impacts from activities where BMP's do not perform as expected.**
6. **Adjust BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level. Evaluate the appropriateness of water quality criteria for reasonably assuring protection of beneficial uses. Consider recommending adjustment of water quality standards.**

The process agreed to in the following Memoranda of Understanding (MOU) shall be used to implement the State Water Quality Management Plan on lands administered by the USDA Forest Service:

1. **The Oregon Department of Environmental Quality and U.S. Department of Agriculture, Forest Service (February 12, 1979 and December 7, 1982), and "Attachments A and B" referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest December, 1978, and Best Management Practices for Range and Grazing Activities on Federal Lands, respectively).**
2. **The State Water Resources Control Board, State of California, and U.S. Department of Agriculture Forest Service, Pacific Southwest Region, 1981.**

For a more complete explanation, refer to Appendix F, "Best Management Practices "

Individual, general Best Management Practices are described in *General Water Quality Best Management Practices*, Pacific Northwest Region, November, 1988. This provides guidance but is not a direction document. Also included in this document is a description of the process, and limitations and use of these BMPs. Each BMP listed includes the Title, Objectives, Explanation, Implementation, and Responsibility, and Monitoring. Evaluations of ability to implement and estimated effectiveness are made at the project level.

Not all of the general BMPs listed will normally apply to a given project, and there may be specific BMPs which are not represented by a general BMP in this document.

The sensitivity and significance of the project determines whether the site-specific BMP prescriptions are documented in an EA, EIS, sale plan, project plan, or in analysis files

Best Management Practices relating to protection of water quality shall be followed for any chemical application projects. In the event of an accidental spill of hazardous materials, procedures shall be followed as set forth in the Oil and Hazardous Substances Pollution Contingency Plan (FSM 7443).

7-15 **Management activities, particularly road building and timber harvest, shall be scheduled to minimize long-term detrimental changes in watershed conditions.** Spatial distribution and timing of activities will be the principle factors used to reduce unacceptable cumulative impacts. Harvest will vary between planning basins depending upon each basin's unique physical environment.

Project planning shall assess the potential for adverse effects beyond the immediate activity site. The watersheds identified on the Watershed Analysis Area (WAA) Maps (on file) should be the primary unit for this assessment. When more than five percent of a WAA is proposed to be part of the road system (including temporary roads), a detailed analysis should be made and safeguards shall be taken to ensure that the watershed's condition will not be irreversibly and detrimentally altered. If more than 20 percent of a WAA is proposed to be harvested in a single decade, a more detailed evaluation shall demonstrate that watershed conditions will not be impaired.

AIR QUALITY

8-1 **Management activities shall be planned to maintain air quality at a level adequate for the protection and use of the National Forest resources, and meet or exceed applicable Federal and State standards and regulations (36 CFR 219.27(a)(12)).**

The Forest shall coordinate with the appropriate air quality regulatory agencies. Prescribed burning operations shall comply with the procedures identified in the Smoke Management Operations Plan (Oregon State Forestry Directive 1-4-1-601) and Open Burning Regulations for California North Coast Air Basin.

Reasonable progress shall be demonstrated in reducing total suspended particulate (TSP) emissions. Projected TSP should not exceed 7,300 tons on an annual basis. TSP emissions associated with wildfires and wilderness prescribed fire from unplanned ignitions will not be included in the annual total.

The best available predictive methods and models and the most cost efficient technology should be utilized to minimize the impact of prescribed burning on smoke sensitive areas and designated Federal Class I areas. Smoke from prescribed fires initiated from lightning caused ignitions occurring inside wilderness is considered a natural component of the ecosystem and does not constitute a violation of the Class I area ambient air quality standards. (The original portion of the Kalmiopsis is currently the only Class I airshed on the Forest Studies are underway to consider classification of other wilderness area on the Forest.)

The adherence to sound smoke management principles is the key element in mitigating the impacts of smoke on air quality and Air Quality Related Values. Smoke management approaches the concept of maintaining air quality by avoiding unacceptable combinations of concentration, duration and placement of smoke (Cramer 1974); or, more simply stated - risk avoidance. Pierovich (1976) states that the central principle of smoke management is to avoid overloading natural clearance mechanisms--both pulmonary and environmental

Three basic strategies may be used to manage prescribed fire smoke: reduction, dilution and avoidance.

The strategy of *reduction* focuses on reducing the amount of smoke (particulates) produced by increasing the efficiency of burning and reducing the amount of fuel consumed by fire. This may be accomplished by such methods as:

1. Increasing wood utilization standards and the continued use of YUM and PUM specifications (yarding or piling of unmerchantable material), consistent with the objectives for large woody material, in timber sale contracts.
2. Specifying logging methods that reduce timber breakage and minimize creation of unmerchantable debris (e g directional felling, tree lining)
3. Selection of fuel moisture parameters which reduce the total consumption of fuel and reduce the smoldering phase of combustion.
4. Selection of ignition (fire starting) methods and techniques which lower the TSP production.
5 Utilizing alternative slash treatment methods, such as chipping or burying, in lieu of prescribed fire.
6 Requiring prompt and vigorous mop-up (extinguishing of remnant traces of fire, to prevent its recurrence).
7 Increasing the air supply to slash piles and burn bays (specially created areas along roads for accumulating and treating slash).
8. Changing the specification of a "utility log".

The *dilution* or dispersion strategy may also be utilized to mitigate air quality impacts. This strategy is governed by weather-related processes The capacity of these processes determines the amount of fuels that may be consumed, as well as the time, location and amount of particulates that could be released into the atmosphere. Specific mitigation measures that could be utilized in respect to the dispersion strategy include:

1 The scheduling of burns over a period of several days, rather than all on a single day.
2 Igniting the units during unstable atmospheric conditions.
3. Limiting burning when transport wind speeds are less than nine miles per hour and the morning mixing height is less than 1,500 feet above the burn site.
4. The selection of a combination of prescription parameters, i.e., fuel conditions, weather conditions and ignition techniques, that will generate an elevated plume that will mix well with the surrounding air mass.
5. Utilizing precipitating cloud systems as a "scrubber" to remove particulates and soluble gases.
6. Coordinating prescribed burning activities with adjacent agencies and land managers to reduce the total impact on local airsheds.

The third strategy, *avoidance*, may also be utilized in a Forest smoke management program. This strategy involves the selection of on-site and meteorological conditions that will either put the smoke up and over smoke-sensitive areas or away from these areas. Practices that may be followed include.

1. Burning when wind direction is favorable for avoiding smoke-sensitive areas.
2. The selection of a combination of burning prescription parameters that will generate an elevated plume that will exceed the ceiling of the smoke-sensitive area and then move quickly over or away from the area.
3 Using the combination of terrain elevation and inversion layers to prevent smoke from settling into sensitive areas.

Public understanding of prescribed fire and smoke management will be most helpful in assuring that any one of the strategies, or a combination of strategies, is successful Some measures that may be employed include:

1. Educating the public as to the objectives of prescribed fire use in the local environment, the steps taken to reduce smoke, and how smoke is managed
2. Informing the public before the ignition of potentially troublesome units

Coordination with other local agencies which also have responsibilities for the maintenance of air quality is a key in assuring a viable air quality maintenance program for the Forest. Some measures that may be taken to ensure overall air quality are:

1. Cooperating with local air pollution authorities in monitoring activities which may result in new or modified sources of emissions that may impact Class I areas
2 Completing review of any air quality studies that are part of new source permits.

LANDS

9-1 Acquisition of non-Federal land in the Winchuck Recreation Composite should be completed as parcels become available.

9-2 Acquisition of non-Federal land in the Agness townsite area should not be planned.

In the case of privately-owned parcels within the Wild and Scenic River system, the values which provided the basis for Congressional designation should be protected through cooperation with Josephine and Curry Counties in utilizing the zoning powers of the state and local governments. Where this is not practicable to protect these values, the Forest should seek to acquire conservation easements to accomplish this goal. Fee simple acquisition of private property would be a last resort to protect Wild and Scenic River values

Public interest in non-Federal land should be acquired by one of the following methods which best supports the Forest Plan:

Land exchange
Purchase
Donation
Partial interest - scenic easements, conservation easements, etc.

9-3 All non-Federal lands inside the Siskiyou National Forest boundary and a limited amount of National Forest Land shall be placed in one of the following landownership planning groups: (see Figure IV-3, Land Adjustment Map)

Group 1 - Congressional Direction

Definition - This group includes those lands where Congress has either directly or indirectly instructed the Forest Service to retain National Forest ownership and acquire non-Federal lands for a designated purpose. Land management allocations which could be associated with this group include Wilderness Areas and Wild and Scenic Rivers.

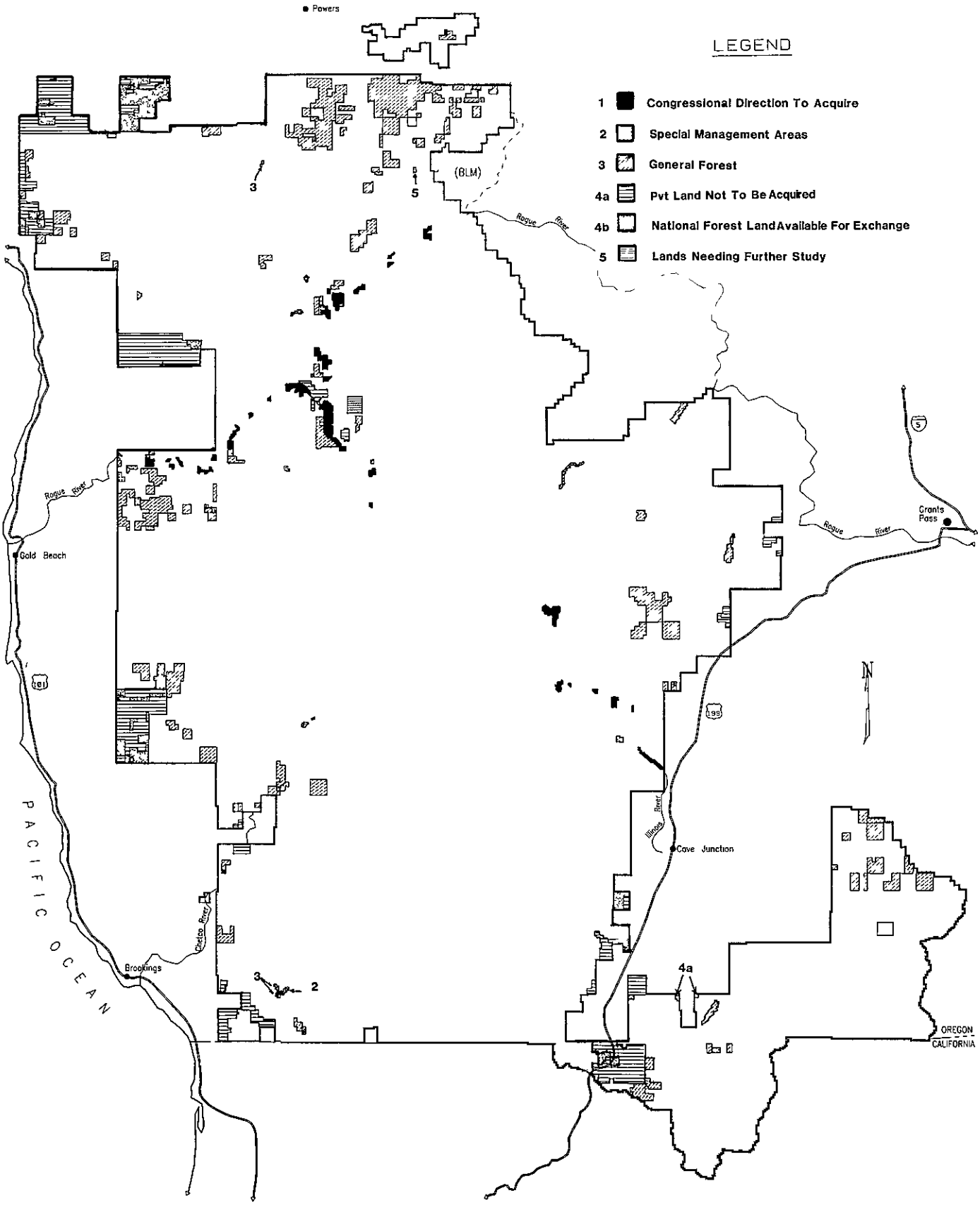


Figure IV-3. Land Adjustment Map

Group 2 - Special Management Areas

Definition - This group includes those lands where the Forest Service, through the land and resource management planning process, has recognized the need for a special kind of management or determined that National Forest ownership is necessary to meet objectives. The target is to retain National Forest ownership and acquire private land as the opportunity and/or need occurs. The special land management allocations which could be associated with this group include Retention Forest, Partial Retention Forest, Mature Old-Growth Habitat Areas, Supplemental Resource Areas, and Inventoried Wild and Scenic Rivers.

Group 3 - General Forest (private)

Definition - Land in this group would characteristically be in the General Forest allocation, where management direction emphasizes commodity production. These lands could be considered for land adjustment and usually would provide most of the land involved in exchange projects.

Group 4a - Private Land Not To Be Acquired

Definition - Land in this group is highly developed and not suited for National Forest purposes. These lands would not be acquired.

Group 4b - National Forest Land Available for Exchange

Definition - This group generally includes small, isolated tracts of National Forest Lands that are situated away from contiguous blocks of the National Forest, are costly to administer, and contain no special resource features. These areas could be parts of land management allocations associated with groups 2 and 3.

Group 5 - Lands Needing Further Study

Definition - This group includes situations where it is determined that more intensive study and planning are necessary before landownership decisions can be made. Non-Federal lands which could be acquired to meet essential National Forest management needs are assigned to following land adjustment priorities:

Priority 1 - Group 1 lands
Priority 2 - Group 2 lands
Priority 3 - Group 3 lands

The above guidelines should be followed; however, it may be necessary to deviate from this ranking to take advantage of opportunities as they arise. Proposals that emphasize consolidation of landownership should be favored.

9-4 **The objective of Special Use Management is to provide for the use and occupancy of the National Forest land when such use is consistent with Forest Management area goals and objectives. This use must be in the public interest and such that it cannot be served by reasonable development on private land. Special use applications should be evaluated through environmental analysis before the permit is issued, and appropriate site-specific requirements and mitigation measures developed for inclusion in the permit.**

Uses should not be authorized beyond a unit's ability to provide minimum administration.

RECREATION USES

9-5 **Existing special use permits for recreation residences shall be reviewed prior to scheduled termination (five in 1989 and one in 1990) to determine if:**

1. **The land will be needed for a higher public purpose within the following 20 years.**
2. **The land should continue to be occupied as a recreation residence for an additional 20 years.**
3. **The land could best serve the public need by being in private ownership.**

Applications for new recreation residences shall be denied.

All recreation special uses shall be compatible with the ROS classification of the area. Facilities shall be designed to meet the designated services to be provided. The number of permits for a specific use should be limited in order to create or maintain economical operations, reduce administrative costs, and provide high quality services. Prospective permittees must demonstrate that they have the financial resources to undertake the proposed venture or the permit shall not be issued.

Commercial rafting and guide permits on the Illinois and Rogue Rivers shall be issued in accordance with requirements of the management plans for these rivers.

Permits for commercial services may be issued in campgrounds or other developed sites when the public interest can best be served by such service.

NONRECREATION USES

9-6 **Existing Transportation Corridors, as identified in this Plan shall be managed by the agency which acquired the rights-of-way. The viewsheds of these corridors shall be managed as provided for in the individual land allocation which they are within.**

Future Transportation Corridor planning or subsequent interagency environmental analysis shall be in accordance with the requirements of exclusion areas, avoidance areas, sensitive areas and other areas as for future utility corridor planning.

The utilization of residual capacity in existing special use permit corridors and designated Utility Corridors shall be given the first priority for right-of-way requests by utilities. Wherever practicable, locate small utilities in other corridors or roadways. Install underground where practicable.

Existing utility corridors, as identified in this Plan, shall be managed in accordance with existing permits. An exception is the Happy Camp corridor, which should be relocated outside the view of Happy Camp Road when the opportunity arises. These corridors shall be considered a part of the Management Areas which they cross; analogous to roads, developed recreation sites and administrative sites. An attempt should be made to manage and protect other resources in accordance with the land allocations made for this Plan. Existing utility lines crossing the Recreation and Scenic portions of the Rogue River (these lines not designated as a utility corridor) should be relocated, eliminated or combined into fewer crossings, as opportunity permits.

Additional corridors which may be needed by major utilities shall be designated through an interagency environmental analysis following procedures set forth in the Regional Guide. Future utility corridor planning and subsequent interagency environmental analysis shall be in accordance with the following allocations:

1. **Exclusion areas, which are land areas determined to be unavailable for corridor allocation or facility siting. Exclusion areas include Wilderness (MA-1) and Wild River (MA-2) Management Areas.**
2. **Avoidance areas, which are land areas that pose particular environmental impacts which would be difficult or impossible to mitigate, or which impose unusual engineering constraints. Avoidance areas include Research Natural Area (MA-3), Unique Interest (MA-5), Backcountry Recreation (MA-6) and Special Wildlife Site (MA-9) Management Areas.**
3. **Sensitive key values, identified by a thorough analysis of the potential effects, should be avoided in the Botanical (MA-4), Supplemental Resource (MA-7), Designated Wildlife Habitat (MA-8), Scenic/Recreation Rivers (MA-10) and Retention Visual (MA-12) Management Areas.**
4. **Other areas may contain site-specific key values, such as recreation or administrative sites. These key values shall be considered in the Riparian (MA-11), Partial Retention Visual (MA-13) and General Forest (MA-14) Management Areas.**

Applications for uses associated with dams, reservoirs, and water transmission may be recommended for approval if they are consistent with management goals and objectives for the area. Water rights acquired for developments on National Forest lands shall be obtained by the applicant in the name of the United States.

Existing sites used for electromagnetic communications shall be protected from interferences generated by power transmission lines. This may require the power transmission lines to be rerouted or redesigned to protect those sites, or may otherwise require the power line proponent to equitably mitigate the uses established for those sites.

The following actions should be taken in connection with electronic sites:

1. **Develop site plans for existing sites which have facilities in place.**
2. **Identify potential sites for future development during environmental analyses.**
3. **Develop site plans for new sites prior to development.**
4. **New permits should be issued to direct use of the sites in the following order:**
   a. **Utilize residual capacity of existing sites.**
   b. **Utilize identified potential sites.**
   c. **Utilize other sites deemed suitable through environmental analysis after preparation of a site plan.**

Application for other uses shall be considered and evaluated, and decisions made as a result of appropriate environmental analysis. If funds are not available to process applications, an applicant may pay the cost of processing, including the cost of environmental analysis, in order to obtain faster service.

LAND LINE LOCATION

9-7 **Property lines adjacent to timber harvest or other activities with the potential to impact adjacent private property shall be surveyed, marked, and posted.**

MINERALS

10-1 **The prospecting, development, and production of mineral and energy commodities shall be facilitated.** Under the mining law, claimants are entitled to access to their mining claims **Access for exploration and development of locatable mineral resources should be analyzed in response to a proposed operating plan. A decision on approval of reasonable access should be made as a result of appropriate environmental analysis.** Specific direction and guidelines are found in FSM 2800 (Minerals and Geology).

10-2 National Forest lands are part of the land base available for mineral exploration and development; **withdrawals from mineral entry should be held to a minimum. Areas with mineral potential should be recommended for withdrawal from mineral entry only when mitigation measures would not adequately protect other resource values which are of greater public benefit.** Those coincident values may include, but are not limited to, administrative sites, sites that meet eligibility criteria for inclusion into the National Register of Historic Places, and developed recreation sites. In most cases, P.L 69 STAT 367 (Multiple Use of Surface of Public Land) 36 CFR 228, 36 CFR 261, and the California Surface Mining and Reclamation Act will be used to provide adequate protection of surface resources. Withdrawals from entry under the general mining laws will be in conformance with Section 204 of the Federal Land Policy and Management Act of 1976 (P.L. 94-579)

10-3 **Review of mineral lease applications shall include any special stipulations needed to protect surface resources.**

10-4 **Operating plans and permits for mineral-related operations shall comply with 36 CFR 228, Subpart A. Mineral material requests shall be processed in accordance with procedures in 36 CFR 228.4 (C).**

10-5 **Reasonable and economically-feasible requirements for timely and effective environmental protection and reclamation should be incorporated in operating plans and permits.**

10-6 **Timely responses (as per FSM 2800) shall be made to such activities as (1) operating plans, (2) minerals lease applications, (3) mineral patent applications, and (4) mineral resource potential of selected areas involved in landownership adjustments.**

10-7 **In developing plans of operation and administering minerals activities, emphasis should be given to addressing areas of high risk of surface disturbance and water quality impacts. This includes requiring reasonable, operationally feasible measures to protect other resources. Adequate bonding should be required to insure that provisions of the operating plan are accomplished.**

Development of reclamation requirements should emphasize:

1. **Identification of reasonable reclamation objectives. The following objectives should be considered:**
   a. Restoration of vegetative and habitat productivity, using natural vegetation where possible.
   b. The condition of disturbed land does not contribute to short-term or long-term environmental degradation, either in the form of air or waterborne material, or chemical pollution.
   c. The disturbed land will be left in a condition that is aesthetically acceptable and safe for intended future use.

2. **Identification of reasonable reclamation opportunities.**
3. **Achieving these objectives in the shortest practicable time.**
4. **Requiring reasonable interim reclamation measures to mitigate effects on water quality and provide for treatment and disposal of solid wastes.**

10-9 **Unauthorized use and occupancy should be eliminated. Occupancy should be approved only if it is reasonably incident to and required for the proposed mining activity.** Relevant considerations include: (1) the stage of mineral activities; (2) the expected size and life of the proposed operations; (3) the remoteness of the site; and (4) the kind of equipment protection needed Occupancy and structures must be identified and approved in the operating plan.

10-10 **Removal of common mineral materials shall be administered on a permit basis in areas where development does not conflict with other resource objectives. Mineral material requests shall be processed in accordance with procedures in 36 CFR 228. Proposed mineral material sources should have a development plan as outlined below.**

10-11 **A development and rehabilitation plan for mineral materials needed for resource management (e.g., road gravel) should be included in the plan for the resource project. Rock sources should be located in areas with the least other resource values. A rock material resource management plan should be prepared that assesses the long-term resource potential and makes a projection of public and Forest Service needs. This plan should be coordinated with the land management plan and transportation system planning. The plan should include procedures for:**

1. **Site investigation.**
2. **Material source development and operation.**
3. **Identification of reclamation objectives and planned procedures.**
4. **A uniform inventory process.**

FACILITIES: TRANSPORTATION SYSTEM

TRANSPORTATION PLANNING

11-1 **Transportation planning analysis shall be conducted to compare feasible alternatives where choices that maximize net public benefits are not obvious from environmental and resource considerations.** Direction for transportation planning is found in FSM 7710, Transportation Planning, and the Transportation Planning Handbook, FSH 7709 55

The analysis for transportation alternatives should:

1. **Identify viable alternative routes from the planning area to available access points.**
2. **Identify the long- and short-term needs for each road (service life).**
3. **Determine the traffic criteria for each route.**
4. **Evaluate existing and potential mineral material sources considering Site development and rehabilitation as described under Minerals.**
5. **Estimate development, maintenance, and user costs for economic comparison of alternatives.**
6. **Recommend the road system and standards to meet the needs identified.**
7. **Document the analysis, decisions, and management direction for preferred routes.**

CONSTRUCTION AND RECONSTRUCTION

11-2 The Road Development Plan includes the multiyear Capital Investment Program, the multiyear Timber Sale Program, and the Transportation Information System (TIS).

Design standards shall be based on resource management objectives, environmental constraints, user safety, environmental factors, traffic requirements, vehicle characteristics, road user, and economics.

New and reconstructed roads shall be planned, constructed, and managed to carry the anticipated traffic safely with a minimum impact to the land and other resources. In coordination with project interdisciplinary teams, specified construction methods shall include provisions for reducing environmental impacts, with emphasis to:

1. **Minimize impacts to soil and water values.**
2. **Establish or protect native vegetation on cut and fill slopes and other disturbed sites off the roadway.**
3. **Limit the spread of Port-Orford-cedar root disease where risk is present, and**
4. **Limit the spread of noxious weeds where risk is present.**
5. **Protect other resource values.**

TEMPORARY ROADS

11-3 **Construction of "temporary roads" should normally be discouraged. Roads planned and constructed as "temporary roads" should be obliterated as part of the project work. Methods used, timing, and mitigation measures should be in accordance with the site-specific project plan. Such roads should be planned and designed to re-establish vegetative cover on the disturbed area within a reasonable period of time, not to exceed 10 years after the termination of contract, lease or permit (36 CFR 219.27(a)(11)). Those roads which subsequently are determined to be needed for additional use, or those not obliterated as planned, shall be entered into TIS with appropriate road management objectives developed.**

MINING ROADS

11-4 **Roads built by miners within the scope of an approved operating plan shall meet the minimum safety and water quality protection standards for local roads. Where practicable, location should promote orderly development of the mine and accommodate future Forest transportation system needs. A Forest Service representive should inspect the road construction. Road entrance management and road maintenance requirements shall be identified in the approved operating plan. Reasonable provisions for termination of road use by the miner should identify the future status of the roadway, e.g., obliteration by the miner, operation and maintenance assumed by the Forest Service, etc. Bonding adequate to obtain conformance with roadway-related agreements in the operating plan should be required.**

ROAD MAINTENANCE

11-5 **Arterial roads, major collector roads and local roads open to passenger car use should have maintenance emphasis of Level III or higher. Some collectors and most local roads should have a Level II or lower maintenance emphasis, depending on the stated objectives for the road. Any road with less than the average daily traffic (ADT) stated in the Road Management Objectives for that road should be considered for reduction of one maintenance level below that assigned above. Road maintenance objectives shall consider emphasis items one through five listed above in Standard and Guideline 11-2, Construction and Reconstruction.**

Prior to roads in Level I maintenance emphasis being blocked at the entrance, they shall be put into condition to be self maintaining with low potential for resource damage.

OPERATIONAL MANAGEMENT

11-6 **The Forest shall maintain a Road Management Plan for the total road system. This plan shall include information on: road management objectives, commercial use rules, road development, road maintenance, traffic surveillance, and the Forest Highway Program by inclusion or by reference. Other traffic management plans or direction may also be included. All permanent roads under Forest jurisdiction and all other roads within the Siskiyou National Forest boundary should be listed in TIS. Objectives for Forest roads shall be identified in project environmental documents and be coordinated with Commercial Road Rules. The public should be kept informed of operational changes. All commercial road use shall be in accordance with Forest Commercial Road Rules.**

ROAD CLOSURE

11-7 **Road closures may be implemented to meet wildlife needs, fire protection, other resource needs, or to reduce road damage and maintenance costs. Existing roads determined not to be needed for future use may be obliterated.**

Travel restrictions may be imposed on Forest road users to reduce or eliminate conflicts between user groups, or provide for public safety.

FACILITIES: ADMINISTRATIVE SITES

SITE PLANNING

11-8 **Administrative site development planning analysis shall be conducted to compare feasible alternatives where choices that maximize net public benefits are not obvious from environmental and resource considerations.** Direction for site planning is found in FSM 7300 and FSH 7309.11.

The analysis of alternatives should:

1. **Identify viable alternative facilities.**
2. **Identify the long- and short-term needs for each site.**
3. **Determine the management criteria for each alternative.**
4. **Evaluate existing and potential site development and rehabilitation needs.**
5. **Estimate development and maintenance costs for economic comparison of alternatives.**
6. **Recommend the structures, supporting utilities, and standards to meet the identified needs.**
7. **Document the analysis, decisions, and management direction for preferred uses.**

CONSTRUCTION, RECONSTRUCTION, AND OPERATIONAL MANAGEMENT

11-9 The Facilities Master Plan clarifies existing Forest Plan direction and guides the acquisition, continued use and disposal of facilities.

Design standards shall be based on site management objectives, environmental constraints, user safety, national and local uniform building codes, traffic requirements, and economics.

All new sites shall be planned, constructed, and managed to provide the anticipated uses safely with a minimum impact to adjacent uses and landowners. Completed projects shall include provisions for reducing adverse environmental effects of sight, sound, odor and drainage.

Site or structure closures may be implemented to meet health and safety needs, or to reduce damage and maintenance costs.

Building maintenance funds and quarters collections should be allocated to cover operation, maintenance, and management proposals for facilities according to the following priorities:

1. **Health and safety - hazard elimination.**
2. **Condition inspections - of District facilities, and site development plan preparation and updates.**
3. **Prevent further deterioration - of facilities, grounds maintenance, and other site improvement.**
4. **Program Support - facilities that contribute to increased resource production and/or decreased unit costs for projects.**
5. **Energy Conservation.**
6. **Comply with other laws and regulations.**
7. **All others.**

TEMPORARY STRUCTURES

11-10 **Construction of "temporary facilities" should normally be discouraged. Structures planned and constructed as "temporary" should be removed or obliterated when the need is finished. Methods used and timing should be in accordance with the project plan. Structures which subsequently are determined to be needed for additional use, or those not removed or obliterated as planned, shall be included in the Site Plan.**

FIRE AND PEST MANAGEMENT

FIRE MANAGEMENT

12-1 **All wildfires shall receive an appropriate suppression response. The response shall be safe, timely, and cost efficient, and meet management objectives for the area including objectives for biological diversity.**

Any suppression strategy--confine, contain or control--may be preplanned at Fire Intensity Level 1 (FIL 1). A control strategy should normally be preplanned at FIL 2 or greater. A confine or contain strategy may be preplanned at FIL 2 or greater as deemed appropriate by a site-specific analysis. Each wildfire shall be surveyed in a timely manner to confirm the appropriateness of the preplanned strategy. The preplanned strategy may be changed at that time to more accurately reflect the site specific situation and further minimize the sum of fire suppression costs plus resource damage costs, and the potential for adverse resource, safety, air quality impacts and political concerns.

12-2 **The fire hazard presented by natural, activity or prior activity fuels should be reduced to appropriate levels, considering the site specific risk, and utilizing economically efficient treatment methods. The selected treatment methods should meet fuel management objectives which integrate consideration for all resource values.** The photos listed below from "Photo Series for Quantifying Forest Residues in the Coastal Douglas-fir/Hemlock Type and Coastal Douglas-fir/Hardwood Type" (Maxwell and Ward 1976) depict the standard for post

treatment, downed woody fuel loadings on cutting units and other project sites. The photos can be used individually or in combination

1 *Clearcuts and Hardwood Conversions:* 1DF4CC, 2DF4CC, 3DF4CC, 6DF4CC, 1DFHD4CC, 2DFHD4CC, 3DFHD4CC, 4DFHD4CC
2. Partial Cuts: 1DF4PC, 3DF4PC, 1D3PC, 2DF3PC, 1DFHD4PC
3. Precommercial thinning (roadside and fuelbreaks only): 1DF1TH, 2DF1TH

12-3 **Prescribed fire may be used in natural fuels: to reduce fire hazard by enhancing horizontal and vertical diversity in fuels; to enhance diversity in the structure and composition of plant communities; to enhance the production and protection of commercial timber yields; and to enhance other resource outputs such as wildlife habitat, forage, and browse. Prescribed fire may include both planned and unplanned ignitions.**

Prescribed fire from both planned and unplanned ignitions shall be used in wilderness areas only to reduce the risks and consequences of wildfire within or escaping from wilderness, and to permit lightning-caused fires to play their natural ecological role.

12-4 **Proposed activity units (harvest, thinning, conversion, release, etc.) should be designed and coordinated on the ground so that size, shape, location, timing, spatial distribution, and management risk are considered for fire management and other resource requirements and help make the fuel treatment and fire protection of the units as practical and economical as possible.**

The following techniques and practices are examples of those that can be used to help meet Forest-wide fire management standards.

1. Project or sale area subdivisions could be designed so that treatment of activity-created fuels in any one unit or logical grouping of units can start before the second burning season after the residue fuels are created.
2 Grasses and other vegetation used for rehabilitation and erosion control work could be selected for low fuel volume and low flammability characteristics whenever possible.
3 Roads can be planned and managed to accommodate short-term and long-term fuel treatment and fire protection needs as well as other resource treatments. The fire management needs will be documented in the road management objectives.
4 Activities could be planned and developed to avoid the buildup of fuels adjacent to sensitive areas such as riparian areas, Spotted Owl Management areas, partial cuts, thinning areas, plantations, Class IV streams, and private property.
5. Activities in riparian areas could be planned to minimize the risk from fire associated with treatments in adjacent units. Riparian areas will be protected from prescribed fire unless burning is prescribed through the environmental analysis
6 Wildlife trees and snags could be located to minimize risks of escaped fire and threats to safety Dangerous trees (snags) may be removed after on-site review of fire management, safety, and wildlife needs

A number of mitigating measures (operational procedures or practices) are available to reduce the impacts of prescribed fire and, in some cases, wildfire, on Forest resources. The key to reducing fire impacts is to reduce the intensity or duration of the fire. Mitigation measures will be consistent with resource objectives.

Fire intensity can be reduced by implementing such measures as:

1. Reducing the total fuel load, especially fuels in the 0-3 inch diameter class, which will reduce the damaging effects of the flaming front on soil and vegetation
2. Reducing the amounts of large-diameter fuels on the site, which will reduce the total burning time and reduce the total amount of heat pulsed into the soil.
3. Scheduling prescribed burning to periods when fuel moistures are higher to lessen the amount of heat generated by the fire.
4. Utilizing ignition patterns and techniques which will produce shorter flame lengths and slower spread characteristics.

Fire duration can be reduced by utilizing such techniques as.

1. Removing large material from the fuels complex to be burned, prior to ignition.
2. Scheduling prescribed burning to periods when fuel moistures are higher, to reduce the glowing or smoldering stage of the fire

The erosion problems associated with both wildfire and prescribed fire can be reduced by such practices as·

1. Seeding the burned area with grasses and forbs to hold the soil in place and reduce the impact of raindrops on the soil surface Seeding will use species that occur naturally on the site wherever possible.
2. Constructing waterbars in firelines to reduce the velocity of overland flow and divert it to undisturbed areas.
3. Taking full advantage of natural barriers, other terrain features, and environmental conditions when locating control lines for prescribed fire and wildfire suppression purposes.

The visual impacts, especially in high-use areas, may be mitigated to some degree by such actions as:

1. Seeding to increase the amount of vegetation on the site and, thereby, camouflaging the blackened soil.
2. Removing fire killed trees and brush
3. Restoring firelines to natural-like conditions, once they are no longer needed
4. Keeping logging slash and amenity uses of the Forest separate, in both time and space.

Impacts to soil productivity may be lessened by:

1. Mulching to improve the soil microclimate.
2. Fertilizing to replace volatilized nitrogen and other minerals

The most substantial mitigating measure for the slash disposal (activity fuels) program is an aggressive utilization program that removes most of the woody biomass in excess of the amount desired to be retained on site (see Standard and Guideline 7-8). The program will actively support continued research and marketing efforts for new uses of woody biomass residues

Table IV-11 summarizes the specific fire management direction and the intensity of fire management activities as outlined in the management prescriptions for each of the land allocations on the Forest. This direction is based on the Forest-wide Standards and Guidelines and is presented in the table to provide a quick reference and comparison of the direction for each management area.

Table IV-11. Summary of Fire Management Direction by Management Area

Management Area	Preplanned Suppression Strategy and Acre Objective: Strategy 1/	Objective 2/	Attack Emphasis	Range of Suppression Technology/Equip.	Prevention Emphasis and Level of Visibility	Activity Fuels Treatment Emphasis	Natural Fuels Treatment Emphasis
1 Wilderness							
Kalmiopsis	Contain	3/	Indirect	Modified	Moderate w/high vsby	N/A	Direct 4/
Wild Rogue	Control	90	Indirect	Modified	Moderate	N/A	Direct 5/
Grassy Knob	Control	30	Direct	Limited	Moderate w/low vsby	N/A	N/A
Red Buttes/Siskiyou	Control	30	Indirect	Modified	Moderate w/low vsby	N/A	Direct
2 Wild River	Control	30	Direct	Modified	High w/Low vsby	N/A	Direct
3 Research Natural Area	Control	30	Indirect	Limited	Low	N/A	Direct 6/
4 Botanical	Control	30	Indirect	Modified	Low	N/A	Direct
5 Unique Interest	Control	30	Direct	Modified	High	Direct/Indirect	Direct
6 Backcountry Recreation	Control	30	Direct	Modified	High	N/A	Direct
7 Supplemental Resource	Control	30	Direct	Limited	Low	N/A	N/A
8 Designated Wildlife Habitat	Control	30	Direct	Modified-full	High	Direct	Direct
9 Special Wildlife Site	Control	30	Indirect	Modified	Low	Direct	Direct
10 Recreation River	Control	30	Direct	Modified	Moderate	Direct/Indirect	Direct
Scenic River	Control	30	Direct	Modified	High	Direct/Indirect	Direct
11 Riparian	Control	30	Direct	Modified	Keyed to adj. lands	Direct	N/A
12 Retention Visual	Control	30	Direct	Modified-full	High	Direct/Indirect	Direct
13 Partial Retention Visual	Control	30	Direct	Full w/modifications	High	Direct/Indirect	Direct
14 General Forest	Control	30	Direct	Full	High	Direct	Direct

1/ At Fire Intensity Level 2 and above (flame lengths greater than 2-4 feet).
2/ Firefighting efforts shall be such that a wildfire is suppressed at the acre objective or less, 90 percent of the time
3/ To be determined through a wilderness fire management plan, a 30-acre objective will be used in the interm.
4/ Includes the use of unplanned ignitions.
5/ Includes the use of unplanned ignitions at FIL 1 (flame lengths less than 2 feet).
6/ Planned ignitions are appropriate as part of ongoing research in the RNA.

INTEGRATED PEST MANAGEMENT

12-5 **All planned activities shall include integrated pest management practices. All insect, disease and vegetation control projects shall be carried out in ways that meet management area objectives.**

12-6 **Control of noxious weeds should be accomplished in cooperation with state, county, and private organizations through Weed Control Districts or Coordinated Resource Management Agreements.** Preventive management is critical to an effective control program.

12-7 **Silvicultural methods and cultural treatments should be applied to reduce susceptibility to hazards of insects and diseases (36 CFR 219.27(c)(7)). If normal insect surveillance indicates the threat of an epidemic, project level detection and control operations, including coordination with other land ownerships, shall be accomplished on a Forest-wide basis.**

MANAGEMENT OF PORT-ORFORD-CEDAR

12-8 **Strategies for Port-Orford-cedar management shall be integrated into environmental analyses and project planning for all areas that support Port-Orford-cedar.** An example is to interplant existing plantations that are scheduled for planting or have been planted. **Port-Orford-cedar should be managed as a major component of the appropriate plant association in areas of low to moderate risk of infection.** Representative areas within plant associations containing Port-Orford-cedar will be identified and protected.

Appropriate practices identified from experience and research should be applied on a site or drainage-specific basis to prevent or reduce the spread and severity of Port-Orford-cedar root disease. Additional information and suggested practices can be found in *Port-Orford-cedar Root Rot on the Siskiyou National Forest* (Harvey, Hadfield, and Greenup 1985); *Siskiyou National Forest Tree Improvement Plan* (Tibbs, Brady, and Vagle 1988); *Port-Orford-Cedar Root Disease* (Roth, Harvey and Kliejunas 1988) and *Ecology, Pathology, and Management of Port-Orford-cedar (Chamaecyparis lawsoniana)* (Zobel, Roth and Hawk, 1985).

Of special significance to the support of management of Port-Orford-cedar is the Region Five-Region Six Port-Orford-cedar Root Disease Action Plan dated June 29, 1988 This is a formal commitment by both Regional Foresters for (1) Inventory and Monitoring, (2) Research, (3) Public Involvement and Education, and (4) Management Policy. In short, this commitment provides the support to insure the viability and continued presence of Port-Orford-cedar in the ecosystem throughout its native range on Forest Service managed lands.

To emphasize the importance of achieving success in this effort, specific examples of requirements are listed below:

1. Silvicultural prescriptions for sites having potential for growing Port-Orford-cedar will provide for the establishment of the species through natural or artificial regeneration and maintenance as a viable stand component through the current and future rotations. Prescription analysis will also consider distribution of Port-Orford-cedar so that spacing will inhibit spread of the disease, particularly in susceptible habitats.

2. Road construction and use that can potentially affect Port-Orford-cedar will be evaluated and appropriate control measures used that limit the spread of the disease. Road closures or controlled access can be used as part of the overall management scheme to reduce the risk of contamination of individual areas (such measures should be documented in the road management objectives).

3 Logging systems used in infested Port-orford-cedar stands should minimize disturbance and redistribution of soil In a given case, this might exclude use of ground yarding equipment such as tractors or rubber-tired skidders. In other situations, it might require full suspension of logs during yarding operations with skyline systems or helicopters. It might also, be necessary to operate during the dryer time of the year to reduce soil movement

BIOLOGICAL DIVERSITY

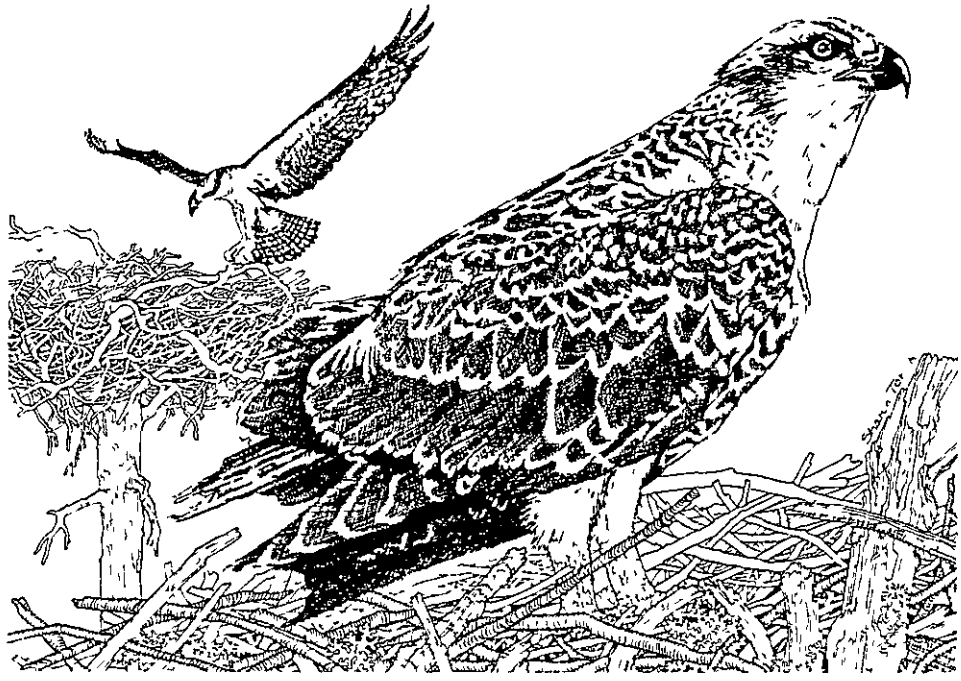
13-1 Site specific management prescriptions developed in project planning should consider biological diversity and ecosystem function in keeping with Forest-wide Standards and Guidelines 4-1 through 4-20, 5-1, 6-1, 6-6, 6-8, 6-9, 6-12 through 6-14, 7-5, 7-8, 7-10, 7-15, 10-7, 11-5, 11-7, 12-1 through 12-5, and 12-8. The following management actions will contribute to maintenance of biological diversity:

1. Evaluate opportunities to maintain or enhance stand, basin and Forest level components of biological diversity on a project by project basis as commensurate with watershed *analysis direction (see Standard and Guideline 7-15).*

2. Plan management activities so that riparian habitats serve as corridors linking later seral stages of forest stands.

3. Complete species management guides for sensitive species during the period of the plan to ensure viable populations are maintained.

4. Develop a process in the next five years to periodically evaluate the spatial location of allocations and habitat conditions on and off Forest, and the potential to reduce or *minimize fragmentation.*



MANAGEMENT PRESCRIPTIONS

The National Forest Land within the Siskiyou National Forest has been assigned to fourteen management areas, each with different management goals, resource potential and limitations (The objectives of each are listed in Table IV-13) The acres assigned to each management area and the acres selected for timber management within each are displayed in Table IV-12 The management areas are shown on the accompanying map, which can be used for reference The management area maps of record are two inches equals one mile scale and are located in the Forest Supervisor's Office

Except for Congressionally established or special administrative boundaries, the management area boundaries are not firm lines and do not always follow easily found topographic features, such as major ridges The boundaries represent a transition from one set of opportunities and constraints to another with management direction established for each The boundaries are flexible to assure the values identified are protected and to incorporate additional information gained from further on-the-ground reconnaissance and project-level planning.

The Forest-wide management direction including the Standards and Guidelines apply to all management areas unless specifically excepted in the management area prescription The Standards and Guidelines of individual management area prescriptions are only to define exceptions to, or additions to the Forest-wide direction

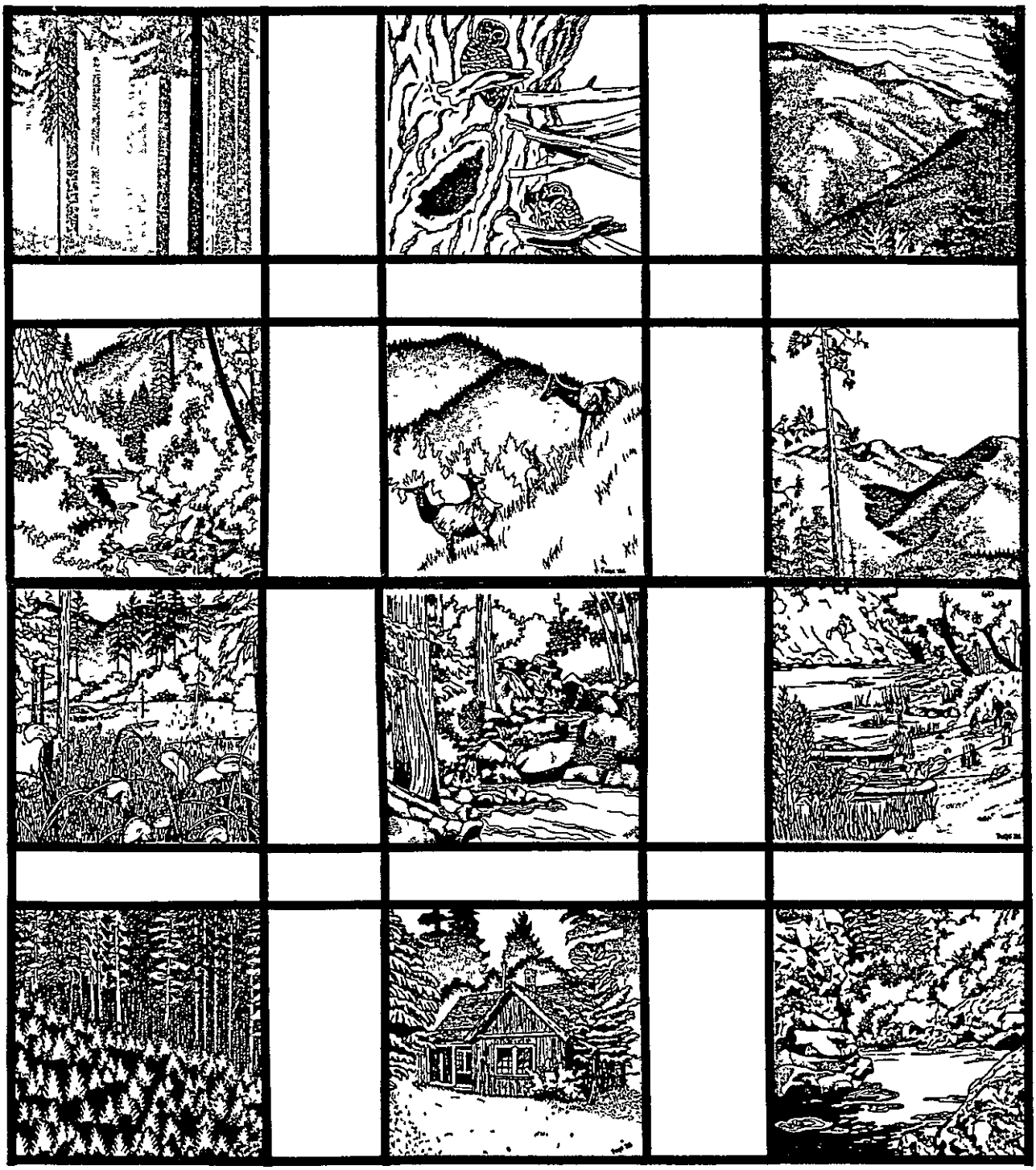
The following section contains a description of the 14 management prescriptions, including a description of the management area, management goals, desired future conditions, and Standards and Guidelines Where overlap occurs between management area allocations, or with Congressionally or administratively designated areas, the most stringent restrictions shall apply.

Table IV-12 Management Area Acres

	Acres	
Management Area No and Name	Management Area	Selected Suitable for Timber
1 - Wilderness	232,495	0
2 - Wild River	5,029	0
3 - Research Natural Area	4,608	0
4 - Botanical	16,275	0
5 - Unique Interest	2,015	0
6 - Backcountry Recreation	40,871	0
7 - Supplemental Resource	26,921	0
8 - Designated Wildlife Habitat	50,287	0
9 - Special Wildlife Site	28,762	0
10 - Scenic/Recreation River	10,317	8,000
11 - Riparian	96,623	70,000
12 - Retention Visual	9,861	7,000
13 - Partial Retention Visual	133,931	105,000
14 - General Forest	434,307	320,000
Total	1,092,302	510,000

Table IV-13. Management Areas

Management Area No and Name	Objective
1 - Wilderness	Maintain wilderness character in its natural condition and provide opportunities for solitude and recreation
2 - Wild River	Maintain the natural, free-flowing, and primitive character of Wild segments of the river corridor
3 - Research Natural Area	Provide opportunities for research, observation and study of ecosystems influenced only by natural processes
4 - Botanical	Provide exhibits of plants, plant groups and communities with exceptional botanical and ecological value
5 - Unique Interest	Provide opportunities for understanding the earth's unique geologic, historical, and archaeological features
6 - Backcountry Recreation	Provide both motorized and non-motorized recreation opportunities in a largely undeveloped setting with the minimum management necessary for resource protection
7 - Supplemental Resource	Provide quality fish habitat, water, wildlife habitat and recreation opportunities in a largely undeveloped setting
8 - Designated Wildlife Habitat	Provide mature and old-growth habitat for dependent wildlife species
9 - Special Wildlife Site	Provide an array of unique plant and animal conditions that contribute to overall wildlife habitat diversity
10 - Scenic/Recreation River	Provide river-oriented recreation in an area of high quality scenery and largely undeveloped shoreline of Scenic and Recreation segments of the river corridor
11 - Riparian	Protect intrinsic values of ecosystems bordering bodies of water and wetlands while providing limited multiple-use development opportunities.
12 - Retention Visual	Protect scenic values while providing multiple-use development opportunities that are not visually evident to the casual Forest visitor
13 - Partial Retention Visual	Protect scenic values while providing multiple-use development opportunities that are visually subordinate to the characteristic landscape
14 - General Forest	Provide multiple-use development opportunities and a high yield of timber, subject to multiple use constraints



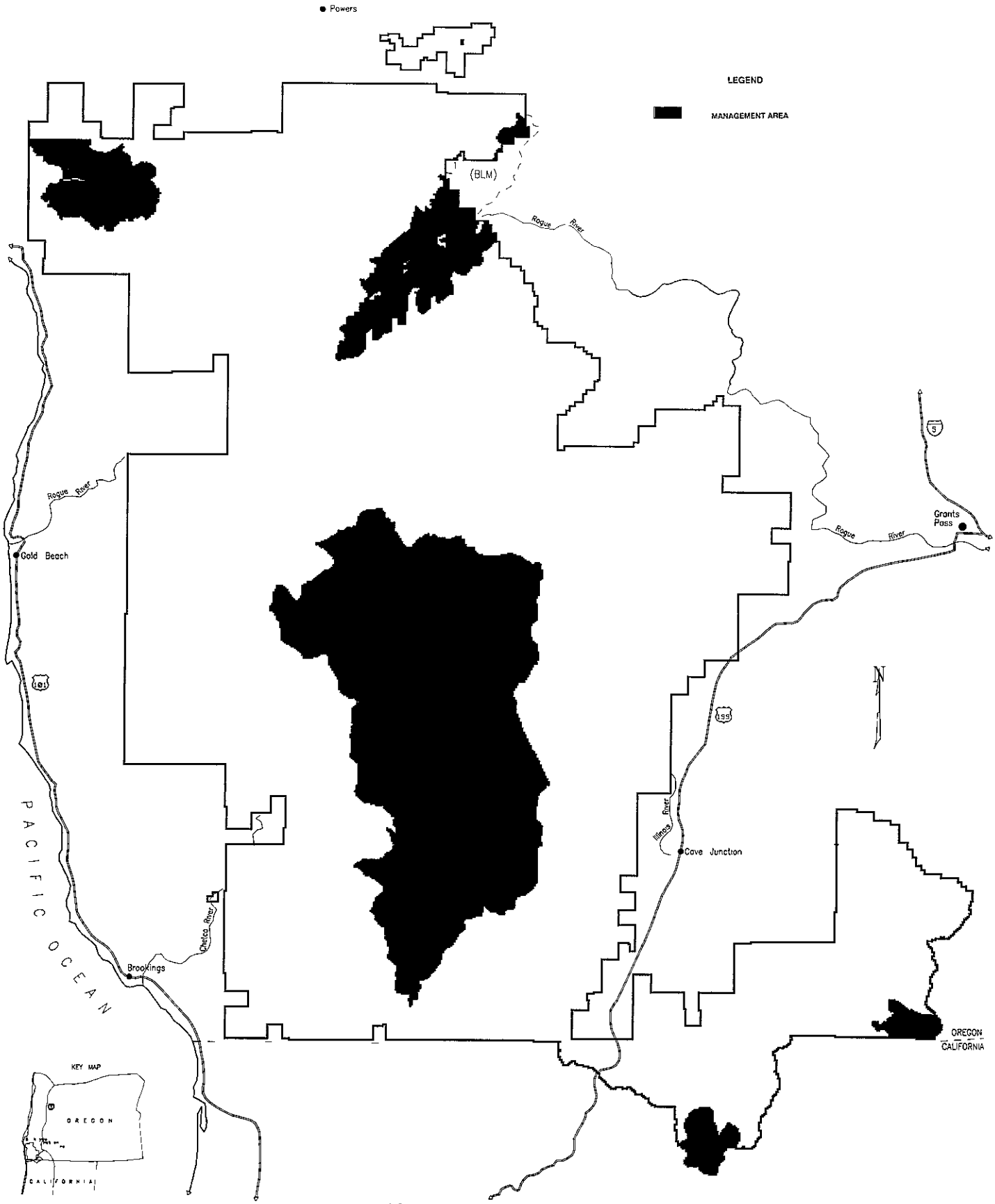


Figure IV-4. Wilderness Management Area Map

MANAGEMENT AREA 1 - WILDERNESS

DESCRIPTION

This prescription applies to the following wildernesses: Kalmiopsis, Wild Rogue, Grassy Knob, and those parts of Red Buttes and Siskiyou within the Siskiyou National Forest. These wildernesses are pristine, scenic landscapes that are preserved as "vestiges" of wild America, and provide an opportunity for solitude The wilderness areas on the Siskiyou are characterized by deep, rugged canyons containing clear rushing streams. Refer to Figure IV-4 for a map displaying allocated acres within the management area.

Table IV-14 Acres Allocated to Wilderness

	Acres		
Name	Management Area 1	Overlap by Management Area	Total Area
Grassy Knob	17,200	0	17,200
Kalmiopsis	179,850	0	179,850
Red Buttes	3,414	0	3,414
Siskiyou	5,323	0	5,323
Wild Rogue	26,708	0	26,708
Total	232,495	0	232,495

These wildernesses must be managed according to the Wilderness Act of 1964, the Endangered American Wilderness Act of 1978, the Oregon Wilderness Act of 1984, the California Wilderness Act of 1984 and regulations pursuant to those acts Refer to Figure IV-4 for a map displaying allocated acres within the management area

MANAGEMENT GOALS

The goals of this management area are to:

1. Preserve the wilderness character and maintain the natural conditions of each wilderness (nondegradation policy);
2. Assure that changes which take place in the natural conditions are the result of natural rather than human processes; and
3. Provide Primitive and Semi-primitive Non-motorized recreational opportunities.

DESIRED FUTURE CONDITION

Each of the wildernesses will appear to be affected primarily by the forces of nature, with the imprint of human activities substantially unnoticeable. Natural processes, including fire, will continue to be the primary forces which are affecting the condition of these areas The areas will have been managed so as not to have degraded the wilderness attributes for which they were designated There will be some evidence of human influence due to the existence of valid mining claims; however, mitigation techniques will have been utilized to minimize the impact of these activities

Foot-trails and camping spots will be the only permanent modifications in these areas; developed commensurate with the desired high level of primitiveness. Most of the area will be essentially unmodified, with large areas between the trails in which the probability of experiencing solitude will be very high. The Limits of Acceptable Change (LAC) concept will have been implemented and monitoring of recreation use and its attendant impacts will be under way. Recreation use will still be relatively light compared to other Forests in the region.

Management plans in areas adjacent to the wildernesses will have been fully implemented so that all influences to the wilderness environment will have been felt. The overall character of the wilderness will have been maintained

STANDARDS AND GUIDELINES

Administration

MA1-1 While seeking to achieve the stated goals for Wilderness, a nondegradation policy of management shall be followed This policy recognizes that in Wilderness a range of natural and social settings exist from the most pristine to those where the natural feeling and opportunities for solitude have been diminished by established uses It is the intent of this policy to assure that appropriate diversity and existing wilderness character are maintained The most pristine areas should not be reduced to the minimum acceptable standard of natural state simply to disperse and accommodate more use.

Periodically, usually on an annual basis, meetings should be held between adjacent forests administering the same wilderness to:

1 Maintain continuity and consistency in Wilderness management decisions;
2 Review and set priorities for the use of available administrative resources,
3. Review trail maintenance schedules;
4 Review outfitter and guide permit administration.

Recreation

MA1-2 *Pristine Wilderness Recreation Spectrum (WRS).* This area is characterized by an extensive unmodified natural environment. The area should be managed so that the natural processes and conditions that currently exist will not be measurably affected by the actions of users Access to these areas shall be limited to cross country travel Use of motorized or mechanized equipment is prohibited unless authorized by the Forest Supervisor or Regional Forester. Encounters with other users should be infrequent (one encounter per day or less).

Primitive WRS. This area is characterized by an essentially unmodified natural environment. This area should be managed so that it remains essentially free from human induced restrictions and controls. Access to these areas shall be limited to trails. Trails shall be planned to disperse use. No facilities for the comfort or convenience of wilderness users shall be provided. Use of motorized or mechanized equipment is prohibited unless authorized by the Forest Supervisor or Regional Forester. Encounters with other users should be infrequent (three to five encounters per day).

Semi-primitive WRS. This area is characterized by a predominately unmodified natural environment. The area should be managed so that natural processes and an unmodified character are maintained. Access is limited to trails and minimum controls, and restrictions may be present but are subtle. Facilities are only provided for the protection of wilderness resource values. Motorized or mechanized equipment is prohibited unless authorized by the Forest Supervisor or Regional Forester. Encounters with other users should be infrequent (five to seven encounters per day)

As use approaches calculated recreation visitor day (RVD) capacity levels, management policies should be reviewed and revised as needed to maintain the desired degree of recreation experience. The LAC concept should be used to accomplish this objective

Signing within the wilderness shall be at the minimum level necessary to insure the safety of the public Signs should be checked for accuracy throughout the year

The wilderness trail map should be checked periodically for accuracy and updated when necessary to insure public safety and convenience

Visitors should be advised and educated in waste disposal to assure sanitary conditions are maintained

If wilderness use exceeds the degree of impact established through the LAC or the capacities identified for each, the corrective actions shall be taken·

1 Initiate public information and site restoration activities.
2 If the first action is unsuccessful, recreation activities should be restricted by regulation
3 If the second action is unsuccessful, the level of use should be restricted.
4. If the first three actions are unsuccessful, a zone should be closed to all recreation use until the area is rehabilitated and restored to wilderness conditions

Kalmiopsis Wilderness The carrying capacity for recreation use is calculated to be 32,000 RVD's. Vegetative impacts that result from recreation use should be monitored and restrictions applied to areas where impacts are changing the natural characteristics of the area

Wild Rogue Wilderness The carrying capacity for recreation use is calculated to be 6,000 RVD's. (This does not include use on the Wild River)

Grassy Knob Wilderness. The wilderness should be managed to provide a Semi-primitive (trailess) recreation experience. Minimum recreation opportunities should be offered. No trail systems or trailheads should be constructed. The wilderness area should be maintained in a condition that would provide an estimated 4,000 RVD capacity.

Red Buttes Wilderness. The Siskiyou National Forest portion of this wilderness should be managed to provide a Semi-primitive (trailed) recreation experience Standards and Guidelines developed by the Rogue River National Forest shall be adhered to in this planning effort. The Siskiyou portion of the Wilderness should be maintained in a condition that would provide an estimated 4,500 RVD capacity.

Siskiyou Wilderness. The Siskiyou National Forest portion of this wilderness should be managed to provide a Semi-primitive (trailed) recreation experience. The Forest shall adhere to the Wilderness Standards and Guidelines developed by the lead Forest in this planning effort (Klamath National Forest). The Siskiyou portion of the wilderness should be maintained in a condition that would provide an estimated 2,000 RVD capacity.

Visual

MA1-3 All management activities within the wilderness shall meet the Preservation VQO (Agriculture Handbook #462, Visual Management System, and FSM 2320); except mineral entry as approved in operating and rehabilitation plans.

A visual analysis should be completed prior to construction of any new trail to insure the trail will not detract from the natural character of the landscape.

Cultural

MA1-4 To date, no cultural sites within the wildernesses are listed on the National Register of Historic Places, however certain historic and/or prehistoric properties may be eligible for nomination. Due to the rugged nature of much of the wilderness acreage, there is limited potential for a high quantity of sites. However, those present are likely undisturbed except for the deterioration caused by natural weathering

Further cultural resource inventory work should be conducted in the wildernesses in order to ascertain the nature, distribution and condition of cultural sites present The survey work should be designed to provide an inventory of the high probability sites. Inventory priorities will be focused on finding and recording those sites threatened by loss or serious deterioration during the next decade

Inventoried cultural resources in wilderness should be protected until evaluated Priorities should be set for site evaluations. Those sites that are threatened with loss or deterioration should receive highest priority. Other evaluations may be conducted in order to gain data relevant to the past use of the National Forest. All evaluation work shall comply with the preservation of the wilderness resource.

All actions, direct or indirect, that will have an effect on a significant cultural resource are subject to compliance with Section 106 of the National Historic Preservation Act, as amended, and through its implementing regulations, 36 CFR 800. Adverse effects to significant cultural resources (eligible and listed) shall be mitigated. Decisions to abandon a significant historical structure and allow it to deteriorate naturally, or to remove one, shall be preceded by the consultation process defined in 36 CFR 800, including agreement on appropriate mitigation measures

Cultural resource research within the wilderness shall meet the following criteria: (a) must be necessary to support the values set forth in Section 4(b) of the Wilderness Act, or (b) must be done in compliance with preservation ethic for the wilderness resource.

The works of human beings within wilderness should not be designated for protection as cultural resources unless they are (a) necessary to support the values set forth in Section 4(b) of the Wilderness Act, (b) serving administrative purposes as necessary for protection of the wilderness resource (Section 4(c)), or (c) essential to cultural resource management (FSM 2323.83) Thus we will nominate to the National Register of Historic Places only those sites deemed worthy of preservation and protection.

On-site interpretation of sites shall not be done. Interpretation may be done off-site through brochures and audio-visual programs.

Wildlife and Sensitive (Rare) Plants

MA1-5 Wildlife and plant habitat will be subject to natural processes. Fire may play its natural ecological role in maintaining specific habitats Fire may maintain meadows in grass cover and reduce encroachment of trees, or may maintain the habitat of rare plants such as the *Kalmiopsis leachiana.*

Fish

MA1-6 Management direction is to maintain existing fish habitat subject to natural processes

Range

MA1-7 New allotments for livestock range shall not be allowed. The use of pack stock by wilderness users will be permitted Users should be encouraged to carry feed for their stock

Timber

MA1-8 No timber management practices are allowed inside designated Wilderness areas.

Water and Soil

MA1-9 Degraded sites created as a result of past human activities should be rehabilitated to a near natural condition A rehabilitation site plan shall be prepared for each site prior to any on-the-ground rehabilitation. Revegetation efforts shall use only those plant species indigenous to the area.

Minerals

MA1-10 Mineral entry was permissible as provided by the Wilderness Preservation Act of 1964. After December 31, 1983, mining only on valid claims is permitted, subject to approved operating plans. Provisions in operating plans shall satisfy the rights of the claimant while creating the least impact on wilderness values. Provide for restoration of the disturbed lands as near as practical to their natural condition as soon as possible during or after the mining activity Site specific mitigation shall be required seasonally for active mining operations. Rehabilitation of the surface area shall be required upon completion of all mining activities.

Facilities

MA1-11 Roads shall not be constructed or reconstructed within designated Wildernesses except those that are permitted within the constraints specified in approved operating plans for mineral development. Close any existing mining roads if they are abandoned or determined that the claim is invalid. Trails should be maintained to keep the trails passable and drainage structures functioning (Level 2). Fire protection facilities may be constructed, provided they meet the intent of the Wilderness Preservation Act of 1964. Future utility corridor siting shall be excluded from this Management Area

Fire Management

MA1-12 *Kalmiopsis Wilderness* A Wilderness Fire Management Plan shall be developed within 3 years following approval of this Land & Resource Management Plan The plan will incorporate suppression strategies which reflect fire's role in the local ecosystems as follows:

1. For ecosystems in which fire plays a significant role (high intensity, stand replacement fire), the fire management plan should contain fires from unplanned ignitions (lightning only) in the area classified as primitive in the Wilderness Recreation Spectrum classification system (WRS) Human-caused fires shall receive an appropriate response as determined in the wilderness fire planning process.
2 For ecosystems in which fire plays only a minor role, (ground or surface fires), all wildfires should be evaluated using the fire management plan The plan will provide specific

decision criteria for determining the suppression strategy as well as the kinds and amounts of suppression action (tactics) to be taken on the fire.

3. In "nonfire" dependent ecosystems, all fires should be controlled in accordance with a Wilderness Fire Management Plan which provides criteria for determining the suppression tactics to be taken on the fire.

Prior to the development of the plan, all wildfires occurring at FIL 2 and above should be detected and controlled at 30 acres or less, 90 percent of the time. Safe and cost effective suppression tactics which adhere to Wilderness fire fighting principles will be used. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A moderate level of prevention should be provided. Public contacts should be emphasized through the wilderness rangers. Emphasis should also be placed on prevention techniques that accomplish the fire prevention mission prior to the user entering the wilderness. Fuel Treatment may be used for hazard reduction at heavily-used sites

A prescribed fire program as determined by the wilderness fire planning process, using both planned and unplanned ignitions, should be initiated to: (1) reduce the risks and consequences of wildfire within the Wilderness, or escaping from the Wilderness and (2) allow fire to play its natural ecological role. Planned ignitions could be used to maintain a fuels complex commensurate with levels of protection. Unplanned ignitions may be used, outside the "Primitive" WRS areas, at FIL 1 to supplement planned ignitions.

In a fire management situation where prescribed fires from unplanned ignitions are allowed in the Primitive WRS areas, an aggressive program of planned ignitions should be used to develop a fuels mosaic around the Primitive WRS areas

MA1-13 *Wild Rogue Wilderness.* All wildfires occurring at Fire Intensity Level FIL 2 or above should be controlled at 90 acres or less 95 percent of the time Indirect attack should be emphasized utilizing a modified range of suppression technology and equipment and adherence to the basic wilderness fire fighting principles This is necessary due to the physical layout and topography of the Wilderness and adjacent resource values Wildfires occurring at Fire Intensity Level FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A moderate level of prevention activities should be provided. Public contacts should be emphasized through the use of the Wilderness rangers. Emphasis shall also be placed on methods that accomplish the fire prevention mission prior to the user entering the Wilderness area Hazard reduction should be accomplished around heavily used sites

A prescribed fire program as determined by the wilderness fire planning process, using both planned and unplanned ignitions, should be initiated to reduce the risks and consequences of wildfire within the Wilderness, or escaping from the Wilderness. Planned ignitions could be used to maintain a fuels complex commensurate with levels of protection Unplanned ignitions may be used at FIL 1 to supplement planned ignitions.

MA1-14 *Grassy Knob Wilderness.* All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less, 90 percent of the time. A limited range of suppression equipment and technology emphasizing direct attack and adherence to basic wilderness firefighting techniques should be used in the suppression of wildfires. Wildfires occurring at FIL 1 shall be handled as outlined in the basic suppression direction for the Forest.

A low level of prevention activities should be provided Public contacts should be limited, with most of the prevention efforts concentrated on techniques that accomplish the fire prevention mission prior to the user entering the area.

MA1-15 *Red Buttes and Siskiyou Wildernesses.* All wildfire occurring at FIL 2 or above should be controlled at 30 acres or less, 90 percent of the time. A limited range of suppression equipment and technology emphasizing indirect attack and adherence to basic wilderness firefighting techniques should be used in the suppression of wildfires Wildfires occurring at FIL 1 shall be handled as outlined in the basic suppression direction for the Forest.

A moderate level of prevention with a low level of visibility should be provided. Limited field contacts should be made by Wilderness Rangers, with the emphasis placed on prevention efforts through the media and Wilderness Permit System. Hazard reduction should be accomplished around heavily-used sites.

A prescribed fire program utilizing both planned and unplanned ignition may be used to maintain a fuels complex commensurate with levels of protection as determined by the wilderness fire planning process, initiated by the lead National Forest for each wilderness



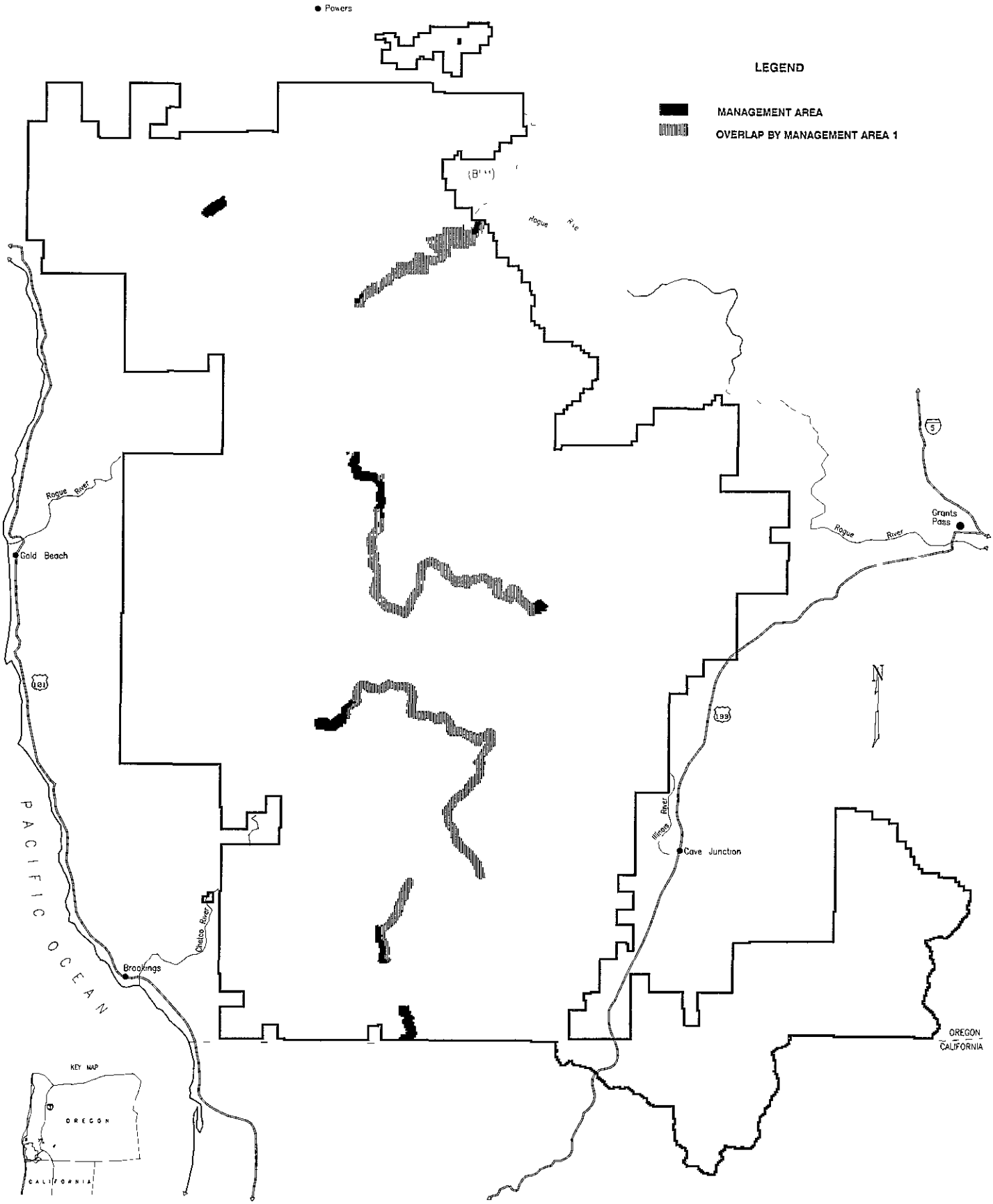


Figure IV-5 Wild River Management Area Map

MANAGEMENT AREA 2 - WILD RIVER

DESCRIPTION

This prescription is applicable to those "Wild" segments of the Rogue, Illinois, Chetco, North Fork Smith, and Elk Rivers which were designated by Congress under the National Wild and Scenic Rivers Act. The Wild designation was reserved for those rivers that are free flowing, free of impoundments and generally inaccessible except by trail. The rivers are incised into deep, often shear-faced rock canyons

The Wild segment on the Rogue extends from Grave Creek downstream to Watson Creek near Foster Bar for a total of 33 miles On the Illinois, the Wild section begins at Briggs Creek and encompasses 28 7 miles down to Nancy Creek. The Wild segment on the Chetco is from the headwaters to Boulder Creek, about 25.5 miles. On the North Fork Smith, there are two wild segments: from the headwaters 6.5 miles to Horse Creek; and from Baldface Creek 2 miles to the Oregon and California stateline The Wild segment of the Elk River is the North Fork Elk, from the falls to its confluence with the South Fork. The corridor boundary averages 1/4 mile on each side of the rivers.

Although the rivers are designated "Wild," the character of each is significantly different and consequently management objectives for each river differ. These objectives are defined in the individual river management plans. The management plans for the Rogue and Illinois rivers are not affected by this Forest Plan It is expected that the popularity of white water rafting and other river-related recreation will continue to increase, so that modifications to these plans can be anticipated at some point in the future. Development of management plans for the Chetco, North Fork Smith and Elk rivers is scheduled to begin in fiscal year 1989. Refer to Figure IV-5 for a map displaying allocated acres within the management area

Table IV-15 Acres Allocated to Wild River

	Acres		
Name	Management Area 2	Overlap by Management Area 1	Total Area
Chetco River	1,008	7,967	8,975
Elk River	607	0	607
Illinois River	1,819	7,456	9,275
North Fork Smith River	1,371	1,674	3,045
Rogue River	224	5,002	5,226
Total	5,029	22,099	27,128

MANAGEMENT GOAL

The goal is to maintain the river environment in a natural state while providing for recreation opportunities.

DESIRED FUTURE CONDITION

The character of the wild section of the Rogue River within the Forest boundary will be maintained. Most of the lands adjacent to this river segment are within designated Wilderness and will be influenced only by natural processes. Impacts due to river-related recreation will be monitored according to the Rogue River Management Plan and any restrictions on use may have been implemented according to that Plan.

The character of the wild section of the Illinois River will be maintained. Within the Kalmiopsis Wilderness, recreation use, both from wilderness and river users will have been monitored and impacts assessed according to the Illinois River Management Plan. The section of the river between Pine Flat and Colliers bar and the lands adjacent will be maintained in a trailess condition. The lands outside the river corridor and within the viewshed adjacent to the last six miles of the wild section of the river will have been managed

in an unroaded status in order to maintain the pristine character of the river corridor. The river is expected to remain among the "wildest" in the western United States; a gem in the Nation's Wild and Scenic River system.

The character of the wild sections of the Chetco, North Fork Smith and Elk rivers will be maintained as well. Development of the individual river management plans will include descriptions of the desired future conditions.

STANDARDS AND GUIDELINES

Many standards and guidelines for the river corridors are in the management plans for the respective rivers and will not be repeated here

Fire Management

MA2-1 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. A modified range of suppression technology and equipment emphasizing indirect attack *should be used. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire* management direction for the Forest.

A high level of wildfire prevention activities with a low level of visibility should be maintained. Only limited field contacts should be made, with most of the contact effort handled through the media and river permit system Hazard reduction activities keyed to heavily-used sites may be used.

Both direct and indirect methods should be emphasized in the treatment of activity fuels Direct treatments should be used where visuals or management risks carry a high priority. Indirect treatment is encouraged outside visually-sensitive or high-risk areas Direct treatment of natural fuels is encouraged

MA2-2 Future utility corridor siting shall be excluded from this Management Area



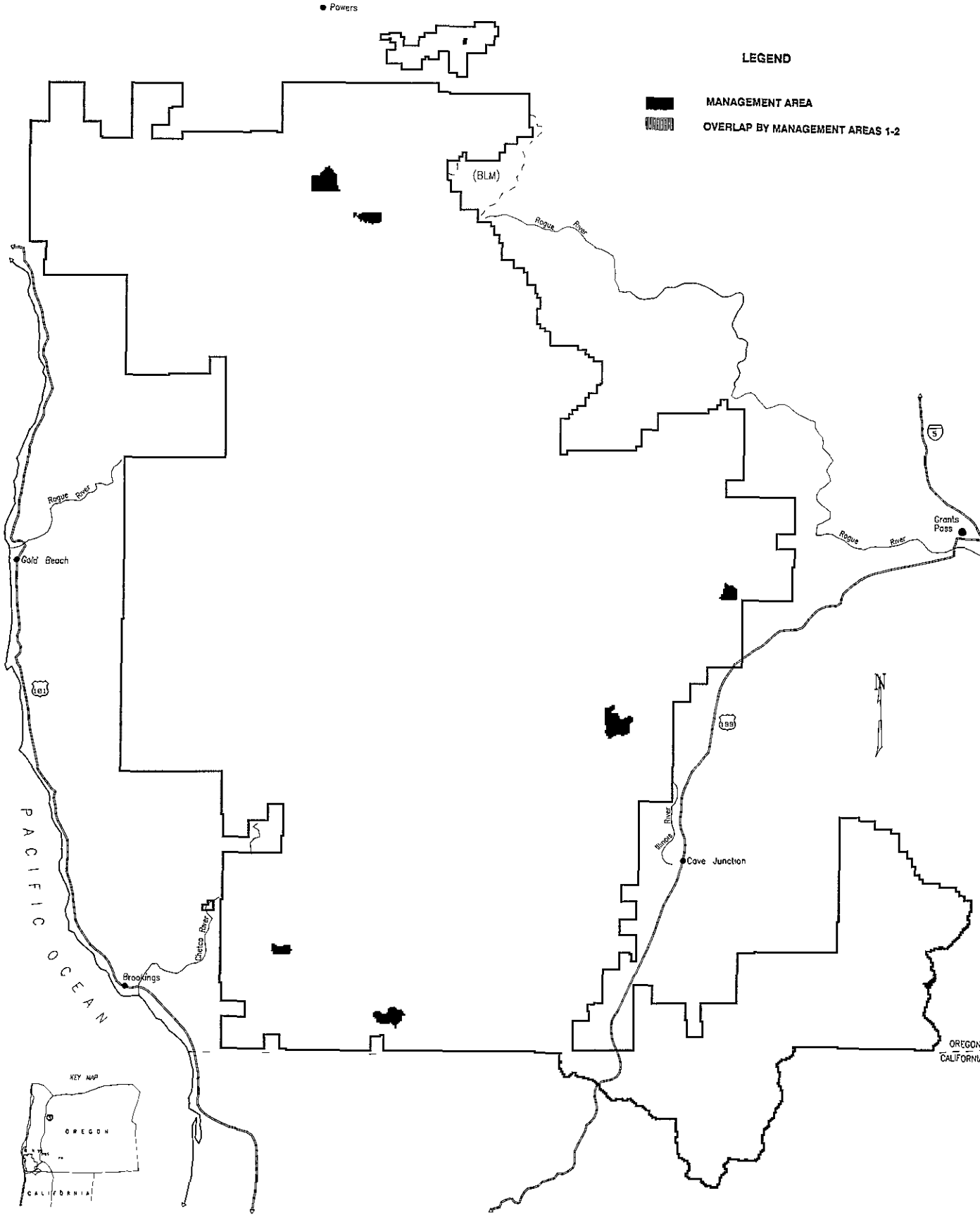


Figure IV-6. Research Natural Area Management Area Map

MANAGEMENT AREA 3 - RESEARCH NATURAL AREA

DESCRIPTION

This prescription is applicable to existing or recommended Research Natural Areas (RNA) (FSM 4063 Research Natural Areas)

Research Natural Areas are part of a national network of field ecological areas designated for research and/or to maintain biological diversity on National Forest System lands. Research Natural Areas are for non-manipulative research, observation, and study. They also may assist in carrying out provisions of special acts, such as the Endangered Species Act and the monitoring provisions of the National Forest Management Act

This Forest Plan provides overall direction and standards and guidelines for management of RNA's The Regional Forester and Pacific Northwest Station Director shall prepare an Establishment Record for each recommended area; this document will describe features, objective for establishment, and management direction. The Establishment Record will be submitted to the Chief of the Forest Service for signature (Designation Order). Once approved by the Chief, an RNA will not be re-evaluated in subsequent rounds of Forest Planning . Refer to Figure IV-6 for a map displaying allocated acres within the management area.

Table IV-16 Acres Allocated to Research Natural Areas

	Acres		
Name	Management Area 3	Overlap by Management Areas 1-2	Total Area
Cedar Log Flat	441	0	441
Coquille River Falls	501	0	501
Craggy Peak	100	0	100
Hoover Gulch	1,292	0	1,292
Lemmingsworth Gulch	818	0	818
Port Orford Cedar	1,120	0	1,120
Wheeler Creek	336	0	336
Total	4,608	0	4,608

MANAGEMENT GOAL

Preservation of naturally occurring physical and biological units where natural conditions are maintained insofar as possible for the purposes of: (1) comparison with those lands influenced by man; (2) provision of educational and research areas for ecological and environmental studies; and (3) preservation of gene pools for typical and rare and endangered plants and animals.

DESIRED FUTURE CONDITION

Areas in condition to provide for naturally occurring physical and biological processes without undue human intervention. Areas containing naturally functioning and evolving plant and animal populations that may serve as a source for gene pools and for education and research on plant and animal communities

STANDARDS AND GUIDELINES

Wild and Scenic Rivers

MA3-1 Wild and Scenic Rivers shall take precedence where they overlap with RNA's Land use regulations are generally more restrictive in Wild portions of Wild and Scenic Rivers than in RNA's, and less restrictive in Scenic portions. Management plans for Wild and Scenic Rivers shall address overlaps with RNA's.

Recreation

MA3-2 Recreation activities and uses within an RNA shall be discouraged if they threaten the values for which the RNA is established; this includes overnight camping, recreation use within 200 feet of lakes, ponds and streams, and pack and saddle stock use All recreation ORV use shall be prohibited If other recreation uses threaten research or education values, closures or permits should be instituted

Education use of an RNA should generally be directed toward the graduate level, but may be approved for any group or purpose On-site interpretive or demonstrative facilities should be prohibited Publicity that would attract the general public to the area shall be avoided.

Existing trails may be allowed to remain as long as the RNA objectives are not compromised See MA3-10 for direction on new trails.

Visuals

MA3-3 Visual management shall meet or exceed the inventoried VQO's of the specific areas

Wildlife and Fish

MA3-4 Introduction of exotic plant, animal, and fish species shall not be permitted. Reintroduction of former native species may be permitted as long as the objectives of the RNA are met. Control of excessive animal populations may be considered where such populations threaten the RNA objectives Hunting and trapping shall not be encouraged. Habitat improvement projects may be approved if they meet the objectives of the RNA

Range

MA3-5 No grazing of domestic livestock shall be permitted.

Timber

MA3-6 Cutting and removal of all vegetation, including firewood, shall be prohibited, except as part of approved scientific investigation.

No action shall be taken against insects or diseases unless the outbreak drastically alters the natural ecological processes within the RNA.

Soil and Water

MA3-7 In cooperation with the PNW Research Station, rehabilitation plans shall be developed and implemented in the event of soil disturbing activities such as fire suppression. Soil stabilization of naturally occurring soil loss or movement should not be permitted unless part of an authorized study.

Minerals

MA3-8 Valid claims existing prior to Research Natural Area designation may be developed. Valid claims existing prior to any withdrawal from mineral entry shall be required to have an operating plan providing the least amount of impact. Research Natural Areas may be recommended for withdrawal from mineral entry in situations where mitigation measures do not adequately protect management area values The mineral potential of the area shall be assessed before withdrawal is recommended.

Lands

MA3-9 An Establishment Record shall be written for each RNA recommended in the preferred alternative of the Forest Plan (joint responsibility of the PNW Station Director and Regional Forester - procedures described in Forest Service Manual 4063)

A management plan should be written for each established RNA The management plan should include analysis of surrounding lands as related to the integrity of the RNA.

All new special uses shall be denied except for permits for research approved by the PNW Experiment Station and directly related to the objective for the particular Research Natural Area (as determined in the Establishment Record) Noncompatible existing special uses shall be terminated

Rights-of-way easements existing before RNA establishment shall be honored Upgrading that would compromise the objectives of the RNA shall be discouraged. The Forest Service should recommend against FERC licenses or permits that compromise the objectives of the RNA

Facilities

MA3-10 New facilities shall not be built except on valid existing mining claims with approved operating plans or as required as part of an authorized study. New roads, fences, or signs shall not be permitted on RNA's unless they contribute to the objectives or to the protection of the area New trails may be allowed only if compatible with the objectives for the area and if approved by appropriate PNW Research officers and National Forest System line officers.

Future utility corridor siting should avoid this Management Area. This Management Area may only be entered following environmental analysis in which all other alternatives have been rejected by the Forest Service.

Hazard tree felling for safety reasons is permitted along trails or roads. Felled trees shall remain in place, unless lying across a trail or road. Trees shall not be removed.

Development of rock sources shall not be permitted; stockpiling of rock materials should not occur. Waste material from road construction, reconstruction, or maintenance shall not be left in RNA's.

Fire Management

MA3-11 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less, 90 percent of the time. A limited range of suppression technology and equipment emphasizing indirect attack should be used. In suppressing fires, chemical fire retardants and ground disturbing activity should be avoided Wildfires occurring at FIL 1 should be handled as outlined in the basic fire management direction for the Forest.

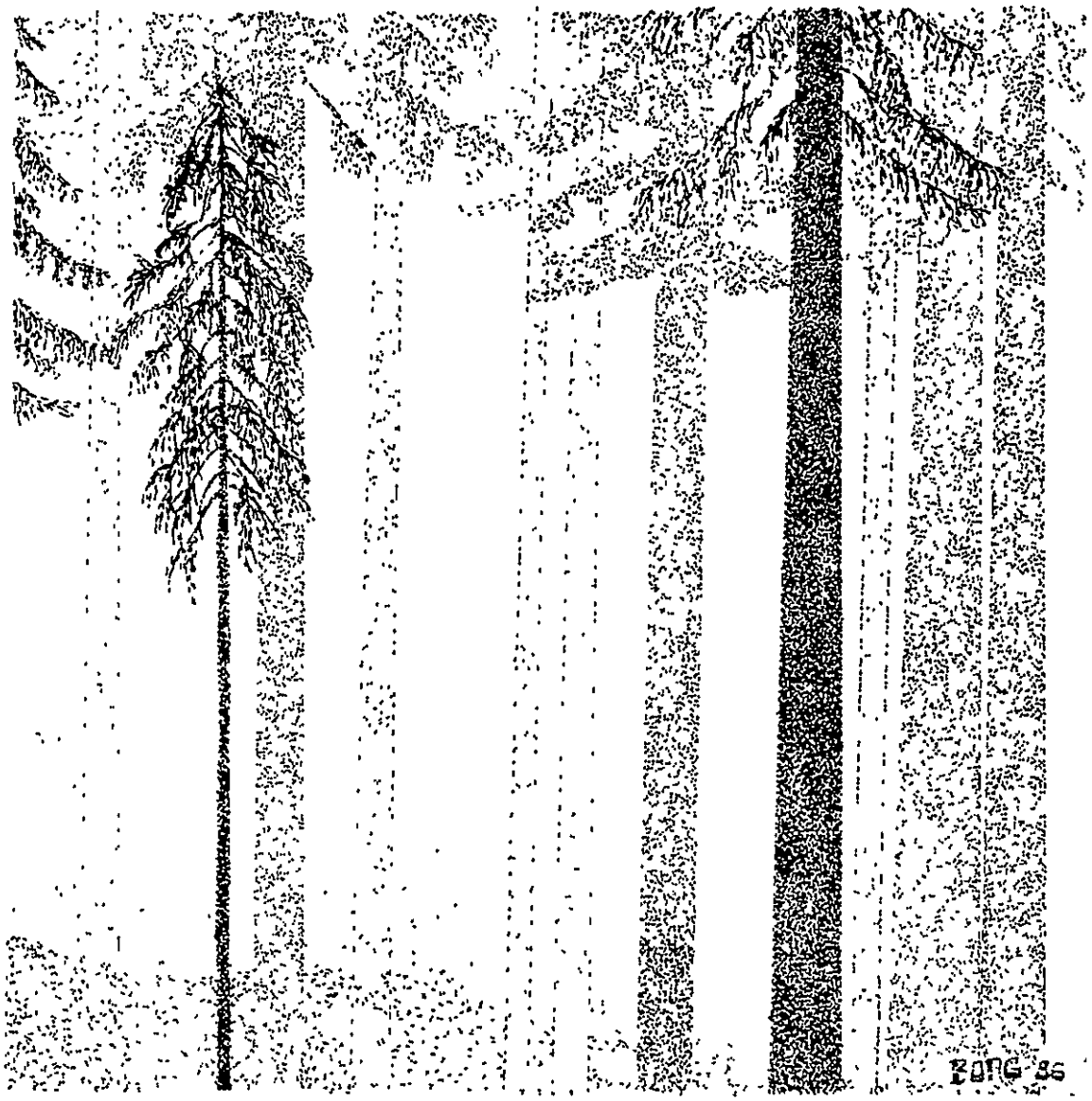
Management should provide for a low level of prevention activities. Prevention public contacts should be limited to those which are made incidental to normal fire management activities, with most of the effort concentrated on techniques that accomplish the fire prevention mission prior to the user entering the area.

If authorized by appropriate PNW Research officers and National Forest System officers, prescribed fire may be utilized as a tool to return fire to its natural role in the area and return plant communities to a condition similar to that which existed prior to active fire suppression. Managed or naturally occurring fire may be use to perpetuate the sere and thus the cell(s) that the RNA is meant to represent. If fire is used to perpetuate a sere, it should mimic a natural fire, but with prudent measures to avoid catastrophe.

Fuels normally should be allowed to accumulate at natural rates unless they threaten the objectives of the RNA

Research

MA3-12 All research proposals shall be approved by the PNW Station Director and any applicable permits obtained from the appropriate NFS line officer. Research should be limited to non-consumptive, non-destructive, and essentially observational activities. Some collecting of soil, plants, or animal specimens (State coordination needed) may be permitted on a case by case basis.



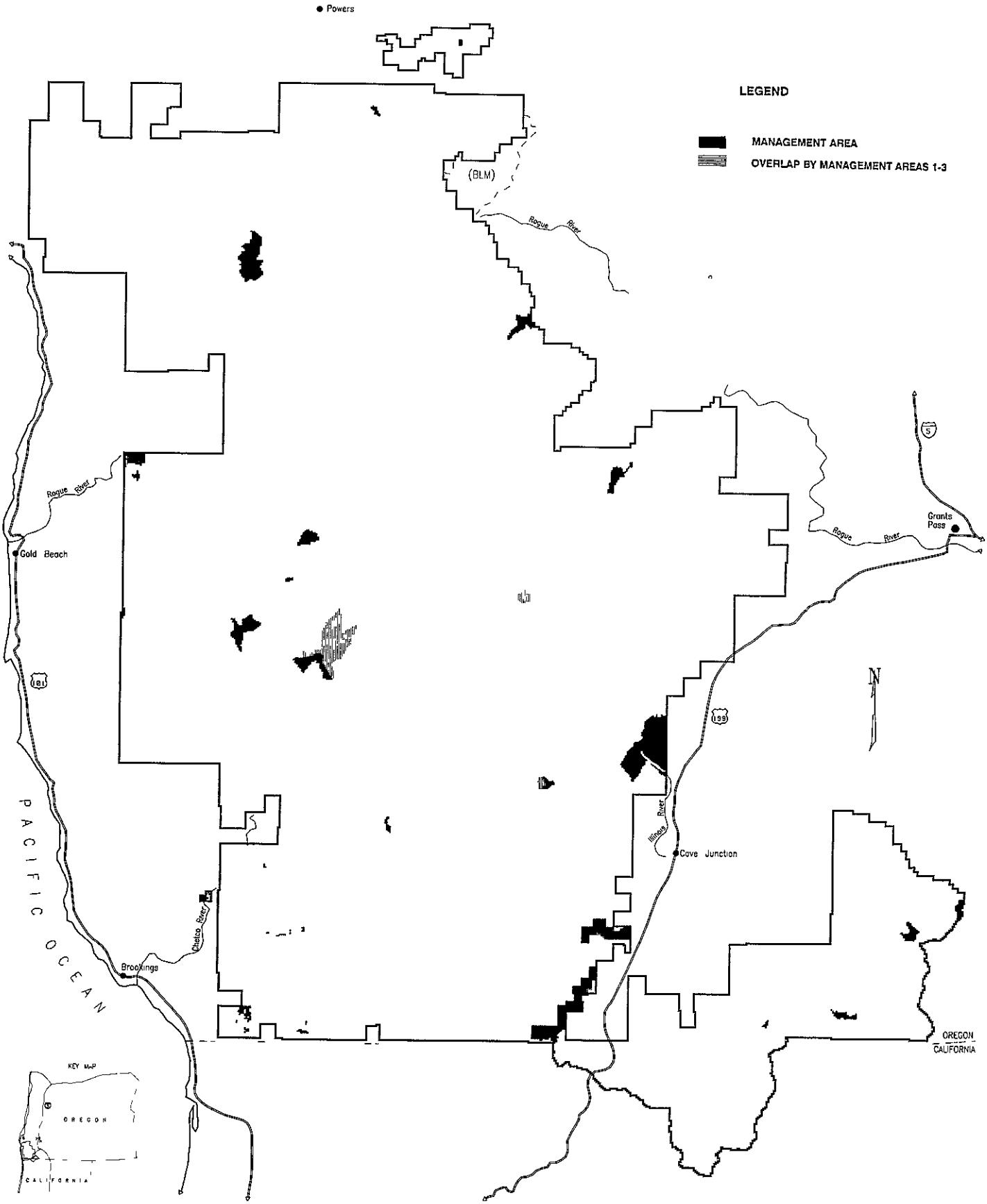


Figure IV-7. Botanical Management Area Map

MANAGEMENT AREA 4 - BOTANICAL

DESCRIPTION

Botanical areas are classified under 36 CFR 294.1 and managed to protect areas of the Forest with important botanical resources (FSM 2370 Special Recreation Designations, Areas Designated Administratively). Management Area 4 includes the best representations found on the Forest of unusual plants indigenous to southwestern Oregon, both sensitive plant and old-growth conifer sites Existing Botanical Areas (Babyfoot, Big Craggies, and York Creek) were established under authority of the Chief of the Forest Service and their status will not be reviewed. Refer to Figure IV-7 for a map displaying allocated acres within the Management Area. See Appendix F of the FEIS for detailed descriptions of areas listed below

Table IV-17 Acres Allocated to Botanical

	Acres		
Name	Management Area 4	Overlap by Management Areas 1-3	Total Area
Babyfoot	221	131	352
Bear Camp	630	0	630
Big Craggies	908	2,895	3,803
Bigelow Lakes	411	0	411
Big Tree	127	0	127
Bolan Lake	297	0	297
Chrome Ridge	589	0	589
Days Gulch	1,252	0	1,252
Eight Dollar Mountain	2,738	0	2,738
Grayback Mountain	197	0	197
Iron Mountain	1,866	0	1,866
Lobster Grove	534	0	534
Oregon Mountain	2,623	0	2,623
Page Mountain Grove	64	0	64
Red Flat	53	0	53
Redwood Groves	500	11	511
Rough and Ready Flat	1,499	0	1,499
Snaketooth Redwood	21	0	21
Snow Camp	1,041	0	1,041
Sourgame	571	0	571
Vulcan	133	0	133
York Creek	0	320	320
Total	16,275	3,357	19,632

MANAGEMENT GOAL

The goal is to protect, preserve, and enhance the exceptional botanical features of these areas

DESIRED FUTURE CONDITION

Natural physical and biological processes will prevail without human intervention. Plant and animal life inhabiting these unique ecosystems will continue to flourish.

STANDARDS AND GUIDELINES

General

MA4-1 Management plans may be developed for individual Botanical Areas; plans may supplement direction provided here, and ultimately should be appended to the Forest Plan (FSM 2372 3 and 2371 2).

Wilderness and Wild and Scenic Rivers

MA4-2 Wilderness shall take precedence where it overlaps with Botanical Areas Wild and Scenic Rivers shall take precedence where they overlap with Botanical Areas Land use regulations are generally more restrictive in Wild portions of Wild and Scenic Rivers than in Botanical Areas, and less restrictive in Scenic and Recreation portions Management plans for Wild and Scenic Rivers shall address overlaps with Botanical Areas.

Recreation

MA4-3 Management of recreational resources is important, but should be secondary to botanical aspects. Education and interpretation shall be the focus of recreational use Interpretive services should be provided to enhance visitor's understanding and appreciation of the area's special features Public use and enjoyment of each Botanical Area shall be encouraged up to the level that will insure protection of the special values for which the area was established.

Recreational use of Botanical Areas and the placement of protective improvements is consistent with the management goals. For instance, it may be appropriate to build trails or boardwalks to direct visitors to or away from specific sites Improvements such as picnic areas are appropriate in Old-growth Groves, however, protective measures may also be required, such as safeguarding Port-Orford-cedar from introduction of root rot.

Existing and potential trails should be permitted, consistent with the goals for the area In general, *use of pack and saddle stock should be discouraged. Vehicles shall not be used off roads and* trails.

Visual Resources

MA4-4 Visual management shall meet or exceed the inventoried VQO's of the specific areas.

Wildlife and Sensitive Plants

MA4-5 Habitat manipulation techniques may be used to maintain existing meadows, provided the objectives for the area are met (may include improvements such as bird boxes and water developments). No other special wildlife management practices should be permitted in these areas, except as needed to meet the objectives of 1) recovery plans for endangered or threatened species, or 2) management plans for sensitive species See Forest-wide Standards and Guidelines for direction on plant collecting.

Range

MA4-6 Livestock grazing shall be prohibited in Botanical Areas, except where such use is part of an existing allotment.

Bigelow Lakes is the only recommended Botanical Area with an existing grazing allotment (Big Grayback Allotment, administered by the Applegate Ranger District of the Rogue River National Forest) Cattle shall be prevented from reaching the Lakes area by a drift fence The effects of grazing in the Bigelow Lakes basin shall be monitored, and corrective action taken as necessary.

Timber

MA4-7 Timber harvesting shall not be programmed and should normally not occur. Timber harvest shall be permitted only under the conditions outlined below.

Timber harvest may be allowed: to eliminate hazards, remove timber incidental to construction or maintenance of improvements; or in case of natural catastrophe, when removal of such timber is necessary to achieving the goals of the management area

Timber harvest may be permitted, if it can be shown to be beneficial to specific endangered, threatened, or sensitive plant species and is shown by environmental analysis to best meet the goals of the management area.

MA4-8 If no other alternative exists, occasional trees situated just inside the boundary of the Botanical Area may be used as logging cable anchors to facilitate harvest of timber from nearby harvest units. Any tree used as an anchor shall be protected from girdling.

MA4-9 Firewood cutting shall not be allowed.

Minerals

MA4-10 Valid claims existing prior to botanical area designation may be developed. Every effort should be made to protect botanical resources, especially sensitive plant species Botanical areas may be recommended for withdrawal from mineral entry in situations where mitigation measures do not adequately protect management area values. The mineral potential of the area shall be assessed before withdrawal is recommended.

Facilities

MA4-11 Roads, trails, sanitary facilities, picnic grounds, and parking spaces shall be located without disturbing the special features of Botanical Areas. Developments such as roads, trails, and other facilities shall be kept to the minimum necessary for public enjoyment of the area

Existing facilities should be allowed to remain New facilities (roads, buildings, towers, etc.) may be built if they do not detrimentally affect endangered, threatened, and sensitive plant species or their habitat. New trails, signing, and protective facilities (e.g. boardwalks, fencing) may be allowed.

Hazard tree felling for safety reasons is permitted along trails or roads. Felled trees shall remain in place, unless lying across a trail or road. Trees shall not be removed

Development of rock sources shall not be permitted, stockpiling of rock materials should not occur. Waste material from road construction, reconstruction, or maintenance shall not be left in Botanical Areas.

The key resource values, identified in a thorough analysis of the potential effects, should be avoided in future utility corridor siting in this Management Area. Wherever possible, future utility corridor siting should avoid this management area.

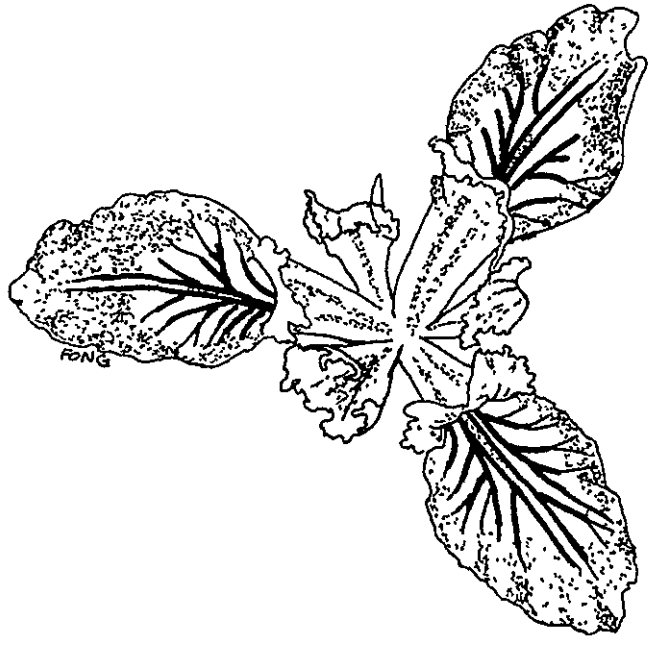
Fire Management

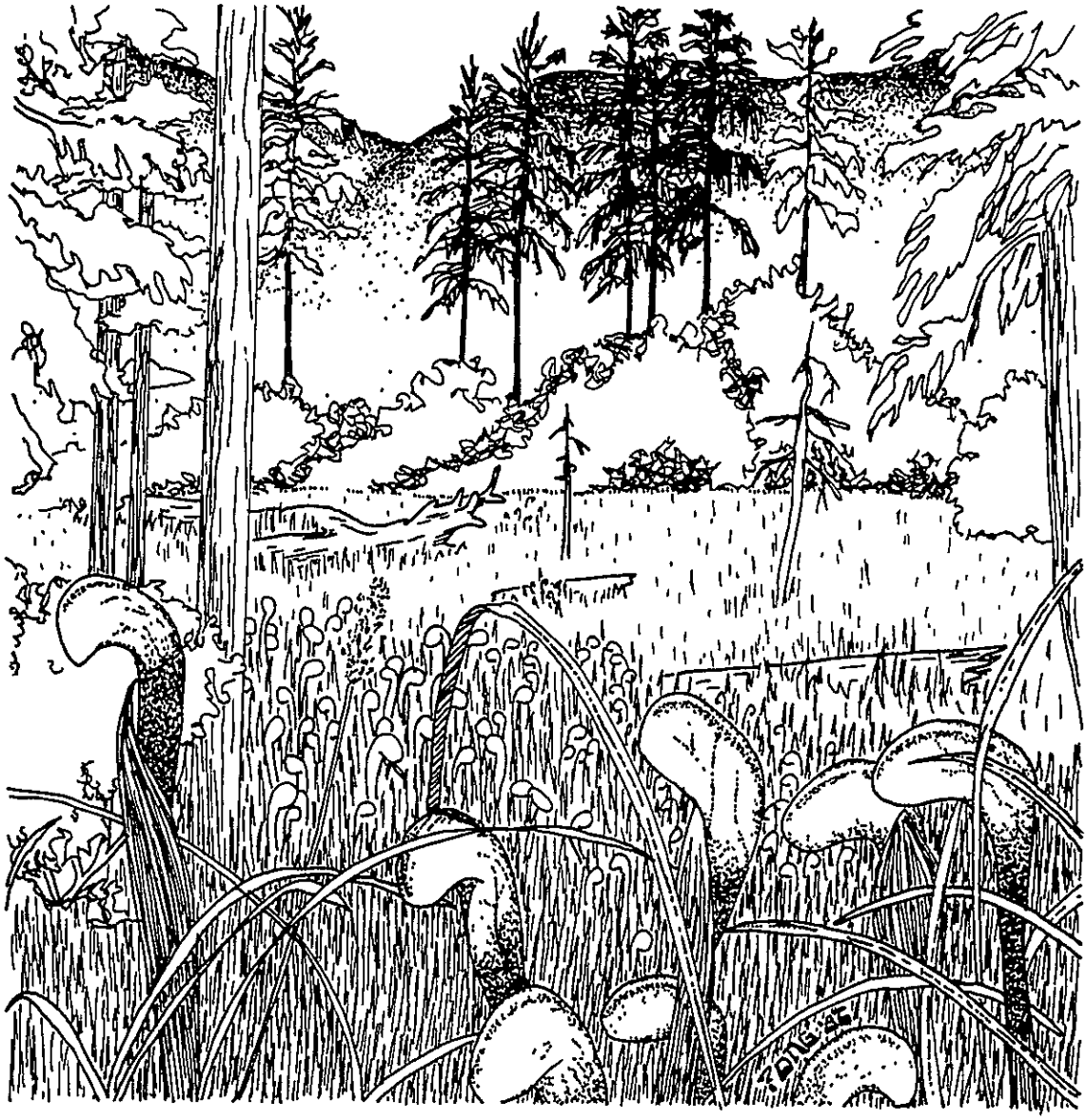
MA4-12 All wildfires occurring at FIL 2 or above will be controlled at 30 acres or less 90 percent of the time. A modified range of suppression technology and equipment emphasizing indirect attack will be used. Wildfires occurring at FIL 1 will be handled as outlined in the basic fire management direction for the Forest.

Management should provide a low level of prevention activities Public contacts should be limited, with most of the prevention effort concentrated on techniques that will accomplish the fire prevention mission prior to the user entering the botanical area

MA4-13 *Insect and disease control activities should be used where necessary to protect the outstanding* botanical attractions of these areas

MA4-14 Prescribed fire may be utilized as a tool to return fire to its natural role in the areas and return plant communities to a condition similar to that which existed prior to active fire suppression





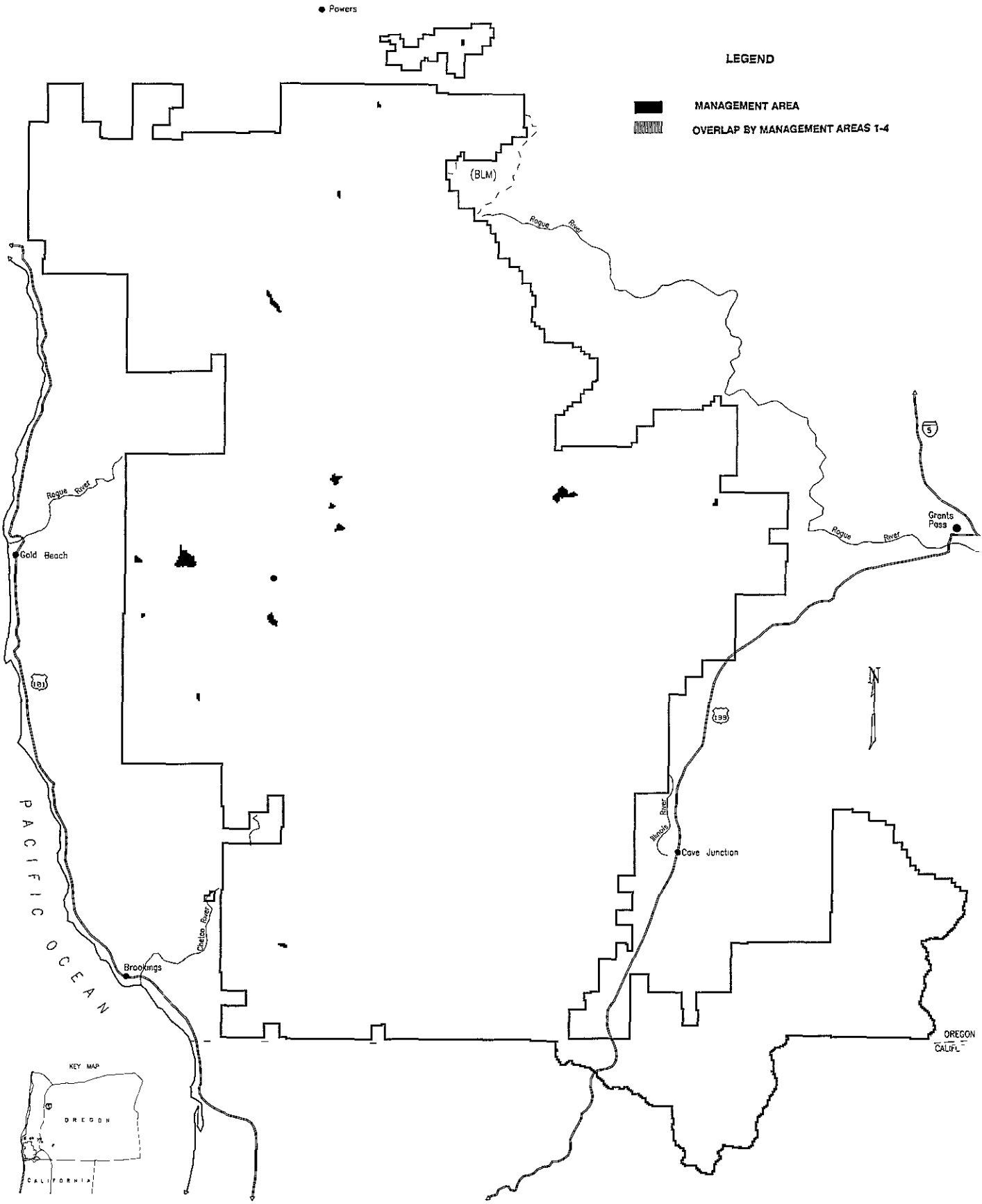


Figure IV-8. Unique Interest Management Area Map

MANAGEMENT AREA 5 - UNIQUE INTEREST

DESCRIPTION

Unique Interest areas are classified under 36 CFR 294.1 and managed to protect, and where appropriate, foster public use and enjoyment of significant cultural or exceptional geologic sites on the Forest (FSM 2360 Special Interest Areas). Cultural sites include prehistoric or historic sites, buildings, or objects of historical significance Geologic sites consist of prominent or unusual rock buttes or waterfalls Refer to Figure IV-8 for a map displaying allocated acres within the management area. This prescription includes the following areas·

Table IV-18 Acres Allocated to Unique Interest

	Acres		
Name	Management Area 5	Overlap by Management Areas 1-4	Total Area
Collier Butte	171	0	171
Devils Half Acre Ridge	203	0	203
Elk Creek Falls	32	0	32
Ferris Ford Cedar Log House	48	0	48
Gray Butte	48	0	48
Horse Sign Butte	101	0	101
Lawson Butte	155	0	155
Pyramid Rock	27	0	27
Quosatana Butte	543	0	543
Saddle Mountain	59	0	59
Signal Buttes	75	0	75
Silver Creek Falls	388	0	388
Stack Yards Rock	48	0	48
Taylor Creek Falls	64	0	64
Wheeler Creek Bomb Site	53	0	53
Total	2,015	0	2,015

MANAGEMENT GOALS

The goal is to protect the significant cultural sites or outstanding geological features on the Forest.

DESIRED FUTURE CONDITIONS

These sites and features will be preserved and managed for education, research, and to protect their unique character The primary benefiting uses of these areas will be for developed and dispersed recreation, research, and educational opportunities.

STANDARDS AND GUIDELINES

Recreation

MA5-1 Existing and potential trails should be permitted, but additional recreational developments should not be undertaken unless needed to protect cultural or geological values Recreational use of these areas and the placement of protective improvements is consistent with the management goals Management of recreational resources is important, but shall be secondary to cultural and geologic aspects.

Visual Resource

MA5-2 Visual management shall meet or exceed the inventoried VQO's of the specific areas

Range

MA5-3 Range use may be allowed if it does not detrimentally affect the management goals of the area.

Timber

MA5-4 Timber harvest shall not be programmed and shall be allowed only to eliminate hazards, remove timber which is incidental to construction or maintenance of improvements, or in case of natural catastrophe when removal of such timber is not detrimental to achieving the goals of the management area Firewood cutting shall not be allowed.

Minerals

MA5-5 Strong mitigation to protect Unique Interest Management Area values is essential Operators of valid claims shall be required to have an operating plan providing the least amount of impact. Unique Interest areas may be recommended for withdrawal from mineral entry in situations where mitigation measures do not adequately protect management area values. The mineral potential of the area shall be assessed before withdrawal is recommended. Rock quarries shall not be permitted.

Lands

MA5-6 Any special use permits issued shall meet the management objectives for these areas.

Facilities

MA5-7 Existing facilities shall be allowed to remain. Roads may be built if they do not detrimentally affect management goals for the area New trails, signing, and protective facilities may be allowed.

Future utility corridor siting should avoid this Management Area This Management Area shall be entered only after environmental analysis, in which all other alternatives have been rejected by the Forest Service

Fire Management

MA5-8 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Direct attack utilizing a modified range of suppression equipment and technology should be emphasized. Wildfires occurring at FIL 1 should be handled as outlined in the basic suppression direction for the Forest.

A high level of wildfire prevention activities with a low level of visibility should be maintained Only limited public field contacts should be made, with most of the contact effort handled through media efforts. Hazard reduction activities may be utilized near heavily-used sites

Both direct and indirect treatment methods should be emphasized in the treatment of activity fuels. Direct treatments should be used where visuals or management risks carry a high priority. Indirect treatment is appropriate outside of visually-sensitive or high-risk areas. Direct treatment of natural fuels is encouraged.



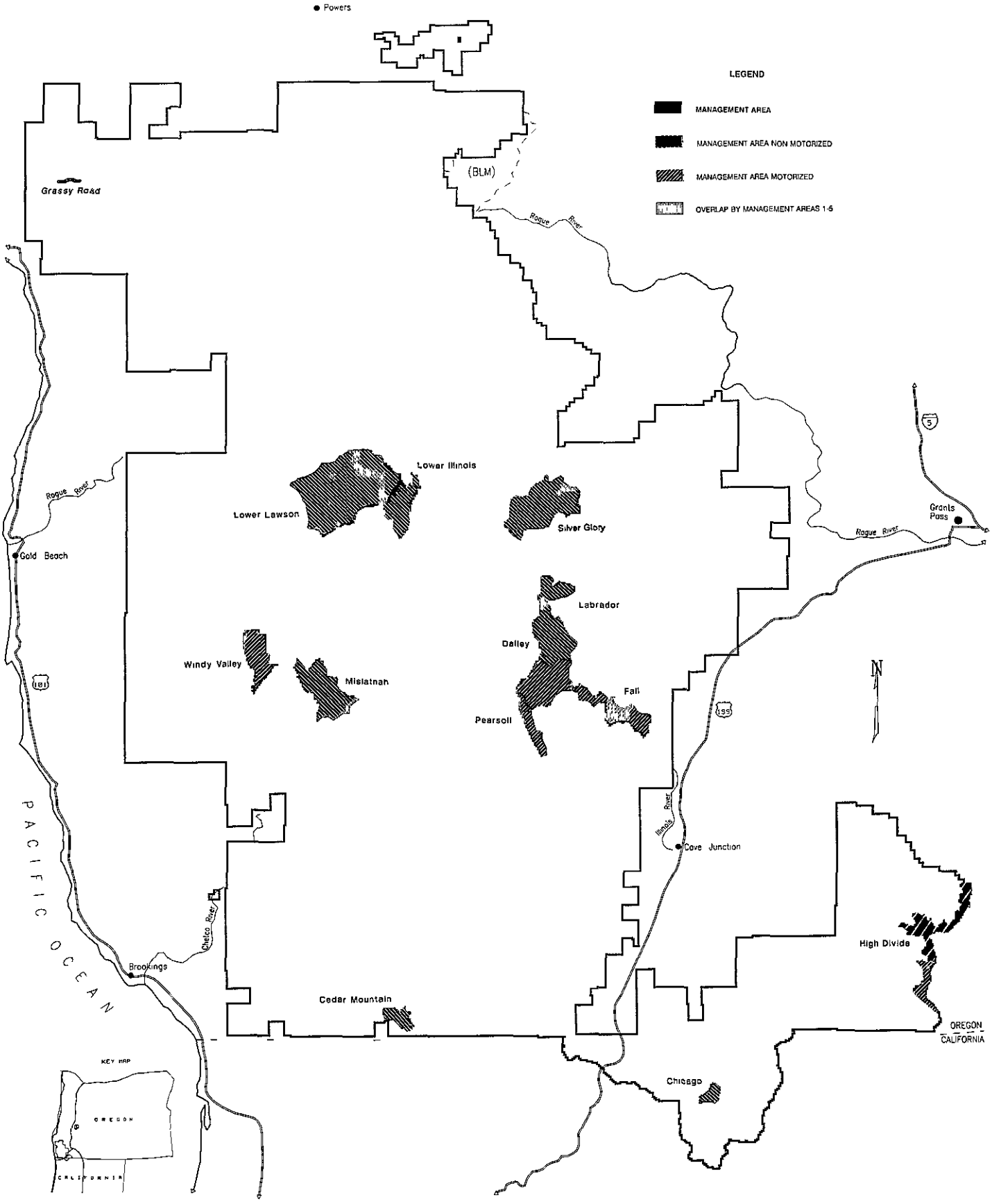


Figure IV-9 Backcountry Recreation Management Area Map

MANAGEMENT AREA 6 - BACKCOUNTRY RECREATION

DESCRIPTION

This prescription applies to areas on the Forest that are unroaded or have little road development. These areas are in a natural or near-natural state, with little or no evidence of human development. Refer to Figure IV-9 for a map displaying allocated acres within the management area. The specific areas covered by this prescription are:

Table IV-19 Acres Allocated to Backcountry Recreation

	Acres		
Name	Management Area 6	Overlap by Management Areas 1-5	Total Area
Motorized			
Dailey	3,598	0	3,598
Fall	1,611	1,247	2,858
High Divide	2,309	711	3,020
Pearsoll	1,333	0	1,333
Windy Valley	2,363	184	2,547
Non-motorized			
Grassy Road	74	0	74
Cedar Mountain	923	350	1,273
Chicago	629	1	630
Labrador	5,435	265	5,700
Lower Illinois	6,256	1,573	7,829
Lower Lawson	6,699	257	6,956
Mislatnah	3,829	417	4,246
Silver Glory	5,812	384	6,196
Total	40,871	5,389	46,260

MANAGEMENT GOALS

The primary goals for this management area are to·

1. Maintain or recreate an essentially undeveloped condition;
2. In areas designated "Non-motorized Backcountry", provide a recreation setting that is appropriate to facilitate Primitive and Semi-primitive, Non-motorized recreation use (Non-motorized use may include the use of human-powered mechanized devices, such as bicycles);
3. In areas designated "Motorized Backcountry", provide a recreation setting appropriate for Semi-Primitive, Motorized recreation use;
4. Provide a minimum of developed recreation facilities, where needed, and where appropriate for the desired recreational experience and environmental setting;
5. Conduct activities and provide improvements which are unobtrusive, or of short duration, and, which complement: (a) recreation management, (b) maintenance and enhancement of fish and wildlife habitat, and (c) administration or management of other resources; and
6. Sustain natural ecological processes, to the extent that other Management Area goals are not impaired.

DESIRED FUTURE CONDITION

In the interior of the areas, there will be moderate to high isolation from the sight and sounds of human facilities and activities Recreational use will be relatively light so that users meet infrequently. The only

facilities will be trails, Primitive camps (including some rudimentary facilities such as toilets, fire rings and cleared, level areas for tents), and relatively inconspicuous facilities needed for wildlife or fish habitat improvement (such as nest structures, created pools or stream passageways). Motorized Backcountry areas will also have primitive roads used as ORV and jeep trails, and may have roads used for mining, or to cross to management areas with timber harvest Human activities do not interfere with natural processes involving the development of vegetation communities and the interactions of wildlife and habitat In some instances, natural processes may be enhanced by management activity.

STANDARDS AND GUIDELINES

Recreation

MA6-1 The Management Area shall be divided into administrative subunits, based on location, presence of existing roads and past history of recreational use. A site-specific recreation management plan shall be developed for each subunit. Primitive facilities may be constructed and maintained, provided they are unobtrusive and do not alter the existing character of the area.

In areas designated "Non-motorized Backcountry," the use of motorized equipment is prohibited, except by:

1. Authorized Forest Service personnel, or their agents, in the performance of approved *administrative or management duties, and*
2. Mining operators, or their agents, within the provisions of approved operating plans.

Visual Resource

MA6-2 A visual quality objective of Preservation will be emphasized in the management of this area Visual quality will be managed at the inventoried VQO's on areas affected by mining activity under approved operating plans Visual quality management will emphasize the maintenance of undisturbed forest character in the viewshed seen from the Wild Illinois River between Silver Creek and Nancy Creek.

Wildlife and Fish

MA6-3 Backcountry Recreation Management Areas are important focal points for habitat diversity. In general, wildlife habitat should be maintained or improved. Fish and wildlife habitat improvement work may be done, provided that activities and structures do not conflict with the long-term recreational objectives for the area.

Habitat enhancement work for Sensitive plant and animal species may be done if recommended as part of a Biological Evaluation. Habitat enhancement work for Threatened and Endangered Species may be done in conjunction with an approved species Recovery Plan

Timber

MA6-4 Timber harvest is not programmed. Harvest shall be allowed only to eliminate hazards, or in capturing losses resulting from catastrophic events. Removal of timber should not occur where it is detrimental to achieving the goals of the Management Area. See Forest-wide Standard and *Guideline 1-12 for guidance on environmental analysis following catastrophic events. If analysis* is initiated, strong consideration should be given to the visual management guidance in MA6-2, above.

Minerals

MA6-5 Administration of mining activities shall be geared to produce the least impact to the Management Area values. On-site reviews by the Forest Mining Engineer shall be made before authorizing ground-disturbing activities in operating plans. Backcountry Recreation areas may be recommended for withdrawal from mineral entry where mitigation measures do not adequately protect resource values The mineral potential of the area shall be assessed before withdrawal is recommended

Facilities

MA6-6 Non-motorized Backcountry - Facilities may be constructed, maintained or managed as follows:

1. Trails and trail structures depending on recreational demand and the capability of the land to support such uses.
2. Facilities required for the administration of the Management Area in a Primitive or Semi-primitive condition.
3. Facilities required to protect the Forest from wildfire.
4. Facilities required to conduct mining operations under approved operating plans.
5. Existing roads not required for approved mining operations shall be closed to motorized use and may be obliterated

Motorized Backcountry - New facilities may be constructed, maintained or managed as follows:

1. Trails and trail structures depending on recreational demand and the capability of the land to support such uses.
2. Facilities required for the administration of the Management Area in a Semi-primitive condition.
3. Facilities required to protect the Forest from wildfire.
4. Facilities required to conduct mining operations under approved operating plans.
5 ORV or Jeep trails may be constructed depending on recreational demand and the capability of the land to support such uses.
6. Roads may be constructed across these areas if needed to manage lands with programmed timber harvest; Motorized Backcountry areas will not landlock other management areas. Environmental analysis of such road proposals will consider the values the Backcountry areas are established for in evaluating alternative routes.
7. Existing roads shall be maintained at Maintenance Level 2 for use as ORV or Jeep trails.
8. Closure may be considered on existing roads for the protection of other resource values.

Future utility corridor siting should avoid this Management Area. This Management Area shall be entered only after environmental analysis, in which all other alternatives have been rejected by the Forest Service.

Fire Management

MA6-7 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. A modified range of suppression technology and equipment emphasizing direct attack should be used. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire suppression direction for the Forest.

A high level of fire prevention activities should be maintained.

Direct treatment methods should be emphasized in the management of natural fuels and any activity fuels.

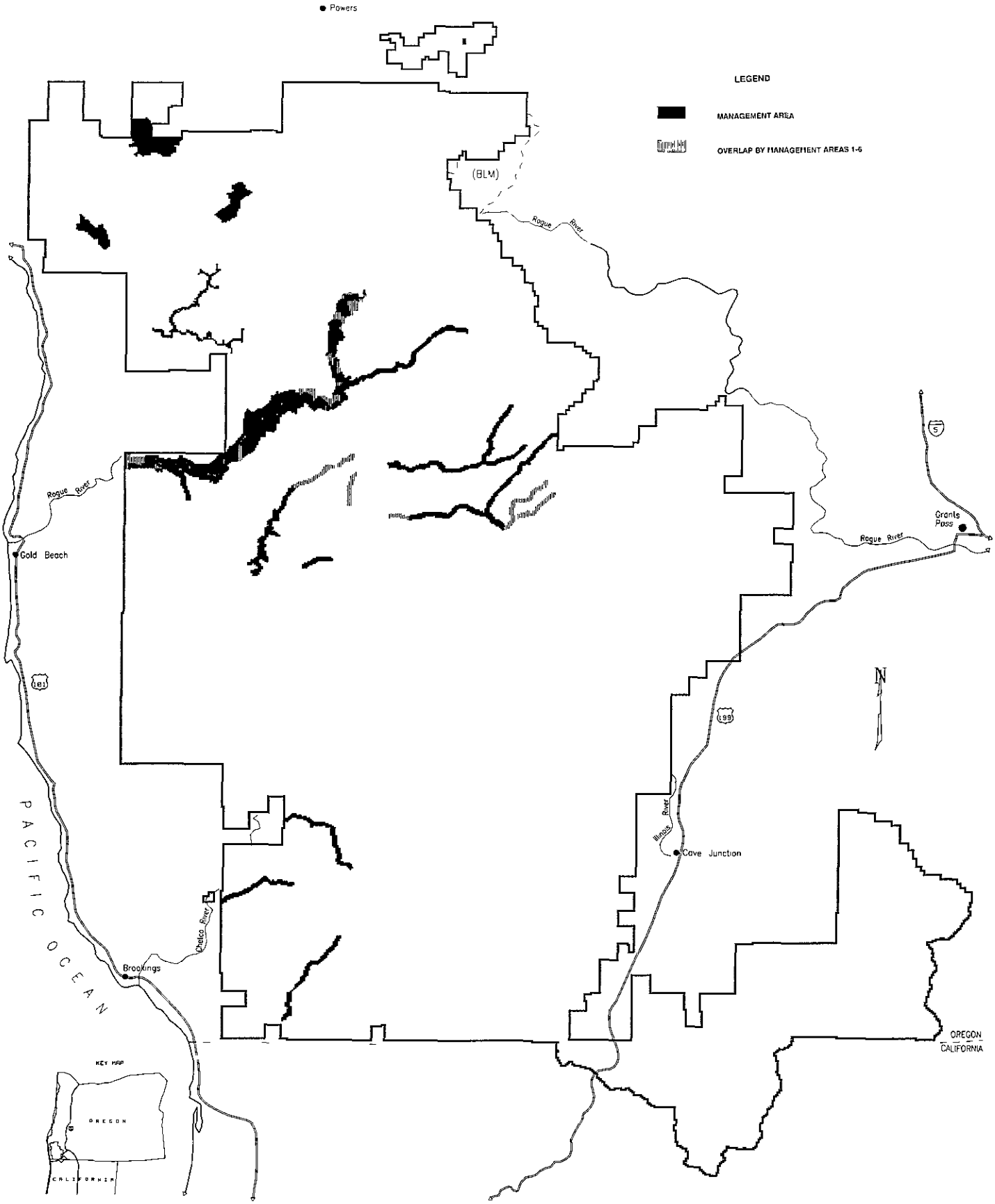


Figure IV-10. Supplemental Resource Management Area Map

MANAGEMENT AREA 7 - SUPPLEMENTAL RESOURCE

DESCRIPTION

This prescription is applicable to areas on the Forest which are considered highly productive or critical habitats for wildlife and fish; are critical for the maintenance of watershed condition; or have special recreation values. Most of these areas are inner gorge along major streams encompassing the land within 1/8 mile on either side of the stream. Refer to Figure IV-10 for a map displaying allocated acres within the management area. The specific areas covered by this prescription are:

Table IV-20 Acres Allocated to Supplemental Resource

	Acres		
Name	Management Area 7	Overlap by Management Areas 1-6	Total Area
Emily Creek	742	0	742
Father Mountain	373	0	373
Horse Sign Creek	0	389	389
Illahe East	469	81	550
Indigo Creek	2,267	0	2,267
Lawson Creek	1,493	691	2,184
Lobster Creek	1,416	0	1,416
North Fork Collier Creek	320	0	320
North Fork Elk River	1,333	606	1,939
Purple Mountain	708	0	708
Quosatana Creek	317	0	317
Rogue River Visual	9,238	705	9,943
Shasta Costa Creek	1,428	0	1,428
Silver Creek	2,357	1,520	3,877
South Fork Chetco	999	0	999
South Fork Sixes River	2,432	0	2,432
Winchuck River	1,029	17	1,046
Total	26,921	4,009	30,930

MANAGEMENT GOALS

The goals are to protect or enhance key fish and wildlife habitats; protect sensitive watershed areas, and protect recreation values.

DESIRED FUTURE CONDITION

These areas will remain in a near natural condition. Timber harvest shall not be programmed; however, some trees may be removed after a catastrophic event. These areas will be withdrawn from power, flood control and water entries.

STANDARDS AND GUIDELINES

Recreation

MA7-1 Trails and camping facilities should be consistent with primitive and Semi-primitive recreation experience Levels I, II, and III (FSM 2300). Existing and planned developed recreation sites may be permitted if compatible with the primary goals for these areas. These areas should generally be managed to remain in a near-natural condition.

The construction of minimum impact hiker trails and primitive camps should be permitted These areas should be maintained at the Semi-primitive, Non-motorized recreation level; except in some areas, motorized equipment may be permitted on designated trails.

Visual Resources

MA7-2 Visual management shall meet or exceed the inventoried VQO's of the specific areas.

Wildlife and Fish

MA7-3 Provide near maximum protection of fishery resources by maintaining, or where practicable, improving water quality and other habitat aspects affecting the production of fish.

Management activities should emphasize the protection or improvement of salmonid fish spawning, rearing, and migration habitat. The following activities may be used where appropriate to accomplish the fisheries objectives:

1. *Improve the rearing capacity for resident salmonids and juvenile anadromous salmonids* through creation of side channels, or pool areas three feet or more in depth Add woody debris where needed for fish cover or channel stability. Revegetate exposed stream banks where needed.
2. Create artificial spawning habitat for salmonid fish species through placement of log weirs or gabions in streams for catching part of the natural gravel progression downstream, or for backfilling with a suitable quality spawning gravel. Create cover for adult fish in connection with spawning habitat.
3. Improve or develop fish passage (migration habitat) at culverts, natural falls, velocity barriers, etc. where the desirability has been determined in cooperation with the Oregon Department of Fish and Wildlife. Examples of improvements are constructing concrete fish ladders, building baffles inside culverts, construction of log gabion or concrete structures to improve pool depth or correct water velocity problems, or modify existing barriers to allow fish passage.

MA7-4 Supplemental resource areas are important focal points for habitat diversity. In general, wildlife habitat should be maintained or improved.

Timber

MA7-5 Timber harvest shall not be programmed and should normally not occur. Timber harvest shall be permitted only under the conditions outlined below.

Timber harvest may be allowed to: eliminate hazards, remove timber which is incidental to construction or maintenance of improvements, or in case of natural catastrophe, when removal of such timber is not detrimental to achieving the goals of the management area.

Timber harvest may be permitted if it is shown to produce specific benefits for fisheries, wildlife, water, or visual resources, and is shown by environmental analysis to best meet the goals of the management area.

Salvage of dead trees should be limited to those trees which are considered to be in excess of wildlife habitat needs, in excess of large woody material needs, or trees in established recreation sites which pose a threat to human safety.

MA7-6 Occasional trees may be used as logging cable anchors to facilitate harvest of timber from nearby harvest units Where required to harvest adjacent areas, corridors for cable logging may be permitted.

MA7-7 Firewood cutting should not be allowed.

Water and Soil

MA7-8 Accelerated soil erosion resulting from management activities within the supplemental resource areas should be minimized or prevented. Minimum impact trails and special construction techniques should be used to minimize the risk of soil movement.

MA7-9 Water quality will be protected, and where practical, improved Efforts should be made to rehabilitate degraded sites or other areas yielding high levels of sediment or turbidity

Minerals

MA7-10 Mining activity is permitted in accordance with mining regulations and an approved operating plan.

Facilities

MA7-11 Stream crossings should be avoided. Where crossing a stream with a road is unavoidable, the stream should be crossed using methods that will minimize adverse impacts to water and fisheries resources. Construction of minimum impact trails and the development of flats into primitive campground sites may be permitted. All facilities shall be developed in keeping with the primary objectives of protecting fish, wildlife, recreation and aesthetic values.

The key resource values, identified in a thorough analysis of the potential effects, should be avoided in future utility corridor siting in this Management Area.

Fire Management

MA7-12 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less, 90 percent of the time. A limited range of suppression technology and equipment emphasizing direct attack should be used. Wildfires occurring at FIL 1 should be handled as outlined in the basic fire management direction for the Forest.

Management should provide for a low level of prevention activities, unless an industrial operation is started Public contacts should be limited, even during high-use periods, with cost of the prevention effort concentrated on techniques that accomplish the fire prevention mission to the forest user entering the area

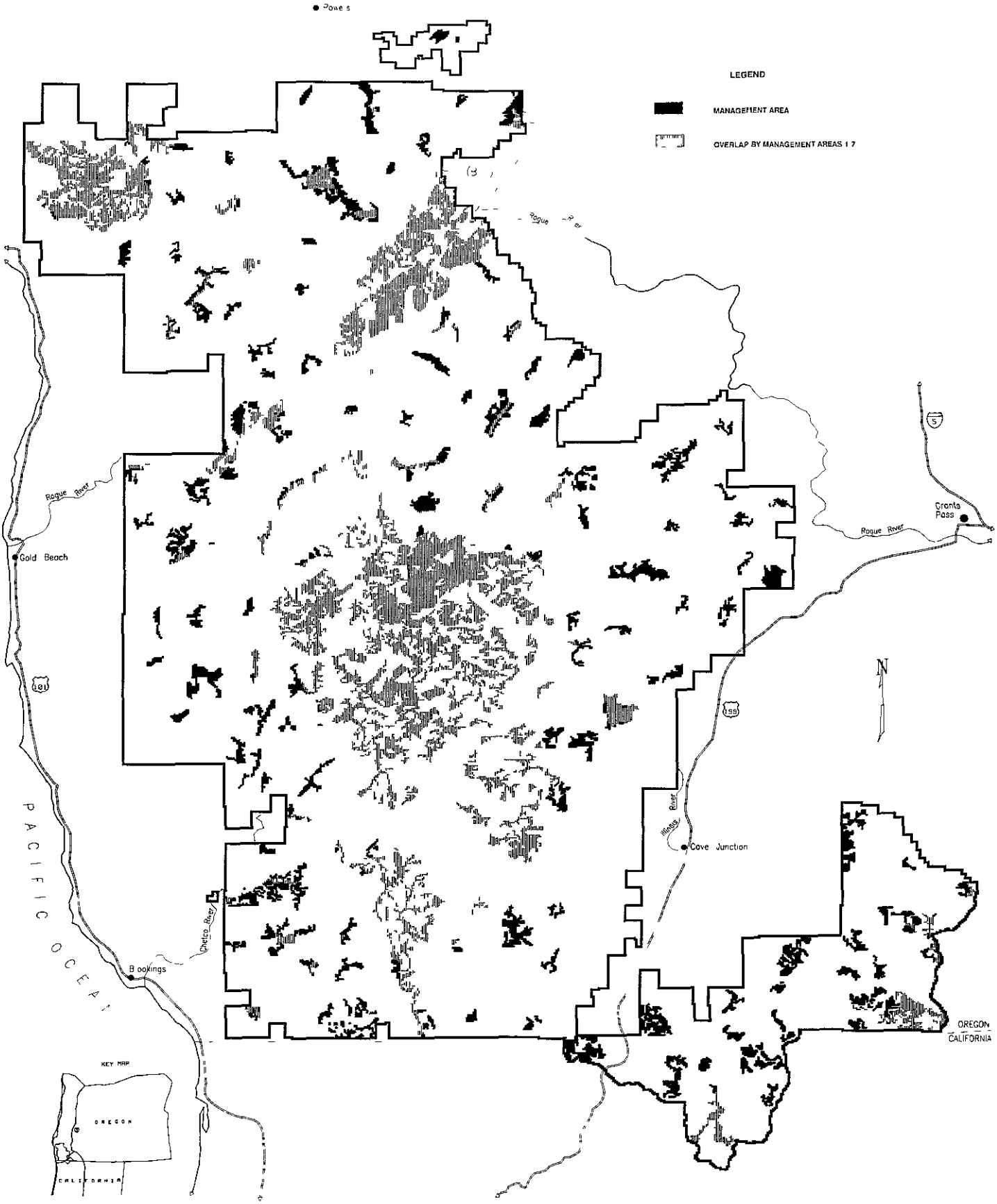


Figure IV-11 Designated Wildlife Habitat Management Area Map

MANAGEMENT AREA 8 - DESIGNATED WILDLIFE HABITAT

DESCRIPTION

This prescription protects habitat sites for spotted owls, pileated woodpeckers, and pine marten These three animals are indicator species for all wildlife inhabitants of mature or old-growth forests. A total of 132,727 acres of habitat are protected in Management Areas 1 through 7 plus 9. Another 5,444 acres of mature and old-growth forest in Management Areas 10-14 are not suitable for timber harvest because of soils or reforestation problems. Management Area 8 contains an additional 41,566 acres necessary to meet Management Requirements (MR's) for those wildlife species inhabiting mature and old-growth forest. Total mature and old-growth habitat protected over the long-term is 179,737 acres

Habitat areas are designated, rather than rotated; no substitute sites are identified as potential replacements. Refer to Figure IV-11 for a map displaying allocated acres within the management area.

Table IV-21. Acres Allocated to Designated Wildlife Habitat

	Acres		
Name	Management Area 8	Overlap by Management Areas 1-7	Total Area
Pileated Woodpecker	14,075	24,793	38,868
Pine Marten	11,851	6,248	18,099
Spotted Owl	24,363	78,619	102,982
Total	50,287	109,660	159,949

MANAGEMENT GOAL

The goal is to protect mature and old-growth habitat for all dependent flora and fauna by providing habitat for the three wildlife indicator species sufficient to maintain viable populations in a well distributed pattern *throughout the Forest (viable populations will be maintained in concert with management of spotted owl* habitat on adjacent public lands: Klamath, Six Rivers, and Rogue River National Forests; Medford, Coos Bay, and Roseburg Districts of the Bureau of Land Management; Oregon Caves National Monument).

DESIRED FUTURE CONDITION

The desired future condition is well dispersed mature and old-growth habitat areas with the optimum characteristics for survival and reproduction of dependent species Characteristics of individual areas will vary somewhat according to the specific indicator they are managed for (see following standards and guidelines for description of habitat areas for spotted owl, pileated woodpecker, pine marten). Although individual mature and old-growth stands may last for many decades, forest conditions are not static; individual areas will not remain as suitable habitat forever. Future plans will likely examine opportunities to enhance habitat in these areas, manage them in an uneven-aged condition, or substitute areas and gradually rotate the designated areas

STANDARDS AND GUIDELINES

Recreation

MA8-1 No new developed recreation sites should be permitted within mature and old-growth habitat areas Dispersed recreation activities are allowed within habitat areas, but should be directed 1,000 feet or more from spotted owl nest sites or roost areas.

These habitat areas shall be managed to provide inventoried levels of dispersed recreation opportunities Minimum developed facilities such as trails may be constructed provided that they do not conflict with management goals It may be desirable to use trails as interpretive facilities in explaining management area objectives to the public

Visual Resource

MA8-2 Visual management shall meet or exceed the inventoried VQO's of the specific areas.

Wildlife and Fish

MA8-3 Existing fish and wildlife habitat shall be maintained or improved, while meeting the primary management goals for the area.

MA8-4 Small inclusions of habitat other than mature or old growth may be included within a specific area, but these acres are not counted as part of the minimum acreage requirements per area, as described below.

MA8-5 Each habitat area (or habitat group, in the case of spotted owls) should be connected to three or more adjacent habitat areas the same size or larger.

MA8-6 Habitat area boundaries and locations may be adjusted to correct errors in mapping; but total acres shall be equal to existing programmed levels.

If an area becomes unsuitable as mature or old-growth forest through fire or other natural catastrophe, it shall be replaced with another nearby suitable area if available. If no suitable area exists, it may be replaced with a capable habitat area. In either case, Management Requirements shall be met as outlined below The exchange process, including disposition of the replaced area, shall be documented though environmental analysis procedures and could result in an amendment to this Forest Plan.

Specific habitat requirements for spotted owl (USDA 1988), and pileated woodpecker and pine marten (USDA 1986) are described below and summarized in Table IV-22

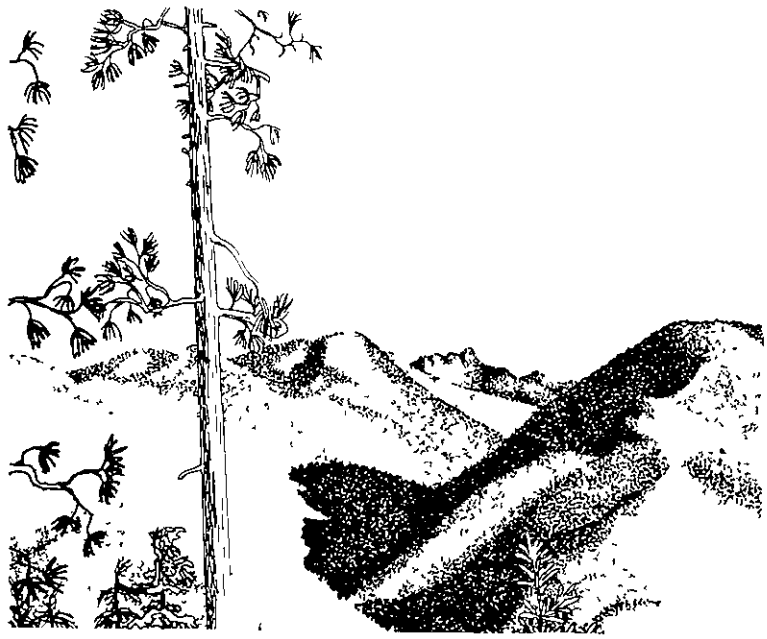


Table IV-22. Summary of Habitat Needs for Pine Marten, Pileated Woodpecker, and Northern Spotted Owl

Habitat Parameter	Pine Marten	Pileated Woodpecker	Northern Spotted Owl
Successional stages required	Mature or Old Growth	Mature or Old Growth	Old Growth or Mature
Acres/Habitat Area in mature/old-growth forest	160 acre/Habitat Area (represents territory of 1 female and part of territory of 1 male)	300 acres/Pair (within a 1,000 acre unit, which also includes 300 acres of feeding habitat)	1,000 acres/Pair (habitat must be within 1 1/2 miles of core center)
Canopy closure	50% or greater	---	Moderate to high
Minimum habitat block size (habitat within each area should be as *contiguous as possible*)	160 acres	50 acres (blocks maximum 1/4 *mile apart*)	300 acres in nesting core, 60 acres in *other habitat*
Maximum dispersal distance between habitat areas	One habitat area for every 4,000 to 5,000 acres (area of circle with diameter of 3 miles)	One habitat area for every 12,000 to 13,000 acres (area of circle with diameter of 5 miles)	6 miles between single pairs, 12 miles between groups of 3 or more pairs, edge to edge
Snag maintenance requirements in habitat areas	Maintain minimum average of 2 hard snags/acre > 12" DBH; 24 of the 320 snags should be > 20" DBH	Maintain minimum average of 2 hard snags/acre > 12" DBH, within the 300 M/OG area; 45 of the 600 snags should be > 25" DBH; within the 300 acres for feeding, maintain minimum average of 2 hard snags/ acre > 10" DBH	Must meet requirements for pileated woodpecker; should have dead standing trees and fallen decayed trees to support abundant populations of prey species, especially n. flying squirrel and woodrat
Down timber requirements	Minimum average of 6 down logs/acre > 12" DBH and 20' long.	Must meet requirements for marten	Must meet requirements for marten

Spotted Owl. The "Final Supplement to the EIS for an Amendment to the PNW Regional Guide (Spotted Owl)" (USDA 1988) provides a general description of suitable habitat; the Siskiyou habitat network for spotted owls conforms to standards and guidelines established in the preferred alternative (F).

Specifically, the Siskiyou's spotted owl habitat occurs predominately in California Mixed Evergreen and Mixed Conifer forest vegetation types; the Siskiyou also supplies relatively small amounts of habitat for spotted owls in the Redwood and Cedar/Hemlock/Douglas-fir forest vegetation types.

The general characteristics of the Forest's spotted owl habitat are (a) relatively large diameter of dominant trees (26 inch average DBH and greater than 20 MBF per acre), with Douglas-fir the dominant overstory species; (b) multi-layered canopy of trees with moderate to high canopy closure in overstory, midstory, and understory layers (greater than 60 percent canopy enclosure - dominant understory tree species are Douglas-fir, white fir, other conifers, and hardwoods), (c) large, tall trees with cavities, broken tops, mistletoe, or platforms of branches capable of holding accumulated organic matter suitable for nesting; (d) dead standing trees and fallen decayed trees to support abundant populations of prey species.

Specific old-growth stand characteristics vary from site to site. Objectives should be to maintain dense multi-layered stands on which overstory trees are at least 200 years old, and understory trees range in age from saplings to 200 years old; i e , uneven-aged understory

Each spotted owl habitat area shall contain at least 1,000 acres of coniferous old-growth habitat below 5,000 feet elevation. On each site managed for a pair of owls, maintain an old-growth core area of at least 300 acres around the nest and an additional 700 acres of old-growth foraging habitat within a 1 5 mile radius of the nest or core center. If 1,000 acres of old growth does not exist within a 1 5 mile radius of the nest, then the oldest stands available shall be designated and managed in the same manner as old growth. There shall be no overlap of breeding or feeding habitat between adjacent pairs. Each habitat area should be as contiguous as possible. For spotted owls, the habitat area should include at least one 300 acre block that includes the nest site; block size of other habitat should be at least 60 acres.

Whenever possible, spotted owl habitat areas should be in groups of three or more (three or more pair per group), with the core areas one to three miles apart. Habitat groups should be no more than 12 miles apart, edge to edge. Occasionally, single habitat areas must be designated where only remnant habitat exists, or to improve distribution or take advantage of areas with known nesting pairs. In these instances the nearest adjacent habitat area(s) must be spaced no more than six miles away (edge to edge). Whenever possible, habitat areas should be connected by 200-foot wide (minimum) corridors of forest land with trees at least 30 years old; gaps of not more than 500 feet are acceptable (Eric Forsman, personal communication).

Spotted owl habitat areas shall also serve as sites for pileated and marten habitat areas.

Habitat suitability index models can be used to rate sites designated for spotted owls. Laymon and others (1985) compare specific variables: average DBH of overstory trees (over 36 inches DBH is best), percent tree canopy cover (70 percent); tree canopy diversity (multi-storied)

Pileated Woodpecker Each pileated woodpecker habitat area shall contain at least 300 acres of mature or old-growth coniferous forest habitat for reproduction and 300 additional acres of feeding habitat (USDA 1986). The 300 acres of feeding habitat is not part of this management area. However, each 600-acre area shall be mapped and managed as one unit. The entire 600-acre area shall be surveyed during Forest Plan Monitoring activities

Each habitat area shall support one pair of pileated woodpeckers This 600 acres should be within a 1,000-acre unit Each habitat area should be as contiguous as possible. If contiguous habitat for pileated woodpeckers is not available, the minimum block size is 50 acres, with blocks no more than 1/4 mile apart.

Mature or old-growth forest will support pileated woodpeckers. Most habitat areas for pileated woodpeckers will be in old-growth forest. Old growth is described under spotted owls above Minimum stand age for mature forest habitat is approximately 100 years. Stand parameters for mature forest habitat are similar to those listed above for old growth in the spotted owl section, except that size of dominant trees is less (average 20 inches DBH, and volume per acre is in the 20 MBF range); trees are not as tall and cavities, broken tops, mistletoe, or platforms of branches are not as prevalent.

At least 2 hard snags per acre equal to or greater than 12 inches DBH shall be maintained in the 300-acre reproduction area. Forty-five of these 600 snags should be equal to or greater than 25 inches DBH. According to Brown (1985) reproduction habitat must contain at least six hard snags over 24 inches DBH and 40 feet tall per hundred acres. The 300 acres of feeding habitat may be of any age, but must contain a minimum average of 2 hard snags per acre equal to or greater than 10 inches DBH. Pileated habitat areas should be spaced at the rate of one site per every 12,000 to 13,000 acres (area of a circle with a diameter of five miles).

Pileated habitat areas will also serve as sites for marten habitat areas

Habitat suitability index models can be used to rate sites designated for pileated woodpeckers. Schroeder (1982) assumes overall habitat suitability for the pileated woodpecker is limited by either the density (over 75 percent canopy closure is best) and maturity (100 or more years) of the forest, or the abundance of snags. Other index models may be developed from studies done in southwest Oregon habitats (such as by Mellen [1987]).

Pine Marten. Each marten habitat area shall contain at least 160 acres of contiguous mature or old-growth coniferous forest At least 2 hard snags per acre equal to or greater than 12 inches DBH shall be maintained within each habitat area; 24 of the 320 snags shall be equal or greater than 20 inches DBH. Also, a minimum average of 6 down logs equal to or greater than 12 inches DBH and 20 feet long shall be maintained per acre (USDA Forest Service 1986).

Mature or old-growth forest will support pine marten. Most habitat areas for pine marten will be in old-growth forest. Old growth is described under spotted owls above; stand parameters for mature forest habitat are described under pileated woodpeckers. Each pine marten habitat area represents the territory of one female and part of the territory for a male. Habitat areas shall be spaced at the rate of one site per every 4,000 to 5,000 acres (area of a circle with a diameter of three miles)

Habitat suitability index models can be used to rate sites designated for pine marten Allen (1982) states that overall habitat suitability for marten is determined by four habitat variables: percent tree canopy closure (50 percent or better is optimum), percent of overstory canopy closure comprised of fir or spruce (more than 40 percent), successional stage of stand (mature or older), percent ground surface covered by downfall which is three inches or greater in diameter (best between 20 percent and 50 percent).

Timber

MA8-7 Timber harvesting shall not be programmed and should normally not occur. Down or dead material should not be salvaged Where necessary, uneven-aged management may be used to

insure that the goals for the management area are met Timber harvest shall be permitted only under the conditions outlined below.

1. Timber harvest may be allowed: to eliminate hazards; remove timber incidental to construction or maintenance of improvements; or in case of natural catastrophe, when removal of such timber is necessary to achieving the goals of the management area.
2. Timber harvest may be permitted, if it can be shown to be beneficial to specific endangered, threatened, or sensitive plant species and is shown by environmental analysis to best meet the goals of the management area.

MA8-8 Occasional trees situated just inside the boundary of a designated wildlife habitat area may be used as logging cable anchors to facilitate harvest of timber from nearby harvest units Any tree used as a anchor should be protected from girdling.

MA8-9 Firewood cutting shall not be allowed.

Range

MA8-10 Livestock may be grazed in openings within mature and old-growth habitat areas provided management objectives for the habitat areas are maintained.

Minerals

MA8-11 On valid claims, approve operating plans for mineral activities which minimize detrimental effects to designated habitat (mature and old growth).

Facilities

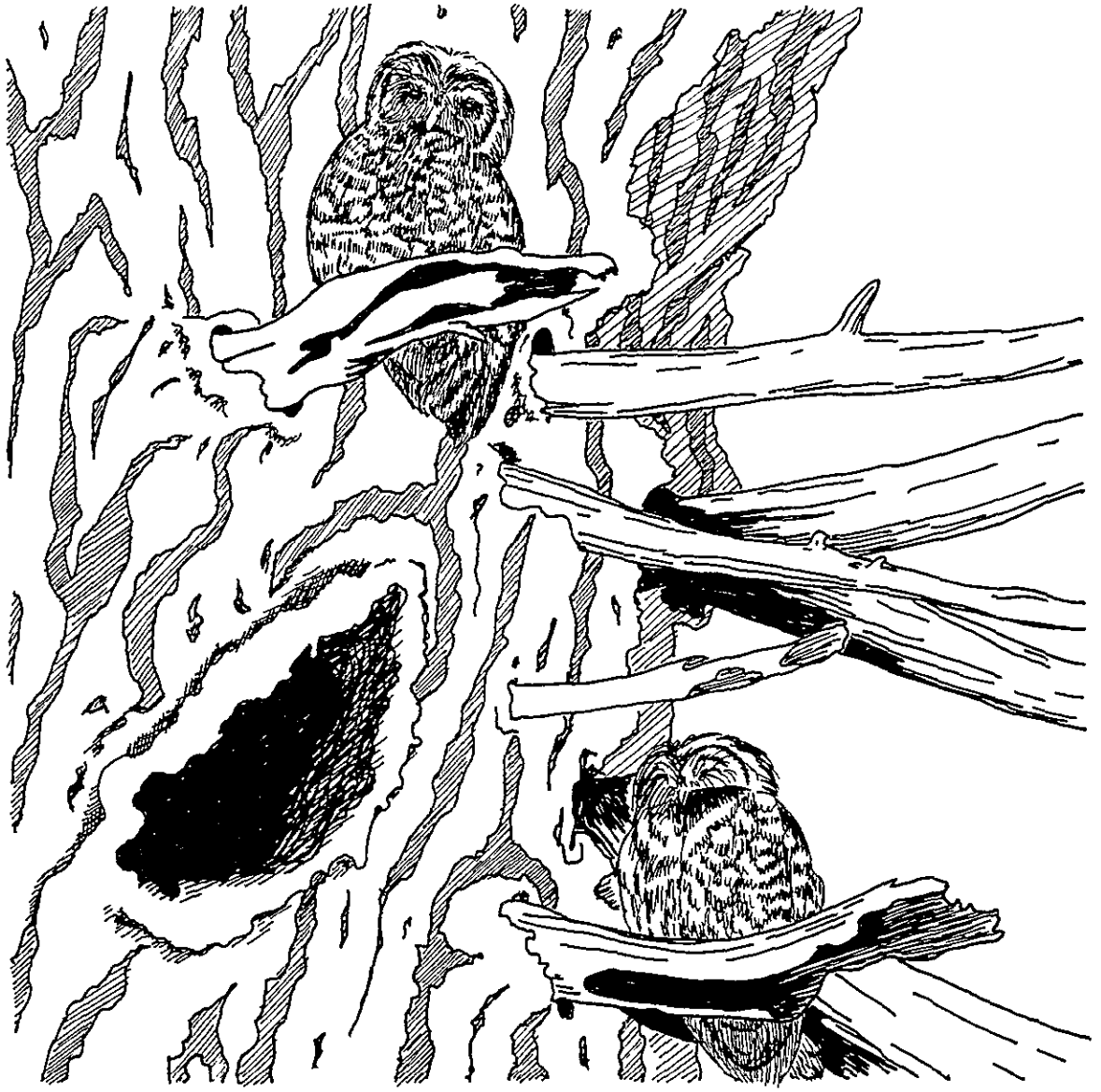
MA8-12 Trails, roads or buildings may be developed provided no significant impact occurs and they do not come within 1,000 feet of a spotted owl nest tree or regularly used roost area. Proposed road locations shall be intensively inventoried for pileated woodpecker and spotted owl nest and roost locations, and pine marten den sites. If new roads and trails usurp more than one percent of the mature and old-growth habitat in an area, then an equal amount of mature and old growth should be added to the habitat area along the periphery.

The key resource values, identified in a thorough analysis of the potential effects, should be avoided in future utility corridor siting in this Management Area.

Fire Management

MA8-13 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Direct attack should be emphasized utilizing a modified-to-full range of suppression technology and equipment. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction of the Forest.

A high level of prevention activities should be provided. Industrial and other operations should be carefully monitored. Industrial closures should be carried out as required by existing contracts and local fire weather conditions. Public contacts through field personnel and other media should be encouraged. Intensive prevention efforts should be made during high fire danger and high-use periods. Signing should be used as appropriate. Direct treatment methods should be emphasized in the management of natural fuels and any activity fuels.



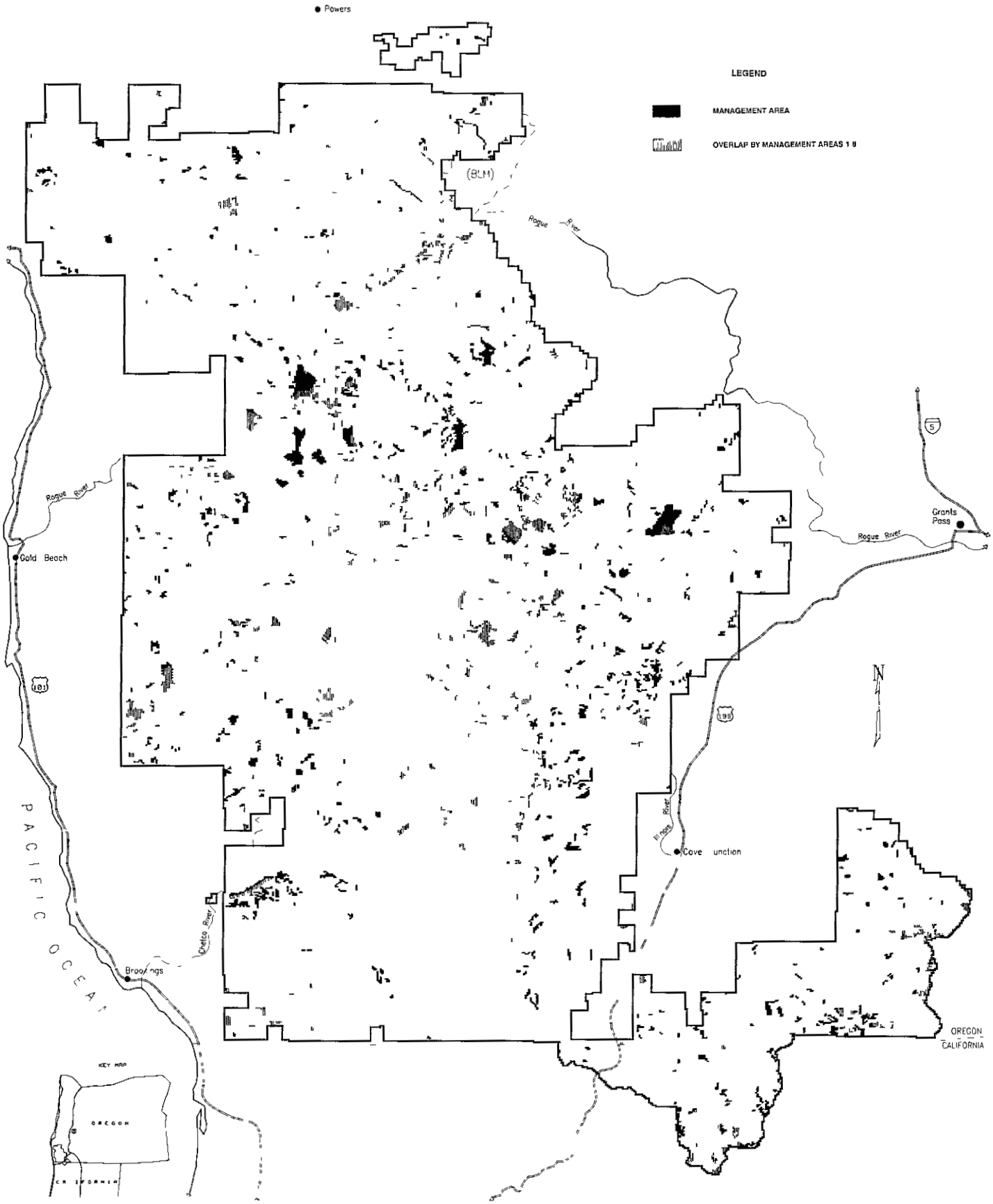


Figure IV-12 Special Wildlife Site Management Area Map

MANAGEMENT AREA 9 - SPECIAL WILDLIFE SITE

DESCRIPTION

This prescription is applicable to special wildlife habitat sites and botanical sites which are important components of overall wildlife habitat diversity and botanical values. Included are. meadows; meadow buffers; swamps, springs, and wet sites; lakes and ponds; tanoak sites; hardwood sites; Roosevelt elk sites, band-tailed pigeon sites; osprey nest sites (outside of Wild and Scenic River corridors); rock sites (cliffs, caves, talus); botanical sites; dispersed old-growth sites; and general wildlife sites. A total of 45,146 acres are identified as Special Sites. Refer to Figure IV-12 for a map displaying allocated acres within the management area The specific types of special sites are described below.

Table IV-23. Acres Allocated to Special Wildlife Site

	Acres		
Name	Management Area 9	Overlap by Management Areas 1-8	Total Area
Botanical Site	75	119	194
Dispersed Old-Growth	11,210	3,497	14,705
Elk Areas	283	26	309
Hardwoods	1,168	872	2,040
Lakes and Ponds	155	117	272
Meadow Buffers	2,859	1,487	4,346
Meadows	4,219	2,297	6,516
Osprey Nest Sites	5	0	5
Pigeon Areas	240	288	528
Rock Bluffs	4,512	6,597	11,109
Swamps, Springs and Wet Areas	15	0	15
Tanoak Areas	298	0	298
Wildlife Areas	3,723	1,086	4,809
Total	28,762	16,384	45,146

Meadows. This habitat type is an important integral component of overall habitat diversity on the Siskiyou. Meadows and meadow/forest edge areas provide hiding and thermal cover, nest and den trees, and food for wildlife species. The Siskiyou has identified 6,516 acres of meadow habitat; 200 feet (average radius) buffer zones surrounding the various meadows comprise 4,346 acres. The Siskiyou's meadow complex totals 10,862 acres. Inventoried meadows range in size from 1 to 250 acres. Meadows smaller than one acre are addressed in the Forest-wide Standards and Guidelines

Swamps/springs/wet sites and lakes/ponds. The Forest contains 287 acres of these water-dominated wildlife habitats; integral or surrounding riparian areas are included

Tanoak and Hardwood sites. Three tanoak sites totaling 298 acres have been identified as important forage areas for wildlife, especially deer, bear, and elk. These are "old-growth" tanoak sites with high mast production. An additional 2,040 acres of hardwoods devoted to wildlife use are interspersed within Designated Habitat (MA-8) (these sites come from the same "background" as those listed under Dispersed old growth).

Roosevelt elk sites 309 acres of these habitats have been identified. Sites include important travel corridors and calving areas.

Band-tailed pigeon sites 528 acres of these habitats have been identified Sites include key feeding areas and mineral spring areas.

Osprey nest sites. Includes active nest sites not in Wild and Scenic River corridors Two active nest sites (five acres) are currently in this category, one on the Galice Ranger District located three air miles from the Rogue River, and one in the Coquille drainage on the Powers District.

Rock sites (cliffs, caves, talus). These geologic features cover relatively few acres (11,706) of the Siskiyou, but contribute substantially to the diversity of wildlife found in the forest environment (the endangered peregrine falcon and sensitive big-eared bat depend on cliffs and caves, respectively). The total acreage includes some buffer areas.

Botanical sites. Seven sites totaling 194 acres have unique plant resources These include unique sites too small to be considered as Botanical Areas.

General wildlife sites Various sites (4,809 acres) with special values for wildlife have been identified over the years during environmental analyses and other field work. These are sites with multiple values for wildlife (e.g , a site may contain water, meadow, and hardwoods). Sites range from larger areas such as Horse Creek, Pebble Hill, Morris Rogers, and Fish Hook Peak, to smaller areas such as Cedar Swamp and Pony Keg.

Dispersed old growth. This term refers to small (less than 160 acres each) wildlife habitat areas which are mostly mature and old-growth forest and generally associated with Designated Wildlife Habitat (Management Area 8) (14,705 acres). This habitat type is sectioned into two categories:

1. The Forest contains many small parcels of mature or old-growth forest unsuitable for timber harvest. These small blocks provide habitat stepping stones between some Designated Wildlife Habitat areas (Management Area 8) (12,350 acres - unsuitable for timber harvest)
2. Small blocks of habitat other than mature or old-growth forest are frequently interspersed within individual Designated Wildlife Habitat areas These blocks may contain a variety of types including: shrubfields, immature conifer stands, and mixed hardwood/conifer stands. When separated from their associated Designated Habitat areas, these blocks would be very difficult to manage for timber products. These blocks add an extra level of habitat diversity to the Forest (2,355 acres - otherwise tentatively suitable for timber production).

MANAGEMENT GOAL

The goal is to protect or enhance these unique wildlife habitats and small botanical sites.

DESIRED FUTURE CONDITION

These areas will continue to provide the unique characteristics that resulted in their identification as special sites. Little change is expected to occur over the next several decades.

STANDARDS AND GUIDELINES

Inventory

MA9-1 During the life of this Forest Plan additional important wildlife and botanical sites will be discovered which are not included as part of this land allocation Each new area should be identified and evaluated as part of a site specific environmental analysis. Each Ranger District shall compile a list of potential candidates for future allocation to Special Wildlife Sites, at the next revision of the Forest Plan, these sites shall be considered for addition to Management Area 9.

Recreation

MA9-2 Use of existing developed recreation sites should not be changed New recreation sites may be developed if environmental analysis indicates that the wildlife habitat or botanical values in the Special Site are not detrimentally affected

MA9-3 Dispersed recreation (including trails) activities may be allowed in special sites; however, motorized activities should be prohibited except where such use is not detrimental to wildlife or botanical resources

Vehicle access should not be provided to meadows or meadow buffers, and no special use permits should be granted for long-term camping in meadows or meadow buffers.

Visual Resource

MA9-4 Management activities shall be planned to meet or exceed the inventoried VQO's of the specific areas.

Wildlife and Fish

MA9-5 Wildlife and fish habitat should be maintained or improved through enhancement projects. Individual wildlife sites may be managed to benefit specific wildlife species or species groups. Mark boundaries of Special Sites on the ground where necessary.

MA9-6 Each Ranger District should develop a comprehensive management plan for their wildlife and botanical sites. The plans, detailing the measures needed to maintain or enhance the sites, should be completed within four years after implementation of the Forest Plan.

MA9-7 *Meadows and meadow buffers* All meadows should be managed as natural openings All inventoried meadows and meadow edges should be maintained at existing size levels and, where opportunities exist, past encroachment by surrounding forest should be reversed Where needed, habitat improvement projects should be initiated in meadow areas. The following activities are important in maintaining optimum meadow habitat for wildlife.

1. Encroaching trees from surrounding forest and other undesirable vegetation should be removed from meadows.
2. Large, live trees within meadow areas may be left as is or girdled, depending on individual circumstances. Dead trees (standing or down) should not be removed.
3. Meadow areas lost to encroachment may be restored to their former size. The Forest's oldest aerial photographs (circa 1940) should be used as reference points in reestablishing the historical boundaries.

MA9-8 *Swamps/springs/wet sites and lakes/ponds.* These sites shall be managed to maintain or improve their value as wildlife habitat

MA9-9 *Tanoak and Hardwood sites* Mature tanoak stands produce outstanding acorn crops year after year; they shall be managed to maintain their inherent wildlife values. Hardwood stands shall be managed to maintain or improve their value to wildlife.

MA9-10 *Roosevelt elk sites.* Elk make greater use of certain forest habitats during the course of their daily and seasonal activities. Special sites such as riparian buffer zones, natural openings, calving areas, and specific old-growth stands meet important elk habitat needs These sites should be managed to maintain their outstanding value as elk habitat.

MA9-11 *Band-tailed pigeon sites.* Certain mineral springs, roosting sites, feeding sites, and fly-through areas on the Siskiyou receive concentrated use. They should be managed to maintain or improve their value to band-tailed pigeon.

MA9-12 *Osprey nest sites.* Occasionally this uncommon bird nests a considerable distance from water. Nest sites outside of the river corridors described under Forest-wide Standards and Guidelines shall be protected. See the Osprey section under Forest-wide standards and guidelines for Fish and Wildlife.

MA9-13 *Rock sites (cliffs, caves, talus).* Rock sites, including adjacent forested areas (edge) should be managed to protect their value to wildlife Rock sites are important habitat for sensitive species, including many plants, and wildlife such as Townsend's western big-eared bat and the Siskiyou Mountain Salamander. Brown (1985), Chapter 9 - Cliffs, Caves, Talus, shall be used as a guide in managing rock sites. Edge width (buffer) shall be designated on a site specific basis

MA9-14 *General wildlife sites.* These sites have multiple values for wildlife (such as a wet area/meadow/shrub complex) and add substantially to the mix of wildlife habitats on the Siskiyou. These areas should be managed to maintain or improve their value to wildlife Individual management plans may be developed for the more complex sites (such as Fish Hook Peak or Horse Creek).

MA9-15 *Botanical sites.* A few small sites with outstanding botanical values have been identified at various locations on the Forest (examples: Taylor fern site and Mud Springs sensitive plant site on the Galice District, and the Huntley Springs sensitive plant site on the Gold Beach District) These sites are too small to qualify as potential Botanical areas, but their plant resources need to be recognized and protected. These areas shall be managed to maintain or improve their outstanding plant values

MA9-16 *Dispersed Old Growth.* Wildlife values in these dispersed habitat areas should be maintained or improved.

Range

MA9-17 Special wildlife sites may be available for range livestock use where there is no conflict with the objectives set for this management area, but wildlife needs shall take precedence.

Maximum acceptable annual utilization levels for meadow sites are included below. These utilization levels shall be monitored under the Allotment Management Plans on meadows included within livestock allotments Studies shall be initiated as directed in FSH 2209.21.

Maintenance of meadow productivity and ecological condition depends on the level and season of use by wild ungulates or livestock. The following standards represent maximum forage utilization levels which may be used for development of proper use criteria for Allotment Management Plans (AMP's). Standards for use of shrubs are included since shrub complexes are often associated with meadows and will generally show browsing impacts by deer (and sometimes livestock) on overutilized habitats. Conflicts between livestock and wildlife use of meadows should be resolved through amendments to the AMP or the Annual Operating Plan, as appropriate. On meadows outside of allotments, these standards should be used to determine impacts to critical ranges for elk and deer; should unacceptable impacts be observed, recommendations may be made to Oregon Department of Fish and Wildlife regarding ungulate herd management.

These utilization levels represent the maximum allowed for all meadow types Some types may require lower use levels to maintain productivity. FSH 2209.21 lists acceptable use levels by ecosystem type.

Percent of Maximum Forage Utilization

Grazing System	% Ungrazed/Rest Rotation	% Season Long
Condition		
Satisfactory		
Grasses	60	50
Upland Shrubs	50	50
Riparian Shrubs	50	30
Unsatisfactory		
Grasses	55	35
Upland Shrubs	40	30
Riparian Shrubs	40	20

Timber

MA9-18 Timber harvesting shall not be programmed in any wildlife or botanical site and shall normally not occur. Down or dead material should not be salvaged. Timber harvest shall be permitted only under the conditions outlined below

1. Timber harvest may be allowed: to eliminate hazards, remove timber incidental to construction or maintenance of improvements, or in case of natural catastrophe, when removal of such timber is necessary to achieving the goals of the management area.
2 Timber harvest may be permitted, if it is shown to be beneficial to specific wildlife or plant species that the habitat is designated for, and is shown by environmental analysis to best meet the goals of the management area.

MA9-19 Occasional trees situated just inside the boundary of special wildlife or botanical sites may be used as logging cable anchors to facilitate harvest of timber from nearby harvest units. Any tree used as an anchor should be protected from girdling.

MA9-20 Firewood cutting shall not be allowed, unless necessary to meet management objectives for the area.

MA9-21 *Meadows and Meadow Buffers.* A forested 200-foot-wide (average) band should be maintained around each meadow one acre or larger (the meadow edge band should be at least equivalent to two "sight-distances"; one sight-distance is the distance at which 90 percent or more of an adult deer or elk is hidden from the view of a human). These buffers serve as hiding cover for many wildlife species that use the meadow or meadow-forest edge. Deer and elk populations are supported at or near maximum rates in meadow areas, assuming adequate hiding and thermal cover is adjacent to the meadows. The band is defined as follows:

1. The meadow edge vegetation (within 50 feet of the meadow edge) should generally not be disturbed (vertical habitat diversity is greatest here) Vegetation in the meadow edge may be manipulated, if beneficial to wildlife. For example, when manipulation of vegetation would help restore meadow areas already lost to encroachment; trees which must be killed should be girdled and left standing unless realization of meadow management objectives would be hampered. In reclaimed portions of meadows, a new buffer zone will be established

2. Ground cover, shrubs, and understory trees should be encouraged in a band from 50 to 200 feet away (average) from the meadow edges If trees need to be killed in this zone, they shall not be removed (harvested) unless necessary to meet meadow management objectives Habitat capability for cavity-using wildlife should never be less than the 100 percent level. As a general guideline, until comprehensive management plans are developed for each District's special wildlife and botanical sites, unprogrammed timber harvest activities should take place in no more than one-third of this buffer area in a 20-year period (one half if the meadow is less than 10 acres)

Standards for meadows of less than one acre are described in the Forest-wide Standards and Guidelines.

Minerals

MA9-22 On valid claims, approve operating plans for mineral activities which minimize detrimental effects to wildlife and botanical special sites

MA9-23 Rock quarries should be located at sites exhibiting the least desirable characteristics as wildlife habitat.

Lands

MA9-24 Special sites should not be available for land exchange, unless the exchange would result in increased habitat capability for endangered, threatened, or sensitive animals or plants However, lands located in areas of the Forest identified as retraction areas may be available for exchange; special wildlife sites in these areas shall be analyzed as part of a site specific environmental analysis

Facilities

MA9-25 New structures should not be permitted within special sites, except as provided in site-specific environmental analysis documents. Trail development is permissible. Roads shall be designed and managed to minimize vehicle access to meadows. New roads shall not be routed to or through meadows and other types of special wildlife or botanical sites unless no other alternative is available, and only after full analysis of values and impacts.

Future utility corridor siting should avoid this Management Area. This Management Area shall be entered only after environmental analysis, in which all other alternatives have been rejected by the Forest Service.

MA9-26 Consideration shall be given to minimizing the detrimental effects of existing or proposed facilities on special sites, including reducing impacts by gating or closing roads after use. Roadways and "wheel tracks" no longer needed should be revegetated and restored; this is especially important in meadow areas.

Waste material from road construction, reconstruction or maintenance should not be left in special wildlife sites

Fire Management

MA9-27 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Indirect attack should be emphasized utilizing a modified range of suppression equipment and technology. Suppression tactics in wildernesses should adhere to wilderness fire fighting principles. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire suppression direction for the Forest.

A low level of prevention activities should be provided. Public contacts should be limited, with most of the efforts concentrated on techniques that accomplish the fire prevention mission prior to the user entering the area. Passive activities keyed to heavily-used sites should be encouraged.

Direct treatment methods should be emphasized in the treatment of natural and activity fuels. The use of prescribed fire is appropriate for meadow restoration and enhancement.

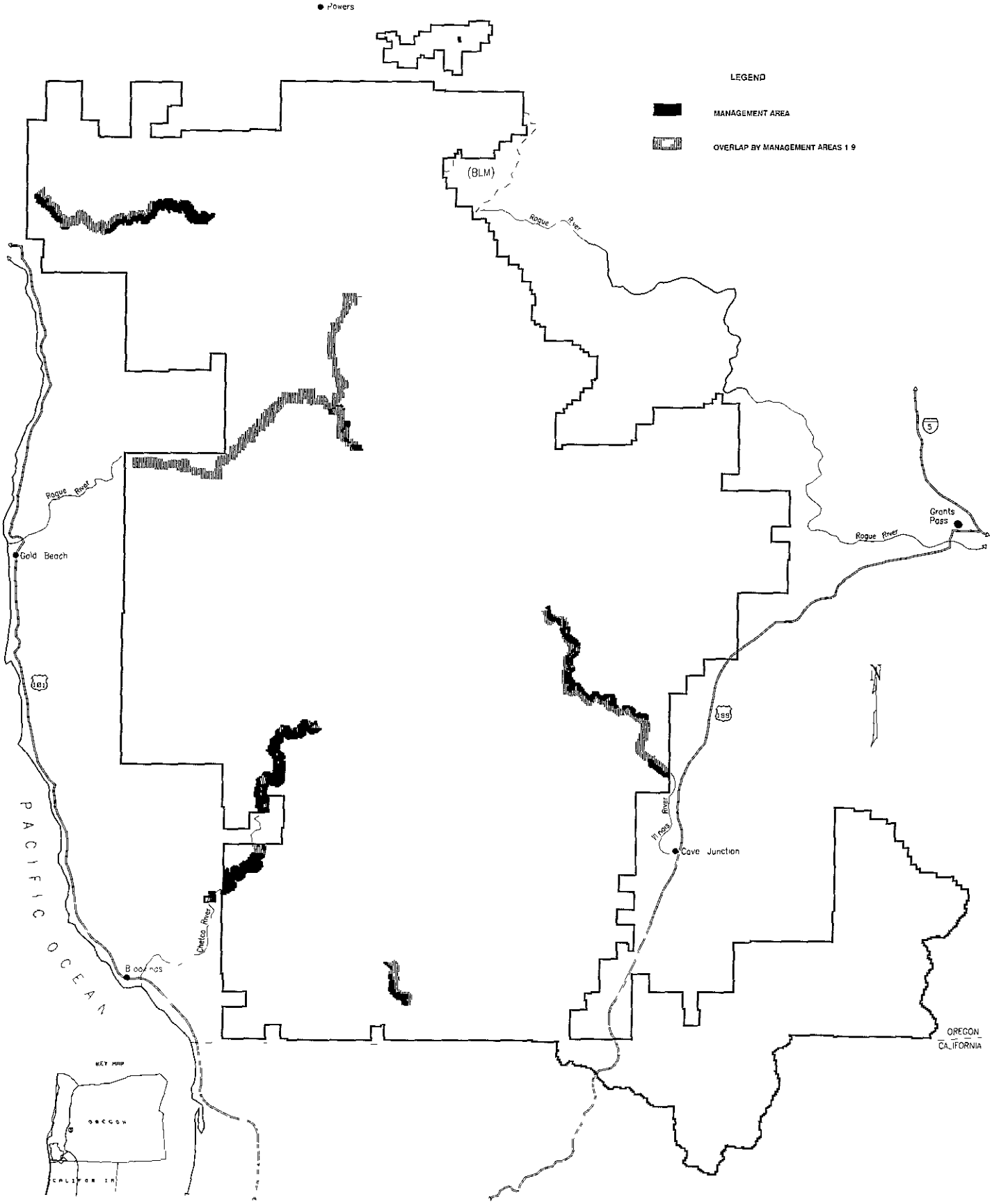


Figure IV-13. Scenic/Recreation River Management Area Map

MANAGEMENT AREA 10 - SCENIC/RECREATION RIVER

DESCRIPTION

This prescription applies to segments of the Rogue, Illinois, Chetco, North Fork Smith, and Elk Wild and Scenic Rivers, and adjacent corridors of land classified as "Scenic" and "Recreational" by the National Wild and Scenic Rivers Act By definition of this Act, a Scenic River must be of high scenic quality, free of impoundments, and have a largely undeveloped shoreline, but can be accessed in places by roads. The recreation classification applies to those river segments which are readily accessible by public roads and have undergone substantial modification to the scenery by man.

The Rogue is designated as Recreational from Watson Creek to Blue Jay Creek, Scenic from Blue Jay Creek to Slide Creek, and back to Recreational from Slide Creek to the bridge at Lobster Creek. The Illinois River is Scenic from the Forest boundary near Kerby to Briggs Creek and Recreational from Nancy Creek to the Rogue River. The Chetco River is designated as Scenic from Boulder Creek to Steel Bridge, and Recreational from Steel Bridge to the Forest boundary, one mile below Wilson Creek The North Fork Smith is designated Scenic from Horse Creek to Baldface Creek. The Elk River is designated Recreational from the confluence of the North and South Forks to Anvil Creek. Generally, the corridor width is 1/4 of a mile from each bank. Refer to Figure IV-13 for a map displaying allocated acres within the management area

Table IV-24. Acres Allocated to Scenic/Recreation River

	Acres		
Name	Management Area 10	Overlap by Management Areas 1-9	Total Area
Recreation-Chetco River	2,712	389	3,101
Scenic-Chetco River	1,973	301	2,274
Recreation-Elk River	2,741	2,057	4,798
Recreation-Illinois River	288	254	542
Scenic-Illinois River	2,123	3,313	5,436
Recreation-Rogue River	0	3,959	3,959
Scenic-Rogue River	0	2,541	2,541
Scenic-North Fork Smith River	480	800	1,280
Total	10,317	13,614	23,931

MANAGEMENT GOALS

For Scenic river segments, the goal is to maintain or enhance the high quality scenery and the largely undeveloped character of the shorelines. For Recreational river segments, the goal is to provide a wide range of recreation activities which are river oriented.

DESIRED FUTURE CONDITION

The Recreation and Scenic sections of the Rogue River will appear to be in a natural condition as seen from the river. An old-growth character will be prevalent along much of these sections of the river as a result of the foreground, with the inventoried visual objective of Retention, being managed with no programmed timber harvest. No new developed sites will have been constructed though use levels will have been monitored at existing sites in order to anticipate changes in future needs not identified in this plan. Recreation use will have increased and may have triggered some restrictions in use in all or portions of these river segments, though the type and extent are difficult to predict. Any changes will be accomplished through cooperation with the inter-agency management group with full public involvement.

The Recreation and Scenic sections of the Illinois River will have been maintained in a natural or near natural condition as seen from the river. Some timber harvest activities will have taken place, however these will not generally be noticed by Forest visitors since they will have been planned to achieve the Retention visual objective. Six new developed recreation sites are programmed for construction along these sections of the river and may be completed depending on the availability of funding. Recreation use will have been monitored and some restrictions may have been implemented in order to protect the Wild and Scenic values of these sections of the river.

The desired future conditions of the Chetco, North Fork Smith and Elk rivers will be natural or near natural conditions, as well Further details will be developed as part of the management plans for these recently designated Wild and Scenic Rivers, scheduled to begin in fiscal year 1989.

STANDARDS AND GUIDELINES

Many standards and guidelines for the river corridors are found in the management plans for the respective rivers and will not be repeated here.

Timber

MA10-1 Timber harvest should not occur in the inventoried foreground Retention areas of the "recreational" or "scenic" sections of the Rogue River, except in circumstances of catastrophic occurrences (fire, flood, wind, etc.) or to remove threats to human safety.

Other areas (not in this described foreground of the Rogue River) and otherwise suitable for timber management may be harvested subject to meeting the Retention VQO and other goals of the management area

Facilities

MA10-2 The Illinois River Road should be developed and maintained to accommodate recreational use and access to the Wilderness. Recreational access may be constructed and maintained to recreation sites along both rivers. Trail development is acceptable.

The key resource values, identified in a thorough analysis of the potential effects, should be avoided in future utility corridor siting in this Management Area.

Fire Management

MA10-3 *Scenic River.* All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. A modified range of suppression technology and equipment emphasizing indirect attack shall be used. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A high level of fire prevention activities shall be maintained. Extensive public contacts should be encouraged along the river, in addition to a signing program at key entrances and media contacts. Hazard reduction activities around heavily-used camping and picnic areas is appropriate.

Both direct and indirect methods should be emphasized in the treatment of activity fuels. Direct treatments should be used where visual or management risks carry a high priority. Indirect treatment is encouraged outside visually-sensitive or high-risk areas. Direct treatment of natural fuels is encouraged.

MA10-4 *Recreation River.* All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Direct attack using a modified range of suppression technology and equipment should be emphasized. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A moderate level of fire prevention activities should be provided Contacts with the public should be encouraged along the river areas, in addition to a signing program at key area entrances Hazard reduction activities around heavily-used camping and picnic areas should be conducted.

Both direct and indirect methods should be emphasized in the treatment of activity fuels Direct treatment should be used where visuals or management risks carry a high priority. Indirect treatment is encouraged outside visually-sensitive areas or high-risk areas. Direct treatment of natural fuels is encouraged.



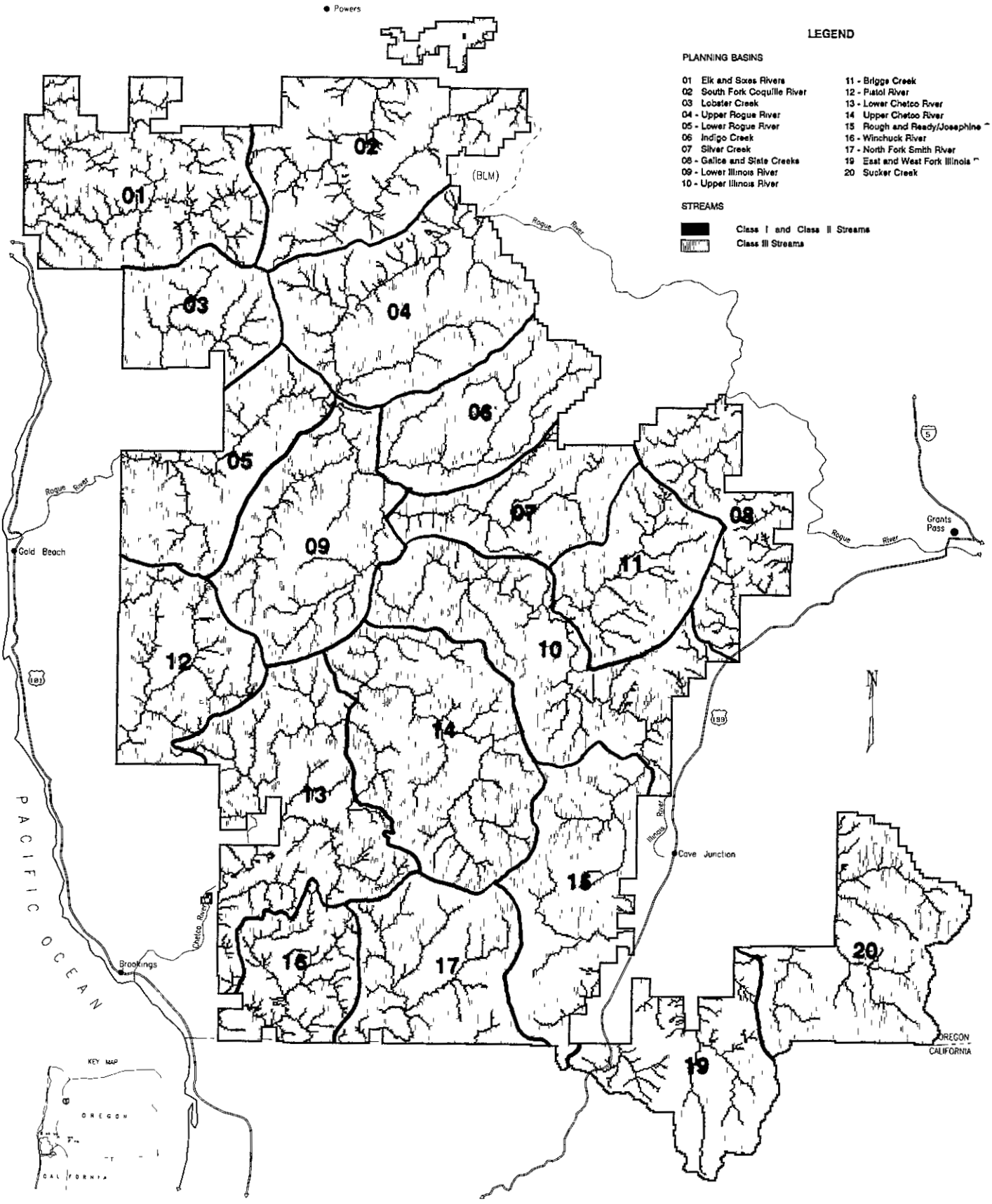


Figure IV-14. Riparian Management Area Map

MANAGEMENT AREA 11 - RIPARIAN

DESCRIPTION

This prescription applies to the riparian ecosystem along all perennial streams (Class I, II, and III) The minimum area of consideration is 100 feet measured horizontally from each side of the stream The actual width of the riparian zone is determined on the ground and varies based on site-specific conditions The expected average distance of consideration for Class I and II streams is 150 feet Within this Management Area there are three prescription themes that are assigned to individual Planning Basins. Two include multiple uses with the emphasis on watershed and fisheries values and limited timber production Prescription B is designed to manage vegetation to maintain water temperature Prescription C manages vegetation to reduce water temperature and improve watershed conditions over time The third prescription is Minimum Level (M) which programs no timber harvest that would remove stream shade producing vegetation Of an estimated 175,500 acres of riparian zones Forest-wide, approximately 70,000 acres are suitable for timber production and included in this Management Area While riparian areas are often overlapped by Management Areas 1 through 10, they are never assigned to Management Areas 12 through 14 since this would not meet the Management Requirements for watershed and fisheries protection Refer to Figure IV-14 for a map displaying allocated acres within the Management Area

Table IV-25 Acres Allocated to Riparian

Riparian Prescription 1/ Planning Basin No and Name	Acres		
	Management Area 11	Overlap by Management Areas 1-10	Total Area
Prescription B			
02-South Fork Coquille River	7,902	2,028	9,930
04-Upper Rogue River	5,836	6,058	11,894
08-Galice and Slate Creeks	6,076	974	7,050
09-Lower Illinois River	3,731	6,959	10,690
10-Upper Illinois River	3,587	10,419	14,046
11-Briggs Creek	5,232	997	6,229
15-Rough and Ready/Josephine Creeks	6,809	1,920	8,729
16-Winchuck River	4,971	1,375	6,346
17-North Fork Smith River	4,366	4,717	9,083
19-East and West Fork Illinois River	4,432	1,522	5,954
20-Sucker Creek	6,764	2,492	9,256
Prescription C			
01-Elk and Sixes Rivers	6,095	6,103	12,198
03-Lobster Creek	3,316	1,297	4,613
05-Lower Rogue River	4,044	2,965	7,009
06-Indigo Creek	6,041	1,810	7,851
07-Silver Creek	3,881	3,046	6,927
12-Pistol River	5,817	1,311	7,128
13-Lower Chetco River	7,723	7,020	14,743
Total	96,623	63,053	159,676

1/ Minimum Level (Prescription M) acres are intermingled within each Planning Basin The Upper Chetco Planning Basin (15,824 acres, all Prescription M) is not displayed because it is entirely within Wilderness (MA-1)

MANAGEMENT GOAL

The goal is to manage these areas under the principles of multiple use while maintaining the integrity of these riparian ecosystems which includes streambank stability, vegetation, terrestrial and aquatic habitats.

Class I and II stream temperature goals are to maintain or decrease summer temperatures in all Planning Basins For the Planning Basins managed under Riparian Prescription B, the objectives for canopy cover associated with these goals are to maintain 85 percent of pretreatment effective canopy cover along Class I and II streams, and 70 percent along Class III streams. For Planning Basins managed under Riparian Prescription C, the objective is to maintain a minimum of 90 percent of the pretreatment effective canopy cover along Class I and II streams and 80 percent along Class III streams.

DESIRED FUTURE CONDITIONS

The vegetation in some portions of the riparian area will be harvested to provide timber and wildlife forage. In other portions, vegetation will be preserved for protection of fish and watershed resources. The portions of the riparian area managed for timber will be in all stages of development from seedlings and saplings to mature timber greater than 100 years old. The vegetation in the riparian zone will be a mixture of hardwoods, with some conifers scattered throughout.

The protected portions of the riparian area will develop naturally. Streams will contain many fallen logs, which will add to fish habitat diversity. The vegetation will randomly vary from shrubs to older forest.

STANDARDS AND GUIDELINES

MA11-1 Activities shall be conducted in accordance with the Siskiyou Riparian Ecosystems Management Policy (FSM 2520.3 Siskiyou Supplement 1).

Visual Resource

MA11-2 Management activities shall be planned to meet or exceed the VQO's of individual areas as appropriate for allocations of adjacent areas. For example, a riparian area dissecting an area allocated to Retention should meet Retention, but if the adjacent area is allocated to General Forest the Visual Quality Objective would be Modification or Maximum Modification.

Fish

MA11-3 Management activities shall have, as a major emphasis, the protection and enhancement of salmonid fish spawning, rearing, and migration habitat.

1. *Spawning Habitat.* Maintain streambed intragravel fines (material less than 2 00 millimeters) at no greater than 20 percent above existing background Existing background will be determined through monitoring (Refer to the Monitoring Plan in Appendix D for fish. If this threshold is exceeded, basin specific analysis will be conducted to determine the appropriate management action.

2 *Rearing Habitat.* Stream temperature should be maintained or improved by management of canopy cover. Rearing capacity for resident salmonids and juvenile anadromous salmonids should be improved through land treatment and habitat work. Present and future sources of large woody debris should be provided to aquatic habitats, and existing instream debris should be maintained or enhanced.

3 *Migration Habitat.* Fish passage to upstream salmonid habitat beyond barriers may be improved or developed where desirability of passage has been determined in cooperation with the Oregon Department of Fish and Wildlife, and such improvements are consistent with other resource goals and objectives.

Wildlife

MA11-4 Habitat values for wildlife should be maintained or enhanced. These habitat values include species diversity; and foraging, watering, breeding, rearing, hiding, resting, and thermal cover. Dead and down woody materials, as described in the Forest-wide standards and guidelines, are particularly critical in riparian areas.

Timber

MA11-5 *Riparian Prescription B Planning Basins.* Timber management is programmed at a level that will provide for maintaining the stream temperatures without significant increase in critical summer temperatures Management activities may include the following: commercial harvest, site preparation, planting, release, and precommercial thinning.

To provide canopy cover for stream shading and large conifers for wildlife and stream habitats; the basal area of conifers should be maintained at or above 70 percent of natural conditions along Class I and II streams, and 30 percent along Class III streams. Harvest shall be done in such a way that damage to remaining streamside vegetation is minimized. Priority should be given to planting vegetation along shade-deficient stream channels. Directional falling and full suspension should be required within the streamside area.

The project level environmental analysis shall examine the cumulative effects of both past and future treatments. No more than 11 percent of the Riparian Area acreage within each planning basin shall be entered on a first entry basis per decade Harvest units shall be distributed within each basin, and subsequent reentries per site should not occur within 20 years.

MA11-6 *Riparian Prescription C Planning Basins.* Timber management is programmed at a level designed to result in up to a 2 degrees Fahrenheit decrease in summer stream temperatures, by the end of the third decade, improving fish habitat capability. Timber management shall include tree removal on a limited basis with the overall direction of retaining at least 80 percent of the basal area of commercial species along Class I and II streams and 60 percent along Class III streams. Harvest shall be done in such a way that damage to remaining streamside vegetation is minimized Priority should be given to planting vegetation along shade deficient stream channels. Directional falling and full suspension should be required within the streamside area.

No more than 11 percent of the Riparian Area acreage within the planning basin shall be entered per decade. Harvest units shall be distributed within the basin, and subsequent reentries per site should not occur within 20 years.

Minerals

MA11-7 Operating plans shall, where reasonable and operationally feasible, include measures to protect or regenerate riparian vegetation, protect water quality, and provide stream bank stability.

Lands

MA11-8 Special use permits should not be recommended if not compatible with riparian area objectives.

Facilities

MA11-9 Roads should avoid riparian zones when possible Necessary crossings should use methods that will minimize adverse impacts to water and fisheries resources (Refer to Appendix F and *General Water Quality Best Management Practices*, USDA 1988).

Fire Management

MA11-10 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less, 90 percent of the time. A modified range of suppression technology and equipment emphasizing direct attack should be used. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A level of prevention activities should be provided that is consistent with the land areas surrounding the riparian areas Industrial operations should have a high level of prevention activity.

Direct treatment methods should be emphasized in the management of natural and activity fuels



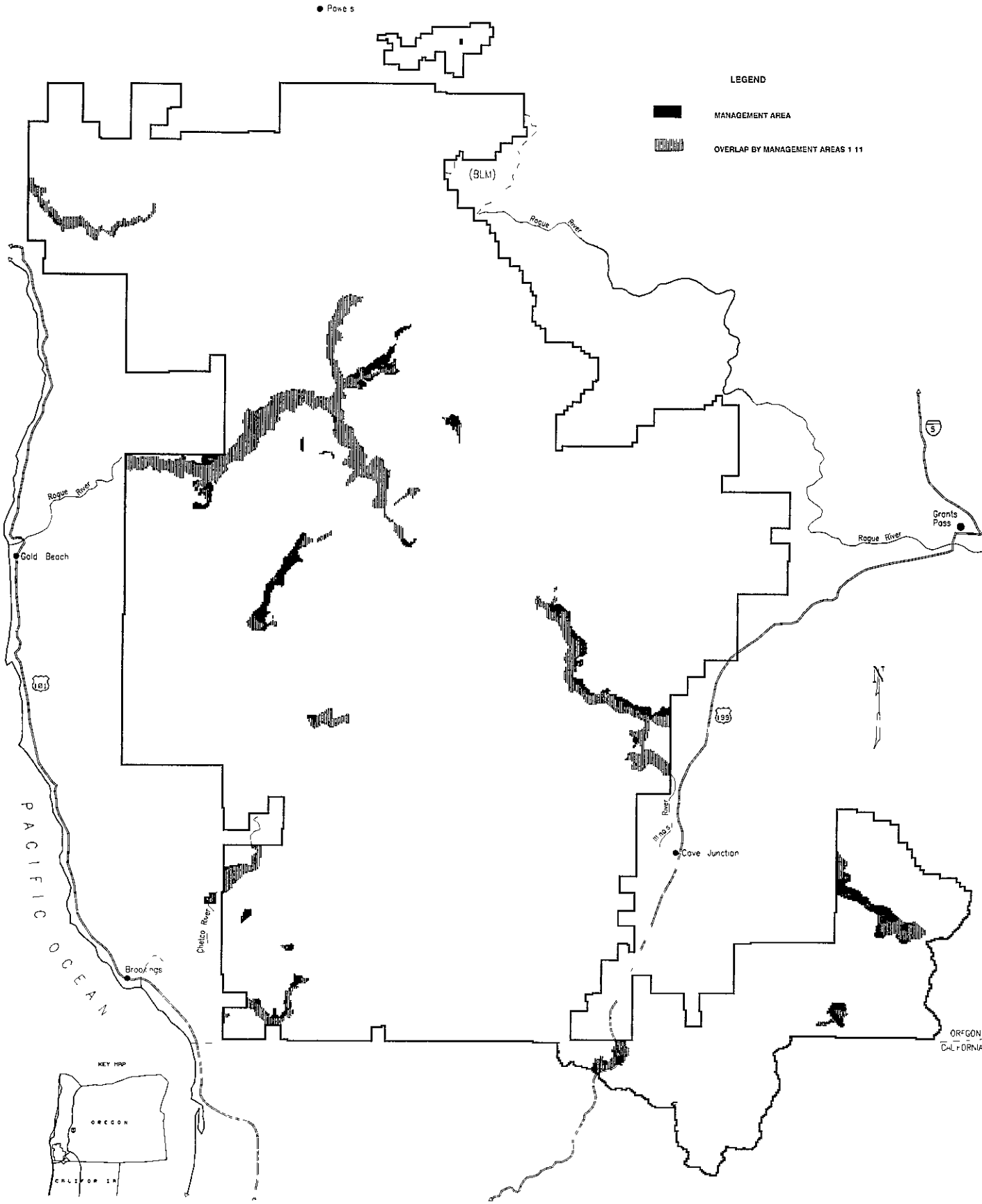


Figure IV-15 Retention Visual Management Area Map

MANAGEMENT AREA 12 - RETENTION VISUAL

DESCRIPTION

This prescription applies to land that is immediately adjacent and visible from major travel routes, rivers and other high use recreation areas. This is the land most seen by the public. The scenic quality of this land substantively affects the recreational experience of those viewing it.

There are 44 separate viewsheds on the Forest. This management area includes the National Forest land inventoried as Retention within those viewsheds allocated to achieve the full complement of VQO's.

Some of the land adjacent to or surrounded by this management area is in private ownership. Although the quality of the scenery from the viewing locations is sometimes determined by activities on private lands, the direction for this management area applies only to National Forest Lands. Refer to Figure IV-15 for a map displaying allocated acres within the management area.

Table IV-26. Acres Allocated to Retention Visual

	Acres		
Name	Management Area 12	Overlap by Management Areas 1-11	Total Area
Bolan Lake	575	363	938
Chetco	246	1,466	1,712
Elk River	222	1,736	1,958
Game Lake	1,922	1,001	2,923
Highway 199	275	109	384
Oregon Caves	1,645	2,024	3,669
Quail Mountain	67	973	1,040
Rogue-Illinois	2,683	15,687	18,370
Upper Illinois	1,667	6,567	8,234
Wheeler Creek	74	65	139
Winchuck River	485	555	1,040
Total	9,861	30,546	40,407

MANAGEMENT GOALS

The primary goal is to provide a level of attractive scenery by maintaining the area in a natural or near natural condition This area also has multiple use goals which include: production of wood products, maintenance of mature conifer, deciduous mix, mature riparian, and grass-forb wildlife habitats; and protection of watershed resources. Management activities will be conducted in such a way that they are completely subordinate to the character of the landscape and not evident to the casual Forest visitor (FSM 2380, *Landscape Management, Agriculture Handbook #462)*

DESIRED FUTURE CONDITION

Viewsheds with the VQO of Retention will have a natural appearance as seen from the viewing location. The results of a wide range of activities will be present, such as timber harvest units, roads, power lines, buildings, developed recreation sites, and fish and wildlife habitat improvements However, evidence of these activities will not be apparent to the average visitor. Most of the land will be in some stage of timber management, exhibiting an equal distribution of age classes Blocks of land may remain unharvested to camouflage the visual effects of management activities.

In a number of places, visual variety will have been purposefully introduced In this way, scenic features can be visually enhanced. Examples of these features include rock outcrops, river corridors, and particularly large trees or groups of trees.

STANDARDS AND GUIDELINES

Recreation

MA12-1 Developed recreation sites and recreation trails shall achieve Retention VQO's

Visual Resource

MA12-2 The viewsheds in which these areas are located should be studied to assess the Existing Visual Condition and to determine the degree of impact that may be permitted in the future, or the need for a rehabilitation plan, under the Retention management objectives.

Timber

MA12-3 All timber management activities shall be designed to meet the Retention VQO as defined in Agricultural Handbook 462, Visual Management System.

Examples of techniques that may be used to meet the Retention VQO are:

1. Limit the size of created openings to approximately five acres, provided they appear natural in the seen areas.
2. Manage foreground Retention areas to produce trees in the range of 36 inches DBH prior to final harvest
3. Program final harvest in Retention viewsheds at the rate of four percent of any Retention area per decade with not more than eight percent in visually perceived created openings at any one time. Schedule final harvest to facilitate meeting these guidelines on openings over the rotation period. This could result in rotation lengths of up to 250 years

Harvest units shall be considered visually perceived openings until the regenerated vegetation has reached a height of 20 feet.

MA12-4 Timber management practices may include all those described under Forest-wide Standards and Guidelines. Up to three commercial thinnings per rotations should be planned for most high and medium sites. Site-specific silvicultural prescriptions should plan to achieve regeneration at stocking levels sufficient to provide for these thinnings. Commercial thinnings should normally occur between stand ages 40 and 100 years, with the objective of contributing substantial volume during the next 8 to 10 decades, or until around the year 2080 Commercial thinning is not programmed for low sites.

Soil and Water

MA12-5 Improvement projects will be designed to restore degraded sites and complement Retention objectives.

Minerals

MA12-6 Reasonable and operationally feasible mitigation measures should be incorporated in approved operating plans to meet Retention objective.

Facilities

MA12-7 New facilities constructed for resource management shall be designed to meet the Retention objective.

Facilities should be constructed that utilize natural materials and muted, earthtone colors compatible with the surrounding landscape Color and line are key considerations in the architectural design.

The key resource values, identified in a thorough analysis of the potential effects, should be avoided in future utility corridor siting in this Management Area

Fire Management

MA12-8 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Direct attack using a modified range of suppression technology and equipment should be emphasized. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A high level of wildfire prevention activities should be maintained. Industrial and other operations should be carefully monitored. Industrial closures shall be carried out as required by the contract in accordance with local fire weather conditions. Public contact through field personnel and the media shall be used. The most intensive prevention efforts should be made during high or greater fire danger and during high-use periods. Signing and site-specific hazard reduction should be used as appropriate.

Both direct and indirect methods should be emphasized in the treatment of activity fuels. Direct treatment should be used where visual or management risks carry a high priority. Indirect treatment is encouraged outside visually-sensitive areas or high-risk areas. Direct treatment of natural fuels is encouraged.



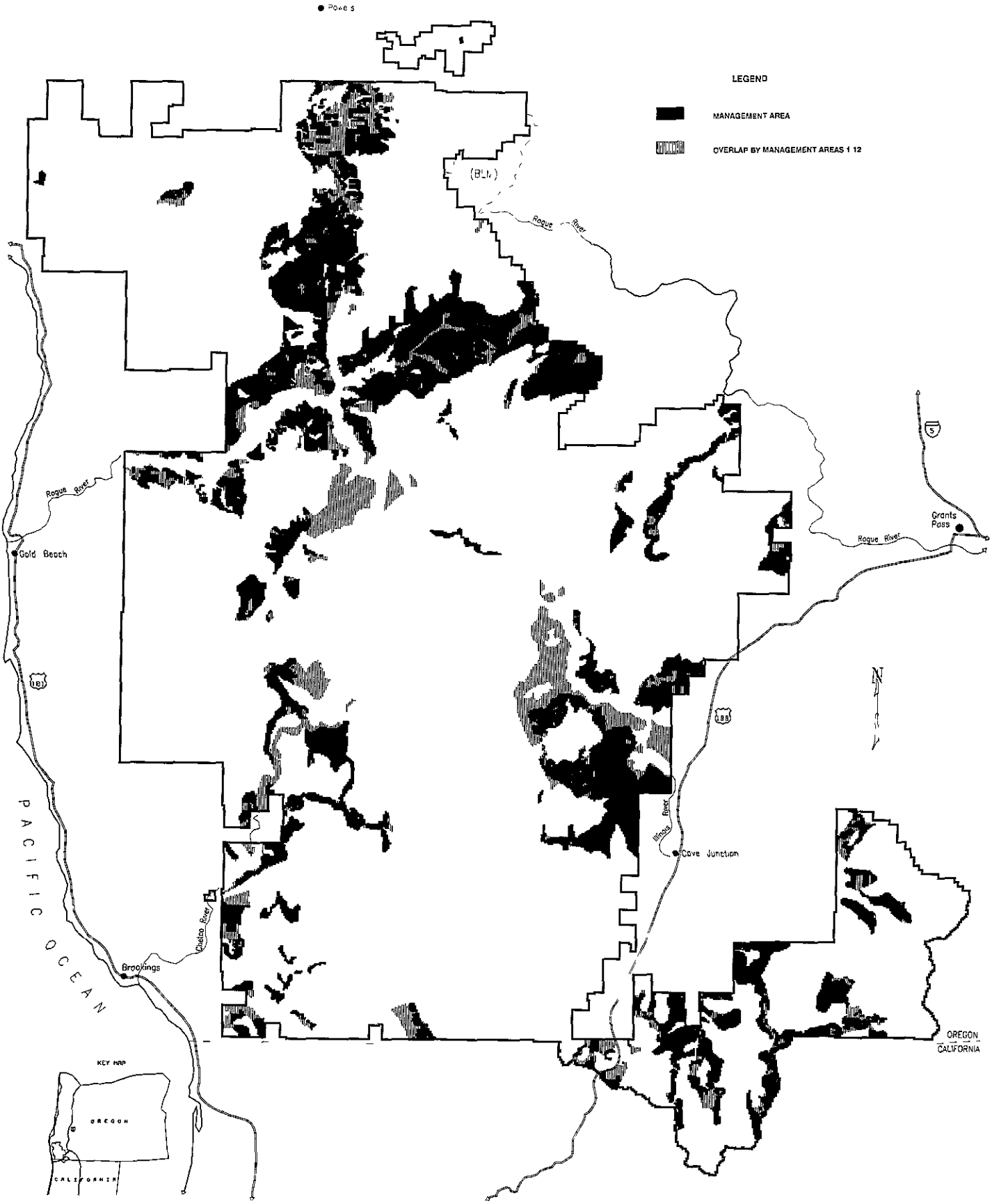


Figure IV-16 Partial Retention Visual Management Area Map

MANAGEMENT AREA 13 - PARTIAL RETENTION VISUAL

DESCRIPTION

This prescription applies to National Forest Land that is visible from major and secondary travel routes, rivers and other high use recreation areas (often in the middle to background).

There are 44 separate viewsheds on the Forest. This management area includes the National Forest land inventoried as Partial Retention within those viewsheds allocated to achieve the full complement of VQO's, and those areas inventoried as Retention or Partial Retention within those viewsheds allocated to achieve the VQO's up to and including Partial Retention.

Some of the land adjacent to or surrounded by this management area is in private ownership. Although the quality of the scenery from the viewing locations is sometimes determined by activities on private lands, the direction for this management area applies only to National Forest Lands Refer to Figure IV-16 for a map displaying allocated acres within the management area.

Table IV-27. Acres Allocated to Partial Retention Visual

	Acres		
		Overlap by	
Viewshed Name	Management Area 13	Management Areas 1-12	Total Area
Babyfoot Lake	12,181	3,275	15,456
Bear Camp	18,638	7,197	25,835
Bob's Garden	2,845	482	3,327
Bolan Lake	8,645	2,960	11,605
Briggs Valley/Shan Creek	6,116	2,077	8,193
Chetco	6,772	2,637	9,409
Coquille River	13,546	5,130	18,676
Crazy Peak	5,422	2,137	7,559
Eden Valley	133	0	133
Elk River	601	604	1,205
Game Lake	3,396	2,732	6,128
Highway 199	3,017	1,341	4,358
Lawson Creek	557	1,285	1,842
Mt Butler	154	0	154
Oregon Caves	3,522	1,199	4,721
Quail Mountain	3,780	1,632	5,412
Rogue-Illinois	30,315	12,552	42,867
Silver Trails	651	137	788
Sourdough	587	1,360	1,947
Upper Chetco	1,986	4,211	6,197
Upper Illinois	9,292	15,176	24,468
Winchuck River	1,775	645	2,420
Total	133,931	68,769	202,700

MANAGEMENT GOALS

The primary goal is to provide a level of attractive scenery by maintaining the area in a near natural condition. This area also has multiple use goals which include: production of wood products; maintenance of mature conifer, deciduous mix, mature riparian, and grass-forb wildlife habitats; and protection of watershed resources. Management activities will be conducted in such a way that they are subordinate to the character of the landscape. (FSM 2380 Landscape Management, Agriculture Handbook #462)

DESIRED FUTURE CONDITION

Viewsheds with the VQO of Partial Retention will have the same types of activities present as in areas for which the VQO is Retention (Management Area 12). As seen from the viewing location, however, evidence of management activities will be more apparent to the average visitor. Even so, the effects of these activities will be visually subordinate to the natural landscape, except in the first year or so of occurrence. There will also be less diversity and fewer scenic features than with a Retention objective.

STANDARDS AND GUIDELINES

Recreation

MA13-1 Developed recreation sites and recreation trails shall achieve Partial Retention VQO.

Visual Resource

MA13-2 Viewsheds allocated to Partial Retention Management Objectives should be studied to assess the Existing Visual Condition of the area, and to determine the degree of future impact that may be permitted, or the need for a rehabilitation plan, under the Partial Retention management objectives.

Timber

MA13-3 All timber management activities shall be designed to meet the Partial Retention VQO as defined in Agricultural Handbook 462, Visual Management System.

Examples of techniques that may be used to meet Retention VQO are:

1. Limit created openings along roads to no longer than 150 feet in length or, if openings are larger, leaving a screen buffer of vegetation of approximately 75 feet deep along the road. Variable width patterns, depending on topography and vegetation present, are preferred to a constant width
2. Limit created openings to approximately 8 acres in size in seen areas.
3 Develop a "feathered-edge" effect whenever possible (not an abrupt edge).
4. Manage foreground Partial Retention areas to produce trees in the range of 30 inches DBH prior to final harvest
5. Program final harvest in Partial Retention viewsheds at the rate of 8 percent of any seen area per decade with not more than 16 percent in visually perceived created openings at any one time. Schedule final harvest to facilitate meeting these guidelines on openings over the rotation period This could result in rotation lengths of up to 130 years.

Harvest units shall be considered visually perceived openings until the regenerated vegetation has reached a height of 20 feet.

MA13-4 Timber management practices may include all those described under Forest-wide Standards and Guidelines. Up to three commercial thinnings per rotations should be planned for most high and medium sites. Site specific silvicultural prescriptions should plan to achieve regeneration at stocking levels sufficient to provide for these thinnings. Commercial thinnings should normally occur between stand ages 40 and 100 years, with the objective of contributing substantial volume during the next 8 to 10 decades, or until around the year 2080. Commercial thinning is not programmed for low sites.

Minerals

MA13-5 Reasonable and operationally feasible mitigation measures should be incorporated in approved operating plans to meet Partial Retention objectives

Facilities

MA13-6 New facilities constructed for resource management should be designed to meet the Partial Retention objective.

Facilities should be located in unseen areas or in seen areas using topography or vegetation for screening during the season of recreation use. Subdued, earthtone colors compatible with the surrounding landscape should be utilized in all structural facilities. Natural building materials should be used for all architectural elements.

Fire Management

MA13-7 All wildfires occurring at FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. Direct attack using a modified range of suppression technology and equipment should be emphasized. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A high level of wildfire prevention activities should be maintained. Industrial and other operations should be carefully monitored. Industrial closures shall be carried out as required by the contract in accordance with local fire weather conditions. Public contact through field personnel and the media should be used. The most intensive prevention efforts should be made during high or greater fire danger and during high-use periods. Signing and site-specific hazard reduction should be used as appropriate.

Both direct and indirect methods should be emphasized in the treatment of activity fuels. Direct treatment should be used where visual or management risks carry a high priority. Indirect treatment is encouraged outside visually-sensitive or high-risk areas. Direct treatment of natural fuels is encouraged.

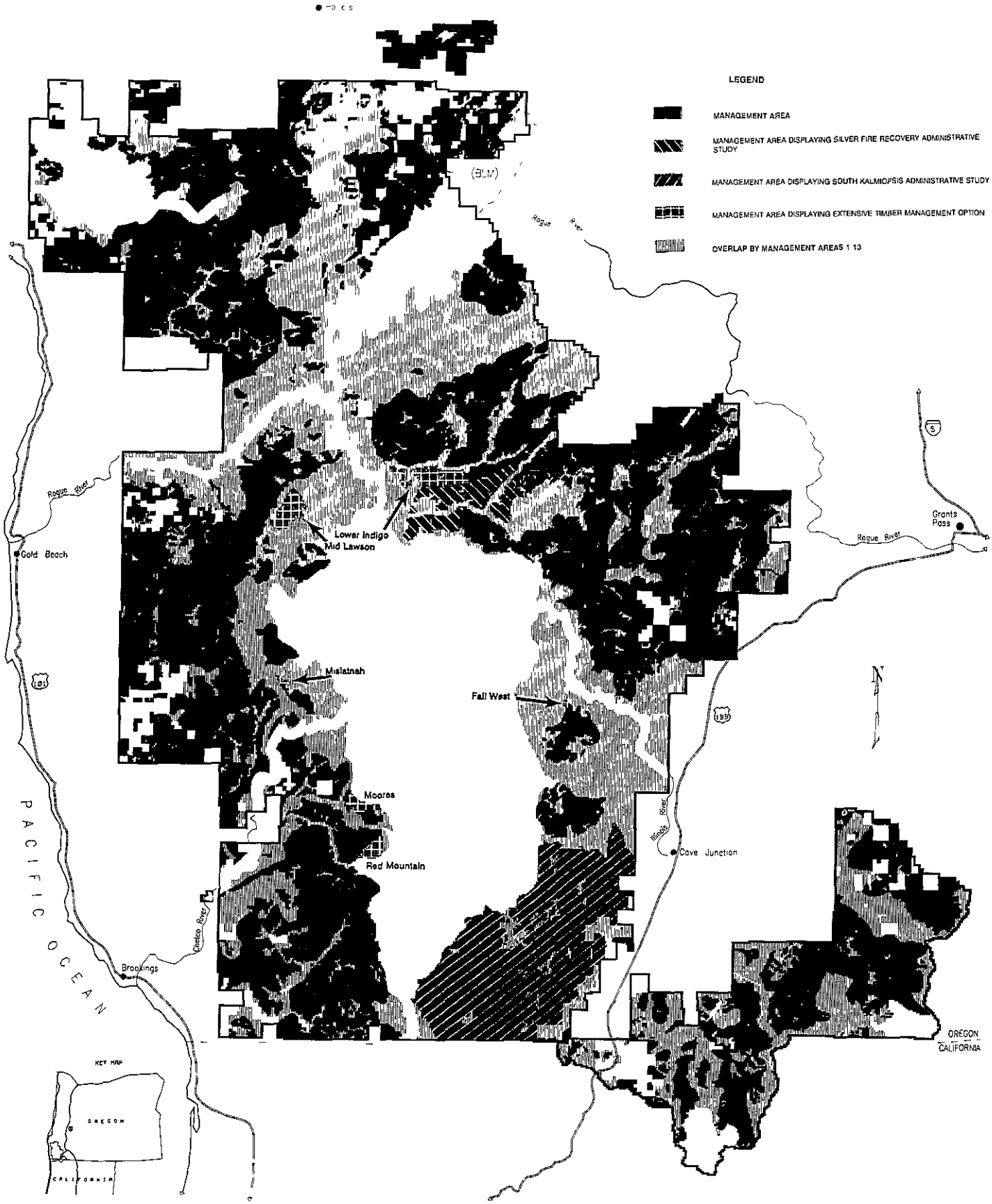


Figure IV-17 General Forest Management Area Map

MANAGEMENT AREA 14 - GENERAL FOREST

DESCRIPTION

This is forested land which is managed for multiple uses including timber production and maintenance of many wildlife habitats. It is the major timber producing portion of the Forest Timber harvest is programmed on lands selected as suitable for timber production throughout the area It is the most intensively managed and includes the most access roads. The vegetation is a mosaic of naturally occurring stands of conifers or hardwoods with interspersed plantations and recent harvest units. A number of other uses and land classifications are also included in the General Forest Management Area: developed campgrounds; roads; utility corridors; cultural sites; administrative sites; and unsuitable timber land. Silvicultural activities include timber harvest, precommercial and commercial thinning, and reforestation. Wildlife species that use early seral stages, such as deer and elk, benefit from the mosaic of harvest units that provide forage opportunities in proximity to hiding cover.

The General Forest Management Area also includes allocation "overlays", or sub-parts, designating some lands for extensive management, and some lands as administrative study areas. The extensive management areas are distinctive in that they lack the operability to gain reasonable road access for intensive timber management and will be managed under a less intensive schedule with no scheduled roading in this planning period. The administrative study areas are in two locations: one is the Silver Fire Recovery Area which was burned in 1987 and is still recovering from the effects of the fire, the other is known as the South Kalmiopsis which is a large area of very poor soils and generally sparse vegetation.

Refer to Figure IV-17 for a map displaying allocated acres within the management area, and overlays of Extensive and Administrative Study allocations.

Table IV-28. Acres Allocated to General Forest

Name (Acres)	Acres Management Area 14
Total	434,307
Extensive Timber Management (10,830)	(4,920)
Fall West (482)	
Lower Indigo (4,085)	
Mid Lawson (3,067)	
Mislatnah (1,120)	
Moores (978)	
Red Mountain (1,098)	
Administrative Study (65,544)	(47,782)
Silver Fire Recovery Project (10,975)	
South Kalmiopsis (54,569)	

MANAGEMENT GOALS

The primary goal is to obtain a full yield of timber within the capability of the land and the management requirements of all other resources. In addition, this area provides many recreation opportunities. It also provides habitat for many species of wildlife and is particularly important for those using openings and early seral stages The areas identified for extensive management have the same general goals with the recognition that management practices designed to produce timber will be less intensive

The goals of the administrative study areas are somewhat different

SILVER FIRE RECOVERY AREA. The goals for this area are to allow time for recovery from the effects of the Silver Fire; to monitor the recovery process; reassess and further refine the operability and suitability of this area for timber production. The area will also continue to provide Primitive and Semi-primitive Non-motorized recreation opportunities, and maintain habitat for many species of wildlife.

SOUTH KALMIOPSIS. The goals for this area are to provide opportunities for administrative studies of uneven-aged management, or other minimal entry timber management systems, on poor sites with scattered timber volume and poor soils; continue to provide mineral exploration and development opportunities, and provide for Semi-primitive Motorized recreation opportunities. The area will also continue to provide habitat for many species of wildlife and many other benefits

DESIRED FUTURE CONDITION

The landscape will be a patchwork of age classes and species of trees On lands suitable for timber production (except the administrative study areas), timber will be available for sale on a nondeclining evenflow basis There will be an orderly transition from the naturally occurring mature forest to a regulated forest with a balance of acres in each age group up to approximately 100 years old. This transition will take place over several decades as plantations progress through the various ages with new plantations created through the orderly harvesting of a portion of the mature stands in each decade There will also be interspersed stands of multiple ages as some stands are managed under uneven-aged prescriptions. Most of the existing plantations are from 1 to 30 years old; the progression to a regulated forest will proceed over the next 70 to 80 years, or more

The young stands will be managed to maintain vigor and growth. They will be predominately conifers of various species depending on the specific sites; although the natural variety of hardwoods, shrubs and forbs will continue to be components of the ecosystems with fluctuations occurring as stands progress through the seral stages. Managed stands will generally be well stocked with many appearing as dense stands of uniform size conifers through much of their lifetime.

The developed road system will provide the access necessary to harvest timber, transport the logs, and tend stands of growing trees. Some of this road system will be in a self-maintaining state with no vehicle traffic planned, to protect watershed conditions, provide for wildlife needs, and control costs. The Bald Mountain road as designed in the Preferred Alternative for the Silver Fire Recovery Project may be extended approximately 3 miles to provide access for timber salvage, reforestation needs, and long-term management for other resources No road construction is envisioned for the extensive areas or for the Silver Fire Recovery administrative area in this planning period.

STANDARDS AND GUIDELINES

Visual Resource

MA14-1 The VQO's are Modification and Maximum Modification Activities of vegetative and landform alteration must borrow from naturally established form, line, color, and texture so completely, and at such a scale that its visual characteristics are those of natural occurrences within the surrounding character type Impacts should be mitigated within five years after project completion.

Timber

MA14-2 To meet long-term Forest-wide timber production and harvest scheduling goals, the FORPLAN model selected a combination of timber management intensities for this management area. Approximately 40 percent of the high site acres were assigned to intensive management and 60 percent to moderate intensity (existing plantations generally went to intensive). The majority of medium site acres were assigned to intensive, only about 15 percent to moderate. Most low site were assigned to extensive management. Site-specific silvicultural prescriptions implemented during the life of this Plan (10 to 15 years) should be designed to achieve the stand conditions that will accommodate this framework for scheduling yields. The majority of high and medium site stands should have sufficient stocking to follow the intensive option. (The monitoring program will include an assessment of the acres meeting stocking objectives.) The analysis to determine which stands could go to moderate intensity should appropriately consider the economic efficiency and logging feasibility, as well as the stocking potential of the specific site.

Areas in the Extensive overlay allocation should normally be managed under the extensive option. More intensive timber management practices may be applied if such investments are justified though site-specific economic and environmental analysis.

SILVER FIRE RECOVERY AREA. This area has no programmed timber harvest and none should occur until recovery of the area has progressed sufficiently to mitigate the risks of adverse cumulative watershed effects. Dead trees and additional mortality that may result from the effects of the fire may be salvaged.

SOUTH KALMIOPSIS. This area has no programmed harvest; the majority of the area is classed as unsuitable for timber production due to reforestation difficulty. Timber harvest shall not be planned from this area except: as provided for in Forest-wide Standard and Guideline 6-2, which allows for research study to test the feasibility of silvicultural and harvesting practices; or, in the case of suitable lands, timber may be harvested where operationally feasible consistent with the direction for this management area.

MA14-3 *INTENSIVE TIMBER MANAGEMENT OPTION.* Timber management practices may include all those described under Forest-wide Standards and Guidelines. Based on silvicultural prescriptions, commercial thinnings should be planned for high and medium sites. Sufficient stocking levels should be prescribed to provide these opportunities. Thinnings should normally occur between stand ages 40 and 60 years, with the objective of harvesting the most thinning volume that can be removed without extending the rotation beyond that of the managed yield tables used in the planning analysis Commercial thinnings are not programmed for low sites; the intensive option does not apply.

The following ages, at which 95 percent of culmination of mean annual increment occurs in the managed yield tables, shall be used as the minimum stand age for final harvest unless site specific analysis is done as described in the Forest-wide Standards and Guidelines:

High Site : 95 years
Medium Site : 105 years

MA14-4 *MODERATE TIMBER MANAGEMENT OPTION.* All management practices may be used, except that no commercial thinning is planned.

The following ages, at which 95 percent of culmination of mean annual increment occurs in the managed yield tables, shall be used as the minimum stand age for final harvest unless site specific analysis is done as described in the Forest-wide Standards and Guidelines:

High Site : 75 years
Medium Site : 85 years
Low Site : 105 years

MA14-5 *EXTENSIVE TIMBER MANAGEMENT OPTION.* All management practices may be used, except that no precommercial or commercial thinning is planned. Additionally no scheduled roading is planned.

The following ages, at which 95 percent of culmination of mean annual increment occurs in the managed yield tables, shall be used as the minimum stand age for final harvest unless site specific analysis is done as described in the Forest-wide Standards and Guidelines:

High Site : 95 years
Medium Site : 95 years
Low Site : 135 years

Facilities

MA14-6 The Forest-wide Standards and Guidelines provide the direction for facilities appropriate for most of this management area. Specific direction for the administrative study areas is presented here.

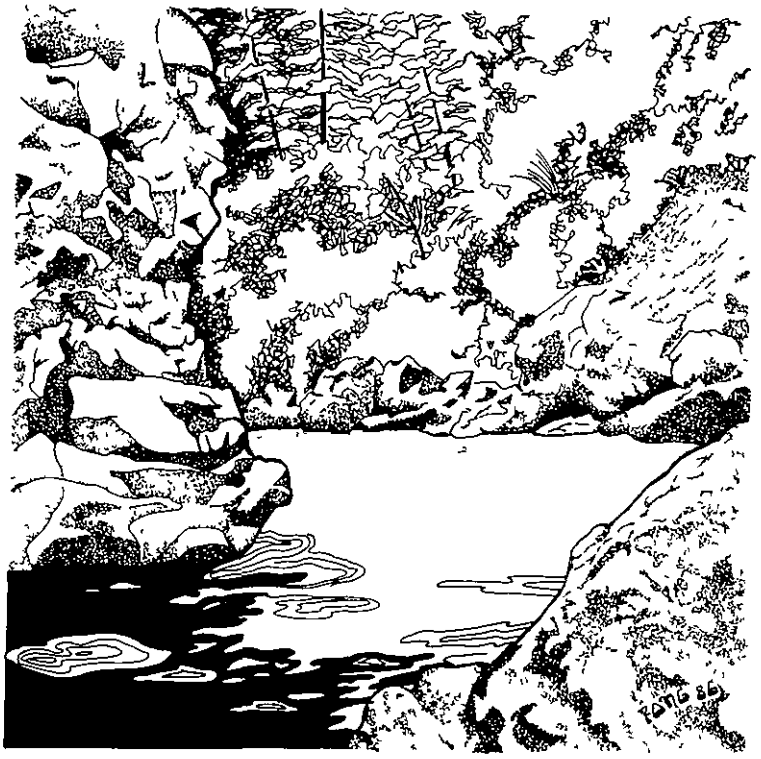
1. *Silver Fire Recovery Area* - Facilities may be constructed, maintained or managed as follows.
   (a) Trails and trail structures depending on recreational demand and the capability of the land to support such uses.
   (b) Facilities required for the administration of the Management Area in a Primitive or Semi-primitive condition.
   (c) Facilities required to protect the Forest from wildfire.
   (d) Facilities required to conduct mining operations under approved operating plans.
2. *South Kalmiopsis* - Facilities may be constructed, maintained or managed as follows:
   (a) Trails and trail structures depending on recreational demand and the capability of the land to support such uses.
   (b) Facilities required for the administration of the area in a Semi-primitive condition
   (c) Facilities required to protect the Forest from wildfire
   (d) Facilities required to conduct mining operations under approved operating plans.
   (e) ORV or Jeep trails may be constructed depending on recreational demand and the capability of the land to support such uses
   (f) Roads may be constructed across this area if needed to manage lands with programmed timber harvest, to access areas harvested under administrative study plans, or for the harvest of suitable lands within this area
   (g) Existing roads should be maintained at Maintenance Level 2 for use as ORV or Jeep trails.

Fire Management

MA14-7 All wildfires occurring at Fire Intensity Level FIL 2 or above should be controlled at 30 acres or less 90 percent of the time. The full range of suppression technology and equipment is applicable. Direct attack should be emphasized. Wildfires occurring at FIL 1 shall be handled as outlined in the basic fire management direction for the Forest.

A high level of wildfire prevention activities should be maintained. Industrial and other operations should be carefully monitored. Industrial closures shall be carried out as required by the contract in accordance with local fire weather conditions. Public contact through field personnel and the media should be used. The most intensive prevention efforts should be made during high or greater fire danger and during high-use periods. Signing and site-specific hazard reduction should be used as appropriate.

Direct treatment methods should be emphasized in the management of natural and activity fuels.



CHAPTER V

IMPLEMENTATION OF THE FOREST PLAN

Chapter V

IMPLEMENTATION OF THE FOREST PLAN

INTRODUCTION

This chapter describes how the Forest Plan is to be put into practice. The first section is divided into three parts which explain how the management goals and objectives described in Chapter IV, Forest Management Direction, provide the driving force for project selection and scheduling. It sets target dates for achieving consistency with other plans on the Forest, as well as explaining the budgeting and environmental analysis processes. The second section describes the Evaluation and Monitoring Program which will be used in determining whether the Standards and Guidelines set forth in Chapter IV are met. Finally, the circumstances are described under which the Plan could be amended or revised.

IMPLEMENTATION DIRECTION

Implementation of the Forest Plan is achieved through identification, selection, and scheduling of projects and execution of management practices, to meet the management direction provided by the Plan. Implementation also involves responding to proposals by others for use or occupancy of National Forest System lands. In all cases, such use or occupancy will be in accordance with the goals and objectives of the Plan. Refer to Chapter IV, Standards and Guidelines, Special Uses, for further discussion regarding responses to requests for use or occupancy of National Forest System lands.

PROJECT PLANNING

The Forest Plan serves as the single land management plan for the Siskiyou National Forest; all other management plans are replaced by this direction. The Forest Plan incorporates the Rogue River Wild and Scenic River Management Plan (1972) and the Illinois Wild and Scenic River Management Plan (1985). A number of other plans have been (or will be) developed to give additional, more specific guidance to management activities. These are developed within the direction that is established in this Plan. They are needed for site-specific information or to carry out the direction in this Plan. Some examples of these include:

* Road Management Plan
* Area Transportation Analysis
* Fire Management Action Plans
* Wilderness Management Plans (Appendix A)
* Off-Road Vehicle (ORV) Plan (Appendix E)
* Corridor Viewshed Study
* Deer and Elk Management Plan
* Osprey, Bald Eagle and Peregrine Falcon Management Plans
* Wild and Scenic Rivers Management Plans
* Redwood Management Plan

The management direction provided by this Forest Plan comprises the framework within which project planning and activities take place. It defines management area goals and management standards that guide project activities toward achieving a desired future condition for the Management Area and, collectively, for the Forest. It specifies a schedule for project activities. It provides guidance concerning potential land and habitat limitations, including assumptions about the appropriate vegetation management practices for timber sale projects. Site-specific project level analysis verifies the appropriateness of those assumptions.

Within this guidance, projects are developed to most efficiently and effectively accomplish management goals and objectives. Project environmental analyses provide an essential source of information for Forest Plan monitoring. First, as project analyses are completed, new or emerging public issues or management concerns may be identified. Second, the management direction designed to facilitate achievement of the Management Area goals are validated by the project analyses. Third, the site-specific data collected for project environmental analyses serve as a check on the appropriateness of the land allocation. The information included in the project environmental analyses is used as part of the monitoring process to determine when changes should be made in the Forest Plan.

PROJECT SCHEDULING

The schedule of proposed and possible projects for the first decade is contained in the appendices of this document. Projects necessary to accomplish the goals and objectives of the Plan are scheduled through a process which takes Forest-wide outputs and activities and locates them to more site-specific areas on the Ranger Districts.

The Forest will maintain Forest-wide activity and project level data bases to support both plan implementation and program budget development. These data bases include the Ten-year Timber Sale Action Plan, Capital Investment Projects, and Projected Budgets (Appendix B).

The following direction from FSM 1922.52 governs the process of identifying capital investment and Timber Sale projects to be placed on an implementation schedule.

1. Projects will be analyzed to identify those that efficiently meet plan direction. (Appropriate analytical techniques are described in the Timber Sale Economic Analysis Guide [Kramer and Owen, n.d.])

2. An interdisciplinary approach will be used to document project identification and selection.

3. Costs for specific projects should generally be within the range of costs used in developing the Forest Plan with consideration given to on-the-ground conditions.

4. Environmental analysis and project decision making will be completed before a proposed project is placed on the implementation schedule.

5. The project must be consistent with the Forest Plan.

6. Normally, economic analysis of appropriate projects will be based on cost effectiveness (Least Cost analysis or Present Net Value). Partial cost-efficiency analysis (FSM 1970) may be used where costs or consequences are in question. Projects will be selected that reduce the overall cost while meeting the Plan's direction.

Projects are selected based on public issues, management concerns, resource opportunities, quality of the environment, major outputs, and management's costs. Resource specialists and managers will make priorities and select projects through an annual process.

Projects are scheduled in response to the planned output of goods and services and the annual budgeting process. All projects will comply with National Environmental Policy Act requirements and with the Standards and Guidelines of this Forest Plan.

Project scheduling will be available for review at the Ranger District offices and the Supervisor's Office. Schedules of possible projects will routinely change as projects are implemented or are removed from the listings for other reasons, and as new projects take their place. Adjustment to the schedule may be made based on budgets and other unforeseen events.

CONSISTENCY WITH OTHER INSTRUMENTS

The Forest Plan supersedes the following land and resource management plans prepared for the Siskiyou National Forest:

Land Management Plans	FEIS Filed
Land Use Plan for Rogue Planning Unit (Essentially the Wild Rogue Wilderness)	2/12/75
Land Use Plan for Mt. Butler-Dry Creek Planning Unit (Essentially the Grassy Knob Wilderness)	5/20/76
Rogue-Illinois Land Management Plan	10/12/79
Chetco-Grayback Land Management Plan	12/05/79
Multiple Use Plans	**Date Approved**
Powers Ranger District Multiple Use Plan	5/27/69
Illinois Valley Ranger District Multiple Use Plan (Revised)	6/08/70 6/08/82
Timber Resource Management Plan	**Date Approved**
Timber Management Plan, Siskiyou Working Circle	8/21/62

The Forest Plan incorporates the following land and resource management plans prepared for the Siskiyou National Forest:

River Management Plans	Date Approved
Illinois Wild and Scenic	10/85
Rogue National Wild and Scenic River (Combined BLM/FS Report)	7/7/72

Subject to existing rights, all other contracts (except as noted below for timber sale contracts) including cooperative agreements, memoranda of understanding, and instruments for occupancy and use of the lands will be brought into compliance with the plan generally within three years after the plan is enacted or as otherwise specified in Standards and Guidelines.

TIMBER

The schedule of timber sale offerings contained in Appendix C will be updated at least annually. All timber sales offered for sale will be in compliance with Forest Plan direction. Timber sales under contract prior to issuance of the Forest Plan will be administered under provisions of the existing contracts. Changes to existing timber sale contracts may be proposed on a case-by-case basis where over-riding resource considerations are present.

All reforestation, timber stand improvement and related silvicultural activities proposed will be in compliance with Forest Plan direction. Existing contracts for nontimber sale silvicultural work issued prior to Forest Plan approval will continue to be administered under provisions of the pre-existing contracts. Changes to pre-existing contracts may be made on a case-by-case basis when over-riding resource considerations exist. Ongoing silvicultural work being accomplished by Forest Service crews will immediately comply with direction upon approval of the Forest Plan.

Functional timber plans such as the Forest Tree Improvement Plan, Seed Orchard Management Plans and Tree Seed Inventory Plan will be brought into compliance with the Forest Plan within two (2) years of issuance. Updates to functional plans will be in compliance with provisions of the Forest Plan.

RECREATION

Issuance of new recreation special use permits or reissuing of existing annual recreation special use permits will be consistent with Forest Plan direction on the first issuance or reissuing date following Forest Plan implementation.

Reissuing of existing term recreation special use permits will be consistent with Forest Plan direction on the first reissuing date or the first proposed permit transfer date following Forest Plan implementation.

MINERALS

New minerals lease applications, permits, contracts and operating plans will be evaluated for consistency with the Forest Plan as they are received or proposed. All existing permits and operating plans will be reviewed for consistency with Forest Plan Standards and Guidelines within one year. Operators and permittees will be notified of any necessary, appropriate modifications. The circumstances under which an operating plan can be modified are detailed in 36 CFR 228.

Minerals materials sales now under contract will be administered under provisions of the existing contracts. Changes to these may be proposed on a case-by-case basis where over-riding resource protection considerations are present.

The Forest Service has no authority to modify stipulations attached to existing mineral leases.

LANDS

Issuance of new non-recreational special use permits or reissuing of existing special use permits will be consistent with Forest Plan direction on the first issuance or reissuing date following Forest Plan implementation. Term permits will be consistent with plan direction on the first reissuing date or the first proposed permit transfer date following Forest Plan implementation.

The Land Adjustment Program will be consistent with the Forest Plan when it is implemented. All future land ownership adjustment proposals will be evaluated for consistency with the Forest Plan as they are received or proposed.

All facilities and management plans thereof (e.g. roads, buildings, etc.) will be consistent with Forest Plan direction within one (1) year of issuance of the Forest Plan, subject to valid existing rights of outstanding permits, contracts and cooperative agreements.

RANGE

Issuance of new term grazing permits or reissue of existing term grazing permits will be consistent with Forest Plan direction on the first issuing or reissuing date following Forest Plan implementation.

At the time of new or reissue of existing term grazing permits, range allotment plans will be evaluated for, and brought into compliance with, the Forest Plan.

BUDGET

The Plan's scheduled projects are translated into multiyear program budget proposals. The schedule is used for requesting and allocating the funds needed to carry out the planned management direction. The

Forest's current year tentative annual program of work will be derived from this process. Upon approval of a final budget for the Forest, the annual work program will be updated and implemented. Accomplishment of the annual program is the incremental implementation of the management direction in the Forest Plan. Depending on final budgets, outputs and activities in individual years may be significantly different from those shown in Chapter IV. Cost and accomplishment data will be utilized to update and revise data bases and modify budget proposals.

The Forest program development and budget process consists of evaluating fixed and variable cost activities, and capital investment projects. Fixed cost activities include those necessary to ensure public safety and environmental protection, and to maintain existing capital assets at certain levels of service and availability. Additionally, long-term management planning and resource inventories, general administration costs, and other costs that cannot be assessed on a per-unit basis are included in fixed cost activities.

Variable cost activities generally include those whose outputs or uses can be controlled or changed. For instance, certain costs may vary relative to the number of acres harvested proposed in an alternative.

Capital investments entail monies spent to provide or improve a facility or product for continued or future use.

A summary of the budget proposal submitted by the Siskiyou National Forest in December, 1988, for fiscal year 1991, is displayed in Appendix B, Table B-1.

BUDGET PROPOSALS

The Plan's scheduled projects are translated into multiyear program budget proposals by extracting projects from the data bases described below and identifying needed expenditures. The schedule is used for requesting and allocating the funds needed to carry out the planned management direction. The Forest's current year tentative annual program of work will be derived from this process. Upon approval of a final budget for the Forest, the annual program of work will be updated and carried out. Accomplishment of the annual program is the incremental implementation of the management direction of the Forest Plan. Depending on final budgets, outputs and activities in individual years may be significantly different from those shown in Chapter IV. Cost and accomplishment data will be utilized to update the data bases and modify budget proposals.

The Forest program development and budget process consists of evaluating fixed cost activities, variable cost activities, and capital investment projects. National Activity Structure units of measure, activity and funding codes will be used in these data bases to provide a uniform, simple, and hierarchical way of displaying information. A summary of the budget proposal submitted by the Siskiyou National Forest in December, 1988 for fiscal year 1991 is in Table B-1 of Appendix B. Capital Investment Proposals for future years are displayed in the other tables in Appendix B.

(1) The fixed cost activities include non deferrable activities for ensuring public safety and environmental protection, costs to keep existing capital assets at agreed levels of service and availability, long-term management planning and resource inventories, cost of general administration, and cost that cannot be assessed on a per-unit basis.

(2) The variable cost activities includes costs incurred as a result of program activities of controllable outputs or controlled use, costs which vary between alternatives based on the acres of harvest.

(3) Capital investment projects are dollars spent to provide or improve a facility or product for future use.

ENVIRONMENTAL ANALYSIS

Projects and activities designed for implementation under the Forest Plan will be subject to environmental analysis to assure compliance with the National Environmental Policy Act (NEPA). The form of documentation for such analysis will be consistent with the Council of Environmental Quality Regulation (40 CFR 1500-1508). A NEPA document in the form of an Environmental Impact Statement or Environmental Assessment will be prepared; or if the analysis shows neither the activity nor the impacts to be significant and the activity conforms to the list of categories listed in Forest Service Manual 1950, the analysis would result in a Categorical Exclusion. The kind of project specific public input needed will be scoped as part of the analysis process. Regardless of the form of NEPA documentation, an analysis file will be maintained and available for public review.

MONITORING AND EVALUATION PROGRAM

The Monitoring and Evaluation Program is the management control system governing implementation of the Forest Plan. At established intervals (once per year), the Interdisciplinary Team shall evaluate implementation to verify compliance with the Standards and Guidelines established in Chapter IV of this Plan, and to determine the effectiveness of those Standards and Guidelines in meeting Land and Resource Management Plan objectives. Based upon this evaluation, the Interdisciplinary Team shall recommend to the Forest Supervisor such changes in management direction, revisions, or amendments to the Forest Plan as deemed necessary.

Monitoring involves a periodic comparison between the end results that are realized and those projected in the Forest Plan. Costs, outputs, and environmental effects, both experienced and projected, will be compared to gauge the overall progress in implementing the Forest Plan, as well as to determine whether the overall relationships on which the Forest Plan is based continue to be accurate. When differences occur, they will be evaluated as to their significance, and appropriate amendments or revisions will be considered and installed in compliance with NEPA and Forest Service processes.

The specific objectives of the Monitoring and Evaluation Program are to determine whether:

1. Planned goals and objectives are achieved.
2. Programs and activities address existing and emerging public issues and management concerns.
3. Management Standards and Guidelines are being followed.
4. Management Standards and Guidelines effectively maintain environmental quality.
5. Workforce, resource, and cost information used in projecting output and impacts are correct.
6. Activities on nearby lands managed by other agencies or landowners are affecting management of the Forest.
7. Research, beyond that identified in Chapter II of the Forest Plan, is needed.
8. The Forest Plan needs to be amended or revised.
9. Intensity of monitoring is commensurate with the risks, costs and values involved in meeting plan objectives.

Table V-1 displays the actions, effects, or resources to be measured in the Monitoring and Evaluation Program governing implementation of the Forest Plan. Appendix D contains additional explanatory

information on many of the items in Table V-1. Only actions necessary to comply with the Regulations set forth by the National Environmental Policy Act (P.L. 91-190) and National Forest Management Act (P L. 94-588) are included in this Monitoring and Evaluation Program. All monitoring necessary to comply with other laws and orders (functional monitoring) will continue to occur.

MONITORING

Components of the Monitoring and Evaluation Program are as follows:

RESOURCE ELEMENT - The decision variable code, which indicates the functional area of responsibility for completing listed activities.

ACTIVITY (UNIT OF MEASURE) - The item to be measured or evaluated, e.g., management direction, costs, outputs, or effects.

MONITORING PURPOSE - Each activity is designed to satisfy sections of the NFMA and NEPA regulations to demonstrate:

- Compliance with management direction (36 CFR 219.12 (k)).
- Achievement of output (goods and services) objectives (36 CFR 219.12 (k)(1)).
- Maintenance of environmental quality (effects) as projected (36 CFR 219.12 (k)(2)).
- Consistency with cost projections (36 CFR 219.12 (k)(3)).
- Resource mitigation measures are employed (40 CFR 1505.3).

THRESHOLD OF CONCERN - The degree by which actual performance may vary before further evaluation is initiated. It establishes the evaluation criterion for the first node in the Decision Flow Diagram (Figure V-1).

DATA SOURCE - A description of collection techniques or sources of information to be employed in Forest Plan monitoring.

A - *Administrative studies - requires a special project to gather information (not associated with* a timber sale).

A1 - Vegetative Inventory scheduled *1989* or *1990* (see description in "Resource Summaries - Timber" in Chapter IV).

B - Project plans, environmental analysis, or assessments - information required for or because of a project, such as a timber sale.

C - Data obtained from other agencies, ie. State of Oregon, Pacific Northwest Experiment Station, U.S. Geological Services, etc.

D - Management Reviews including general, activity, and program reviews

E - Resource Inventories.

F - Management Attainment Reports.

RESPONSIBLE POSITION - Position responsible for the implementation and specified reporting of the monitoring program.

MONITORING FREQUENCY - The number of times during the year when information will be collected, and the interval between measurements as appropriate

DATA STORAGE - A description of where the collected information will be maintained.

TRI (Subsystem Number) - Total Resource Information.

Layer Numbers

1. Master Cell File
2. Aquatic
3. Ecoclass
4. Genetic
5 Landline
6 Preattack
7. Range
8. Recreation
9 Soil
10 Timber
11. Travel
12. Visual
13. Wildlife
14. Mineral

GIS - Geographic Information System

DCC-FC - Departmental Computer Center at Ft. Collins

STORET - Environmental Protection Agency storage system for water quality data.

OTHER (Specify) - Computer files (Regional Office, Forest Level Information Processing System (FLIPS), Recreation Information Management System, etc)

PAPER FILES - Information stored other than on computers.

ANNUAL COST - The actual cost of completing the monitoring activity expressed in annual terms Project costs are NOT included; only the incremental cost associated with responding to the activity is indicated.



Table V-1. Monitoring and Evaluation Program

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
All Elements	Standards and Guidelines (S&G's)	----	(1) Any deviation identified and mitigation not prescribed. (2) Prescribed mitigation not implemented. (3) Applied management direction produces undesirable effect.	D	District Rangers, Forest Staff	Continuous	Computer, Other	$ 21,500
All Elements	Forest Programs and Budget	Outputs, Funding Levels	(1) +/- 20% projected outputs achieved. (2) +/- 20% funding of projected needs for fisheries, soil, and watershed for 3 years. (3) +/- 20% funding of projected needs for wildlife habitat for 3 years. (4) +/- 20% funding of projected needs for recreation for 3 years. (5) +/- 20% variable timber analysis costs for 3 years. (6) +/- 20% of analysis road costs for 3 years.	F	Forest Staff	Annual	Computer, DCC-FC	400
Recreation AN121(a)	Recreation (Undeveloped)	Acres	(1) >5% variance from objectives in Primitive and Semi-primitive. (2) Visible resource degradation in ORV areas.	A,B	District Rangers, Forest Landscape Architect, Recreation Staff	Annual	TRI/GIS	5,000
Recreation AN121(b)	Wild and Scenic Rivers	Acres by VQO	(1) Visible degradation within river corridors (2) Visual quality below Objectives	A	District Rangers, Forest Landscape Architect, Recreation Staff	Annual	Computer	10,000
Visuals AV121	Visual Resource Management	Acres by VQO	5% increase in retention, partial retention, or modification visual objectives.	B	District Rangers, Forest Landscape Architect, Recreation Staff	Continuous	TRI/GIS	5,000
Wilderness AW121	Wilderness Character	Acres by WRS	(1) 5% lower than Semi-primitive (2) Use >80% estimated capacity for WRS class	A,B	District Rangers, Forest Landscape Architect, Recreation Staff	Annual	TRI/GIS	10,000

Table V-1. Monitoring and Evaluation Program (continued)

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
Fish/Water CF121	Fish Habitat	Numerous	(1) 10% decline in pool vol. (2) 3 year decline or more in smolt production. (3) 10% decline in large woody material. (4) Stream temperatures exceed State Water Quality Standards. (5) Fine sediment >20% above background. (6) One scale-class reduction. (7) >25% failure rate of habitat improvement structures.	A,B,E	District Rangers, Forest Staff	Variable, rotation and annual	Computer, Paper File, STORET	86,000 to 113,000 1/
Wildlife CT121(a)	Endangered, Threatened, Sensitive, Unique Animals	Active Nests	(1) Nest site does not produce young for two consecutive years. (2) Surveys not completed. (3) Non-compliance with S&G's	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	9,200
Wildlife CT121(b)	Bald Eagle	Sightings	(1) Nest unoccupied >2 years. (2) <90% sites suitable for occupancy. (3) Non-compliance with S&G's	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	1,850 to 850 1/
Wildlife CT121(c)	Spotted Owl	Acres Occupied	(1) Thresholds exceed those set by Regional Monitoring Program. (2) Non-compliance with S&G's	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	97,500
Wildlife CT121(d)	Sensitive Plants	Acres	20% decline in population	A	District Rangers, Forest Staff	Annual	TRI/GIS	3,500
Wildlife CW121(a)	Pileated Woodpecker	Acres	(1) Habitat suitability less than minimum standards. (2) >15% decline in detected presence. (3) Habitat area numbers and distribution below minimum. (4) >20% decline in occupancy or reproduction success.	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	14,300 to 10,450 1/

Table V 1 Monitoring and Evaluation Program (continued)

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
Wildlife CW121(b)	Pine Marten	Acres	(1) Habitat suitability less than minimum standards. (2) >25% decline in detected presence. (3) Habitat area numbers and distribution less than minimum requirements.	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	10,600 to 3,520 1/
Wildlife CW121(c)	Osprey	Active Nests	(1) 25% decline in active nests over 3 years. (2) Surveys not completed for 2 consecutive years. (3) <90% of potential nest sites suitable for occupancy.	A	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	9,100 to 10,350 1/
Wildlife CT121(d)	Woodpeckers	Acres	(1) >10% of surveyed areas have <90% of prescribed trees and snags. (2) >10% decline in snags as shown in Forest-wide inventory. (3) Inadequate cavities created for secondary users	B	District Rangers, Forest Staff	Annual	Paper File, TRI/GIS	3,000 to 4,450 1/
Wildlife CW121(e)	Blacktail Deer and Roosevelt Elk	Acres	(1) Populations are <80% or >120% of plan objective for a 5 year period. (2) Habitat capability is <80% of objective.	A,C	District Rangers, Forest Staff	Annual - Summarize every 5 years	Computer, Paper File,	5,500 to 6,000 1/
Range DN121	Range Condition and Utilization	Acres	(1) >20% of an allotment shows downward trend. (2) Unauthorized range utilization or utilization <80% of authorized.	B	District Rangers, Lands and Recreation Staff	Annual	Paper File,	550
Timber ET121(a)	Port Orford-cedar	Rate of Spread	Rate of spread increases or decreases	A	District Silviculturists, Forest Silviculturist	Annual	Paper File, Computer	150,000 to 35,000 1/
Timber ET121(b)	Destructive Insects and Disease Organisms	% of Population	Unacceptable damage or growth loss.	B	District Silviculturists, Forest Silviculturist	Annual	Paper File, TRI/GIS	0

Table V-1. Monitoring and Evaluation Program (continued)

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
Timber ET121(c)	Land Suitability	Acres	(1) Change of more than 15,000 acres in productivity or vegetation class or more than 10,000 acres proposed for change of suitability classification.	B	District Rangers, Forest Planning Staff	Annual	TRI/GIS	2,000
Timber ET121(d)	Acres and Volume Harvested	Acres Volume	(1) Total acres harvested varies >10% from projected acres. (2) >10% variance in proportion of acres and volume harvested.	B	Timber Staff	Annual	TRI/GIS	2,000
Timber ET121(e)	Harvest Unit Size Limit	Acres	>10% of sold harvest units exceed 60 acre size limit.	B	Forest Silviculturist	Annual	(1) TRI/GIS	1,000
Timber ET121(f)	Reforestation and Intensified Forest Management Practices	Acres	(1) >10% reforestation acres lag time > than 5 years. (2) >10% certified acres stocked at less than recommended stocking level. (3) >10% of acres needing pre-commercial thinning at age 15, but not treated. (4) >10% acres prescribed for release but not treated within 3 years. (5) >10% acres prescribed for fertilization not treated.	B	District Silviculturists, Forest Silviculturist	Annual	Computer TRI/GIS	0
			(6) 10% change in predicted timber volume outputs.	A-I		Every 10 yrs	TRI/GIS	
Timber ET121(g)	Biological Diversity	Numerous	To be developed.	A,A-I,B	Forest Staff	Annual	Computer, TRI/GIS	40,000 1/
Timber ET121(h)	Social and Economic Setting	Numerous	(1) >15% unemployment in 4 counties. (2) <1 2 ratio bid price/ advertised rate. (3) >80% capacity in primitive or developed recreation areas. (4) +/- 15% change in local income levels. (5) Significant changes in community lifestyle,values, etc. (6) +/- 20% change in annual payments to counties	F,C	Planning Staff, Recreation Staff, Timber Staff	Annual	DCC-FC, Paper File,	700

Table V-1 Monitoring and Evaluation Program (continued)

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
Timber ET121(1)	Economics (Cash Flow)	Dollars	Negative annual cash flow for timber program.	F	Timber Staff	Annual	Computer, DCC-FC	50
Air Quality FA121	Suspended Particulate	Tons tot. Suspended Particles	>7,300 tons/year total suspended particulate.	B,C	Fire Staff	Annual	Computer	650
Soil/Water FW121(a)	Water Resources	Numerous	(1) BMP's not being implemented. (2) Water quality does not meet State of Oregon and California Water Quality Regs.	A,D	District Hydrologists, Forest Hydrologist (3) District Rangers,	Annual	Computer, STORET	43,250 to 21,500 1/
Soil/Water FW121(b)	Soil Productivity	Numerous	(1) Organic residues detrimentally altered (2) Mineral soil exposure >40% for low to moderate erosion soils, >30% for high erosion soils, and >15% for very high erosion soils. (3) >15% of activity area, including roads, have compaction, displacement, puddling or severely burned conditions. (4) Tree growth less than acceptable.	A,D	Variety of District Staff 1/ Variety of Forest Staff 1/	Continuous	Computer, Paper File, TRI/GIS	25,000 to 10,000 1/
Soil/Water FW121(c)	Water Resources	Numerous	(1) After 5 years, harvest acres >70% or <30% of projected basin harvest constraint. (2) Any quantifiable, management-related loss of favorable stream flow; cumulative effects are outside predicted range. (3) Loss of downstream, off-Forest favorable stream flow conditions as a result of NF activities. (4) Measurable increase in management-related landslides. (5) Decline in beneficial uses, on- or off-forest, related to management activities.	A,C,D	District Rangers, Dist. Specialists, Forest Hydrologist, Forest Geologist, Forest Fish Biol.	Continuous	Computer, Paper File, STORET	500 to 3,500 1/

Table V-1. Monitoring and Evaluation Program (continued)

Resource Element	Activity	Unit of Measure	Threshold of Concern	Data Source	Position Responsible	Reporting Frequency	Data Storage	Annual Cost ($)
Soil/Water FW121(d)	Water Resources	Landslide Frequency	(1) Observed landslide frequency exceeds frequency in project cumulative effects analysis. (2) Landslide frequencies correlate positively to cumulative area roaded and harvested, and there is potential for degrading beneficial uses of water or irretrievable loss in soil productivity. (3) Off-Forest landslides affect channel stability/beneficial uses; reduces management options for Forest lands.	A,C,D	Forest Geologist, Other Geologists, Soil Scientists	Annual	Computer, Paper File,	13,500 to 8,000 1/
Soil/Water FW121(e)	Acres burned by Wildfire	Acres	(1) Actual acres burned/decade exceed prediction. (2) Actual acres burned/year >50% predicted for decade.	B	Fire Staff	Annual	Computer	650
Minerals GM121	Mineral Resources	Numerous	(1) Field review reveals surface resources and environmental quality declines in excess of previously described thresholds of concern (2) Rehabilitation activities are not being performed or are below standards.	B,D	District Rangers, Lands and Recreation Staff	Annual	Paper File	2,760

1/ See LRMP, Appendix D for further information.

EVALUATION

The data collected during monitoring will be evaluated using the Decision Flow Diagram (Figure V-1) As indicated in the diagram, the results of the evaluation lead to recommendations of the following types:

1. Referring the problem to the appropriate line officer for action;
2. Modifying the management practice, or direction, as a Plan amendment;
3. Modifying the land allocation as a Plan amendment;
4. Revising the schedule of outputs;
5. Revising the cost/unit of output;
6. Initiating revision of the Plan.

The document resulting from the use of the Decision Flow diagram constitutes the evaluation report As applicable, the following will be included in each evaluation report:

1. A quantitative estimate of performance comparing outputs and services with those projected by the Forest Plan;
2. Documentation of measured effects, including any changes in productivity of the land;
3. Unit costs associated with carrying out the planned activities as compared with unit costs estimated during Forest Plan development;
4. Recommendations for changes;
5. A list of needs for evaluation of management systems and for alternative methods of management,
6 A list of additional research needed to support the management of the Forest;
7. Identification of additional monitoring needs to facilitate achievement of the monitoring goals

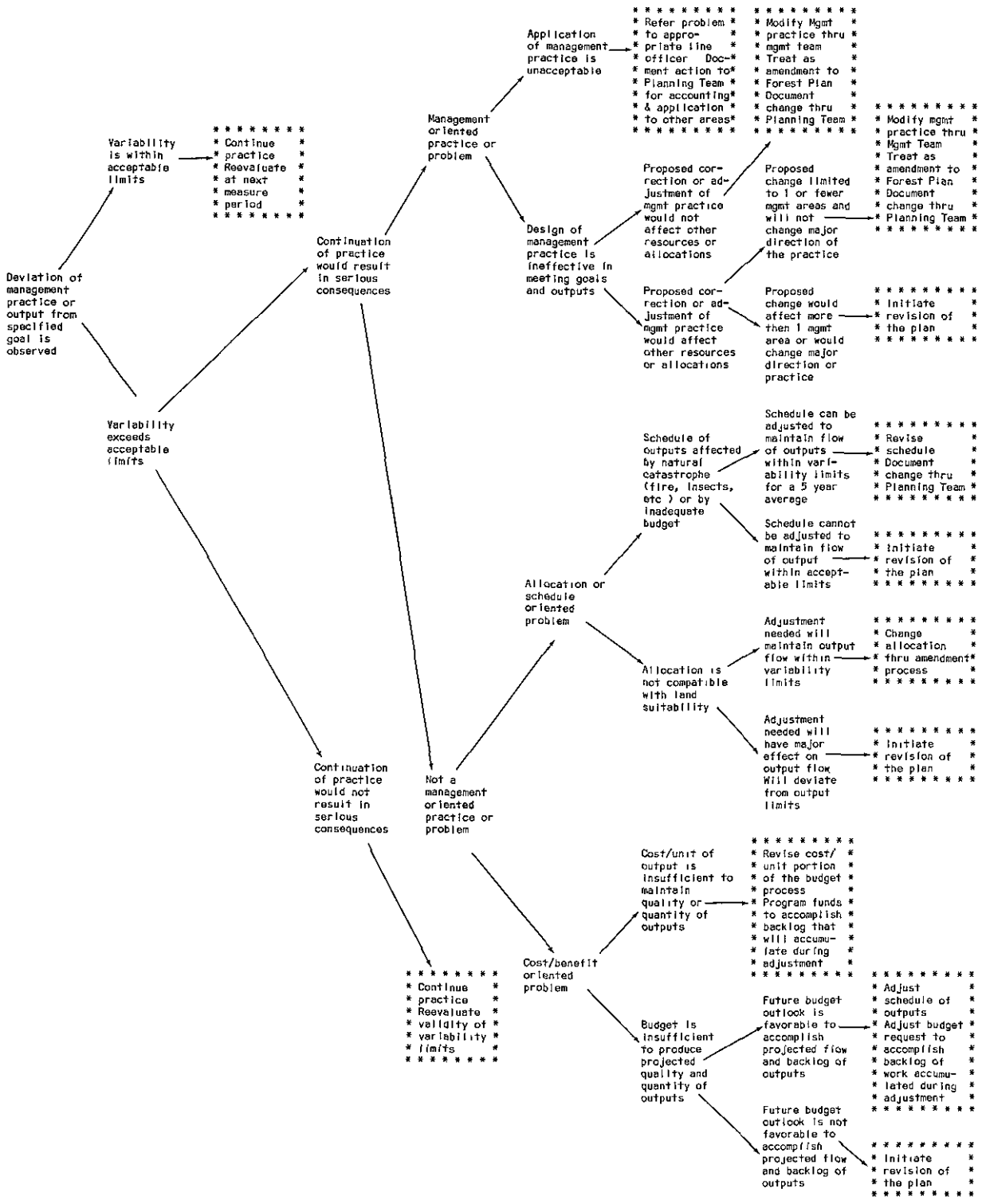


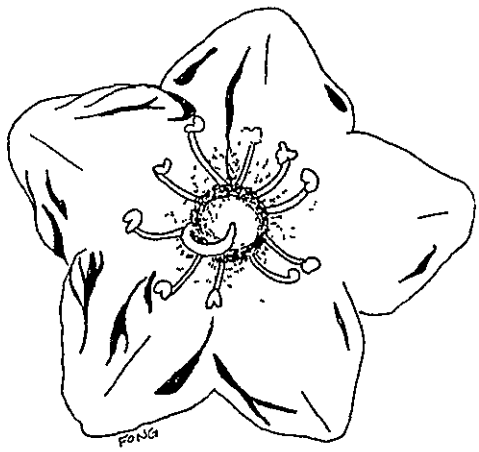
Figure V-1. Decision Flow Diagram

AMENDMENT AND REVISION

The Forest Plan incorporates legal mandates, professional judgement and the public's stated concerns into a future vision of the Forest. It charts a path for getting there by developing management goals and objectives and translating them into management direction in the form of standards and guidelines for management areas on the Forest. National Forest planning is a dynamic process, and the products -- Forest Plans -- are similarly dynamic. Forest Plans can and should be modified if conditions warrant As management goals are applied on the ground or goals and objectives, or activities the goals generate, may no longer be appropriate. In such instances, activities may be tailored to fit the resource, or planning objectives as stated in the Plan may be amended Plans do not apply direction in site-specific management activities. It would be unrealistic and wrong to try to identify, analyze and schedule the myriad projects or activities that occur on a National Forest Instead, this type of site-specific planning occurs at the project-level planning stage, such as allotment management planning.

The Forest Supervisor may amend the Forest Plan. Based on an analysis of the objectives, standards, and other contents of the Plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change. If the change resulting from the proposed amendment is determined to be significant, the Forest Supervisor shall follow the same procedure as that required for development and approval of a Forest Plan. If the change resulting from the amendment is determined not to be significant for the purposes of the planning process, the Forest Supervisor may implement the amendment following appropriate public notification and satisfactory completion of NEPA procedures

The Forest Plan shall ordinarily be revised on a 10-year cycle or at least every 15 years It also may be revised whenever the Forest Supervisor determines that conditions or demands in the area covered by the Plan have changed significantly or when changes in Resource Planning Act policies, goals, or objectives would have a significant effect on Forest level programs. In the monitoring and evaluation process, the Interdisciplinary Team may recommend a revision of the Forest Plan at any time. Revisions are not effective until considered and approved in accordance with the requirements for the development and approval of the Forest Plan. The Forest Supervisor shall review the conditions on the land covered by the Plan at least every five years to determine whether conditions or demands of the public have changed significantly



LITERATURE CITED

LITERATURE CITED

Allen, A W 1982 Habitat suitability index models· marten. USDI Fish and Wildlife Service FWS/OBS-82/10/11 9 p

Amaranthus, M.P. 1982. Investigation of a rare conifer, *Picea breweriana*. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Boyer, Donald E. and John D Dell 1980 Fire effects on Pacific Northwest forest soils USDA Forest Service, Pacific Northwest Region, Portland, OR 59 p

Brown, E. R. (Tech Ed) 1985 Management of wildlife and fish habitats in forests of western Oregon and Washington (two volumes) USDA Forest Service Publication No. R6-F&WL-192-1985. Pacific Northwest Region, Portland, OR. 332 p., 302 p

Craig, David W. 1984. Managed yield tables for Siskiyou National Forest USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Cramer, Owen P. 1974. Air quality influences. In. Environmental Effects of Forest Residues Management in the Pacific Northwest USDA Forest Service General Technical Report PNW-24. Pacific Northwest Forest and Range Experiment Station, Portland, OR

Dyrness, C. T., J Franklin, C Maser, S. Cook, J Hall, and G Faxon 1975 Research natural area needs in the Pacific Northwest, a contribution to land-use planning USDA Forest Service General Technical Report PNW-38 Pacific Northwest Forest and Range Experiment Station, Portland, OR 231 p.

EPA. 1985. Final report on the federal/state/local nonpoint source task force and recommended national nonpoint source policy U S Environmental Protection Agency Office of Water. Washington, DC. 17 p

EPA. 1987. Nonpoint source controls and water quality standards U.S. Environmental Protection Agency Water Quality Standards Handbook, Chapter 2, General Program Guidance p. 2-25

Forsman, E , E Meslow, and H. Wight 1984 Distribution and biology of the spotted owl in Oregon. Wildlife Monographs 87·1-64

FSM 1979. Forest Service Manual Title 2500 Watershed Management USDA Forest Service, Siskiyou National Forest Supplement 1

Hankin, D. G. and G. H. Reeves 1986. Estimating total fish abundance and total habitat area in small streams based on visual estimation methods. Canadian Journal of Fisheries. Ag Sci 45. in Press

Harvey, Robert D., Jr., James S Hadfield, and Mel Greenup. 1985. Port-Orford-cedar root rot on the Siskiyou National Forest in Oregon. USDA Forest Service, Pacific Northwest Region, Portland, OR. 10 p

Jackman, S M and J. M. Scott 1975 Literature review of twenty-three selected forest birds of the Pacific Northwest. USDA Forest Service, Pacific Northwest Region. Portland, OR.

Kaiser, J. R., James D Keyser, and E. Gail Throop. 1983 Cultural resource management. A guidebook of procedures and techniques for managing historical and archaeological resources USDA Forest Service, Pacific Northwest Region, Portland, OR

Kliejunas, John and David Adams 1980 An evaluation of *Phytophthora* root rot of Port-Orford-cedar in California. Forest Pest Management Report No. 80-1. USDA Forest Service, Pacific Southwest Region, San Francisco, CA

Kraemer, James P. 1977. The long term effect of burning on plant succession. Unpublished M S Thesis Oregon State University, Department of Forest Science

Kramer, Brian and Linda Owen n d. Timber sale economic analysis guide USDA Forest Service, Pacific Northwest Region, Portland, OR.

Laymon, S. A , H. Salwasser, and R.H Barrett. 1985 Habitat suitability index models· spotted owl. USDI Fish and Wildlife Service Biological Reports 82(10.113) 14 p.

Maxwell, Wayne G. and Franklin R Ward 1976. Photo series for quantifying forest residues in the coastal Douglas-fir--hemlock type, coastal Douglas-fir--hardwood type. USDA Forest Service General Technical Report PNW-51. Pacific Northwest Forest and Range Experiment Station, Portland, OR 103 p

Mellen, Teresa Kim. 1987 Home range and habitat use of pileated woodpeckers, western Oregon. Unpublished M S. Thesis Oregon State University, Corvallis, OR

Meyer, LeRoy C and Michael P. Amaranthus 1979. Siskiyou National Forest soil resource inventory. USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

Oregon Department of Fish and Wildlife 1985. Fish and wildlife habitat protection criteria for forest lands. Environmental Management Section, Oregon Department of Fish and Wildlife, Portland, OR

Pierovich, John M 1976. Perspectives. In Southern Forestry Smoke Management Guidebook. USDA Forest Service General Technical Report SE-10 Southeastern Forest Experiment Station, Asheville, NC 140 p.

Roth, Lewis F., Robert D. Harvey, Jr., and John T. Kliejunas. 1987 Port-Orford-cedar root disease. USDA Forest Service Publication R6-FPM-PR-294-87. Pacific Northwest Region, Portland, OR.

Schroeder, R L 1982 Habitat suitability index models· pileated woodpecker USDI Fish and Wildlife Service FWS/OBS-82/10-39. 15 p

Tibbs, T , Brady G and Vagle, N. 1988 Siskiyou National Forest tree improvement plan USDA Forest Service, Siskiyou National Forest, Grants Pass, OR.

U S Department of Agriculture, Forest Service 1974. National forest landscape management volume 2 (nine chapters) USDA Forest Service Agricultural Handbooks 462 and 559, Washington, DC

U.S. Department of Agriculture, Forest Service. 1983 Regional guidelines for incorporating minimum management requirements in forest planning Regional Memo Pacific Northwest Region, Portland, OR.

U S. Department of Agriculture, Forest Service 1984. Regional guide for the Pacific Northwest Region. USDA Forest Service, Pacific Northwest Region, Portland, OR

U S Department of Agriculture, Forest Service 1985 National information requirements project. USDA Forest Service, Washington, DC

U S. Department of Agriculture, Forest Service 1986 A report on minimum management requirements for forest planning on the national forests of the Pacific Northwest Region USDA Forest Service

U S Department of Agriculture, Forest Service 1988a Final supplement to the environmental impact statement for an amendment to the Pacific Northwest Regional Guide (two volumes) USDA Forest Service, Pacific Northwest Region, Portland, OR

U S. Department of Agriculture, Forest Service 1988b. General water quality best management practices USDA Forest Service, Pacific Northwest Region.

U.S Department of Interior, Fish and Wildlife Service 1981 Bald eagle management guidelines, Oregon-Washington. USDI Fish and Wildlife Service

U.S. Department of Interior, Fish and Wildlife Service. 1982 Pacific coast recovery plan for American peregrine falcon. USDI Fish and Wildlife Service

U.S. Department of Interior, Fish and Wildlife Service. 1986 Recovery plan for the Pacific bald eagle USDI Fish and Wildlife Service, Portland, OR. 160 p

Werschkul, David F and Otis D. Swisher 1983 Birds and small mammals of southwestern Oregon: Tanoak forest Non-game Project, Oregon Department of Fish and Wildlife, Portland, OR. 29 p

Winget, Robert N and Fred A Mangum 1979. Biotic condition index· integrated biological, physical and chemical stream parameters for management USDA Forest Service, Intermountain Region.

Wisdom, M J , L R. Bright, C. G Carey, W. W. Hines, R. J. Pedersen, D A Smithey, J W Thomas, and G. W. Witmer 1986 A model to evaluate elk habitat in western Oregon USDA Forest Service Publication No R6-F&WL-216-1986 Pacific Northwest Region, Portland, OR 36 p.

Zarn, M. 1974. Habitat management series for unique or endangered species, report no. 12 osprey. USDI Bureau of Land Management Technical Note. Denver Service Center, Denver, CO. 41 p.

Zobel, Donald B , Lewis F. Roth, and Glenn M Hawk. 1985 Ecology, pathology, and management of Port-Orford-cedar (Chamaecyparis lawsoniana) USDA Forest Service General Technical Report PNW-184. Pacific Northwest Forest and Range Experiment Station, Portland, OR

ACRONYMS AND GLOSSARY

ACRONYMS AND GLOSSARY

The definitions and abbreviations included herein are most common to Forest Service management and planning terminology Meanings may differ when used in context other than these documents The sources of the definitions vary, but the majority were taken from the Regional Guide for the Pacific Northwest, FSM, FSH, the Wildland Planning Glossary, NFMA Regulations (36 CFR 219), and CEQ Regulations (40 CFR 1500-1508) Some definitions have been shortened, paraphrased, or adapted to match usage implied within this document.

ABBREVIATIONS AND ACRONYMS

AC	Acres
ADT	Average Daily Traffic
AMP	Allotment Management Plan
AQRV	Air Quality Related Value
ASQ	Allowable Sale Quantity *
ATV	All-Terrain Vehicle
AUM	Animal Unit Month *
BD	Brush Disposal
BLM	USDI-Bureau of Land Management
BMP	Best Management Practice *
BTU	British Thermal Unit
CEQ	Council on Environmental Quality
CFL	Commercial Forest Land *
CFR	Code of Federal Regulations *
CFS	Cubic Feet Per Second
CMAI	Culmination of Mean Annual Increment *
CPRC	Center for Population Research and Census
CRM	Cultural Resource Management
CRMP	Cooperative Resource Management Program
CZMA	Coastal Zone Management Act of 1972
DBH	Diameter at Breast Height *
DEIS	Draft Environmental Impact Statement
DEQ	Oregon Department of Environmental Quality
DF	Douglas-fir
DFSIM	Douglas-fir Simulator
DIB	Diameter Inside Bark
DP/DFSIM	Dynamic Programming Douglas-fir Simulator
E.O.	Executive Order
EA	Environmental Assessment (also E.A.) *
EEO	Equal Employment Opportunity
EIS	Environmental Impact Statement *
EPA	Environmental Protection Agency
EVC	Existing Visual Condition
F&WL	Fish and Wildlife
FEIS	Final Environmental Impact Statement
FES	Forms Entry System
FERC	Federal Energy Regulatory Commission
FIL	Fire Intensity Level
FIR	Forestry Intensified Research
FLIPS	Forest Level Information Processing System

FMEI	Fire Management Efficiency Index *
FORPLAN	Forest Planning Model *
FPFO	Forestry Program For Oregon
FS	*USDA-Forest Service*
FSH	Forest Service Handbook
FSM	Forest Service Manual
FY	*Fiscal Year (Oct. 1 to Sept. 30, unless otherwise noted)*
GIS	Geographic Information System *
GNP	Gross National Product *
HCI	Habitat Capability Index
ICO	Issues, Concerns, and Opportunities *
IDT	Interdisciplinary Team
IMPLAN	Forest Service Input-Output Model
JTPA	Job Training Partnership Administration
K-V	Knutson-Vandenberg Act of 1924 *
LAC	Limits of Acceptable Change
LCDC	*Oregon Land Conservation and Development Commission*
LIM	Land Inventory Mapping *
LRMP	Land and Resource Management Plan
LTSY	*Long-Term Sustained Yield* *
M	Roman Numeral for 1,000
M AUM	Thousand Animal Unit Month
M RVD	Thousand Recreation Visitor Day
M WFUD	Thousand Wildlife Fish User Day
MA	Management Area
MBF	Thousand Board Feet
MCF	Thousand Cubic Feet
MEP	Monitoring and Evaluation Program
MM	Million (Thousand Thousand)
MM $	Million Dollars
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MMR	Minimum Management Requirement *
MOU	Memorandum of Understanding
MR	Management Requirement *
NEPA	National Environmental Policy Act
NF	*National Forest*
NFMA	National Forest Management Act
NFS	National Forest System land
NIRP	*National Information Requirements Project*
NPB	Net Public Benefits *
NPS	National Park Service
O&C	Oregon and California
ODEQ	Oregon Department of Environmental Quality
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ONHDB	Oregon Natural Heritage Data Base
ORS	Oregon Revised Statute

ORV	Off Road Vehicle (also O R.V.) *
OSGC	Oregon State Game Commission (now ODFW)
OWRD	Oregon Water Resources Department
P.L	Public Law (also PL)
PAMARS	Program Accounting and Management Attainment Reporting System
PAOT	People at One Time *
PARS	* (See Glossary)
PNV	Present Net Value *
PNW	Pacific Northwest
POC	Port-Orford-cedar
PSW	Pacific Southwest
PUM	Piling of Unmerchantable Material
PVT	Private (Land)
R-5	Forest Service, Pacific Southwest Region (also R5)
R-6	Forest Service, Pacific Northwest Region (also R6)
R.D.	Ranger District (also RD) *
R2MAP	A grid land inventory mapping system (LIM)
RARE II	Roadless Area Review and Evaluation II *
RIM	Recreation Information Management
RNA	Research Natural Area *
ROS	Recreation Opportunity Spectrum *
RPA	Forest and Rangeland Renewable Resources Planning Act of 1974
RVD	Recreation Visitor Day *
S&G	Standard and Guideline
SHPO	State Historic Preservation Officer
SEIS	Supplemental Environmental Impact Statement
SMU	Streamside Management Units *
SOHA	Spotted Owl Habitat Area *
SOMA	Spotted Owl Management Area *
SRI	Soil Resource Inventory
SSC	Separate Suitability Component *
STAT	Statute
T&E	Threatened and Endangered Species *
TIS	Transportation Information System
TM	Timber Management
TPA	Trees Per Acre
TRI	Total Resource Information *
TSI	Timber Stand Improvement *
TSP	Total Suspended Particulates
U.S C.	United States Code (also USC)
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USFS	USDA- Forest Service
USFWS	USDI- Fish and Wildlife Service
VQO	Visual Quality Objectives *
WAA	Watershed Analysis Area
WFUD	Wildlife and Fish User Day
WIN	Watershed Improvement Needs Inventory
WL	Wildlife

WRS	Wilderness Recreation Spectrum *
YUM	Yarding of Unmerchantable Materials

* Term defined in Glossary

GLOSSARY

A

Acre-foot
A unit of measurement equal to the volume which would cover one acre to a depth of one foot (i.e , 43,560 cubic feet)

Activity
The work processes or management practices that are conducted to produce, enhance, or maintain outputs or achieve administrative and environmental quality objectives An activity can generate multiple outputs.

Activity Fuels
Burnable material created by various management activities

Affected Environment
The natural, physical, and human-related environment that is sensitive to changes due to proposed actions

Age Class.
One of the intervals into which the age range of trees is divided for classification or use.

Airshed
A geographical area that, because of topography, meteorology, and climate, shares the same air

Allowable Cut Effect.
An increase in today's permissible timber harvest level that is made by intensive timber management practices applied now or in the future

Allowable Sale Quantity.
The quantity of timber that may be sold from the area of suitable land covered by the Forest Plan. Both the time period and utilization standards are specified by the Plan. This is usually expressed on an annual basis as the "average annual allowable sale quantity "

Allocated Funds
Those funds transferred to the Forest from other agencies (including those from the Land and Water Conservation Fund, the Department of Labor, and the Soil Conservation Service) or provided from the K-V, Brush Disposal, Co-op Road Maintenance, or Purchaser Road Credits accounts.

Allocation
The assignment of management prescriptions to specific land areas to achieve the goals and objectives of an alternative

Alternative.
A mix of management prescriptions and land allocations applied to specific land areas to achieve a set of goals and objectives. The resulting alternative provides the management direction of the Forest

Amenity.
Resources or experiences enjoyed on the Forest that do not have established market values, e.g., scenic views, recreational activities, etc.

Anadromous Fish
Species of fish which mature in the ocean and migrate into streams to spawn; use herein refers to salmon and steelhead

Analysis Area
A delineated area of land subject to analysis of (1) responses to proposed management practices in the production, enhancement, or maintenance of Forest outputs and environmental quality objectives, and (2) economic and social impacts

Animal Community.
Any assemblage of animals which interact and occur in a common area.

Animal Unit Month (AUM)
The quantity of forage required by one mature cow and calf, or equivalent, for one month

Annual Sale Quantity
See Allowable Sale Quantity.

Appropriated Funds
Monies authorized by Congress which permit Federal agencies to incur obligations and to make payments for specific purposes

Appropriate Suppression Response
The kind, amount, and timing of suppression action on a wildfire which most efficiently meets fire management direction under current and expected burning conditions.

Area of Influence.
Local area where most of the goods and services produced from the Forest are processed or used, and where the employment, income, and other social impact of Forest policies are felt.

Arterial Road
A major transportation route that accesses and services a large land area; usually connects with public highways or other arterial routes.

Association.
(Plant Ecology) A kind of plant community with a definite species composition and structure, and relatively uniform environment.

Available Land.
Capable land which has not been administratively or legislatively withdrawn from timber production on a permanent basis by the Chief or higher authority.

B

Basal Area.
The cross-sectional area, in square feet, of a tree measured at breast height (4 5 feet).

Base Sale Schedule.
A timber sale schedule formulated on the basis that the quantity of timber planned for sale and harvest for any future decade is equal to or greater than the planned sale and harvest for the preceding decade, and that this planned sale and harvest for any decade is not greater than the long-term sustained-yield capacity. This definition expresses the principle of nondeclining flow.

Benchmark
An analysis reference point of the maximum physical/biological capability to produce a resource output from Forest lands while maintaining minimum legal requirements for production of other resources and maintenance of soil and water productivity. Benchmarks define the area (i.e., provide the bounds) within which alternatives can be formulated.

Benefit-Cost Ratio.
Measure of economic efficiency computed by dividing total discounted *primary benefits* by total discounted *economic costs*.

Best Management Practice (BMP)
The method, measure or practice selected by an agency to meet its nonpoint source pollution control needs. BMPs include, but are not limited to, structural controls, operations, and maintenance procedures. BMPs can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters.

Big Game
Those species of large mammals normally managed for sport hunting Herein, generally refers to Roosevelt elk, black-tail deer, or black bear

Biological Diversity.
The distribution and abundance of different plant and animal communities and species over time and space

Biological Growth Potential
The average net growth attainable in a fully stocked natural forest stand

Biotic Community.
Any interacting assemblage of animal and plant communities living in a prescribed area or physical habitat.

Board Foot (BF).
A unit of measurement equal to an unfinished board one foot square by one inch thick

Botanical Area
An area which has been designated by the Forest Service as containing specimens or groups of plants, and plant communities which are significant because of form, color, occurrences, habitat, location, life history, arrangement, ecology, environment, rarity and/or other features (FSM 2360).

C

Calibration
The process of adjusting modeled fire sizes by fire intensity levels for each Fire Management Analysis Zone against historical occurrence and burn acreage to accurately reflect the "real world " Adjustments are based on modeling the current organization (1978) against historical occurrence (1970-1979) using the same dispatch philosophy and suppression strategies.

Canopy.
The uppermost spreading, branchy layer of a forest

Canopy Closure
The progressive reduction in space between tree crowns as they spread laterally (Ford-Robertson 1971); a measure of the percent of potential open space occupied by the collective tree crowns in a stand.

Capability.
The potential of an area of land to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, and geology, as well as the application of management practices, such as silviculture or protection from fire, insects and disease.

Capability Area
A delineated area with a logical combination of biological potential and physical characteristics which are used to estimate responsiveness to various management practices, resource values, output coefficients, and multi-resource or joint production

Capital Investment
Money spent to provide a facility or product that will be used in the future.

Carrying Capacity.
The maximum number of organisms that a particular habitat can support without causing deterioration of the ecosystem.

Cavity Nester.
Wildlife species that excavate and/or occupy cavities in trees and snags.

Chargeable Volume.
All timber volume included in the growth and yield projections for the selected management prescriptions used to arrive at the allowable sale quantity, based on regional utilization standards.

Clearcutting.
The harvesting of an entire stand of trees in one cutting operation, leading to the establishment of an even-aged stand

Climax.
The culminating stage in plant succession for a given site where the vegetation has reached a highly stable condition

Code of Federal Regulations (CFR).
The listing of various regulations pertaining to management and administration of the National Forests.

Collector Road.
A road which collects traffic from Forest local roads or other collector roads These roads serve smaller land areas than arterial roads and are usually connected to a National Forest arterial or public highway.

Commercial Forest Land (CFL)
See Tentatively Suitable Forest Land

Commercial Thinning
Timber sales which call for selective harvest in immature stands designed to improve the quality and growth of the remaining trees.

Commodity
A resource product with commercial value, all resource products which are articles of commerce (transportable)

Community Cohesion
The degree of unity and cooperation evident in a community as it defines problems and attempts to resolve them

Community Stability
A community's capacity to handle change without major hardships or disruptions to component groups or institutions.

Concern.
See Issues, Concerns, and Opportunities

Confine Wildfire Strategy
To restrict fire within determined boundaries.

Constraint.
A limit placed in the FORPLAN model designed to control the functioning of the model to meet specified goals, legal or feasibility requirements.

Consumptive Use
Those uses of a resource that reduce its supply.

Contain Wildfire Strategy.
To surround a fire with control line to check the fire's spread.

Control Wildfire Strategy
To complete and hold the control line around a fire

Conversion. (Management)
A change from one silvicultural system to another (e.g. from hardwood to conifer forest) or from one tree species to another

Cord
A wood stack equivalent to 128 cubic feet (4 x 4 x 8 feet).

Cost Effective
Achieving specified outputs or objectives under given conditions for the least cost

Cover.
Vegetation used by wildlife for protection from predators, or to ameliorate conditions of weather, or in which to reproduce

Cover/Forage Ratio.
The ratio, in percent, of the amount of area in forage conditions to that in cover conditions

Created Opening
An opening in the forest created as the result of even-aged silviculture through clearcutting, group selection, or shelterwood regeneration timber harvest systems

Critical Habitat
That habitat designated by the Secretary, USDI, as critical to the continued survival of threatened or endangered species

Critical Minerals
Minerals vital to the National defense; securing these minerals is less serious than those classified as strategic minerals

Cubic Feet Per Second (cfs)
A unit of measure applied to fluid flow A rate of discharge.

Cubic Foot.
A measure of volume equivalent to 1 foot by 1 foot by 1 foot

Culmination of Mean Annual Increment (CMAI)
The age at which the average annual growth is greatest for a stand of trees. Mean annual increment is expressed in cubic feet measure and is based on expected growth according to the management

intensities and utilization standards assumed in accordance with 36 CFR 219 16(a)(2)(i) and (ii). Culmination of mean annual increment (CMAI) includes regeneration harvest yields and any additional yields from planned intermediate harvests

Cultural Resources
Buildings, sites, areas, architecture, memorials, and objects having scientific, prehistoric, historic, or social values.

Cumulative Effect
The impact on the environment which results from the incremental impact of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency or person undertakes such other actions Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Current Direction.
The combination of activities dictated by laws, regulations, the Forest Service Manual, and existing unit plans

D

Departure
A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the sale schedule at any time during the planning horizon. A departure is characterized by a temporary increase, usually in the beginning decade(s) of the planning horizon, over the base sale schedule originally established. This increase does not impair the future attainment of the long-term sustained yield capacity.

Designated Habitat Area.
A mature of old-growth habitat area that has been located on a map or in the field, or both. For this document, specific areas identified for spotted owls, pine marten, and pileated woodpeckers.

Desired Residue Profile.
The desired level of both living and dead vegetative material that is desired by the land manager for a specific site or prescription. Residue includes slash materials, litter on the forest floor, living brush, tree and standing dead trees and snags.

Developed Recreation.
Outdoor recreation requiring significant capital investment in facilities to handle a concentration of visitors on a relatively small area Examples are ski areas, resorts and campgrounds

Diameter at Breast Height (DBH).
The diameter of a standing tree measured at a point four feet-six inches from ground level on the uphill side.

Direct Attack.
A method of fire suppression that treats the fire at its burning edge

Discounting
The process of estimating the present worth of an anticipated item of income or expenditure by determining the amount of money which, if presently invested and allowed to accumulate at compound interest, will exactly equal the expected item of income or expenditure at the time when it becomes due.

Dispersed Recreation.
Outdoor recreation in which visitors are diffused over relatively large areas Where facilities or developments are provided, they are more for access and protection of the environment than for the comfort or convenience of the people.

Diversity
The distribution and abundance of different plant and animal communities and species within an area

Downward Sloping Demand
A price-quantity demand schedule based on the assumption that the quantity offered inversely affects the price received.

E

Ecosystem
The complete system formed by the interaction of a group of organisms and their environment

Ecosystem Function.
The manner in which organisms interact with each other and their environments.

Edaphic.
Pertaining to the soil.

Edge
Where plant communities meet or where successional stages of vegetative conditions within plant communities come together, e.g., field and woodland, forest and meadow.

Edge Effect.
The increased richness of flora and fauna resulting from the mixing of two communities where they join, as at the edge of a meadow.

Effects (or Impacts).
Environmental consequences (the scientific and analytical basis for comparison of alternatives) as a result of a proposed action. Effects may be either *direct*, which are caused by the action and occur at the same time and place, *indirect*, which are caused by the action and are later in time or farther removed in distance, but are still reasonably foreseeable, or *cumulative* (See definition above)

Empirical Yield Table.
A table showing, for one or more given species on a given site, the progressive development of a timber stand at periodic intervals covering the greater part of its useful life This table is prepared for existing stands on the basis of actual average stand conditions.

Endangered Species.
Any plant or animal species which is in danger of extinction throughout all or a significant portion of its range. (Endangered Species Act of 1973).

Endemic Species.
A species whose natural occurrence is confined to a certain region and whose distribution is relatively limited

Environment
The aggregate of physical, biological, economic, and social factors affecting organisms in an area

Environmental Analysis
An analysis of alternative actions and their predictable environmental effects, including physical, biological, economic, and social consequences and their interactions; short- and long-term effects; direct, indirect, and cumulative effects

Environmental Assessment (EA)
A concise public document which serves to (a) Briefly provide sufficient evidence and analysis for determining whether to prepare an EIS or a Finding of No Significant Impact, (b) Aid an agency's

compliance with NEPA when no EIS is necessary; (c) Facilitate preparation of an EIS when necessary.

Environmental Impact Statement (EIS)
A detailed statement prepared by the responsible official in which a major Federal action which significantly affects the quality of the human environment is described, alternatives to the proposed action provided, and effects analyzed.

Erosion.
Detachment or movement of soil or rock fragments by water, wind, ice, or gravity. Accelerated erosion is much more rapid than normal, natural, or geologic erosion, primarily as a result of the influence of activities of man, animals, or natural catastrophies

Escaped Fire Situation Analysis.
A study of the factors influencing the suppression of a fire not controlled during initial attack, conducted for the purpose of deciding which suppression strategy will be used.

Even-aged Management
The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together Managed even-aged forests are characterized by a distribution of stands of varying ages (and therefore tree sizes) throughout the forest area The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand at harvest rotation age Regeneration in a particular stand is obtained during a short period at or near the time that the stand has reached the desired age or size for regeneration and is harvested Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands

Expected Burned Acreage
The expected annual number of acres burned by fire size class and intensity level for a given program option or budget level, and which must equal or be less than the resource protection objective to be a valid option

F

Fire Intensity Level (FIL).
A relative measure of fire severity based on flame height, higher flames indicating a more intense fire

Fire Management Analysis Zone (FMAZ)
The geographically delineated areas into which the planning unit is divided for the purpose of analysis based upon common fire-behavior characteristics.

Fire Management Efficiency Index (FMEI).
An index based on the protection costs (less proposed fuels investment), expected annual fire-fighting costs, and expected annual net value change for the next planning period.

FIREPLAN
The title for a computer system consisting of eight programs which perform data retrieval and processing for the fire management analysis.

Fire Program Option
A given program mix funded at a given program level developed in response to specific fire management direction established for the Forest Plan

Fixed Program Management
The cost of managing Forest programs which is independent of output levels

Floodplain
The lowland and relatively flat areas adjoining inland and coastal waters, including, at a minimum, that area subject to a one percent or greater chance of flooding in any given year.

Forage.
Vegetation used for food by wildlife, particularly ungulate wildlife and domestic livestock

Forb.
Any herbaceous plant species other than those in the Gramineae (grasses), Cyperaceae (sedges), and Juncaceae (rushes) families; fleshy-leaved plants.

Forage Areas
Vegetated areas with less than 60 percent combined canopy closure of tree and tall shrub (greater than seven feet in height). This includes the grass-forb, shrub and open sapling-pole stand conditions and may include some older stands that have been thinned. In a managed forest the primary forage areas are those that have had all or most of the forest canopy removed, i e clearcut or shelterwood units

Forest Fragmentation.
The creation of habitat islands through land development or through natural causes, such as fire

Forest Land
Land at least 10 percent occupied by forest trees or formerly having had such tree cover and not currently developed for nonforest use Lands developed for nonforest use include areas for crops, improved pasture, residential, or administrative areas, improved roads of any width, and adjoining road clearing and powerline clearing of any width.

FORPLAN
A linear programming model used for development and analysis of Forest Plan alternatives, and to display long and short-term resource interactions in forest management.

Fry.
The life stage of salmonid fish species that refers to the juvenile fish which have either not emerged from the gravel or have recently emerged

Fuelbreak.
A natural or constructed barrier utilized to stop or control the spread of fire

Fuel Treatment.
The process of removing and/or modifying natural or human created fuels to reduce fire hazard and achieve other resource objectives.

Fuelwood.
Wood that is round, split, or sawn and/or otherwise generally refuse material cut into short lengths or chipped for burning.

Full Log Suspension.
The system of transporting logs from the cutting site to the landing without touching the ground.

G

Game Species
Any species of wildlife or fish for which hunting seasons and bag limits have been established, and which are normally harvested by hunters and fishermen.

Goal

A concise statement that describes a desired condition to be achieved sometime in the future. Normally expressed in broad, general terms, it is timeless in that it has no specific date by which it is to be completed. Goal statements form the basis from which objectives are developed.

Geographic Information System (GIS)

An information processing technology to input, store, manipulate, analyze, and display spatial resource data to support the decisionmaking processes of an organization. Generally, an electronic medium for processing map information, typically used with manual processes, to effect specific decisions about the land base and its resources

Gross National Product (GNP)

The sum of final products, such as consumption of goods and gross investment, produced in the Nation in a given year. It is reported in dollars, as a measure of the economic performance of the entire economy

Guideline.

An indication or outline of policy or conduct

H

Habitat

The natural environment of a plant or animal.

Habitat Capability Index.

An indirect measure of the quality and quantity of habitat for a specific species, or group of species. The index is usually a range that is based on the predicted number of animals that could theoretically occupy the habitat available given a certain set of management prescriptions.

Habitat Diversity.

Distribution and abundance of plant and wildlife habitats

Habitat Island.

The occurrence of a habitat, such as an old-growth forest, that is physically separated from the next closest habitat of the same type by vegetation that is markedly different in composition and structure.

Hard Snag.

A snag composed primarily of sound wood, particularly sound sapwood; generally merchantable.

Hardwood.

A conventional term for the wood of broadleaf trees Hardwood areas reference herein are usually the result of past forest fires, and once supported conifer trees in the past. See Tentatively Suitable Forest Land

Hardwood Conversion.

The replacement of broadleaf trees or brush with conifer trees.

Hazard Reduction.

Any treatment of forest fuels that reduces the threat, ignition, or spread of wildfire.

Hiding Cover

Vegetation capable of hiding 90 percent of a standing adult deer or elk at 200 feet or less. Includes some shrub stands and all forested stand conditions with adequate tree stem density or shrub layer to hide animals In some cases, topographic features also can provide hiding cover

I

Immature-Poles.
See Tentatively Suitable Forest Land.

Immature-Small Timber.
See Tentatively Suitable Forest Land

Impacts.
See Effects.

Indicator Species
Species of fish, wildlife, or plants which reflect ecological changes caused by land management activities See Management Indicator Species.

Indirect Attack.
A method of fire suppression in which the control line takes advantage of natural fire breaks, topography, and fuel between the line and the fire

Individual Tree Selection.
The selection of trees for harvest based on individual tree characteristics.

Instream Flow.
Streamflow required to support instream uses, the flow required varying widely by type of channel, water quality, and time of distribution.

Integrated Pest Management
A process for selecting strategies to regulate forest pests in which all aspects of a pest-host system are studied and weighed The information considered in selecting appropriate strategies includes the impact of the unregulated pest population on various resources values, alternative regulatory tactics and strategies, and benefit and cost estimates for these alternative strategies. Regulatory strategies are based on sound silvicultural practices and ecology of the pest-host system and consist of a combination of tactics such as timber stand improvement plus selective use of pesticides. A basic principle in the choice of strategy is that it be ecologically compatible or acceptable.

Integrated Prescription.
A planning prescription in which the Forest ID team identifies and quantifies outputs, effects, benefits, and costs of all forest resources to the extent practical. The management emphasis may be single or multiple use.

Intensive Management
A high investment level of timber management that includes precommercial and commercial thinnings, planting with genetically improved stock, control of competing vegetation, and other practices which increase tree growth.

Irretrievable.
Applies to losses of production, harvest, or use of renewable natural resources. For example, where production is lost, the action is irretrievable, but not irreversible

Irreversible.
Applies primarily to the use of nonrenewable resources, such as minerals or cultural resources, or to those factors, such as soil productivity, that are renewable only over long time periods; also includes loss of future options

Irreversible Soils.
See Unsuitable Forest Lands

Issue.
See Issues, Concerns, and Opportunities.

Issues, Concerns, and Opportunities (ICO)
A public issue is a subject or question of widespread public interest relating to management of the National Forest resources, as identified through public participation and addressed through the planning process A management concern is an issue, problem, or condition which constrains the range of management practices identified by the Forest Service in the planning process Opportunities are those resource uses and development possibilities suggested by both the public and the Forest Service.

K

K-V Funds
Funds collected from timber purchasers for reforestation under the Knutson-Vandenburg (K-V) Act of 1930 National Forest Management Act expanded collection authority to include other resource protection and improvement on the sale area.

Knutson-Vandenburg Act of 1930, as amended.
A law which provides for a special fund, derived from the sale of timber, which may be used to fund reforestation and the protection and improvement of the Forest renewable resources on the sale area

L

Land Allocation
The assignment of a management emphasis to particular land areas with the purpose of achieving the goals and objectives of the alternative

Land Class
The topographic relief of a unit of land. Land classes are separated by slope, which coincides with the timber inventory process

Land Exchange.
The conveyance of non-Federal land or interests to the United States in exchange for National Forest Land or interests.

Land Inventory Mapping (LIM)
A grid mapping system with overlay and computational capability to input, store, edit, manipulate, overlay, and display resource information layers in a geographical quadrangle format.

Landscape Ecology.
The science of describing and understanding how plant and animal species and communities interact across watershed- and regional-scale areas

Land Stratification
Inventory of land according to a set of specific land characteristics, such as the ability to grow timber or the ability to resist erosion

Leasable Minerals
Mineral deposits specifically excepted from the General Mining Law by Congress (principally through the Mineral Lands Leasing Act of 1920, the Mineral Leasing Act of Acquired Lands of 1947, the President's Reorganization Plan No 3 of 1946), and the Geothermal Act of 1970

Linear Programming
A mathematical process that provides numerical solutions to problems of meeting a certain objective, within given boundaries and constraints. Information is expressed in linear, mathematical format.

Local Road.
A road constructed to provide access to specific resource areas. As such, these roads connect terminal facilities with Forest collector or arterial roads or public highways.

Locatable Minerals
Mineral deposits open to exploration, location, development, and purchase under the General Mining Law of 1972, as amended and interpreted. Minerals in sufficient quality and quantity to be a "valuable deposit" (FSM 2810)

Long-term Productivity.
The redistribution of resources within the ecosystem into products used by humans.

Long-term Sustained Yield (LTSY).
The estimated timber harvest that can be maintained indefinitely over time, once all stands have been converted to a managed state under a specific management intensity consistent with multiple use objectives.

M

Management Area
An area composed of aggregate pieces of land (generally several to many analysis areas) to which a given management objective and prescriptions are applied.

Management Concern.
See Issues, Concerns, and Opportunities.

Management Direction
A statement of multiple use and other goals and objectives, along with the associated management prescriptions and standards and guidelines to direct resource management

Management Indicator Species
Management indicator species are animals or plants selected for special attention in the Forest Plan for one or more of three reasons They may be:

1. *Emphasis species* - species to be managed as key resources on the basis of identified issues, e.g., threatened, endangered, rare, sensitive, harvest, or special interest species;

2. *Indicate special habitat conditions* - species that require special habitat such as snags, riparian, old-growth forest stands, etc ; and/or

3. *Indicate cumulative forest ecosystem change* - generally species having large home ranges and requiring a diversity of habitats.

Management Intensity
A management practices or combination of management practices and associated costs designed to obtain different levels of goods and services

Management Practice
A specific action, measure, course of action, or treatment

Management Prescription
Management practices and intensity designed to attain multiple use benefits and other goals and objectives when applied to a specific land area at a particular point in time

Management Requirements (MR)
Requirements designed to assure compliance with the applicable laws and regulations, specifically 36 CFR 219.27 for resource protection

Mass Failure (also Wasting).
All geologic processes in which earth materials move downslope, either slowly or quickly, by gravitational forces.

Mature.
See Tentatively Suitable Forest Land.

Mean Annual Increment.
The average annual growth of a stand, calculated by dividing the total growth accrued over its life by its age in years at the time of measurement.

Mean Basin Variation (Coefficient of Variation).
The coefficient of variation is a statistical tool used to compare the amount of variation in populations having different means In this case, to compare the variation in accelerated sediment production in a Planning Basin over the first five decades. Lower values indicate a more even distribution of the sediment production, therefore less risk of watershed degradation that might result from concentrations of peak outputs

Minimum Management Requirements (MMR).
Specific requirements consistent with 36 CFR 219 27 that are designed to prevent damage to forest resources beyond a minimum threshold established by law or regulation An outdated phrase, see Management Requirements.

Mitigation
Actions to avoid, minimize, reduce, eliminate, compensate, or rectify the impact of a management practice.

Monitoring and Evaluation.
The evaluation, on a sample basis, of Forest Plan management practices to determine how well objectives are being met, as well as the effects of those management practices on the land and environment.

Multiple Use.
Management of all the various renewable surface resources of the National Forest so that they are utilized in the combination that will best meet the needs of the American people. The concept also includes making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions. Some of the land will be used for less than all of the resources There should be harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land. Consideration is given to the relative values of the various resources, and not necessarily to the combination of uses that will give the greatest dollar return or the greatest unit output.

N

Native species.
A plant or animal species that occurs indigenously in an area.

Natural Opening
A break in the forest canopy. A naturally-occurring area of bare soil, grasses, forbs, or shrubs located in a large area dominated by trees Also included are created openings no longer suitable for timber production

Naturalized Species.
A non-native species established as if it were a native species

NEPA Process
An interdisciplinary process, mandated by the NEPA, which concentrates decisionmaking around issues, concerns, alternatives and the effects of alternatives on the environment

Net Public Benefit (NPB).
The total benefits minus costs of all priced and non-priced resource outputs and effects. It is an expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not Maximization of NPB's to be derived from management of units of the National Forest system is consistent with the principles of multiple-use and sustained yield.

Nonchargeable Timber.
Timber volumes that are not included in calculations of a regulated sale schedule and therefore cannot be included when determining achievement of that timber sale schedule.

Nondeclining Flow and **Nondeclining Yield**
See base sale schedule.

Nonforest Land
Lands that never have had or that are incapable of having 10 percent or more of the area occupied by forest trees; or lands previously having such cover and currently developed for nonforest use.

Nonvegetative
Rock and rock outcrops.

O

O&C (Oregon and California) **Funds**
A fund administrated by the Bureau of Land Management accummulated from payments made by timber purchasers when timber is harvested on O&C lands. O&C lands are those which were repossessed by the U.S. Government from the Oregon and California Railroad Company in 1916. Payments are made to counties by BLM in lieu of taxes from these funds, and a portion of the fund is used for resource mitigation and enhancement projects on those lands.

Objective.
Specific statement of measurable planned results to be achieved within a stated time period. Reflects alternative mixes of all outputs or achievement which can be attained at a given budget level.

Objective Function
The item to be maximized or minimized; for example, timber or present net value in the solution of a linear programming model.

Off-Road Vehicle (ORV).
A vehicle capable of cross-country travel or travel on low-standard roads and trails, e g , motorbikes, ATV's, 4-wheel drive vehicles, snowmobiles

Old Growth.
Any stand of trees 10 acres or greater generally containing the following characteristics· (1) stands contain mature and overmature trees in the overstory and are well into the mature growth stage, (2) stands will usually contain a multi-layered canopy with trees of several age classes; (3) standing dead trees and down material are present, and (4) evidence of human activities may be present, but do not significantly alter the other characteristics and are a subordinate factor in the stand description.

Opportunity.
See Issues, Concerns, and Opportunities.

Opportunity Cost.
The dollar-quantifiable net loss resulting from selecting a less efficient course of action.

Optimal Thermal Cover
A forest stand with. (1) four layers (overstory canopy, sub-canopy, shrub layer, and herbaceous layer); and (2) an overstory canopy which can intercept and hold a substantial amount of snow yet has dispersed, small (less than one-eighth acre) openings. These criteria are generally achieved when the dominant trees average 21 inches Diameter at Breast Height (DBH) or greater crown closure, and are in the large sawtimber or old-growth stand condition.

Outputs.
The goods, services, and products which are measurable and capable of being used to determine the effectiveness of programs and activities in meeting objectives Also goods, end products, or services that are purchased, consumed or utilized directly by people

Overstory.
The portion of trees in a forest which forms the uppermost layer of foliage

P

PARS
The burned acreage and fire occurrence guidelines which represent the annual average long-term loss; PARS are expressed by forest size classes and intensity levels

Peak Flow.
The highest value of stream stage or flow attained during a flood.

Perennial Streams.
Streams which normally flow throughout the year

Peridotite
Plutonic rocks containing olivine, amphibole, pyroxenes, and micas See Ultramafic.

Permittee
A holder of a permit to use public land or resources for a specific purpose

Persons At One Time (PAOT)
A recreation capacity measurement indicating the number of people who can use a facility or area at one time.

Pioneer Species
A plant capable of invading bare sites (newly exposed soil surface) and persisting there, i.e., "colonizing" them, until supplanted

Planning Basins
Geographical locator areas that approximate major drainages on the Forest. Designated for planning purposes.

Planning Horizon.
In the planning process, the overall time period that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions that would influence the planning decisions; in this case, 150 years

Planning Period
The length of time that a Plan is intended to be in effect; in this case, 10 to 15 years.

Plant Community.
Any assemblage of plants which occur in the same area and that form a distinct ecological unit

Pool/Riffle Ratio.
The ratio of pools to riffles, expressed as a percentage, used to describe fish habitat rearing quality

Population.
All interbreeding individuals of a given species living in a particular area

Population Viability.
The degree to which a population can maintain itself over time, population viability analysis is the process by which this is estimated See also Viable Population.

Precommerical Thinning
The selective felling or removal of trees in a young stand, conducted to accelerate diameter growth on remaining trees, maintain a specific stocking density, and improve vigor and quality of remaining trees; conducted at an age before the trees are commercially merchantable

Prescribed Fire.
Intentional application of fire, of either planned or unplanned ignitions, to accomplish certain planned objectives

Prescription.
Management practices selected and scheduled for application on a specific area to attain goals and objectives

Present Net Value (PNV).
The difference between discounted benefits and discounted costs

Presuppression
Activities conducted in advance of fire occurrence to insure effective suppression.

Primitive Recreation Opportunities.
See Recreation Opportunity Spectrum

Programmed Harvest
Timber scheduled for harvest for a specific time period.

Public Issue.
See Issues, Concerns, and Opportunities

Purchaser Road Credit
Dollar credits earned by a timber purchaser for constructing or reconstructing roads needed for removal of timber included in a timber sale contract. Credits are applied toward the purchase price of the timber

R

Ranger District (R.D.)
Administrative subdivision of the Forest, supervised by a District Ranger who reports to the Forest Supervisor

Rare.
Plant or animal species which are uncommon in a specific area. All endangered, threatened, and sensitive species can be considered rare, but the converse is not true

Rearing Habitat.
The river or stream areas where juvenile salmonids must find food and shelter to survive for a period of time

Reconstruction
Activities performed on an existing road or other facility to restore it to a specified standard.

Recreation Capacity
The number of people that can take advantage of the supply of a recreation opportunity during an established use period without substantially diminishing the quality of the recreation experience or the resources.

Recreation Inventory Management (RIM)
The Forest Service system for recording the condition of recreation facilities and use

Recreation Opportunity Spectrum (ROS)
Land delineations that identify possible combinations of recreation activities, settings, and experience opportunities, from Primitive to Urban, arranged along a continuum. Classes used herein are.

Primitive - Area is characterized by essentially unmodified natural environment of a size or location that provides the opportunity for isolation from sights and sounds of people Motorized use within the area is normally not permitted

Semi-primitive Non-motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people. Motorized use is not normally permitted

Semi-primitive Motorized - Area is characterized by predominantly unmodified natural environment of a size or location that provides a good-to-moderate opportunity for isolation from sights and sounds of people except for facilities essential for the use of motorized equipment Motorized use is permitted. Limited primitive road construction to enhance recreation opportunity is permissible.

Roaded Natural - Area is characterized by predominantly natural appearing environments with moderate evidences of the sights and sounds of people. Conventional motorized use is provided for in construction standards and design of facilities.

Rural - Area is characterized by substantially modified natural environment Facilities for intensified motorized use are available

Recreation Visitor Day (RVD)
A unit for measuring recreation activities One unit equals 12 visitor hours and may consist of one person for 12 hours, or 12 persons for one hour, or any equivalent combination

Recreation River
See Wild, Scenic and Recreation Rivers

Redd.
Nest in gravel of stream bottom where fish deposit eggs; herein, refers to salmon spawning redds

Reforestation.
The natural or artificial restocking of an area with forest trees; includes measures to obtain natural regeneration, as well as tree planting and seeding The work is done on National Forests to produce timber and other forest products, protect watershed functioning, prevent erosion, and improve other social and economic values of the forests, such as wildlife, recreation, and natural beauty.

Regeneration.
The renewal of a tree crop, whether by natural or artificial means Also the young tree crop (seedlings and saplings) itself

Release
All work done to free desirable trees from competition with other less desirable vegetation.

Research Natural Area (RNA)
An area representing the major natural timber types or other plant communities in unmodified condition (FSM 4060). A natural plant community established for research and study of ecosystem and their changes

Residue (Timber).
The portions of trees left in the forest during timber harvest, i e., tops, limbs, chunks and other material not usable for manufacturing into timber products.

Resource Allocation.
Designation of specific parcels of land for the production of certain resources; the resources derived may be commodities, amenities, or a combination of each See Land Allocation.

Riparian Areas.
Terrestrial areas where the vegetation and microclimate are influenced by perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics, this habitat is transitional between true bottom land wetlands and upland terrestrial habitats and, while associated with water courses, may extend inland for considerable distance

Riparian Ecosystems.
See Riparian Areas

Riparian Habitat.
See Riparian Areas.

Riparian Prescription.
As used in this document, a method to provide flexibility for retaining shade, large organic material, and other inherent features in the riparian areas for long-term input to stream systems Three options are identified (B, C, and M Prescriptions) for management of the riparian vegetation in areas suitable for timber management; they differ in the amount of vegetation that must be retained after management activities

Risk
Different possible outcomes, where a probability can be assigned to each outcome with a degree of accuracy

River Corridor.
A strip of land, ridge top-to-ridge top, which is seen or potentially seen from a river

Road Corridor
A strip of land between two points used by a road, or some future road whose exact location remains to be determined; usually with an indefinite width

Roadless Area Review and Evaluation II (RARE II).
A comprehensive process (the second) instituted in 1977 to identify roadless and undeveloped land areas containing 5,000 acres or more in the National Forest System for the purpose of determining which of the inventoried areas should be recommended to Congress for inclusion in the National Wilderness Preservation System, which areas should be managed for nonwilderness uses, and which areas required further planning before a reasonable decision on them could be made. This assessment was documented through an FEIS.

Roaded Natural.
See Recreation Opportunity Spectrum

Rotation.
The planned number of years required to establish (including the regeneration period) and grow timber crops to a specified condition or maturity for regeneration harvest. Selected management prescriptions in the Forest Plan provide the basis for the rotation age.

S

Salable Minerals
Mineral deposits outside the scope of the General Mining Law because of widespread occurrence and "common" nature (disposal under the Materials Act of 1947, as amended).

Salmonid.
Member of the fish family *salmonidae*; includes salmon and trout.

Sale Schedule
The quantity of timber planned for sale by time period from the area of suitable land covered by a Forest Plan. The first period, usually a decade, of the selected sale schedule provides the allowable sale quantity. Future periods are shown to establish that long-term sustained yield will be achieved and maintained.

Salvage.
Removal of recently-dead or dying trees to minimize the loss of wood products.

Sawtimber
Trees that are nine inch Diameter at Breast Height (DBH) or larger and can be made into timber

Scenic Easement.
An interest in the land which allows the holder specified uses or rights without ownership of the land In this case, control of the use of land adjacent to public highways, parks, and rivers It may provide something attractive to look at within the easement area, an open area to look through to see something attractive beyond the easement itself, or a screen to block out an unsightly view beyond the easement area.

Scenic River
See Wild, Scenic and Recreation Rivers

Scoping.
The procedures by which the Forest Service determines the extent of analysis necessary for a proposed action, i e., the range of actions, alternatives, and impacts to be addressed, identification of significant issues related to a proposed action, and establishing the depth of environmental analysis, data, and task assignments needed.

Second Growth (Young Growth).
Timber stands established after natural or human-caused removal of the original stand or previous forest growth.

Seed Tree
A tree selected, and often reserved for seed collection.

Seed Tree Cutting
Similar to clearcutting, except that a few of the better trees of the desired species are left scattered over the area to provide seed for regeneration

Seedlings and Saplings
See Tentatively Suitable Forest Land.

Selection Cutting.
The annual or periodic removal of trees, individually or in small groups, from an uneven-aged forest in order to realize yield and establish a new stand of irregular constitution.

Semi-primitive Motorized
See Recreation Opportunity Spectrum.

Semi-primitive Non-motorized.
See Recreation Opportunity Spectrum

Sensitive Species.
Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in (a) population numbers or density, or (b) habitat capability that would reduce a species' existing distribution.

Separate Suitability Component (SSC).
See Tentatively Suitable Forest Land.

Seral Stage
A transitory or developmental stage of a biotic community in an ecological succession (does not include climax successional stage)

Serpentine.
A mineral or rock (serpentinite) consisting essentially of a hydrous magnesium silicate usually having a dull green color and often a mottled appearance. Term sometimes used with soil, to indicate environmental conditions found on soils derived from serpentinite or peridotite. See Ultramafic.

Shelterwood Cutting
A regeneration method under an even-aged silvicultural system A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration The mature stand is removed in two or more cuttings

Significant.
As used in NEPA, requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected region, interests, and locality Intensity refers to the severity of impacts (40 CFR 1508.27)

Silviculture.
The art and science of growing and tending forest vegetation, i e , controlling the establishment, composition, and growth of forests, for specific management goals

Silvicultural System
A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration, and according to the type of forest thereby produced

Sight Distance.
The distance at which 90 percent or more of an adult elk or deer is hidden from the view of a human.

Site Preparation.
Removal of unwanted vegetation, slash, roots, and stones from a site before reforestation.

Slash
Woody material left after logging, pruning, thinning, brush cutting, or other management activities and/or accumulating there as a result of storm, fire, or other damage.

Smolt
Juvenile salmon or steelhead which are ready to leave freshwater for the ocean They mature in the ocean before returning as adults to rivers and streams to spawn

Smolt Habitat Capability Index
An indicator of the quality of rearing habitat for young salmon or steelhead (smolt). It assumes that spawning gravels are adequate to provide sufficient spawning areas to fully seed the existing rearing habitat and that sufficient numbers of adults will escape past fishermen, dams, or natural mortality to return and fully seed the spawning gravels. It is expressed as the number of smolt which could be produced, estimating potential rather than actual production

Snag.
A standing dead tree

Spatial.
Referring to the distance, interval, or area between or within things.

Special Use Permit
A permit issued to an individual, organization, or company for use of National Forest Land for some specified purpose

Species.
Organisms that successfully reproduce among themselves and cannot reproduce successfully with other organisms

Species Diversity
The distribution and abundance of different plant and animal communities and species.

Spotted Owl Habitat Area (SOHA).
A habitat area designated to support one owl pair

Spotted Owl Management Area (SOMA).
A habitat area designated to support more than one owl pair. An outdated phrase, see Spotted Owl Habitat Area

Stand
A community of trees or other vegetation sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and so form a silvicultural or management entity.

Standard.
A principle requiring a specific level of attainment, a rule to measure against

Steelhead.
A large-sized, silvery anadromous rainbow trout

Stocking.
The degree to which trees occupy the land, measured by basal area and/or number of trees by size and spacing, compared with a stocking standard, that is, the basal area and/or number of trees required to fully utilize the land's growth potential

Strategic Minerals.
Any mineral neither found or produced in the United States in sufficient quantities to sustain the Nation during a period in which the security and/or economy of the country is threatened by a foreign power.

Stream Class.
The classification of streams according to their beneficial uses Whole streams or parts of streams can be classified One stream may be divided into several classes

Class I. Perennial or intermittent streams have one or more of the following characteristics. (1) Is the direct source of water for domestic use (cities, recreation sites, etc.), (2) Are used by large numbers of fish for spawning, rearing, or migration, (3) Flow enough water to have a major influence on water quality of a Class I stream

Class II Perennial or intermittent streams have one or both of the following characteristics· (1) Are used by moderate though significant numbers of fish for spawning, rearing, or migration, (2) Flow enough water to have a moderate influence on downstream quality of a Class I or II stream.

Class III. All other perennial streams not meeting Class I or Class II definitions.

Class IV. All other intermittent streams not meeting Class I, II, or III definitions

Streamside Management Unit (SMU)
The stream and an adjacent area of varying width where practices that might affect water quality, fish, and other resources are modified, as necessary, to meet management goals for each class of stream.

Stumpage
Standing timber or its value.

Successional Stage
A stage or recognizable condition of a plant community which occurs during its development from bare ground to climax.

Suitable Forest Land.
Land to be managed for timber production on a regulated basis Also, see Tentatively Suitable Forest Land.

Suppression Strategy.
The broad application of plans and tactics to a specific fire situation, basic strategies include confine, contain, and control.

Sustained Yield.
The achievement and maintenance in perpetuity of a high-level annual or regular periodic output of the various renewable resources of the National Forest System, without impairment of the productivity of the land.

T

Talus
The loose accumulation of fragmented rock material on slopes, especially at the base of a cliff

Temporal.
Referring to time

Tentatively Suitable Forest Land
Forest land that is producing or is capable of producing crops of industrial wood and. (a) has not been withdrawn by Congress, the Secretary, or the Chief; (b) existing technology and knowledge is available to ensure timber production without irreversible damage to soils productivity, or watershed conditions, (c) existing technology and knowledge, as reflected in current research and experience, provides reasonable assurance that it is possible to restock adequately within 5 years after final harvest; and (d) adequate information is available to project responses to timber management activities

Mature - In the context of timber -- trees or stands that have reached rotation age, generally around 100 years. In the context of wildlife -- Mature forest habitat with characteristics needed to provide habitat for species such as pine marten and pileated woodpecker (generally occurs around age 100) With regard to land type -- Lands with 100-year-old, or older, timber stands available for harvest cutting

Immature-Small Timber - With regard to land type -- Lands with well stocked timber stands less than rotation age that are suitable for commercial thinning in the next two decades

Immature-Poles - With regard to land type -- Lands with timber stands less than rotation age that do not have excess stocking available for commercial thinning

Seedlings and Saplings - With regard to land type -- Lands with non-commercial-size young stands, generally plantations.

Hardwoods - With regard to land type -- Lands occupied by hardwood stands with less than 10 MBF per acre stocking of conifer timber

Separate Suitability Component (SSC) - Lands with timber production potential less than 20 cubic feet per acre per year The vegetation on these lands was not inventoried in the 1979 timber inventory (they were arbitrarily considered noncommercial at that time)

Terrestrial.
Living on land· distinguished from aquatic (living in water)

Thermal Cover
Vegetation used by animals to modify the adverse effects of weather. A forest stand that is at least 40 feet in height with tree canopy cover of at least 70 percent These stand conditions are achieved in closed sapling-pole stands and by all older stands unless the canopy cover is reduced below 70 percent. Deciduous stands may serve as thermal cover in summer, but not in winter

Threatened Species
Any species of plant or animal which is likely to become endangered within the foreseeable future throughout all or a significant portion of its range

Timber Site Index
A measure of site productivity based on the maximum rate of tree height growth. It is normally expressed as the height in feet reached by a tree at a given or base age (the site index).

Timber Stand Improvement (TSI)
Measures such as thinning, pruning, release cutting, prescribed fire, girdling, weeding, etc , of unwanted trees with the objective of improving growing conditions of the remaining trees

Tolerance
The forestry term for expressing the relative capacity of a tree to compete under low light and high root competition·

Tolerant Trees - Trees which reproduce and form understories beneath canopies of less tolerant trees or even beneath shade of their own species

Intolerant Trees - Trees which reproduce successfully only in the open or where the canopy is greatly broken

Total Resource Information (TRI) System
A natural resource data base used on National Forests in the Pacific Northwest Region. This multimedia information system was established to provide storage and retrieval of large volumes of in-place resource data

Transportation Corridor
As used in this document, a strip of land of variable width designated to accommodate the clearing and access control of a State or Federal Highway

Tradeoff.
Foregoing certain options in the decision process to take advantage of others

Travel Corridor.
A road, trail, or waterway used by people; or a strip of land used by wildlife.

TRI Compartment
An area identified on an orthophoto map for indexing and storing data locations. Each compartment has a unique name and number.

Turbidity.
The optical property of water as affected by suspension of material such as sediment, i e , the muddy or cloudy state of water.

U

Ultramafic
Intrusive rocks composed chiefly of mafic minerals such as olivine, pyroxene, and serpentine Also called ultrabasic. See Peridotite and Serpentine

Unavailable Forest Land
Lands which have been legislatively or administratively withdrawn from timber production by law, the Secretary of Agriculture, or the Chief of the Forest Service.

Understory
Vegetation (trees or shrubs) growing under the canopy formed by taller trees

Uneven-age Management.
The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within each area, thereby maintaining a planned distribution of size classes Cutting methods that develop and maintain uneven-aged stands are single-tree and group selection

Unsuitable Land
Forest land withdrawn from timber utilization by statute or administrative regulation, or identified as not appropriate for timber production in the Forest planning process, i e., irreversible soil loss and nonreforestable within five years.

V

Viability.
Capable of living, growing, and developing

Viable Population.
A population of plants or animals large enough and distributed in such a way as to ensure their continued existence over a specified period of time, usually on the order of decades to centuries.

Viewshed.
A total landscape seen or potentially seen from specific points on a logical part of a travel route or water body.

Visual Corridor.
A series of viewsheds identified for special attention under visual quality management.

Visual Resource.
The composite of basic physiographic features and patterns, and land use effects that typify a land unit and influence the visual appeal the unit may have for visitors

Visual Quality Objective (VQO).
Measurable standards for visual resource management based on the acceptable degree of alteration of the characteristic landscape. The VQO's and their definitions are.

Preservation. Provides for ecological changes only.

Retention. Activities are not evident to the casual forest visitor

Partial Retention. Activities may be evident but must remain subordinate to the characteristic landscape.

Modification. Activities may dominate, but must utilize naturally-established form, color, and texture. These areas should appear natural when viewed in foreground or middleground situations

Maximum Modification. Activities may dominate, but should appear as a natural occurrence in background situations

W

Watershed.
The land area drained by a river system

Wetlands.
Areas that are inundated by surface or ground water with a frequency sufficient to support, and that, under normal circumstances, do or would support, a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction Wetlands generally include swamps, marshes, bogs, wet meadows, river overflows, mud flats and natural ponds

Wild, Scenic, and Recreation Rivers
Rivers or river segments which have been designated as part of the National Wild and Scenic Rivers System (Public Law 90-542, 1968) Criteria for classification are as follows:

Wild Rivers - Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America

Scenic Rivers - Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreation Rivers - Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

Wilderness.
All lands included in the National Wilderness Preservation System by public law; generally defined as undeveloped Federal land retaining its primeval character and influence without permanent improvements or human habitation

Wilderness Recreation Spectrum (WRS).
A further refinement of the *primitive* portion of the Recreation Opportunity Spectrum. The following terms deal only with officially designated wilderness:

Pristine - The most remote; generally the core area which is least accessible. The area is characterized by no trails. A *most outstanding* opportunity exists for isolation and solitude free from evidence of past human activity.

Primitive - The sights, sounds, and smells relating to human activities outside the wilderness are essentially nonexistent. The area is generally accessible by trail. An *extremely high opportunity* exists for exploring and experiencing considerable isolation, tranquility and self-reliance.

Semi-primitive - The least remote; generally areas nearest trailheads and major access points or the wilderness periphery. Opportunities for a wilderness-related experience are only *moderate*.

Wildlife Tree.
A snag or a live tree designated for wildlife habitat

Wild River
See Wild, Scenic, and Recreation Rivers.

Winter Range.
An area used by deer and elk during the winter months, usually at lower elevation and/or south and west exposures

Withdrawn
Land areas where certain uses are excluded.

Y

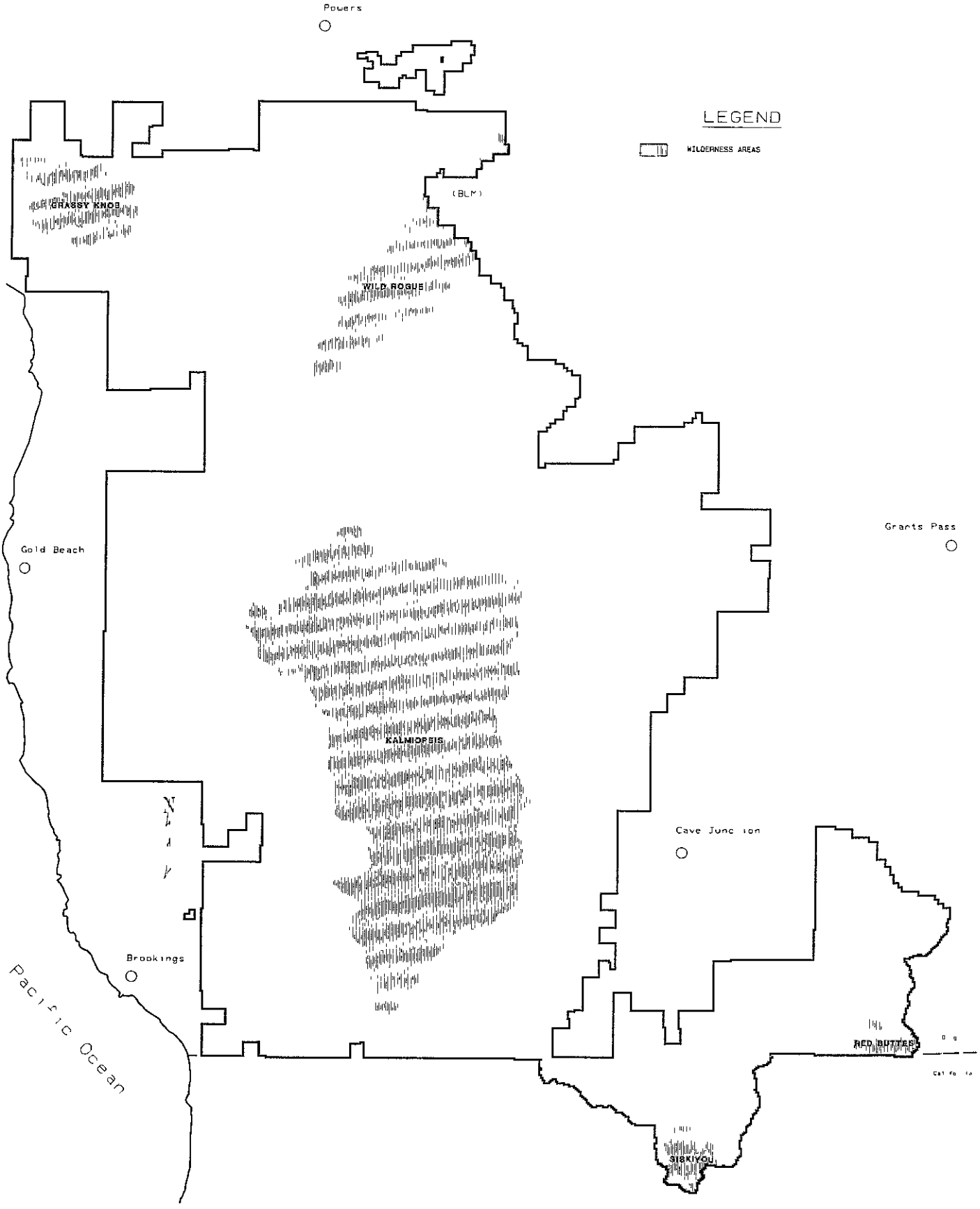
Yield Table.
A table of timber volumes expected to be produced under a specified set of conditions

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APPENDIX A

WILDERNESS MANAGEMENT PLANS



Wilderness Map

GRASSY KNOB

OVERVIEW

The Grassy Knob Wilderness consists of 17,200 acres of very steep, rugged terrain Over most of the area there is little or no evidence of past human activity. Travel in the Wilderness is difficult due to dense vegetation and the lack of maintained trails. Congressional records of the Oregon Wilderness Bill of 1984, which designated Grassy Knob as a wilderness, stated that protection of anadromous fisheries habitat is of prime importance in the Grassy Knob area. Dry Creek provides prime spawning habitat for 65 percent of the salmon and 25 percent of the steelhead in the Sixes River system In addition, Grassy Knob provides spawning habitat and cool water during critical summer months to the Elk River and the Elk River State Fish Hatchery Grassy Knob also provides an opportunity to study the Port-Orford-cedar root disease *Phytophthora lateralis*, in an undisturbed setting. The Powers Ranger District is the administrative unit responsible for management of the Wilderness.

OCCUPANCY

SITUATION

The greatest evidence of human activity within the Grassy Knob Wilderness is the timber harvest and road construction that took place in the early 1960's. At that time, Section 36 was privately owned, and the entire area was clearcut Road access was from the north in the area of China Peak. The Forest Service acquired the land in 1972. In addition, evidence of cedar harvest from as long as one hundred years ago is still evident on the lower stretches of Dry Creek No known structures or cabins are in the wilderness.

OBJECTIVE

Maintain the Grassy Knob Wilderness in a condition as free from human structures and impacts as possible.

MANAGEMENT DIRECTION

Section 36 and the road into the area are healing over naturally, though still quite evident. These areas will be left to return to a natural state Any structures found will be inventoried and evaluated for cultural resource values and a determination will be made at that time whether to remove the structures or leave them to break down with time.

RECREATION CAPACITY

SITUATION

At the present time, recreational use in the Grassy Knob Wilderness is very low, estimated to be less than 100 Recreation Visitor Days (RVD's) per year. Most of this use consists of day trips to the old Grassy Knob Lookout site for the panoramic views of the ocean that it affords The estimated capacity of the Wilderness is 4000 RVD's days per year. At the present time, the Wilderness provides a very challenging trailless experience. Suitable campsites are very limited due to steep slopes and V-shaped canyon bottoms. Along the lower 1-1/2 miles of Dry Creek, approximately 10 small bars exist that would be suitable as campsites, if trail access is provided. Summer access up Dry Creek is very good via the creek bed

OBJECTIVE

Determine actual use and insure that this level of use will not prevent the preservation of the wilderness resource and its natural condition Maintain the Wilderness for a semi-primitive, limited trail or trailless recreation experience

MANAGEMENT DIRECTION

Monitor overall use and recreational impacts on the Wilderness Potential campsites will be monitored by the Wilderness Ranger and impacts evaluated using the Limits of Acceptable Change system to determine if restrictions on use are needed At the present time, no restrictions are needed. An information board will be set up at the trailhead to Grassy Knob, and users will be encouraged to register upon entry into the wilderness so better information on use can be collected

TRANSPORTATION

SITUATION

Prior to the designation of Grassy Knob as a Wilderness, a road was constructed from the Forest Boundary in Section 19 to Section 33 Under the Wilderness Bill, this road was excluded from the wilderness. The wilderness boundary is located 33 feet on either side of the road prism. At the present time, this road is blocked by a guard rail and dirt mound in Section 32 Beyond the guard rail, the roadbed is being used as a trail to the Grassy Knob lookout site. The old road into Section 36 is blocked off at the Wilderness boundary This road is not being maintained as a trail at this time There are no proposed trail construction projects at this time, although potential projects have been identified

OBJECTIVE

Maintain the Wilderness in a condition to provide a Semi-primitive wilderness recreation experience.

MANAGEMENT DIRECTION

The road blockage of the Grassy Knob road in Section 32 will be maintained to reduce the amount of road noise in the Wilderness and to reduce road maintenance costs. The road "finger" from Grassy Knob east is a Backcountry Recreation Management Area The application of Standards and Guidelines for this area are found in Chapter IV of the Forest Plan An administrative closure under a Code of Federal Regulations (CFR) will be issued to enforce the closure The roadbed beyond the closure will be maintained as a Level II trail to the lookout site The road into Section 36 will not be maintained as a trail. No other trails are planned for construction or maintenance, though potential trail locations have been identified if the decision is made at a later date to develop a trail system in the Wilderness

COMMERCIAL OPERATIONS

SITUATION

There are sixteen mining claims on the boundary of the Wilderness along the Elk River and three on the boundary of Butler Creek. In addition, nine claims are in the Wilderness on the slopes above the Elk River None of these claims are active, and only one has proposed an operations schedule. The Forest Service is disputing the validity of this claim No special use permits have been issued, and there are no outfitter or guide operations in the wilderness.

In the Wilderness Bill, provisions were made to allow tailholds in the Wilderness for the China Peak Timber Sale, which had been sold and the roads constructed prior to the enactment of the Bill

OBJECTIVE

Minimize or eliminate any adverse impacts on the wilderness resource resulting from commercial operations.

MANAGEMENT DIRECTION

Insure that any operating plans submitted for mining operations in the Wilderness are compatible with the Wilderness objectives and contain the appropriate rehabilitation measures to insure that the wilderness resource is protected and returned to a natural condition to the greatest extent possible Prior to approval of any operating plan, a mineral examination will be conducted to determine the validity of the mining claim. Collect K-V funds to clean up and remove any evidence of logging where tailholds were used in the wilderness

FIRE

SITUATION

The present fire frequency is very low with only one recorded fire in the Wilderness in the last 60 years, the last major fire occurring in 1929 Historical records and vegetative types in the wilderness show that fire has played an important role in vegetative development. Fires were high intensity due to steep slopes and the fuel types present, resulting in stand replacement on the north slopes, and conversion to, or maintenance of, brush fields on the south slopes Major man-caused fires in the late 1800's swept through most of Grassy Knob The large conifers date to this period.

OBJECTIVE

The principle objective for fire management is to minimize the total acres and intensity of burns over time The protection of water quality and associated fish habitat, and maintenance of the natural functioning of this tanoak/Douglas fir ecosystem are the primary goals of protection.

MANAGEMENT DIRECTION

Fire suppression strategies and tactics developed in the Escaped Fire Situation Analysis (FSM 5132.1) should provide for the least acres burned Both the short-term and long-term effects of the selected fire suppression strategy and tactics on water quality, and fish habitat need to be clearly displayed.

Fire suppression efforts will emphasize direct attack whenever possible. The use of mechanized equipment and aerial retardant in the Wilderness requires prior approval by the Forest Supervisor A more thorough description of fire suppression techniques allowed in the Wilderness are found in the Fire Management Action Plan for the Siskiyou National Forest

Prevention efforts will be concentrated on reaching the users prior to entering the wilderness Areas of emphasis in the prevention effort should be on protection of anadromous fisheries habitat from the adverse effects of wildfire, and personal safety of the user. Because of the dense vegetation and steep slopes, travel is slow, and escape from a wildfire would be difficult for wilderness users.

KALMIOPSIS OVERVIEW

The harsh, rugged terrain, coupled with the unique botanical values and mining history, give the Kalmiopsis Wilderness a character much different than most Pacific Northwest Wilderness areas The management emphasis for the Kalmiopsis is aimed at preserving the natural ecosystem and sensitive plants, as well as providing a place a visitor can experience solitude in a natural environment. The Chetco, Galice, and Illinois Valley Ranger Districts are the administrative units responsible for management of the Wilderness

OCCUPANCY

SITUATION

As a result of past and current mining activities, there are numerous facilities and disturbances that are non-conforming with the Wilderness concept They are:

CABINS

1. Emily
2 Petersen
3 Benjamine
4. Hilltop
5 Copper Creek
6 McTimmonds
7. Numerous ruins of other old cabins

LOOKOUTS

1. Pearsoll Peak

MINING EQUIPMENT AND DISTURBANCE

1 Along Little Chetco River
2 Bowers Mine
3 Carter Creek
4. Slide Creek
5. Taggarts Bar
6. Sluice Creek/Mouth Box Canyon Creek
7. Gold Basin
8. McTimmonds
9 Hilltop

Makeshift cabins and shelters have also occasionally been constructed

OBJECTIVE

Remove existing improvements, structures, equipment and facilities not essential to the protection of the Wilderness resource or to support valid mining operations. Restore the site to pre-existing condition as much as possible and let nature do the rest.

MANAGEMENT DIRECTION

A cultural resource evaluation will be carried out for non-conforming facilities, and appropriate National Historic Preservation Act (1980 amendments) compliance procedures will be followed, including consideration of a range of options to avoid or minimize adverse effects A mining claim validity determination will be made for any facilities recommended for removal. Do not maintain or permit others to maintain these facilities.

RECREATION CAPACITY

SITUATION

Although lightly used overall, there are two areas that are easily accessible and are receiving heavy use.

Present use is approximately 20,100 RVD's.

The capacity is approximately 29,300 RVD's. Although the present use is well below capacity, the Babyfoot Lake area is experiencing overuse

Limits of Acceptable Change concept will be applied to the heavy use areas by 1989 Some of those areas are:

HEAVY USE AREAS

1. Babyfoot Lake
2 Vulcan Lake
3. Mouth of Slide Creek

OBJECTIVE

Determine and manage a standard and capacity of visitor use that preserves the Wilderness resource and opportunities for Wilderness recreation.

MANAGEMENT DIRECTION

Specific direction for each zone (Primitive Trailless, Primitive Trailed, Semi-primitive) is contained in Wilderness Management Area Prescription, Chapter IV, of the Forest Plan.

CORRECTIVE ACTION

The following are specific areas where corrective actions should be implemented during the planning decade. Some of these actions may currently be in effect or planned.

Continue to eliminate nonvalid mining activity in the Babyfoot Lake Area.

Establish and monitor Limits of Acceptable Change.

TRANSPORTATION

SITUATION

There are numerous old mining roads and trails that provide the main transportation network. Some of the roads are occasionally traveled by miners in motorized vehicles as permitted in their Operating plans

Because of rugged terrain and dense brush, cross-country travel is extremely difficult and seldom attempted.

TRAILHEADS

There are thirteen trailhead or entry points into the Wilderness. Improvements are minimal and may consist of only a sign on a post and a registration box. The trailheads are:

1 Babyfoot Parking Area
2 Onion Camp
3 Chetco Pass
4 Briggs Creek
5. Rough and Ready Lakes
6 Sourdough Camp
7. Vulcan Lake
8. Chetco Divide
9 Upper Chetco Trail
10 Pupps Camp Trail
11. Red Mountain
12 Game Lake
13. Oak Flat

TRAILS

Many of the trails are in a relatively primitive condition Although most are passable by pack animals, they are narrow, steep and often treacherous. The serpentine-peridotite geologic formation is very hard on dogs' feet and usually results in a very sore-footed dog within a day or two.

1. There are 153 miles of existing trails
2 There are 28 miles of proposed trails that would open up new areas to Wilderness users
3. There are 120 miles of potential trails that could be added, to more evenly distribute use throughout the area.

ROADS

There are approximately 27 miles of old mining roads within the Wilderness that are sometimes used by miners with motorized vehicles to access their claims.

HELISPOTS

Some helispots have been constructed prior to creation of the Wilderness, but are no longer maintained.

RIVER USE

The Illinois River and, to a very minor degree, the Chetco River are used for white water raft and kayak trips Use of the Illinois is addressed in the Illinois Wild and Scenic River Management Plan (1985).

OBJECTIVE

Provide and maintain a trail system to a standard that will meet legal direction, and management needs for protecting resources and distributing visitor use, eliminating duplication of routes, and minimizing maintenance costs Roads will be converted to hiking trails when they are no longer needed for mining Temporary helispots may be constructed on a limited basis for the management of suppression and prescribed fire activities

MANAGEMENT DIRECTION

Modify trail maintenance and construction standards in order to achieve Wilderness objectives Modified standards can address clearing widths, "step-over" logs, alignment, maximum grade, bridges, and drainage

Develop and implement a trail relocation and reconstruction plan that emphasizes correction of poor alignment, reconstruction of old roadbeds, and design to distribute use away from overused areas

COMMERCIAL OPERATION

SITUATION

There are numerous mining claims within the Wilderness that are in various stages of activity and development. Access to the claims and activities on the claims frequently involve motorized equipment.

Excluding the Illinois River raft trips, outfitter guide use is light There has and will continue to be a demand for some commercial outfitter guide permits.

A mining access road built under a Special Use Permit still exists and is occasionally traveled by motorized vehicles for mining purposes.

OBJECTIVE

Reduce or eliminate the adverse effects on the Wilderness environment caused, or contributed to, by non-conforming uses or activities

MANAGEMENT DIRECTION

After a mining claim validity determination and a cultural resource evaluation, facilities and activities that are not authorized will be eliminated.

FIRE MANAGEMENT

SITUATION

The Wilderness is located in difficult terrain with heavy fuels accumulations in many places. Fuels consist mostly of dense brush but vary from dense forest growth to very open scattered Jeffrey pine and scattered grass The area has a history of large fires, the most recent being the 53,340 acre Silver lightning fire in 1987, preceded by the 34,627-acre Cedar Camp lightning fire in 1938 Many of the historic fires have been high intensity fires, resulting in stand replacement on the north slopes and conversion to, or maintenance of, brush fields on the south slopes. Portions of the Wilderness lend themselves well to the use of "confine" or "contain" strategies. The Illinois National Wild and Scenic River is located in the northeast portion of the Wilderness.

OBJECTIVE

The primary objectives for fire management activities are:

1. Maintain the natural ecosystems of the area and allow fire to play its role in those ecosystems.
2 Reduce the risks and consequences of wildfire in the Wilderness and adjacent areas.

MANAGEMENT DIRECTION

A fire management plan, emphasizing prescribed fire from both planned and unplanned ignitions, should be developed and implemented to ensure the maintenance of the natural ecosystems in the Wilderness and reduce the risk presented to Wilderness resources and adjacent resources caused by the unnatural accumulation of fuels.

A thorough description of fire suppression techniques allowed in the Wilderness should be presented in a fire management action plan. The use of mechanized equipment and aerial retardant in the Wilderness requires prior approval by the Forest Supervisor.

The use of "confine" and "contain" suppression strategies may be appropriate under all burning conditions



WILD ROGUE

OVERVIEW

The Wild Rogue Wilderness was established by the Endangered American Wilderness Act of 1978 (Public Law 95-237). Two provisions of that Act have directed some unusual management considerations for this Wilderness.

The first situation involves the Rogue National Wild and Scenic River, which bisects the Wild Rogue Wilderness. The river was designated a component of the National Wild and Scenic Rivers System by the original Wild and Scenic Rivers Act (1968). The 1978 Wilderness legislation states in part, "...certain lands ...shall be known as the Wild Rogue Wilderness: Provided, That the portion of the segment of the Rogue River designated as a component of the National Wild and Scenic Rivers System which lies within the Wild Rogue Wilderness shall be managed as a wild river *notwithstanding section 10(b) of that Act* (meaning the river act) *or any provision of the Wilderness Act to the contrary* .." (emphasis and parenthetical comment added). This provision was included in recognition of certain established uses (including motorboats) along the river corridor which are not in conformance with the Wilderness concept, but which Congress did not wish to eliminate. The effect of this provision is that, within the Wilderness boundary, the areas north and south of the river are managed in accordance with the Wilderness Act (1964), but the river corridor is managed as a separate entity

The second unusual situation involves public domain land located within the boundaries of the Wild Rogue Wilderness. This land would normally be administered by the Bureau of Land Management, an agency of the Department of the Interior. The 1978 wilderness legislation, in a paragraph titled "Administration of Wilderness Areas," states in part "...each Wilderness area designated by this Act shall be administered by the Secretary ". Elsewhere, the Act states that the "Secretary" is the Secretary of Agriculture. The Bureau of Land Management and the Forest Service reviewed the Act and agreed that the entire Wilderness, including that portion outside the Siskiyou National Forest boundary, should be administered by the Forest Service for purposes of efficiency. If some form of trespass or other legal problem should occur in this portion of the Wilderness, Bureau of Land Management enforcement authority will have to be utilized

The Wild Rogue Wilderness is characterized by rugged, heavily timbered canyons and is located mostly on the Gold Beach Ranger District, with minor portions located on the Galice and Powers Districts plus the aforementioned public domain lands The Gold Beach District is the administrative unit responsible for management of the Wilderness.

OCCUPANCY

SITUATION

There are some existing facilities within the Wilderness that are not in conformance with wilderness concepts or objectives These include:

NONCONFORMING FACILITIES

1. Various abandoned mining cabins and other mining related structures.
2. A seldom used mine and mill site, at which mechanized equipment is used to process ore.
3. Some short water lines and one small concrete dam serving private property located in the river corridor
4 One road used infrequently to access a mining claim, and several abandoned roads.

There are also some structures on private land within the Wilderness, but because they are not on public land, they are not within the scope of management direction.

OBJECTIVE

Remove those non-conforming improvements or facilities that are not essential to protection of the Wilderness or which do not have historical significance.

MANAGEMENT DIRECTION

The older mining structures will be evaluated for significance as cultural resources Those that do have historical value will be retained, but will not receive any maintenance or other preservation effort Other non-conforming structures will be removed. The water lines serving private property may remain because they existed prior to the Wilderness designation, but should any of these become unused they will be removed The mining road will remain if its use is valid under the mining laws; otherwise it is to be blocked to vehicles and revegetated.

RECREATION CAPACITY

SITUATION

No area of the Wilderness is being used in excess of capacity.

Carrying capacity is calculated to be 6,000 RVD's

Because recreational use of the Wilderness is low, there are no unacceptable impacts occurring as a result of this type of activity.

OBJECTIVE

Determine a capacity and manage a standard of visitor use that recognizes the Wild and Scenic River values and preserves the Wilderness values.

MANAGEMENT DIRECTION

Expand the carrying capacity by construction of approximately 10 miles of new trail. Monitor levels of use to insure that recreation use does not prevent the maintenance of the Wilderness character of the area

TRANSPORTATION

SITUATION

Although there were a number of trails and several roads constructed in this area in the past, very little of this system is currently maintained. A description of the transportation system is outlined below:

TRAILHEADS

The only active trailheads are those for the Mule Creek Trail, Panther Ridge Trail and the Mt Bolivar Trail.

TRAILS

Existing

Trails currently being maintained are the above-mentioned, Mule Creek (lower end only), Panther Ridge and Mt Bolivar Trails.

Proposed

There are several abandoned trails that can be reconstructed and would be appropriate for Wilderness uses These include the following.

1. Remainder (upper portion) of the Mule Creek Trail
2. Several unnamed trails in the historic Marial mining district
3. Clay Hill Trail
4. The Bob's Garden Cut-Off (East Creek) and Fall Creek
5. Trails on the south side of the river.

Potential

New trails that could be added to the system include a second connection between the Rogue River and Panther Ridge Trails, and a trail to the Pinnacle Peak area

ROADS

There is a four-wheel-drive road accessing the Old Red Mine in the Mule Creek area, and some abandoned logging roads at Watson Creek The logging roads date from the time that a section of land was in private ownership and have become vegetated since the land was acquired by the Forest Service

HELISPOTS

No permanent helispots are maintained in the wilderness.

OBJECTIVE

Provide and maintain a trail system that meets Wilderness management needs. Close the mining road and facilitate growth of native vegetation to help return it to a natural state

MANAGEMENT DIRECTION

Conduct a mineral exam at the Old Red Mine to determine if the claim and use of the road are valid. Close the road if the use is not valid or if the claim is abandoned. Temporary helispots may be constructed on a limited basis for the management of suppression and prescribed fire activities. Trail construction and maintenance will be to a reduced standard for most of the trails, in keeping with wilderness values.

COMMERCIAL OPERATIONS

SITUATION

Commercial operations in the Wilderness are sporadic, and in recent times have been limited to mining This mining activity has been located in the Mule Creek area only. There are no outfitter-guide special use permits in effect at the present time.

OBJECTIVE

Prevent, minimize and/or mitigate (rehabilitate) those mining activities that have adverse impacts on the Wilderness values Allow limited outfitter-guide services that meet a legitimate public need for use of the wilderness.

MANAGEMENT DIRECTION

Mining claims for which operations are proposed are to be reviewed to determine if such claims are valid Operating plans for valid claims are to include reasonable conditions to protect wilderness values, but which do not interfere with the statutory rights of claimants

Proposals for outfitter-guide special use permits may be approved if the operations meet a public need associated with legitimate use of the Wilderness Self-outfitted use of the Wilderness will be favored, however, and commercial use may be restricted or reduced as necessary to allow for other public use

FIRE

SITUATION

The Wilderness is located in steep canyon country with difficult terrain and heavy fuel accumulations in many places. Fine "flashy" fuels, such as grass, are commonly found adjacent to high use areas and extend to the brush and timber on the middle and upper slopes The Wilderness itself has not had a history of major fires in recent years, but there have been fires in adjacent areas and other portions of the canyon However, the hazard is high, and the risk is great Fire has played a significant role in the development of the vegetation present in the canyon today. The Rogue National Wild and Scenic River is a heavily used white water and fishing river. Located within this river corridor are privately owned lodges and summer homes. Because of the relatively small size and the narrow shape of this Wilderness and the presence of the Wild and Scenic River, the area does not lend itself to "confine" or "contain" suppression strategies

OBJECTIVE

There are four primary management objectives for fire suppression and other fire and fuels related activities that may take place in the Wilderness. These are

1. Protecting life and property in the river corridor.
2. Reducing the risks and consequences of a wildfire in the Wilderness
3. Maintaining the natural ecosystems of the Wilderness.
4. Providing for the least possible impact to visitors to the Wild and Scenic River

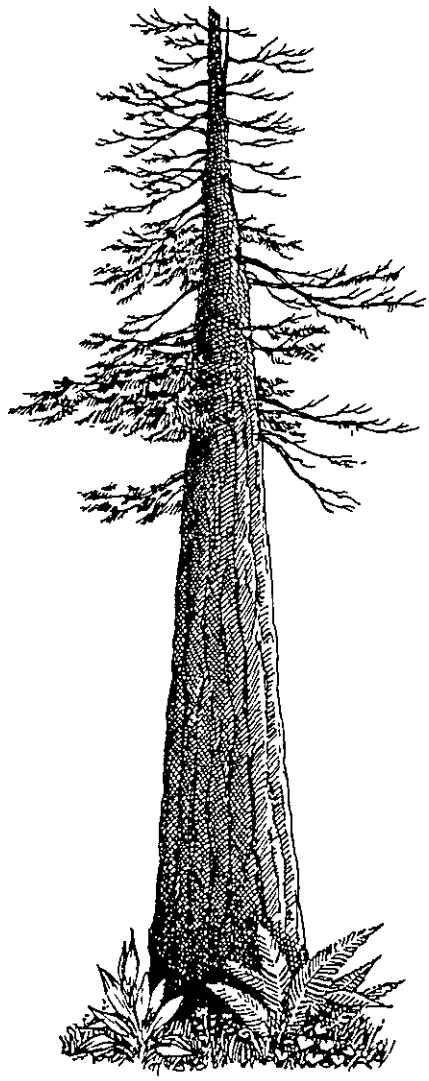
MANAGEMENT DIRECTION

Fire suppression strategies and tactics developed in the Escaped Fire Situation Analysis (FSM 5132.1) should provide for a high degree of public safety and the least amount of operational impairment. Closure of the Rogue River corridor to use by the public should be avoided in all but the extreme cases due to the following reasons:

1. Such a closure would be of limited effectiveness, because it could take up to three days for rafters already on the river to float out of the canyon.
2. Denial of the chance to float the river would be a greater hardship than normal for affected recreationists, because of the permit reservation system which limits access to the Rogue
3. Loss of income that would be suffered by the tour boat services, outfitter-guides, and commercial lodges in the corridor.

Suppression tactics which most protect the Wilderness values and adhere to accepted wilderness fire fighting principles will be used. The use of mechanized equipment and aerial retardant in the Wilderness requires prior approval by the Forest Supervisor A more thorough description of fire suppression techniques allowed in the Wilderness are found in the Fire Management Action Plan for the Siskiyou

National Forest Snags within a fire will be left standing when they do not constitute an unacceptable hazard. Following suppression activities, sites will be restored as appropriate



APPENDIX B

PROJECTED BUDGET

INTRODUCTION

The following tables, B-1 through B-9, depict the activities and projects (capital investments) necessary to provide the level of outputs and services identified in the Forest Plan.

Table B-1 displays information included in the budget proposal submitted for the Fiscal Year 1991. Final approval of the budget proposal is pending; some changes are likely to occur due to the requested level differing from approved funding. The costs associated with activities listed in Table B-1 may not include all costs identified with projects and activities scheduled for Fiscal Year 1991 in Tables B-2 through B-9 since the latter tables were developed subsequent to the date required for revising the 1991 budget

Definitions for the column headings used in the tables are provided below:

Activity Name	Action taken to manage natural resources
Activity Code or Acty	An alpha-numeric label for an activity or grouping of activities
Fund Code or Fund	An alpha label used for budgeting purposes.
Measure or Meas	A quantity descriptor of an activity, used when applicable
Unit	A quantification of measure, used when applicable
M $	Estimated costs in thousands of 1989 dollars
Project Name	Used in tables B-2 through B-9 to indicate a specific capital investment project or work activity.
FY	Fiscal Year.
Preconst	Preconstruction.
Const	Construction.
Struc	Structure.
RD	Ranger District: Chetco=01; Galice=02, Gold Beach=03, Illinois Valley=04; Powers=05; Multi-District=09, Forest-wide=11
Pri	Priority for project funding.
Plan	Used in tables B-4 and B-5 to indicate an expected output, generally in report form, resulting from project completion.
Road No.	Forest Development Road Number.

Table B-1 Budget Proposal Submitted for Fiscal Year 1991

Activity Name	Activity Code	Fund Code	Measure	Unit	M $
Cultural Resource Activities	AC	NFCR	-	-	100 0
Recreation Resource Preparation	AN11	NFRN	-	-	160 0
Recreation Resource Administration	AN12	NFRN	-	-	517 0
Recreation Resource Improvements	AN22	CNRF	PAOT	930	506 0
Recreation Resource Improvement Maintenance	AN23	NFRN	PAOT	1,440	458 0
Trail Operations	AT1	NFTR	-	-	62 0
Trail Construction	AT22	CNTR	MILES	18	101 0
Trail Maintenance	AT23	NFTR	MILES	240	137 0
Visual Resource Activities	AV	NFVR	-	-	45 0
Wilderness Resource Activities	AW	NFRN	-	-	134 0
Fish Operations	CF1	NFWF	-	-	327 0
Resident Fish Structure Improvement	CF221-1	CWKV	STRUC	28	22 0
Anadromous Fish Structure Improvement	CF221-2	CWKV	STRUC	96	103 0
Anadromous Fish Structure Improvement	CF221-2	NFWF	STRUC	246	289 0
Resident Fish Non-Structural Improvement	CF221-1	CWKV	ACRES	10	7 0
Anadromous Fish Non-Structural Improvement	CF222-2	CWKV	ACRES	10	7 0
Anadromous Fish Non-Structural Improvement	CF222-2	NFWF	ACRES	10	7 0
Fish Habitat Improvement Maintenance	*CF23*	*NFWF*	*STRUC*	*110*	*37 0*
Threatened and Endangered Operations	CT1	NFWF	-	-	224 0
Threatened and Endangered Structure Habitat Improvement	CT221	CWKV	STRUC	3	3 0
Threatened and Endangered Structure Habitat Improvement	CT221	NFWF	STRUC	3	3 0
Threatened and Endangered Non-Structural Improvement	CT222	CWKV	ACRES	5	3 0
Threatened and Endangered Non-Structural Improvement	CT222	NFWF	ACRES	400	100 0
Threatened and Endangered Improvement Maintenance	CT23	NFWF	-	-	2 0
Wildlife Operations	CW1	NFWF	-	-	206 0
Wildlife Habitat Structure Improvement	CW221	CWKV	STRUC	269	310 0
Wildlife Habitat Structure Improvement	CW221	NFWF	STRUC	113	104 0
Wildlife Non-Structural Improvement	CW222	CWKV	ACRES	600	66 0
Wildlife Non-Structural Improvement	CW222	NFWF	ACRES	1,315	179 0
Wildlife Habitat Improvement Maintenance	CW23	NFWF	-	-	31 0
Range Resource Operations	DN1	NFRG	AUM	3,000	73 0
Range Resource Structure Improvement	DN221	NFRG	STRUC	1	2 0
Range Non-Structural Improvement	DN222	NFRG	ACRES	20	2 0
Range Non-Structural Improvement	DN222	RBRB	ACRES	10	1 0
Range Resource Improvement Maintenance	DN23	NFRG	-	-	2 0
Noxious Farm Weeds	DN24	NFRG	ACRES	60	10 0
Extensive Timber Inventory	ET111-1	NFTM	-	-	46 0
Silviculture Examination and Prescription	ET111-2	NFTM	ACRES	19,500	296 0
Timber Resource Planning	ET112	NFTM	-	-	270 0
Timber Resource Coordination	ET113	NFAF	-	-	205 0
Timber Resource Coordination	ET113	NFCR	-	-	133 0
Timber Resource Coordination	ET113	NFGE	-	-	142 0
Timber Resource Coordination	ET113	NFSW	-	-	335 0
Timber Resource Coordination	ET113	NFVR	-	-	118 0
Timber Resource Coordination	ET113	NFWF	-	-	262 0
Timber Sale Preparation	ET114	NFTM	MMBF	149	2,042 0
Timber Sale Preparation	ET114	SSSS	MMBF	5	454 0
Timber Harvest Administration	ET12	NFTM	MMBF	173	1,157 0
Timber Harvest Administration	ET12	SSSS	MMBF	5	164 0
Reforestation	ET24	CWKV	ACRES	6,435	3,352 0
Reforestation	ET24	NFRI	ACRES	400	298 0
Timber Stand Improvement	ET25	CWKV	ACRES	5,720	2,259 0
Timber Stand Improvement	ET25	NFRI	ACRES	9,280	1,930 0
Genetic Tree Activities	ET27	NFRI	-	-	718 0
Air Resource Inventory	FA111	NFSW	-	-	49 0
Air Resource Planning	FA112	NFSW	-	-	6 0
Soil Inventory	FW111-1	NFSW	ACRES	100	83 0

Table B-1. Budget Proposal Submitted for Fiscal Year 1991 (Continued)

Activity Name	Activity Code	Fund Code	Measure	Unit	M $
Watershed Resource Planning	FW112	NFSW	-	-	70 0
Watershed Resource Administration	FW12	NFSW	-	-	99 0
Watershed Improvements	FW22	CWKV	ACRES	270	151 0
Watershed Improvements	FW22	NFSW	ACRES	180	124 0
Watershed Improvement Maintenance	FW23	NFSW	-	-	21 0
Minerals And Geology Resource Preparation	GM11	NFGE	-	-	83 0
Minerals And Geology Resource Preparation	GM11	NFMC	-	-	10 0
Minerals And Geology Resource Preparation	GM11	NFME	-	-	2 0
Minerals And Geology Resource Preparation	GM11	NFML	-	-	37 0
Minerals And Geology Resource Administration	GM12	NFMC	-	-	4 0
Minerals And Geology Resource Administration	GM12	NFME	-	-	22 0
Minerals And Geology Resource Administration	GM12	NFML	-	-	208 0
Lands Inventory	JL111	NFLA	-	-	10 0
Special Use Administration (Non-Recreation)	JL122	NFLA	CASES	130	45 0
Land Ownership Administration	JL123	NFLA	CASES	1	5 0
Lands Activity Maintenance	JL23	NFLL	-	-	41 0
Landline Location	JL24	NFLL	MILES	21	141 0
Rights-of-Way	JL25	CNGP	MILES	5	37 0
Rights-of-Way	JL25	CNTM	MILES	5	41 0
Land Purchase	JL261	LALW	ACRES	455	254 0
Land Exchange	JL263	NFLA	ACRES	300	32 0
Facility Improvement Preparation	LF21	CNFA	-	-	10 0
Facility Construction	LF22	CNFA	-	-	688 0
Facility Maintenance	LF23	CWFS	-	-	2 0
Facility Maintenance	LF23	NFFA	-	-	300 0
Transportation Administration	LT12	NFRD	-	-	17 0
Road And Bridge Administration	LT122	CNGP	-	-	8 0
Road And Bridge Administration	LT122	CNRN	-	-	5 0
Road And Bridge Administration	LT122	CNTM	-	-	110 0
Road And Bridge Support	LT123	CNGP	-	-	11 0
Road And Bridge Support	LT123	CNRN	-	-	10 0
Road And Bridge Support	LT123	CNTM	-	-	578 0
Road And Bridge Preconstruction-Construction	LT2141	CNRN	-	-	2 0
Road And Bridge Preconstruction-Construction	LT2141	CNTM	-	-	677 0
Road And Bridge Preconstruction-Reconstruction	LT2142	CNRN	-	-	5 0
Road And Bridge Preconstruction-Reconstruction	LT2142	CNTM	-	-	770 0
Road And Bridge Construction Administration	LT2211	CNRN	MILES	2	21 0
Road And Bridge Construction Administration	LT2211	CNTM	MILES	63	533 0
Road And Bridge Reconstruction Administration	LT2212	CNRM	MILES	5	31 0
Road And Bridge Reconstruction Administration	LT2212	CNTM	MILES	125	481 0
Road And Bridge Construction Contracts	LT222	CNRN	MILES	2	360 0
Road And Bridge Construction Contracts	LT222	CNTM	MILES	10	1,276 0
Road And Bridge Construction Contracts	LT222	PUCR	MILES	50	4,644 0
Road Reconstruction Contracts	LT223	CNRN	MILES	10	1,125 0
Road Reconstruction Contracts	LT223	CNTM	MILES	7	1,158 0
Road Reconstruction Contracts	LT223	PUCR	MILES	120	4,128 0
Bridge Reconstruction Contracts	LT225	CNRN	EACH	1	72 0
Road And Bridge Maintenance	LT23	CWFS	-	-	1,553 0
Road And Bridge Maintenance	LT23	NFRD	MILES	2,930	1,614 0
Land Management Planning	ML	CNGP	-	-	60 0
Land Management Planning	ML	NFAF	-	-	60 0
Land Management Planning	ML	NFML	-	-	60 0
Land Management Planning	ML	NFRN	-	-	60 0
Land Management Planning	ML	NFSW	-	-	60 0
Land Management Planning	ML	NFTM	-	-	240 0
Land Management Planning	ML	NFWF	-	-	60 0
Fire Management Preparation	PF11	NFAF	-	-	1,291 0
Fuels Improvement	PF2	BDBD	ACRES	5,000	1,936 0
Fuels Improvement	PF2	NFAF	ACRES	400	107 0

Table B-1 Budget Proposal Submitted for Fiscal Year 1991 (Continued)

Activity Name	Activity Code	Fund Code	Measure	Unit	M $
Law Enforcement Activities	PL121	NFCL	-	-	97 0
Law Enforcement Activities	PL122	NFCL	-	-	155 0
Law Enforcement Activities	PL131	NFCL	-	-	41 0
Law Enforcement Activities	PL132	CNGP	-	-	5 0
Law Enforcement Activities	PL132	NFAF	-	-	29 0
Law Enforcement Activities	PL132	NFML	-	-	24 0
Law Enforcement Activities	PL132	NFRN	-	-	72 0
Law Enforcement Activities	PL132	NFTM	-	-	111 0
Line Management	TG3	BDBD	-	-	78 0
Line Management	TG3	CWFS	-	-	242 0
Line Management	TG3	SSSS	-	-	96 0
Program Support	TG4	BDBD	-	-	224 0
Program Support	TG4	CWKV	-	-	979 0
Program Support	TG4	NFGA	-	-	1,381 0
Total					47,753 0

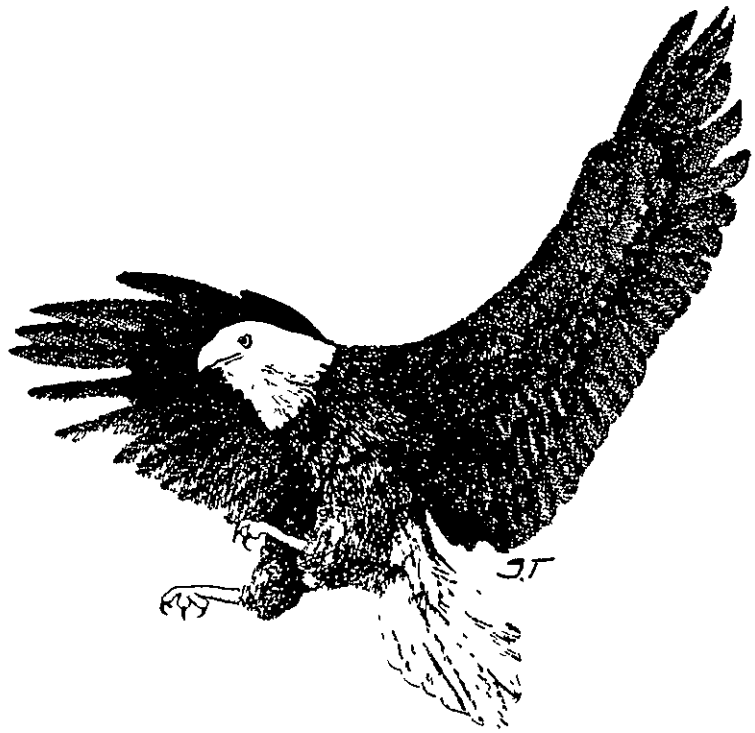


Table B-2 is a projected five-year schedule of recreation capital investments

Table B-2. Recreation Capital Investments

Project Name	Acty	Fund	FY	Pri	Pre-Const	Const	Meas	Unit	M $
Winchuck Rehabilitation	AN22	CNRF	89	1	X		PAOT	0 0	4 9
Daphne Grove Campground	AN22	CNRF	89	2	X		PAOT	0 0	3 0
Sam Brown Group Site	AN2	CNRF	89	3	X		PAOT	0 0	15 0
Illahe Campground	AN2	CNRF	89	4	X		PAOT	0 0	5 0
Cave Creek Campground	AN22	CNRF	89	5		X	PAOT	0 0	7 5
Quosatana Boat Ramp	AN22	CNRF	89	6		X	PAOT	60 0	60 0
Year Total			89					60 0	95 4
Quosatana Campground Rehabilitation	AN22	CNRF	90	1	X		PAOT	0 0	12 3
Bolan Lake Campground	AN22	CNRF	90	2	X		PAOT	0 0	8 6
Sunshine Bar Campground	AN22	CNRF	90	3	X		PAOT	0 0	15 0
Shasta Costa Overlook	AN2	CNRN	90	4	X		PAOT	0 0	2 0
Bear Camp Overlook	AN2	CNRN	90	5	X		PAOT	0 0	2 0
Winchuck Rehabilitation	AN22	CNRF	90	6		X	PAOT	35 0	174 1
Daphne Grove Campground	AN22	CNRF	90	7		X	PAOT	90 0	55 0
Sam Brown Campground	AN22	CNRF	90	8		X	PAOT	215 0	168 0
Illahe Campground	AN22	CNRF	90	9		X	PAOT	0 0	25 0
Year Total			90					350 0	462 0
Illinois River Recreation Site	AN22	CNRF	91	1	X		PAOT	0 0	10 5
Shasta Costa Overlook	AN2	CNRN	91	2		X	PAOT	20 0	23 0
Bear Camp Overlook	AN2	CNRN	91	3		X	PAOT	20 0	23 0
Little Redwood Campground	AN22	CNRF	91	4	X		PAOT	0 0	7 0
Maple Campground Rehabilitation	AN22	CNRF	91	5	X		PAOT	0 0	8 5
Quosatana Campground Rehabilitation	AN22	CNRF	91	6		X	PAOT	70 0	123 0
Bolan Lake Campground	AN22	CNRF	91	7		X	PAOT	20 0	96 0
Sunshine Bar Campground	AN22	CNRF	91	8		X	PAOT	70 0	300 0
Year Total			91					200 0	591 0
Squaw Lake Campground	AN22	CNRF	92	1	X		PAOT	0 0	5
Illinois River Recreation Sites Phase 2	AN22	CNRF	92	2	X		PAOT	0 0	20 6
Butler Bar Campground Rehabilitation	AN22	CNRF	92	3	X		PAOT	0 0	1 0
Illinois River Recreation Sites Phase 1	AN22	CNRF	92	4		X	PAOT	170 0	728 0
Little Redwood Campground	AN22	CNRF	92	5		X	PAOT	80 0	71 0
Maple Campground Rehabilitation	AN22	CNRF	92	6		X	PAOT	60 0	63 0
Year Total			92					310.0	884 1
Rock Creek Campground	AN22	CNRF	93	1	X		PAOT	0 0	2 0
Elk Creek Falls	AN22	CNRF	93	2	X		PAOT	0.0	1 5
Squaw Lake Campground	AN22	CNRF	93	3		X	PAOT	25 0	125 0
Illinois River Recreation Sites Phase 2	AN2	CNRF	93	4		X	PAOT	140 0	352 0
Butler Bar Campground Rehabilitation	AN22	CNRF	93	5		X	PAOT	80 0	18 2
Year Total			93					245 0	498 7

Table B-2a shows future recreation capital investment opportunities beyond Fiscal Year 1993

Table B-2a. Recreation Capital Investment Opportunities

Project Name	Pre-Const	Const	M $/Year
CHETCO RANGER DISTRICT			
Chetco Recreation Roads	0 0	125 0	0 5
Ludlum Place Campground Expansion	0 0	0 0	3 7
Redwood Nature Trail Parking Lot	2 0	30 0	0 5
Low Water Bridge Site Improvement	0 0	42 0	1 0
Little Redwood Campground Rehabilitation	0 0	0 0	4 0
Dispersed Sites Development	15 0	295 0	6 5
Steel Bridge Camp/Road Development	5 0	90 0	4 0
Fourth of July Creek Campground Development	5 0	45 0	3 0
Biker Campground Development	5 0	45 0	3 0
GALICE RANGER DISTRICT			
Sam Brown Group Site	0 0	0 0	8 0
Big Pine Campground Rehabilitation	12 0	157 0	8 0
Spalding Pond Camp Improvement	5 0	33 0	6 0
Little Silver Lake Camp Improvement	6 0	37 0	4 0
Shan Creek Viewpoint Improvement	2 0	25 0	4 0
Bear Camp Pasture Improvement	2 0	27 0	4 0
Meyers Creek Camp Improvement	2 0	27 0	4 0
Tin Can Camp Improvement	2 0	24 0	4 0
Secret Creek Camp Improvement	2 0	29 0	4 0
Briggs Valley Camp Improvement	2 0	27 0	4 0
Taylor Falls Site Improvement	2 0	27 0	4 0
Squirrel Camp Site Improvement	1 0	21 0	2 0
050 R/W Acquisition and Reconstruction	10 0	36 0	3 0
Rogue River Visitor Center	20 0	480 0	15 0
GOLD BEACH RANGER DISTRICT			
Illinois River Initiative	0 0	0 0	0 0
Quosatana Campground Paving	11 0	111 0	0 0
Big Bend Site Plan	50 0	500 0	8 0
Oak Flat Recreation Site Plan	10 0	100 0	3 0
Bill Moore Site	3 0	30 0	2 0
Game Lake Site Improvement	3 0	30 0	2 0
Agness Visitor Center	50 0	500 0	5 0
Forest Management Interpretive Tour	1 0	10 0	1 0
Lobster Creek Campground Improvement	3 0	30 0	0 0
Elko/Wildhorse	1 0	10 0	1 0
Boat Replacement	2 0	40 0	0 0
ILLINOIS VALLEY RANGER DISTRICT			
Grayback Campground Improvement - Bridge/Trail	3 3	25 7	0 5
Bolan Lake Campground	0 0	0 0	2 0
Illinois River Recreation Sites Phase 1	0 0	0 0	4 0
Illinois River Recreation Sites Phase 2	0 0	0 0	6 0
Page Mountain Snow Park	0 0	0 0	0 0
POWERS RANGER DISTRICT			
Rock Creek Campground	0 0	15 0	1 0
Elk Creek Falls	0 0	15 0	0 0
Eden Valley Campground	7.5	300 0	3 0

Table B-3 is a projected five-year schedule of fisheries capital investments and activities

Table B-3. Fish Capital Investments and Activities

Project Name	Acty	Fund	FY	Measure	M $
Anadromous Fish Structural Improvement Resident Fish Non-Structural Improvement Anadromous Fish Maintenance	CF221-2 CF222-2 CF23	NFWF NFWF NFWF	89 89 89	336 60 96	269 0 36 0 29 0
Year Total			89		334 0
Anadromous Fish Structural Improvement Resident Fish Non-Structural Improvement Anadromous Fish Maintenance	CF221-2 CF222-2 CF23	NFWF NFWF NFWF	90 90 90	411 28 120	329 0 17 0 36 0
Year Total			90		382 0
Anadromous Fish Structural Improvement Resident Fish Non-Structural Improvement Anadromous Fish Maintenance	CF221-2 CF222-2 CF23	NFWF NFWF NFWF	91 91 91	34 40 131	227 0 17 0 36 0
Year Total			91		340 0
Anadromous Fish Structural Improvement Resident Fish Non-Structural Improvement Anadromous Fish Maintenance	CF221-2 CF222-2 CF23	NFWF NFWF NFWF	92 92 92	352 28 120	300 0 17 0 36 0
Year Total			92		352 0
Anadromous Fish Structural Improvement Resident Fish Non-Structural Improvement Anadromous Fish Maintenance	CF221-2 CF222-2 CF23	NFWF NFWF NFWF	93 93 93	352 28 120	300 0 17 0 36 0
Year Total			93		352 0
Grand Total					1,760 0

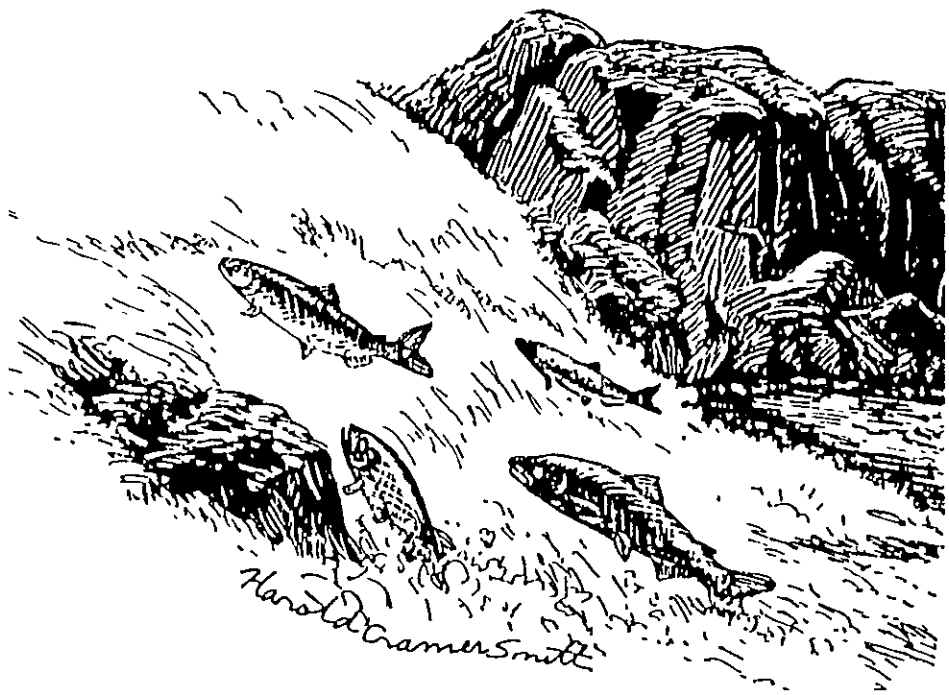


Table B-4 is a projected five-year schedule of capital investments and activities associated with Threatened, Endangered, and Sensitive (TES) wildlife and plant species; the fund code is NFWF. * Indicates a potential Challenge Cost Share project

Table B-4 Threatened, Endangered and Sensitive Wildlife and Plant Capital Investments and Activities

					Measure			
Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
Spotted Owl General Survey	09	3	89	CT111			5	7 5
Peregrine Falcon Management Plan	03	1	89	CT112			1	1 0
Enhance Potential Peregrine Ledge	03	2	89	CT23		1		2 0
Marbled Murrelet Inventory	09	5	89	CT111			1	13 0
Botanical Area Inventory Program	09	9	89	CT111			4	8 0
*Botanical Area Information and Education 2 Sites	09	8	89	CT2		6	2	4 0
Sensitive Plant Survey	09	4	89	CT111			5	10 5
TES Spp Management Plans (Plants)	09	7	89	CT112			5	4 5
*Sensitive Plant Seed Banking	09	11	89	CT222		5		3 5
*Lilla Leach Botanical History Booklet	11	10	89	CT222			1	2 0
*Sensitive Species Status Report (Botanical)	09	12	89	CT111			3	15 0
TES Habitat Improvements (Botanical)	09	6	89	CT22	400			12 0
Land Use Effects on TES Spp (Botanical)	09	13	89	CT121	400			1 5
TES Spp Ecological Studies (Botanical)	09	14	89	CT121	200			3 0
Photo Herbarium	11	15	89	CT11			5	0 5
Year Total			89		1,000	12	32	88 0
Wolverine Survey	09	16	90	CT111			1	3 0
White Footed Vole Habitat and Population Study	09	17	90	CT111			1	10 0
Sensitive Plant Taxonomic Study	09	18	90	CT112			1	7 0
Management Plan for Bald Eagle	11	19	90	CT112			1	5 0
Surveys for Gold Beach and Pistol River Pocket Gopher	09	20	90	CT111			1	2.0
Surveys for Goshawk in California	04	21	90	CT111			1	1 0
Surveys for Willow Flycatcher in California	04	27	90	CT111			1	1 0
Spotted Owl General Survey	09	3	90	CT111			5	7 5
Enhance Potential Peregrine Ledge	03	2	90	CT23		1		2 0
Botanical Area Inventory Program	09	9	90	CT111			4	8 0
*Botanical Area Information and Education 2 Sites	09	8	90	CT2		6	2	4 0
Sensitive Plant Survey	09	4	90	CT111			5	10 5
TES Spp Management Plans (Plants)	09	7	90	CT112			5	4 5
*Sensitive Plant Seed Banking	09	11	90	CT222		5		3 5
*Lilla Leach Botanical History Booklet	11	10	90	CT222			1	2 0
*Sensitive Spp Status Reports (Botanical)	09	12	90	CT111			3	15.0
TES Habitat Improvements (Botanical)	09	6	90	CT22	400			12 0
Land Use Effects on TES Spp (Botanical)	09	13	90	CT121	400			1 5
TES Spp Ecological Studies (Botanical)	09	14	90	CT121	200			3 0
Photo Herbarium	11	15	90	CT11			5	0 5
Year Total			90		1,000	12	37	103 0

Table B-4 Threatened, Endangered and Sensitive Wildlife and Plant Capital Investments and Activities (Continued)

					Measure			
Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
Western Pond Turtle Inventory	09	19	91	CT111			1	3 0
Spotted Frog Survey Inventory	09	20	91	CT111			1	1 0
*Botanical Areas Trails and Overlooks	09	21	91	CT222		4		16 0
Type Localities Designation	09	22	91	CT111	200		5	2 0
Spotted Owl General Survey	09	3	91	CT111			5	7 5
Enhance Potential Peregrine Ledge	03	2	91	CT23		1		2 0
Botanical Area Inventory Program	09	9	91	CT111			4	8 0
*Botanical Area Information and Education - 2 Sites	09	8	91	CT2		6	2	4 0
Sensitive Plant Survey	09	4	91	CT111			5	10 5
TES Spp Management Plans (Plants)	09	7	91	CT112			5	4 5
*Sensitive Plant Seed Banking	09	11	91	CT222		5		3 5
*Sensitive Spp Status Reports (Botanical)	09	12	91	CT111			3	15 0
TES Habitat Improvements (Botanical)	09	6	91	CT22	400			12 0
White Footed Vole Habitat and Population Study	09	17	91	CT111			1	10 0
Year Total			91		600	16	27	99 0
Siskiyou Mountain Salamander Inventory	04	23	92	CT111			1	2 0
Townsend's Western Big-eared Bat Inventory	09	24	92	CT111			1	3 0
*Nickel Laterite Plant Association	09	25	92	CT111	1,000		1	5 0
Spotted Owl General Survey	09	3	92	CT111			5	7 5
Enhance Potential Peregrine Ledge	03	2	92	CT23		1		2 0
Botanical Area Inventory Program	09	9	92	CT111			4	8 0
*Botanical Area Information and Education - 2 Sites	09	8	92	CT2		6	2	4.0
Sensitive Plant Survey	09	4	92	CT111			5	10 5
TES Spp Management Plans (Plants)	09	7	92	CT112			5	4 5
*Sensitive Plant Seed Banking	09	11	92	CT222		5		3 5
*Sensitive Spp Status Reports (Botanical)	09	12	92	CT111			3	15 0
TES Habitat Improvements (Botanical)	09	69	92	CT22	400			12 0
Wolverine Survey	09	16	92	CT111			1	3 0
Sensitive Plant Taxonomic Study	09	18	92	CT112			1	7.0
Surveys for Gold Beach and Pistol River Pocket Gopher	09	20	92	CT111			1	2 0
Surveys for Goshawk in California	04	21	92	CT111			1	1 0
Surveys for Willow Flycatcher in California	04	27	90	CT111			1	1.0
Western Pond Turtle Inventory	09	19	92	CT111			1	3 0
Spotted Frog Survey Inventory	09	20	92	CT111			1	1.0
*Botanical Areas Trails and Overlooks	09	21	92	CT222		4		16.0
Type Localities Designation	09	22	92	CT111	200		5	2.0
Year Total			92		1,600	16	39	113 0
*J.T. Howell Memorial Route	09	26	93	CT222		8	1	6 0
Spotted Owl General Survey	09	3	93	CT111			5	7 5
Enhance Potential Peregrine Ledge	03	2	93	CT23		1		2 0
Marbled Murrelet Inventory	09	5	93	CT111			1	13 0
Botanical Area Inventory Program	09	9	93	CT111			4	8 0
*Botanical Area Information and Education - 2 Sites	09	8	93	CT2		6	2	4 0
Sensitive Plant Survey	09	4	93	CT111			5	10 5
TES Spp Management Plans (Plants)	09	7	93	CT112			5	4 5
*Sensitive Plant Seed Banking	09	11	93	CT222		5		3 5
*Sensitive Species Status Report (Botanical)	09	12	93	CT111			3	15 0
TES Habitat Improvements (Botanical)	09	6	93	CT22	400			12.0
*Botanical Areas Trails and Overlooks	09	21	93	CT222		4		16 0
Type Localities Designation	09	22	93	CT111	200		5	2 0
*Nickel Laterite Plant Association	09	25	93	CT111	1,000		1	5 0
Year Total			93		1,600	24	32	109 0
Grand Total								510 0

Table B-5 is a projected five-year schedule of wildlife capital investments and activities; the fund code is NFWF. * Indicates a potential Challenge Cost Share project.

Table B-5 Wildlife Capital Investments and Activities Schedule

Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
*Forest-Wide Meadow Habitat Improvement	9	1	89	CW2	590	60	5	61 1
*Azalea Lake Wildlife Area Improvement	5	9	89	CW2			1	1 0
*Grayback Meadow Habitat Plan and Improvement	4	10	89	CW2	10	10	1	6 0
*Waterhole/Pond Enhancement/Development	9	11	89	CW2		14	5	48 0
*Horse Creek Habitat Plan and Improvement	2	12	89	CW2	15		1	1 5
*Orchard Improvement	9	13	89	CW2			5	1 0
*Snow Camp Meadow Habitat Improvements	1	4	89	CW2	100	10	1	4 5
*Ranger District-Wide Forage Seeding Deer and Elk	9	14	89	CW2	500		1	37 5
*Band-Tailed Pigeon Habitat Improvement	9	21	89	CW2	50		5	12 5
Road Closure Habitat Improvement	9	18	89	CW2			2	4 0
Roadside Forage Improvement	9	19	89	CW2	50		5	26 0
Bat Roosting Improvement/Bridges	2	15	89	CW221		5		1 2
Wildlife Project Maintenance	9	6	89	CW23	100	100		30 0
*Cedar Swamp Information and Education	5	7	89	CW2		5	1	1 6
*Fish Hook Wildlife Area Information and Education	2	8	89	CW2		3	1	7 5
*Grayback Meadow Wildlife Area Information and Education	4	20	89	CW2		5	1	35 0
Turkey Survey	3/5	22	89	CW11			2	1 0
Blue Grouse Inventory	9	23	89	CW11			5	2 5
Band-tailed Pigeon Inventory	9	24	89	CW11			5	2 5
*Raptor Nest Survey	9	17	89	CW11			5	2 5
Silver Fire Related Inventory	2/5	16	89	CW11			2	6 5
Deer and Elk Management Plan	11	5	89	CW112			1	25 0
*Fish Hook Meadow Complex Management Plan	2	2	89	CW112			1	1 0
Special Wildlife Sites Plan	9	3	89	CW112			2	10 0
Year Total			89		1415	212		329 4

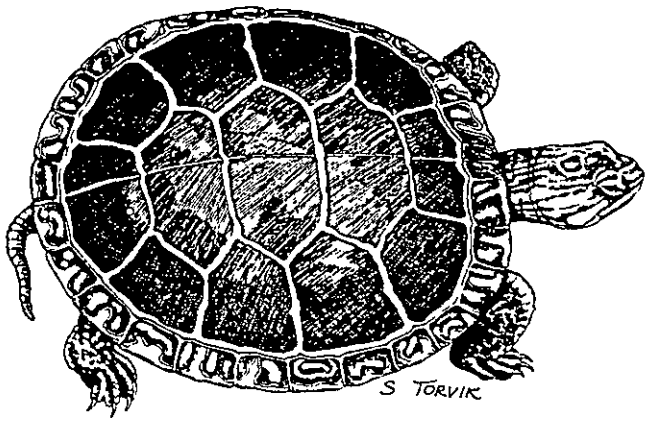


Table B-5. Wildlife Capital Investments and Activities Schedule (Continued)

Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
*Forest-Wide Meadow Habitat Improvement	9	1	90	CW2	590	60	5	61 1
*Azalea Lake Wildlife Area Improvement	5	6	90	CW22	25	10		6 3
*Grayback Meadow Habitat Plan and Improvement	4	7	90	CW2	10			2 5
*Cedar Swamp Wildlife Area Improvement	5	8	90	CW2			1	1 0
*Waterhole/Pond Enhancement/Development	9	9	90	CW2	14		5	48 0
*Dasher Meadow Habitat Improvement	4	11	90	CW2			1	0 5
*Horse Creek Habitat Plan and Improvement	2	12	90	CW222	15			1 0
*Osprey Nest Structures	9	10	90	CW221		5		2 5
*Marial Meadow Wildlife Habitat Improvement	2	13	90	CW2	10	25	1	2 6
*Orchard Improvement	9	14	90	CW222	6			6 0
*Oak Flat Habitat Improvement	3	15	90	CW222	185			9 3
*Mud Springs Habitat Plan and Improvement	2	16	90	CW2			1	0 5
Wooden Meadow	5	17	90	CW22	5	10		0 9
*Bluebird Habitat Enhancement	9	18	90	CW221		90		1 2
*Bald Mt Meadows	5	19	90	CW22	39	10		6 0
*Ranger District-Wide Forage Seeding Deer and Elk	9	20	90	CW2	500		1	37 5
*Band-Tailed Pigeon Habitat Improvement	9	28	90	CW2	50		5	12 5
Road Closure Habitat Improvement	9	5	90	CW2		30	2	28 0
Roadside Forage Improvement	9	30	90	CW2	50		5	26 0
Bat Roosting Improvement/Bridges	2	29	90	CW2		10	1	2 7
Wildlife Project Maintenance	9	21	90	CW2	100	100		30 0
*Horse Creek Wildlife Area Information and Education	2	24	90	CW2		5		0 5
*Azalea Lake Information and Education	5	23	90	CW2		5	1	1 6
*English Meadow Wildlife Area Information and Education	2	22	90	CW2		5		2 0
Turkey Survey	3/5	31	90	CW11			2	1 0
Blue Grouse Inventory	9	32	90	CW11			5	2 5
Band-tailed Pigeon Inventory	9	27	90	CW11			5	2 5
*Raptor Nest Survey	9	26	90	CW11			5	2 5
Silver Fire Related Inventory	2/5	25	90	CW11			2	6 5
Subbasin Deer and Elk Management Plans	9	3	90	CW112			5	15 0
Deer and Elk Management Plan	11	4	90	CW112			1	25 0
Turkey Management Plan	9	33	90	CW112			2	3 2
Special Wildlife Sites Plan	9	2	90	CW112			2	10 0
Year Total			90		1599	365		378 4

Table B-5 Wildlife Capital Investments and Activities Schedule (Continued)

Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
*Forest-Wide Meadow Habitat Improvement	9	1	91	CW2	590	60	5	61 1
*Grayback Meadow Habitat Plan and Improvement	4	6	91	CW222	10			1 0
*Cedar Swamp Wildlife Area Improvement	5	8	91	CW22	25	10		6 3
*Waterhole/Pond Enhancement/Development	9	26	91	CW2	14		5	48 0
*Laird Lake Wildlife Area Improvement	5	9	91	CW2			1	1 0
*Dasher Meadow Habitat Improvement	4	10	91	CW222	20			1 8
*Horse Creek Habitat Plan and Improvement	2	11	91	CW222	15			1 0
*Osprey Nest Structures	9	12	91	CW221		5		2 7
*Orchard Improvement	9	13	91	CW222	6			6 0
*Mike's Gulch Burn Plan and Improvement	4	14	91	CW222	70			3 8
*Adams Prairie Improvement	3	15	91	CW22	254	10		13 0
*Mud Springs Habitat Plan and Improvement	2	16	91	CW2	170	10		1 8
Camp Meadow	5	17	91	CW22	6	10		0 9
*Bluebird Habitat Enhancement	9	18	91	CW221		90		2 3
*Flannigan Prairie	5	19	91	CW22	8	10		1 2
*Ranger District-Wide Forage Seeding Deer and Elk	9	20	91	CW2	500		1	37 5
*Band-Tailed Pigeon Habitat Improvement	9	30	91	CW2	50		5	12 5
Road Closure Habitat Improvement	9	31	91	CW2		60	1	50 0
Roadside Forage Improvement	9	32	91	CW2	50		5	26 0
Bat Roosting Improvement/Bridges	2	21	91	CW221		10	1	3 0
Wildlife Project Maintenance	9	22	91	CW2	100	100		30 0
*Panther Creek Information and Education	5	23	91	CW2		5	1	1 6
Fish Hook Wildlife Area Information and Education	2	24	91	CW2		5		2 0
*Mud Springs Wildlife Area Information and Education	2	25	91	CW2		5		1 2
Turkey Survey	3/5	26	91	CW11			2	1 0
Blue Grouse Inventory	9	33	91	CW11			5	2 5
Band-tailed Pigeon Inventory	9	34	91	CW11			5	2 5
Hardwood Habitat Survey	1/3	3	91	CW11				4 0
*Raptor Nest Survey	9	27	91	CW11			5	2 5
Subbasin Deer and Elk Management Plans	9	6	91	CW112			5	15 0
Deer and Elk Management Plan	11	5	91	CW112			1	25 0
Turkey Management Plan	9	29	91	CW112			2	3 2
Hardwood Habitat Management Guideline	11	4	91	CW112			1	5 0
Special Wildlife Sites Plan	9	2	91	CW112			1	5 0
Year Total			91		1888	390		377 1

Table B-5 Wildlife Capital Investments and Activities Schedule (Continued)

Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
*Forest-Wide Meadow Habitat Improvement	9	1	92	CW2	590	60	5	61 1
*Azalea Lake Wildlife Area Improvement	5	21	92	CW2	25	10		6 3
*Grayback Meadow Habitat Plan and Improvement	4	20	92	CW2	10			2 5
*Cedar Swamp Wildlife Area Improvement	5	19	92	CW2			1	1 0
*Waterhole/Pond Enhancement/Development	9	18	92	CW2	14		5	48 0
*Dasher Meadow Habitat Improvement	4	17	92	CW2			1	5
*Horse Creek Habitat Plan and Improvement	2	16	92	CW2	15			1 0
*Osprey Nest Structures	9	15	92	CW221		5		2 5
*Marial Meadow Wildlife Habitat Improvement	2	14	92	CW2	10	25	1	2 6
*Orchard Improvement	9	13	92	CW222	6			6 0
*Oak Flat Habitat Improvement	3	12	92	CW222	185			9 3
*Mud Springs Habitat Plan and Improvement	2	10	92	CW2			1	0 5
Wooden Meadow	5	11	92	CW22	5	10		0 9
*Bluebird Habitat Enhancement	9	22	92	CW221		90		1 2
*Bald Mountain Meadows	5	23	92	CW22	39	10		6 0
*Ranger District-Wide Forage Seeding Deer and Elk	9	24	92	CW2	500		1	37 5
*Band-Tailed Pigeon Habitat Improvement	9	32	92	CW2	50		5	12 5
Road Closure Habitat Improvement	9	25	92	CW2		30	2	28 0
Roadside Forage Improvement	9	31	92	CW2	50		5	26 0
Bat Roosting Improvement/Bridges	2	5	92	CW2		10	1	2 7
Wildlife Project Maintenance	9	6	92	CW2	100	100		30 0
*Horse Creek Wildlife Area Information and Education	2	7	92	CW2		5		0 5
*Azalea Lake Information and Education	5	8	92	CW2		5	1	1 6
*English Meadow Wildlife Area Information and Education	2	9	92	CW2		5		2 0
Turkey Survey	3/5	30	92	CW11			2	1 0
Blue Grouse Inventory	9	29	92	CW11			5	2 5
Band-tailed Pigeon Inventory	9	28	92	CW11			5	2 5
*Raptor Nest Survey	9	26	92	CW11			5	2 5
Silver Fire Related Inventory	2/5	27	92	CW11			2	6 5
Subbasin Deer and Elk Management Plans	9	4	92	CW112			5	15 0
Deer and Elk Management Plan	11	3	92	CW112			1	25 0
Turkey Management Plan	9	33	92	CW112			2	3 2
Special Wildlife Sites Plan	9	2	92	CW112			2	10 0
Year Total			92		1599	365		378 4

Table B-5 Wildlife Capital Investments and Activities Schedule (Continued)

Project Name	RD	Pri	FY	Acty	Acre	Struc	Plan	M $
*Forest-Wide Meadow Habitat Improvement	9	1	93	CW2	590	60	5	61 1
*Grayback Meadow Habitat Plan and Improvement	4	5	93	CW2	10			0 5
*Waterhole/Pond Enhancement/Development	9	6	93	CW2		16	5	34 8
*Dasher Meadow Habitat Improvement	4	7	93	CW2	20			0 3
*Bluebird Lake Wildlife Area Improvement	5	8	93	CW2	15	10		6 3
*Horse Creek Habitat Plan and Improvement	2	9	93	CW2	15			1 0
*Osprey Nest Structures	9	10	93	CW2		5	1	3 3
*Panther Lake Wildlife Area Improvement	5	11	93	CW2	0		1	1 0
*Orchard Improvement	9	12	93	CW222	6			6 6
*Mike's Gulch Burn Plan and Improvement	4	13	93	CW2	70		1	4 0
*Bluebird Habitat Enhancement	9	14	93	CW2			0	3 0
Foggy Meadow	5	15	93	CW22	10	10		3 8
*Fairview Meadow Habitat Improvement	3	16	93	CW222	25			2 5
*Ranger District-Wide Forage Seeding Deer and Elk	9	22	93	CW222	500			37 5
*Band-tailed Pigeon Habitat Improvement	9	23	93	CW2	50		5	12 5
Road Closure Habitat Improvement	9	17	93	CW221	0	45		36 0
Roadside Forage Improvement	9	18	93	CW221	100		5	52 0
Wildlife Project Maintenance	9	19	93	CW2	160	160		50 0
Turkey Survey	3/5	24	93	CW11			2	1 0
Blue Grouse Inventory	9	25	93	CW11			5	2 5
Band-tailed Pigeon Inventory	9	26	93	CW11			5	2 5
*Raptor Nest Survey	9	20	93	CW11				2 5
Silver Fire Related Inventory	2/5	21	93	CW11			3	12 5
Subbasin Deer and Elk Management Plans	9	3	93	CW112			5	15 0
Black Bear Management Guidelines	11	4	93	CW112			1	5 0
Special Wildlife Sites Plan	9	2	93	CW112				
Year Total			93		1571	306		357 2



Table B-6 is a projected five-year schedule of trail capital investments.

Table B-6 Trail Capital Investments

Project Name	Acty	Fund	FY	Pri	Pre-Const	Const	Meas	Unit	M $
Silver Creek Trail	AT22	CNTR	89	1	X		Miles	0 0	10 0
Briggs Creek Trailhead	AT2	CNTR	89	2	X		Miles	0 0	1 5
Lower Rogue Trail Bridges (2)									
Smithers Creek Bridge	AT22	CNTR	89	3		X	Miles	5	11 0
Morris Rodgers Bridge	AT22	CNTR	89	4		X	Miles	5	11 0
Tincup Trail New Construction	AT22	CNTR	89	5		X	Miles	9 0	175 0
Osgood Ditch Interpretive Trail	AT22	CNTR	89	6		X	Miles	2 0	3 0
Black Butte Trailhead	AT22	CNTR	89	7		X	Miles	5	5 5
Year Total			89					12 5	197 0
Upper Rogue Trail Bridges (9)	AT22	CNTR	90	1	X		Miles	0 0	4 5
Johnson Butte Trail	AT22	CNTR	90	2	X		Miles	0 0	3 0
Coquille River Trail	AT22	CNTR	90	3	X		Miles	0 0	3 1
Onion Camp Trailhead	AT2	CNTR	90	4	X		Miles	0 0	1 5
Lower Rogue Trail Bridges (2)									
Stonehouse Creek Bridges	AT22	CNTR	90	5		X	Miles	5	11 0
Painted Rock Creek Bridge	AT22	CNTR	90	6		X	Miles	.5	11 0
Snowcamp Trail	AT22	CNTR	90	7	X		Miles	0 0	6 0
Briggs Creek Trailhead	AT2	CNTR	90	8		X	Miles	5	3 0
Silver Creek Trail	AT22	CNTR	90	9		X	Miles	20 0	20 0
Illinois River South Bank	AT22	CNTR	90	10		X	Miles	18 1	80 0
Year Total			90					39 6	143 1
Tincup Creek Trail	AT22	CNTR	91	1	X		Miles	0 0	7 0
Madstone Way Trail	AT22	CNTR	91	2	X		Miles	0 0	1 3
Pupp's Camp Trail	AT22	CNTR	91	3	X		Miles	0 0	5 0
Upper Rogue Trail Bridges (2)									
Loggers Creek Bridge	AT22	CNTR	91	4		X	Miles	5	11 0
Bluff Creek Bridge	AT22	CNTR	91	5		X	Miles	5	11 0
Johnson Butte Trail	AT22	CNTR	91	6		X	Miles	3 0	24 0
Coquille River Trail	AT22	CNTR	91	7		X	Miles	6 0	27 9
Year Total			91					10 0	87 2
Mule Creek Trail	AT22	CNTR	92	1	X		Miles	0 0	3 0
Chetco Gorge Trail	AT22	CNTR	92	2	X		Miles	0 0	12 5
Illinois River Trail Relocation	AT22	CNTR	92	3	X		Miles	0 0	1 5
Upper Rogue Trail Bridges (2)									
Flea Creek Bridge	AT22	CNTR	92	4		X	Miles	5	11 0
Flora Del Creek Bridge	AT22	CNTR	92	5		X	Miles	5	11 0
Tincup Creek Trail	AT22	CNTR	92	6		X	Miles	15 0	157 0
Madstone Way Trail	AT22	CNTR	92	7		X	Miles	4 0	16 0
Pupp's Camp Trail	AT22	CNTR	92	8		X	Miles	5 5	6 5
Year Total			92					25 5	218 5
Lawson Creek Trail	AT22	CNTR	93	1	X		Miles	0 0	5 0
Lobster Creek Trail	AT22	CNTR	93	2	X		Miles	0 0	5 0
Grassy Knob Trail	AT22	CNTR	93	3	X		Miles	0 0	12 0
Page Mountain Grove	AT22	CNTR	93	4	X		Miles	0 0	5
Upper Rogue Trail Bridges (2)									
Russel Creek Bridge	AT22	CNTR	93	5		X	Miles	5	11 0
Cy Creek Bridge	AT22	CNTR	93	6		X	Miles	5	11 0
Mule Creek Trail	AT22	CNTR	93	7		X	Miles	6 0	24 0
Chetco Gorge Trail	AT22	CNTR	93	8		X	Miles	13 0	163 0
Illinois River Trail Relocation	AT22	CNTR	93	9		X	Miles	6 0	13 0
Onion Camp Trailhead	AT2	CNTR	93	10		X	Miles	5	5 5
Year Total			93					26 5	250 0

Table B-6a shows future trail capital investment opportunities beyond Fiscal Year 1993

Table B-6a Trail Capital Investment Opportunities

Project Name	Pre-Const	Const	M $/Year
CHETCO RANGER DISTRICT			
Snowcamp Trail	0 0	32 0	3 50
Sourdough Reconstruction	4 5	20 8	0 40
Horse Trail Complex	8 0	75 0	4 00
Chetco Gorge Trail	0 0	0 0	6 00
Chetco River Trail Complex	12 0	205 0	6 00
Tincup Creek-Pass Trail	0.0	0 0	2 50
North Fork Smith Trail (Sourdough to Vulcan)	7 5	125 0	3 00
Boundary Trail	25 0	310 0	5 00
South Fork Chetco Trail	7 8	137 0	2 00
ATV/Motorcycle Trails	5 0	100 0	1 70
Old Growth Redwood Interpretive Trails (2)	4 5	70 0	1 50
Eagle Gap Trail No 1221A	0 0	0 0	0 00
Tincup Pass-Collier Bar	0 0	0 0	0 00
GALICE RANGER DISTRICT			
China Creek Trail	0 0	0 0	3 00
China Creek Trailhead	1 5	5 0	1 00
Briggs Creek Trail	0 0	0 0	4 00
Briggs Creek Trailhead	1 5	3 0	1 00
Taylor Camp Trail	0 0	0 0	4 00
Taylor Camp Trailhead	2 0	2 0	1 00
York Butte Trail	0 0	0 0	2 00
York Butte Trailhead	1 5	5 0	1 00
Red Dog Trail	0 0	0 0	3 00
Red Dog Trailhead	1 5	5 0	1 00
Shan Creek Trail	0 0	0 0	3 00
Shan Creek Trailhead	1 5	4 0	1 00
Dutchy Creek Trail	0 0	0 0	3 00
Dutchy Creek Trailhead	1.5	3 0	1 00
Illinois River Trail	0 0	0 0	7 00
Illinois River Trail Relocation	0 0	13 0	0 00
Silver Peak/Hobson Horn Trail	0 0	0 0	5 00
Silver Peak/Hobson Horn Trailhead	1 5	5 0	1 00
Pine Flat Trail	1 5	10 0	3 00
Pine Flat Trailhead	0 0	0 0	0 00
Silver Falls Trail	0 0	0 0	3 00
Silver Falls Trailhead	1 5	5 0	1 00
Silver Falls Viewpoint	1.5	2 0	0 50
Silver Creek Trail	0 0	0 0	4 00
Silver Creek Trailhead	1.5	5 0	1 00
Little Silver Lake Trail	2 5	10 0	3 00
Little Silver Lake Trailhead	1.5	4 0	1 00
Florence Way Trail	0 0	0 0	3 00
Florence Way Trailhead	0 0	0 0	0 00
Big Pine Loop Trail	2 5	15 0	4 00
Big Pine Loop Trailhead	1 5	2 0	1 00
Pinnacle Point Trail	2 5	15 0	*4 00*
Pinnacle Point Trailhead	1 5	5 0	1 00
Pinnacle Point Viewpoint	1.5	3 0	1 00
Waters Creek Trail	2 5	10 0	3 00
Waters Creek Trailhead	1.5	5 0	1 00
Soldier Creek Trail	2 5	15 0	3 00
Soldier Creek Trailhead	1 5	4 0	1 00
Spalding Loop Trails	2 5	5 0	3 00
Spalding Loop Trailhead	1 5	3 0	1 00
Horse Creek Trail	2 5	15 0	3 00
Horse Creek Trailhead	1.5	5 0	1 00
Taylor Falls Trail	2 5	5 0	1 00
Taylor Falls Trailhead	1 5	5 0	1 00
Burned Timber Trail	0 0	0 0	2 00
Burned Timber Trailhead	1.5	4 0	1 00
Florence Saddle to Flattop	0 0	0 0	0 00

Table B-6a. Trail Capital Investment Opportunities (Continued)

Project Name	Pre-Const	Const	M $/Year
GOLD BEACH RANGER DISTRICT			
Brushy Bar Creek Bridge	0 0	11 0	1 05
Paradise Creek Bridge	0 0	11 0	1 05
Ivan's Creek Bridge	0 0	11 0	1 05
Annual Trail Maintenance	1 0	0 0	30 00
Lawson Creek Trail Bridge	1 5	15 0	0 30
Hardscrabble Trail	0 5	2 0	0 55
Mule Creek/Eden Valley Trail	1 5	4 4	1 20
Old Growth Trail	2 0	12 2	1 20
Upper Rogue River Trailhead	0 7	3 4	0 30
Lower Rogue River Trailhead	0 9	4 2	0 30
Game Lake Trailhead (Oak Flat)	0 9	5 7	0 30
Silver Creek Challenge Trail	2 2	0 0	0 00
Botanical Nature Trail	1 0	0 0	0 00
Lawson Creek Trail	8 0	80 0	0 00
Lobster Creek Trail	2 0	20 0	0 00
Upper Rogue Bridges (3)	1 5	33 0	0 00
Blossom Bar	0 0	0 0	0 00
Clay Hill Creek	0 0	0 0	0 00
Mule Creek East and West	0 0	0 0	0 00
ILLINOIS VALLEY RANGER DISTRICT			
Osgood Ditch Interpretive Trail	0.0	0 0	0 60
Black Butte Trailhead	0 0	4 7	0 20
South Bank Illinois Trail - Phase 1	6 8	82 0	1 50
South Bank Illinois Trail - Phase 2	6 8	82 0	1 00
Fall Creek Trail	1 1	10 5	0 50
Hogue Past Trails	1 6	5 1	0 50
Page Snow Park/Trail	3 4	15 2	0 70
Page Mountain Trail	1 6	5 0	0 30
Mud lake Trail	3 3	10 0	0 50
Porter Trail	2 2	8 0	0 25
Swan Mountain Trail	2 1	15 0	0 50
Elk Creek Trail	2 1	8 0	0 50
Sanger Creek Trail	2 1	9 0	0 50
Hungry Hill Trail	3 2	11 3	0 60
Madstone Way Trail	4 2	19 5	1 00
Baldface Creek Trail	4 1	15 3	1 00
Boulder Creek	0 0	0 0	0 00
Bower Mine Relocation	0 0	0 0	0 00
Josephine Mountain	0 0	0 0	0 00
Rough and Ready Creek	0 0	0 0	0 00
POWERS RANGER DISTRICT			
Barklow Mountain Trail Reconstruction	0 0	5 0	0 20
North Fork Elk River	0 0	0 0	1 50
Poverty Creek	0 0	0 0	0 10
Rusty Buttes	0 0	2 9	0 60
Elk Creek Falls Trail	0 0	0 0	0 30
Coquille Falls Trail	0 0	0 0	0 10
Mt Bolivar Trail	0.0	0 0	0 30
Azalea Lake Trail	0 0	0 0	0 30
Johnson Mountain Trail	0 0	0 0	0 60
Panther Ridge Trail	0 0	0 0	3 30
Iron Mountain Trail	0 0	0 0	0 90
Anvil Mountain Trail	8.0	148 0	0 00

Table B-7 is a projected five-year schedule of road and bridge capital investments

Table B-7. Road and Bridge Capital Investments

Project Name	Road No	Acty	Fund	FY	Pri	Meas	Unit	M $	RD
Bear Camp Road	23	LT22	CNTM	89	1	Miles	0 50	350 0	3
Fish Habitat Improvement (Pollywog Butte)	Various	LT22	CNFA	89	1	Miles	4 50	94 0	1
Fish Habitat Improvement (Eagle/Wilson)	Various	LT22	CNFA	89	1	Miles	0 50	65 0	1
Year Total				89			5 50	509 0	
Agness Road Reconstruction	33	LT22	CNTM	90	1	Miles	12 00	800 0	3
Agness Road Slump	33	LT22	CNTM	90	2	Miles	10 60	85 0	5
Chetco River Bar Access Roads	Various	LT22	CNRN	90	8	Miles	1 00	125 0	1
Chetco River Road Paving	1376	LT22	CNTM	90	5	Miles	1 80	255 0	1
Fish Habitat Improvement (Forest-wide)	Various	LT22	CNFA	90	2		0 00	43 0	11
Illinois River Road Seg 1	4105	LT22	CNRN	90	7	Miles	4 20	600 0	4
So Fk Elk River #2 Bridge	3353	LT22	CNTM	90	3	Miles	0 10	96 0	5
Six Mile Bridge	4105	LT22	CNRN	90	9	Miles	0 10	70 0	5
Year Total				90			29 60	2,074 0	
Bald Mountain Road	(2512)-091	LT22	CNTM	91	20	Miles	3 00	500 0	2
Chetco River Road	1376	LT22	CNTM	91	15	Miles	3 50	118 0	1
Divide Retaining Structure	1108	LT22	CNTM	91	16	Miles	0 50	65 0	5
Fish Habitat Improvement (Forest-wide)	Various	LT22	CNFA	91	3		0 00	60 0	11
Snail Creek	(2308)-076	LT22	CNTM	91	4	Miles	7 00	238 0	2
Winchuck Chetco Paving Seg 1	1107	LT22	CNTM	91	11	Miles	1 50	225 0	1
Winchuck Chetco Paving Seg 2	1107	LT22	CNTM	91	17	Miles	2 00	295 0	1
Year Total				91			17 50	1,501 0	
Fish Habitat Improvement (Forest-wide)	Various	LT22	CNFA	92	4		0 00	60 0	11
Grapevine Timber Sale Contract	Various	LT22	CNTM	92	21	Miles	5 00	400 0	1
Illinois River Road Seg 2	4103	LT22	CNRN	92	12	Miles	7 10	1,090 0	4
Lower Wheeler	1205	LT22	CNTM	92	19	Miles	2 50	300 0	1
Willow Creek Arch	1205	LT22	CNTM	92	13	Miles	0 10	34 0	1
Year Total				92			14.70	1,884 0	
Agness Road Paving	33	LT22	CNTM	93	10	Miles	12 00	1,500 0	3
Fish Habitat Improvement (Forest-wide)	Various	LT22	CNFA	93	5	Miles	0 00	60 0	11
Meadow Creek	(3680)-362	LT22	CNTM	93	18	Miles	4 50	18 0	1
Mt Avery Bridge (1980)	(5201)-080	LT222-2	CNTM	93	22	Miles	0 10	51 0	5
Smith Ranch Road	(33)-240	LT22	CNRN	93	14	Miles	0 50	15 0	3
Year Total				93			17 10	1,644 0	
Grand Total							84 40	7,612 0	

Table B-8 is a projected schedule of capital investments for buildings, water, and sewer projects from 1990 through 1995.

Table B-8. Buildings, Water, and Sewer Capital Investments

Project Name	Acty	Fund	FY	Pri	Meas	Unit	M $	RD
Gold Beach Ranger District Office Relocation	LF22	CNAD	90	1	Struc	1	235 0	3
Year Total			90			1	235 0	
Illinois Valley Ranger District Sewer System	LF221	CNAD	92	2	Struc	1	230 0	4
Powers Ranger District Office Addition	LF22	CNAD	92	3	Struc	1	360 0	5
Year Total			92			2	590 0	
Illinois Valley Ranger District Office Addition	LF22	CNAD	94	4	Struc	1	240 0	4
Year Total			94			1	240 0	
Gold Beach Ranger District Agness Guard Station Relocation	LF22	CNAD	95	5	Struc	1	300 0	4
Year Total			95			1	300 0	
Grand Total						5	1,365 0	

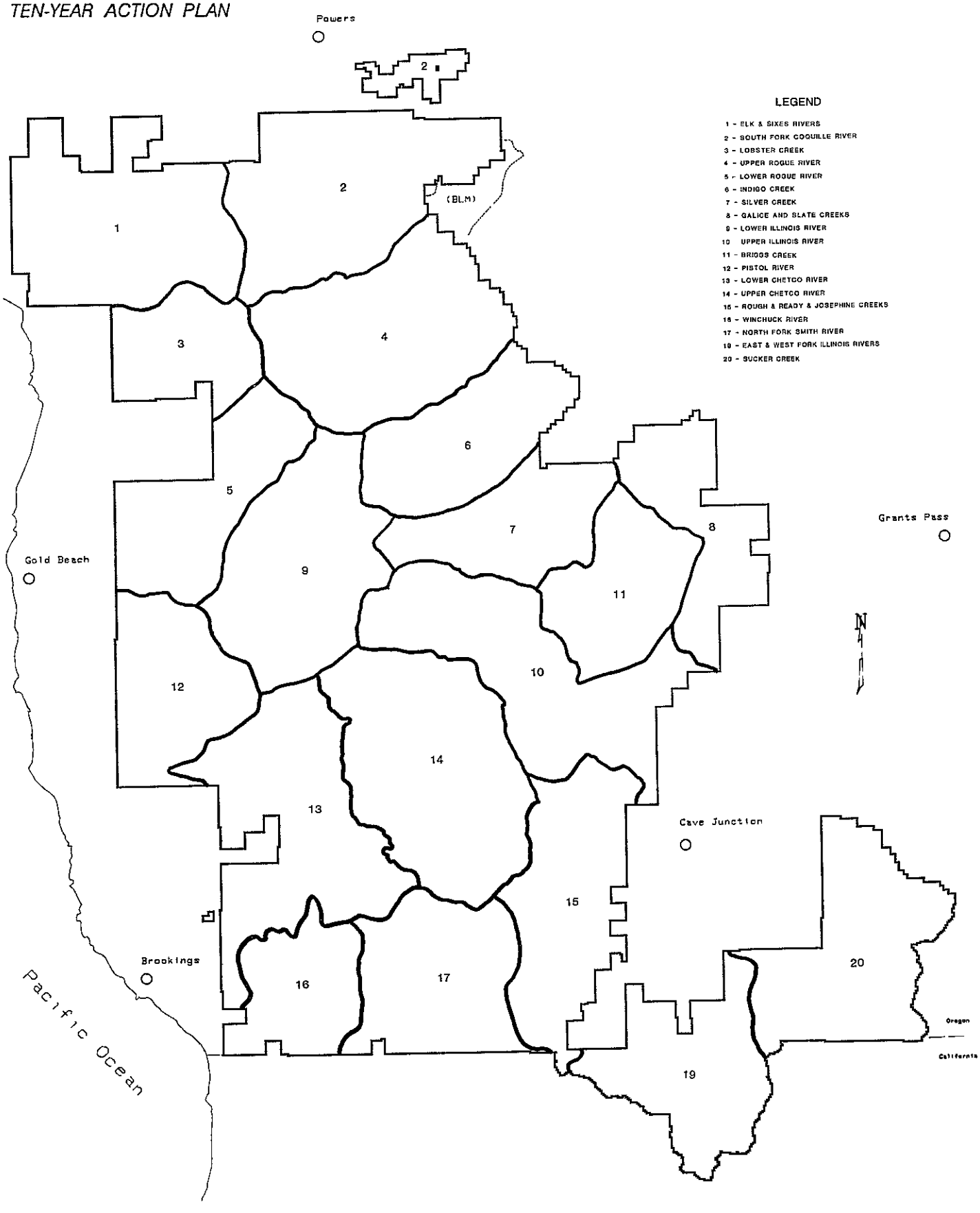
Table B-9 is a projected five-year schedule of capital investments and activities for cultural resources.

Table B-9. Cultural Resources Capital Investments

Project Name	Acty	Fund	FY	Measure	Unit	M $
Ferris Ford Cedar House Rehabilitation	AC	NFCR	89	Sites	1	44 0
Year Total			89			44 0
Historic Mining Survey - Galice and Illinois Valley Ranger Districts	AC	NFCR	90	Surveys	1	30 0
Rogue River Corridor Cultural Resource Interpretation	AC	NFCR	90	Projects	1	1 0
Year Total			90			31 0
Prehistoric Site Data Recovery Gold Beach Ranger District	AC	NFCR	91	Sites	1	25 0
Silver Creek Trail Interpretation Feasibility Study	AC	NFCR	91	Sites	1	2 0
Nancy Creek Cabin Rehabilitation Feasibility Study	AC	NFCR	91	Sites	1	1 0
Year Total			91			28 0
Grayback Cabin Rehabilitation	AC	NFCR	92	Sites	1	15 0
Illinois River Overview Survey	AC	NFCR	92	Surveys	1	10 0
Year Total			92			25 0
Pistol River Overview Survey	AC	NFCR	93	Surveys	1	20 0
Year Total			93			20 0

APPENDIX C

TEN-YEAR ACTION PLAN



Planning Basins Map

INTRODUCTION

The following planned timber sale activity schedule was compiled from site-specific proposals in various stages of project planning. Sales proposed in the earlier years of the decade generally have more intensive field reconnaissance completed, while those in the out-years are based on less refined estimates from aerial photos and extensive field reconnaissance. For instance, the timber volumes (Net MMBF and MMCF), road miles, harvest methods, and yarding systems in Table C-1, are **estimates** and **probable** methods. As the schedule progresses, more intensive field investigation will result in refinement of sale information. Periodic revision of the ten-year plan and estimated sale information will be necessary as more site-specific information becomes available. Individual proposals may be revised, deleted, or added as necessary to accomplish the goals of the Forest Plan. Firm timber sale programs will be announced in the Forests' General Notice of Planned Sales at six month intervals. Additional information and maps are available at the Ranger District offices. The following chart is the key to Table C-1:

Column Heading	Description
Fiscal Year	Fiscal Year 1989 through 1998 with Sale Number identified as last three numbers after Fiscal Year which is first two numbers
Sale Name	Sale Name (TBV=Turn Back Volume)
Planning Basin No	Planning Basin Number
Legal Description	Sec =Section (ie S29) Twn =Township (ie T38S) Rng =Range (ie R12W) Mer =Meridian (WM = Willamette Meridian)
Acres	Number of Acres
Net MMBF	Million Board Feet
MMCF	Million Cubic Feet
Road Miles	C =Construction R =Reconstruction
Harvest Method	HCC =Harvest Clearcut HCR =Harvest Clearcut, with Reserve Seed Trees HFR =Harvest Final Removal Cut HSC =Harvest Selection Cut HSH =Harvest Shelterwood Cut HSM =Harveat Streamside Management Cut HSV =Harvest Salvage Cut HTH =Harvest Thinning Cut
Yarding System	S =Skyline MS =Mobile Skyline C =Cable, or Hilead HEC =Helicopter T =Tractor

Table C-1. Ten-Year Action Plan

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
89101	REDWOOD SPRINGS TBV	13	S29,T39S,R12W,WM	70	3.7	0.7	0.0	6.5	HCC/HSM	S
89102	PARTRIDGE TBV	13	S16,T38S,R12W,WM	145	3.3	0.6	0.0	0.0	HCC/HSM	S
89103	POWDERHORN	12	S05,T38S,R13W,WM	162	6.0	1.1	1.8	0.0	HCC/HSM	S
89104	JASPER	13	S32,T38S,R12W,WM	318	11.5	2.1	0.5	1.8	HCC/HSM	HEC
89105	BEAR RIDGE	16	S14,T41S,R12W,WM	220	8.0	1.4	2.8	1.5	HCC/HSM	S
89201	DEVILS CANYON TBV	4	S27,T33S,R10W,WM	187	10.4	1.9	1.5	0.0	HCC	S,T
89301	KIMBALL PRAIRIE	5	S08,T36S,R13W,WM	110	1.0	0.2	0.0	0.0	HSC	S
89302	SKOOKUMHOUSE	5	S12,T36S,R13W,WM	245	9.6	1.7	3.0	12.0	HCC/HSM	S
89303	UPPER N LOBSTER TBV	3	S04,T34S,R13W,WM	253	5.6	1.0	0.0	2.0	HCC/HSM	S
89304	ALL WET	3	S33,T34S,R12W,WM	244	7.8	1.4	3.5	5.0	HCC/HSM	S
89305	UPPER STONEHOUSE TBV	3	S03,T35S,R12W,WM	67	3.4	0.6	0.0	12.1	HCC/HSM	S
89306	LOST TORCH TBV	3	S25,T34S,R13W,WM	131	4.2	0.8	1.6	4.6	HCC/HSM	S
89307	PAINTED PINCHER TBV	5	S28,T34S,R12W,WM	283	10.2	1.8	3.8	0.2	HCC/HSM	S
89308	SIGNAL POINT TBV	12	S04,T37S,R13W,WM	244	7.8	1.4	0.8	10.9	HCC/HSM	S
89401	DEEP LEFT	20	S23,T40S,R05W,WM	446	13.5	2.4	5.9	3.6	HCC,HTH	MS,S
89402	BOLAN TBV	20	S06,T41S,R06W,WM	70	1.6	0.3		1.0	HCC,HCR	MS
89501	FALLEN HALL	2	S20,T32S,R11W,WM	30	1.9	0.3	0.0	0.0	HCC/HSM	S
89502	LOCKHART 4	2	S32,T32S,R11W,WM	21	1.2	0.2	0.0	0.0	HCC/HSM	S
89503	COPPER IRON TBV	1	S17,T33S,R12W,WM	83	6.2	1.1	0.1	3.0	HCC/HSM	S
89504	SOUTH EDEN	2	S22,T32S,R11W,WM	93	10.3	1.8	0.0	17.5	HCC/HSM	S
89505	DIXIE KNOT TBV	1	S25,T32S,R13W,WM	134	4.3	0.8	0.5	13.0	HCC/HSM	HEC,S
89506	TAYLOR RANCH	1	S05,T32S,R13W,WM	110	5.2	0.9	0.5	8.8	HCC/HSM	S
89507	CROWN DUDE	2	S20,T32S,R12W,WM	210	4.2	0.8	3.5	7.0	HCC/HSM	S
89508	FATHER OAK	1	S20,T33S,R14W,WM	200	5.4	1.0	3.0	9.0	HCC/HSM	S
89509	BUTLER BUTT	1	S28,T32S,R13W,WM	138	7.0	1.3	0.0	3.0	HCC/HSM	S
89510	TOP ROCK	2	S33,T33S,R12W,WM	175	3.7	0.7	2.3	4.0	HCC/HSM	S
89000	SMALL SALES, FOREST-WIDE				5.0	0.9				
FY 89	Subtotal			4,389	162.0	29.1	35.1	126.5		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
90101	KETTLE	13	S15,T39S,R12W,WM	223	4.7	0.8	3.3	2.0	HCC/HSM	S
90102	SUGARCUBE	12	S27,T37S,R13W,WM	238	4.2	0.8	4.0	2.5	HCC/HSM	S
90103	WINRIVER	16	S14,T40S,R11W,WM	414	8.2	1.5	9.0	0.0	HCC/HSM	S
90104	GRAPEVINE	16	S08,T41S,R12W,WM	167	8.3	1.5	2.0	0.0	HCC/HSM	S/HEC
90201	PINE SOUP	11	S34,T36S,R08W,WM	55	0.7	0.1	0.0	0.0	HFR	MS,T
90202	BRIGGS RIDGE	11	S25,T36S,R09W,WM	139	6.9	1.2	4.2	1.0	HCC	S
90203	NORTH FACE	7	S08,T36S,R10W,WM	250	8.8	1.6	5.0	0.0	HCC	HEC,S
90204	LIMPY CANYON TBV	8	S18,T36S,R07W,WM	138	3.3	0.6	1.7	2.0	HCC	MS
90301	LOBSTER	3	S12,T34S,R13W,WM	314	11.4	2.0	5.0	5.0	HCC/HSM	S
90302	HOMESTEAD BUTTE	5	S34,T36S,R13W,WM	274	10.5	1.9	8.0	10.0	HCC/HSM	S
90303	RASPBERRY	6	S10,T35S,R11W,WM	334	15.7	2.8	1.5	15.0	HCC/HSM	S
90304	WEST KNOB	4	S28,T34S,R11W,WM	93	4.4	0.8	1.5	5.0	HCC/HSM	S
90401	BRUSHY ELK HAZEL TBV	19	S15,T18N,R04E,HM	343	10.9	2.0	6.9	3.8	HCC	S
90402	SUGARLOAF	20	S07,T40S,R05W,WM	393	10.9	2.0	9.8	2.0	HCC,HCR	MS,S
90403	CHINA HORSE	20	S18,T40S,R06W,WM	169	4.2	0.8	0.5		HCC	S
90501	BUCK COUNTRY	2	S23,T32S,R11W,WM	100	5.2	0.9	0.0	0.2	HCC/HSM	S
90502	WOLKRAB	1	S31,T32S,R12W,WM	69	3.2	0.6	3.0	6.0	HCC/HSM	S
90503	TOASTBERRY	1	S26,T33S,R13W,WM	69	2.2	0.4	4.0	1.2	HCC/HSM	S
90504	BRAY BOULDER	2	S21,T32S,R12W,WM	175	5.3	1.0	1.0	6.0	HCC/HSM	S
90505	NORTH SALMON	1	S19,T32S,R12W,WM	174	8.3	1.5	2.0	5.0	HTH,HCC	S
90506	SLICK JOHN	2	S07,T32S,R11W,WM	80	2.9	0.5	4.5	5.1	HCC/HSM	S
90507	COKELLY	2	S36,T32S,R12W,WM	40	2.1	0.4	5.0	3.0	HCC/HSM	S
90508	GRASS KNOB	2	S31,T32S,R14W,WM	50	2.1	0.4	1.3	5.0	HCC/HSM	S
90509	CAT TRACK	2	S11,T33S,R11W,WM	160	10.6	1.9	3.0	8.0	HCC/HSM	S
90510	HOMESTEAD	2	S16,T32S,R11W,WM	33	3.1	0.6	0.0	2.0	HCC/HSM	S
90000	SMALL SALES, FOREST-WIDE				1.9	0.3				
FY 90	Subtotal			4,494	160.0	28.7	86.2	89.8		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
91101	RED BOULDER	13	S16,T39S,R11W,WM	300	5.0	0.9	2.0	1.2	HCC/HSM	S
91102	REDBONE	13	S07,T39S,R11W,WM	255	4.7	0.8	4.0	3.7	HCC/HSM	S/HEC
91103	SPUR TRIGGER	12	S17,T38S,R13W,WM	183	5.4	1.0	1.1	4.7	HCC/HSM	S
91104	UPPER QUAIL BASIN	13	S24,T38S,R12W,WM	87	2.2	0.4	0.7	0.9	HCC/HSM	S
91105	ROCKET	16	S21,T40S,R11W,WM	403	7.4	1.3	3.8	1.1	HCC/HSM	S
91201	GARDEN	4	S05,T34S,R10W,WM	140	5.8	1.0	2.0	1.0	HCC	S
91202	LOWER SWEDE	11	S03,T37S,R09W,WM	230	5.5	1.0	4.1	2.0	HCC	S,MS
91203	SNAIL CREEK	6	S04,T35S,R10W,WM	180	7.5	1.3	6.7	1.0	HCC	S
91301	HARDSCRABBLE 2	6	S25,T35S,R11W,WM	81	6.2	1.1	0.0	5.0	HCC/HSM	S
91302	PEBBLE	9	S36,T35S,R12W,WM	272	6.2	1.1	4.4	10.0	HCC/HSM	S
91303	ILLAHE	4	S06,T34S,R11W,WM	250	12.5	2.2	5.0	15.0	HCC/HSM	S
91304	EP	4	S12,T35S,R12W,WM	86	3.1	0.6	0.0	20.0	HCC/HSM	S
91305	LAWSON	9	S15,T36S,R12W,WM	461	11.5	2.1	4.6	6.0	HCC/HSM	S
91401	SOLDIER	11	S15,T37S,R08W,WM	304	8.5	1.5	2.2	1.0	HCC	S
91402	BAIN STATION	17,15	S13,T41S,R10W,WM	76	1.6	0.3	2.1	2.0	HCC,HSC	MS
91403	FAR LEFT	20	S27,T41S,R06W,WM	481	14.8	2.7	2.0	1.0	HCC,HCR	MS,S
91501	SOUTH SIXES	1	S22,T32S,R13W,WM	50	4.7	0.8	0.3	4.0	HCC/HSM	S
91502	LOST BUTLER	1	S33,T32S,R13W,WM	174	8.3	1.5	1.0	3.0	HCC/HSM	HEC,S
91503	PANTHER MTN.	1	S32,T33S,R13W,WM	35	2.0	0.4	2.0	4.0	HCC/HSM	S
91504	ELK FORK	1	S36,T32S,R13W,WM	104	4.9	0.9	3.0	6.0	HCC/HSM	S
91505	DRY NICKEL	2	S13,T33S,R12W,WM	165	7.2	1.3	0.7	5.0	HCC/HSM	S
91506	FAT HICKEY	2	S22,T32S,R12W,WM	175	6.5	1.2	0.8	3.0	HCC/HSM	S
91507	PANTHER WEST	1	S33,T33S,R13W,WM	180	7.5	1.3	1.0	5.0	HCC/HSM	S
91508	SOUTH SWAMP	2	S32,T32S,R11W,WM	70	3.6	0.6	1.2	5.0	HCC/HSM	S
91000	SMALL SALES, FOREST-WIDE				7.4	1.3				
FY 91	Subtotal			4,742	160.0	28.7	54.7	110.6		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MHCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
92101	EMILY CREEK BASIN	13	S05,T40S,R11W,WM	814	8.7	1.6	1.0	2.0	HCC/HSM	S
92102	WEST COON BASIN	13	S36,T39S,R12W,WM	699	10.9	2.0	8.0	3.5	HCC/HSM	S/HEC
92103	NORTH WHEELER TBV	16	S11,T40S,R12W,WM	162	5.3	1.0	0.0	1.0	HCC/HSM	S
92201	DOWN SOLDIER	11	S11,T37S,R09W,WM	149	3.1	0.6	2.1	1.0	HCC	MS
92202	BOBCAT	4	S03,T34S,R10W,WM	232	8.3	1.5	2.0	2.0	HCC	S,MS
92203	FLYING TAYLOR	8	S23,T35S,R08W,WM	200	2.1	0.4	0.9	0.0	HSV	HEC
92204	SILVER FREELAND	7	S26,T35S,R09W,WM	260	6.2	1.1	4.0	2.0	HCC,HFR	MS
92301	SHASTA COSTA 1	4	S31,T34S,R10W,WM	330	10.3	1.8	2.0	5.0	HCC/HSM	S
92302	BRUSHY	4	S14,T34S,R12W,WM	181	9.5	1.7	5.0	10.0	HCC/HSM	S
92303	COLLIER	9	S28,T37S,R12W,WM	862	9.9	1.8	2.0	1.0	HSC	HEC
92304	SADDLE	9	S33,T36S,R12W,WM	527	6.0	1.1	6.0	10.0	HSC	S
92305	WATERS	4	S36,T34S,R12W,WM	467	6.3	1.1	4.0	7.0	HCC/HSM	HEC
92401	HAZEL	19	S05,T18N,R04E,HM	157	3.9	0.7	3.5		HCC	S
92402	SNAILBACK	10	S29,T37S,R08W,WM	331	7.7	1.4	10.5	3.0	HCC,HSC	MS,HEC
92403	BISQUIT	17,15	S14,T40S,R10W,WM	554	13.0	2.3	10.7	8.0	HCC,HSC	HEC
92404	WINDY FAN	20	S31,T39S,R05W,WM	24	1.0	0.2	0.5		HCC	MS
92501	BACKWOODS THIN	2	S22,T31S,R11W,WM	190	2.2	0.4	0.0	4.5	HCC/HSM	S
92502	CEDAR GULCH	2	S32,T32S,R12W,WM	51	4.0	0.7	0.0	2.0	HCC/HSM	S
92503	FATHER PURPLE	1	S26,T33S,R14W,WM	100	3.6	0.6	2.0	7.0	HCC/HSM	S
92504	SKINNY DOE	2	S18,T31S,R10W,WM	300	3.1	0.6	1.6	3.0	HCC/HSM	S
92505	COPPER KETTLE	1	S20,T33S,R12W,WM	166	7.8	1.4	3.0	6.0	HCC/HSM	S
92506	CRYSTAL CLEAR	2	S18,T32S,R10W,WM	120	3.1	0.6	1.0	8.0	HCC/HSM	S
92507	BIG OTTER	1	S04,T32S,R13W,WM	240	11.5	2.1	2.0	4.0	HCC/HSM	S
92508	FOGGY GEM	2	S16,T32S,R10W,WM	60	3.1	0.6	2.0	9.0	HCC/HSM	S
92509	PANTHER DEN	2	S34,T33S,R11W,WM	110	6.3	1.1	3.0	5.0	HCC/HSM	S
92000	SMALL SALES, FOREST-WIDE				3.1	0.6				
FY 92	Subtotal			7,286	160.0	28.7	76.8	104.0		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
93101	BUNTLINE	12	S12,T38S,R13W,WM	231	1.9	0.3	2.8	2.0	HCC/HSM	S
93102	PANTHER CREEK BASIN	13	S07,T39S,R12W,WM	588	8.1	1.5	1.5	4.0	HCC/HSM	S/HEC
93103	UPPER PISTOL RIVER	12	S25,T37S,R13W,WM	481	6.1	1.1	0.5	2.0	HCC/HSM	S
93104	NORTH FORK SMITH	17	S02,T40S,R12W,WM	800	10.0	1.8	3.0	3.0	HCC/HSM	S/HEC
93201	FINLEY OVERLOOK	8	S09,T36S,R07W,WM	51	1.4	0.3	2.3	1.0	HSH	MS
93202	SQUAW RETURN	10	S22,T37S,R08W,WM	184	4.7	0.8	1.5	1.0	HCC	MS
93203	BUCKS UP	6	S24,T34S,R10W,WM	76	2.6	0.5	1.0	1.0	HCC	MS
93204	TOP SHASTA	4	S09,T34S,R10W,WM	120	4.2	0.8	1.0	0.0	HCC	S
93205	TIPSY SQUIRREL	4	S21,T34S,R10W,WM	44	1.1	0.2	0.0	0.0	HSH	HEC
93206	SNAIL BASIN	6	S28,T34S,R10W,WM	130	5.2	0.9	2.3	0.0	HCC	S
93301	BONANZA	3	S18,T34S,R12W,WM	283	6.8	1.2	5.0	10.0	HCC/HSM	S
93302	PANTHER	3	S02,T34S,R13W,WM	257	5.1	0.9	5.0	7.0	HCC/HSM	S
93303	FAIRVIEW	9	S07,T37S,R12W,WM	455	8.0	1.4	1.8	0.0	HCC/HSM	S
93304	DEVILS	3	S21,T34S,R12W,WM	299	8.7	1.6	2.3	10.0	HCC/HSM	S
93305	GAME	9	S15,T36S,R12W,WM	349	6.5	1.2	3.0	10.0	HCC/HSM	S
93306	RASPBERRY 2	6	S25,T35S,R11W,WM	110	5.2	0.9	2.0	0.0	HCC/HSM	S
93401	FINAL GRAY	20	S20,T39S,R06W,WM	319	8.7	1.6	3.2	2.5	HCC	MS,S
93402	HUNGRY TOO	15	S33,T38S,R09W,WM	72	2.3	0.4	2.4		HCC,HCR	MS
93403	WHETSTONE	10	S08,T38S,R09W,WM	655	11.2	2.0	19.4	0.5	HCC,HSC	S,HEC
93404	LITTLE GRAYBACK	20	S18,T39S,R06W,WM	314	5.1	0.9	1.8	1.0	HCC	S,HEC
93501	YOUNG PANTHER	1	S30,T33S,R13W,WM	230	8.4	1.5	2.4	1.0	HCC/HSM	S
93502	SLICK THIN	2	S11,T32S,R12W,WM	300	3.1	0.6	0.5	1.7	HCC/HSM	S
93503	IRON BIRD	2	S21,T32S,R12W,WM	400	6.2	1.1	0.0	2.0	HCC/HSM	HEC
93504	RIDGE RUNNER	2	S22,T32S,R11W,WM	134	8.4	1.5	1.5	3.0	HCC/HSM	S
93505	COW PATTY	2	S02,T32S,R10W,WM	58	2.1	0.4	0.0	4.0	HCC/HSM	S/T
93506	BARKLOW CAMP	2	S32,T32S,R12W,WM	244	11.4	2.0	1.5	3.0	HCC/HSM	S
93507	WOODSY COAL	2	S27,T31S,R11W,WM	200	2.1	0.4	0.0	4.0	HCC/HSM	S
93508	THREE ELK	2	S21,T32S,R11W,WM	73	1.2	0.2	0.0	3.0	HCC/HSM	S
93000	SMALL SALES, FOREST-WIDE				4.2	0.8				
FY 93	Subtotal			7,457	160.0	28.7	67.7	76.7		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
94101	EAGLE CREEK BASIN	13	S30,T38S,R12W,WM	537	4.5	0.8	2.5	2.0	HCC/HSM	S
94102	LOWER WINCHUCK	16	S32,T40S,R12W,WM	776	16.6	3.0	3.0	3.0	HCC/HSM	S/HEC
94103	MISLATNAH CREEK	13	S35,T38S,R12W,WM	473	5.1	0.9	2.0	2.0	HCC/HSM	S
94201	RAMSEY REUNION	8	S26,T36S,R08W,WM	135	2.7	0.5	1.1	1.0	HCC	MS
94202	OLD DOG	11	S28,T36S,R09W,WM	386	8.9	1.6	2.0	2.0	HCC	S
94203	UPPER SECRET	11	S20,T36S,R08W,WM	321	7.5	1.3	3.7	1.0	HCC	MS
94301	KEGGER	5	S14,T35S,R12W,WM	317	10.2	1.8	1.0	3.0	HCC/HSM	S
94302	ADAMS	5	S18,T35S,R12W,WM	211	5.3	1.0	0.2	5.0	HCC/HSM	S
94303	GREEN SHASTA	4	S27,T34S,R11W,WM	292	7.0	1.3	0.9	2.0	HCC/HSM	S
94304	FROG CABIN	5	S15,T36S,R13W,WM	564	18.2	3.3	1.5	4.0	HCC/HSM	S
94401	LOST BUCK	20	S35,T39S,R06W,WM	352	9.8	1.8	0.1	1.0	HCC	MS
94402	UPPER DUNN	19	S18,T18N,R06E,HM	570	11.6	2.1	0.5	2.0	HCR,HSH	MS,S
94403	CHICAGO	19	S28,T18N,R05E,HM	199	6.3	1.1	3.1	1.0	HCC,HCR	MS,S
94501	HALL RIDGE	2	S20,T33S,R11W,WM	200	10.4	1.9	2.0	4.0	HCC/HSM	S
94502	EXPOSKI	2	S18,T33S,R11W,WM	100	4.2	0.8	1.0	1.0	HCC/HSM	S
94503	LOW ELK	1	S13,T32S,R13W,WM	200	8.3	1.5	2.5	4.0	HCC/HSM	S
94504	OAK FORK	1	S28,T33S,R14W,WM	100	3.1	0.6	0.5	5.0	HCC/HSM	S
94505	HIGH SIX	1	S27,T32S,R13W,WM	300	12.5	2.2	2.0	2.0	HCC/HSM	S
94506	CHINA BOWL	2	S15,T32S,R12W,WM	100	3.1	0.6	0.5	1.0	HCC/HSM	S
94000	SMALL SALES, FOREST-WIDE				4.7	0.8				
FY 94	Subtotal			6,133	160.0	28.7	30.1	46.0		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
95101	MINERAL HILL	12	S33,T37.5S,R12W,WM	662	7.5	1.3	2.5	3.0	HCC/HSM	S
95102	HUNTER CREEK	12	S19,T37S,R13W,WM	100	1.0	0.2	0.0	0.0	HCC/HSM	S
95103	TORPEDO	16	S31,T40S,R11W,WM	103	2.4	0.4	1.0	0.0	HCC/HSM	S
95104	BEAR CR. BASIN ONE	16	S10,T41S,R12W,WM	380	15.6	2.8	1.0	1.0	HCC/HSM	S
95201	WATER DOWN	11	S28,T36S,R08W,WM	165	4.7	0.8	1.7	1.0	HCC	MS
95202	LONE MINNOW	8	S03,T36S,R08W,WM	144	4.4	0.8	0.7	1.0	HCC	MS
95203	TEN WRENS	7	S16,T36S,R09W,WM	270	5.4	1.0	5.7	2.0	HCC/HSC	S
95204	BREEZY CHOPPER	6	S32,T34S,R09W,WM	181	5.2	0.9	0.0	2.0	HCC,HSH	HEC
95301	BRADFORD	5	S01,T36S,R13W,WM	378	13.7	2.5	1.0	3.0	HCC/HSM	S
95302	NORTH ROGUE	4	S12,T34S,R12W,WM	112	5.5	1.0	0.0	2.0	HCC/HSM	S
95303	BILL	4	S31,T33S,R11W,WM	76	4.3	0.8	1.0	3.0	HCC/HSM	HEC
95304	COSTAR	4	S03,T35S,R11W,WM	51	1.6	0.3	0.5	5.0	HCC/HSM	S
95305	SOUR	9	S35,T36S,R12W,WM	394	14.8	2.7	0.2	2.0	HCC/HSM	S
95401	SOLDIER TWO	10,11	S09,T37S,R09W,WM	209	7.4	1.3	0.9		HCC,HSC	MS,S
95402	JENNY	20	S01,T40S,R06W,WM	63	2.5	0.4		0.5	HCC	MS
95403	SQUAW	10	S20,T38S,R08W,WM	253	7.5	1.3	3.6	2.0	HCR	MS,S
95404	YEW CREEK	20	S33,T40S,R06W,WM	116	2.9	0.5	2.0		HCC	MS
95405	FINAL POKER	19,20	S19,T18N,R06E,HM	229	4.7	0.8	2.3	3.0	HCR,HSH	MS
95501	LOOKOUT THIN	2	S26,T31S,R11W,WM	200	2.1	0.4	0.0	2.0	HTH	S
95502	WOODEN TOP	2	S12,T32S,R11W,WM	156	7.3	1.3	1.0	7.5	HCC/HSM	S
95503	COPPER PEAK	1	S24,T33S,R13W,WM	213	8.9	1.6	1.5	6.0	HCC/HSM	S
95504	ROUGH ROCK	2	S34,T33S,R12W,WM	234	7.3	1.3	1.0	10.0	HCC/HSM	S
95505	BUCK SNORT	2	S26,T32S,R11W,WM	134	6.3	1.1	0.5	4.0	HCC/HSM	S
95506	RIGGS CREEK	2	S02,T32S,R11W,WM	134	6.3	1.1	0.7	4.5	HCC/HSM	S
95507	DELTA MCELK	2	S21,T32S,R11W,WM	67	4.2	0.8	1.0	3.0	HCC/HSM	S
95000	SMALL SALES, FOREST-WIDE				6.5	1.2				
FY 95	Subtotal			5,024	160.0	28.7	29.8	67.5		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
96101	LOWER WHEELER CREEK	16	S09,T40S,R12W,WM	636	8.3	1.5	0.0	1.0	HCC/HSM	HEC
96102	SUNRISE CREEK	12	S20,T38S,R13W,WM	774	10.4	1.9	3.0	1.0	HCC/HSM	S
96103	UPPER CHETCO	13	S35,T37S,R13W,WM	260	6.8	1.2	1.5	2.0	HCC/HSM	S/HEC
96201	BRANDY CREEK	6	S27,T34S,R10W,WM	232	6.2	1.1	3.1	2.0	HCC	S
96202	BEARCAT	4	S04,T34S,R10W,WM	156	5.8	1.0	1.4	1.0	HCC	S
96203	LOOKOUT	8	S11,T36S,R08W,WM	53	1.5	0.3	0.4	0.0	HCC	MS
96204	MINNOW RETURN	8	S26,T35S,R08W,WM	314	6.2	1.1	7.0	2.0	HCC	MS
96301	BOB	4	S13,T34S,R11W,WM	307	10.8	1.9	0.0	5.0	HCC/HSM	S
96302	OPHIR	4	S03,T35S,R12W,WM	228	4.8	0.9	1.0	5.0	HCC/HSM	S
96303	FULLER	4	S14,T34S,R12W,WM	144	7.6	1.4	0.0	5.0	HCC/HSM	S
96304	CORNER	3	S03,T34S,R13W,WM	588	12.3	2.2	0.0	5.0	HCC/HSM	S
96305	WEST LAWSON	9	S19,T36S,R12W,WM	172	5.2	0.9	1.7	4.0	HCC/HSM	S
96401	CANYON	15	S04,T39S,R09W,WM	627	9.4	1.7	2.4	3.0	HCC	S
95402	WOOD TOO	19	S05,T41S,R08W,WM	58	1.7	0.3			HCC	MS
96403	NAG	20	S07,T40S,R06W,WM	191	3.8	0.7	0.5	1.0	HCC	S
96404	LAYMAN	20	S32,T40S,R06W,WM	342	9.7	1.7	1.6		HCC	MS
96405	RERUN	20	S22,T40S,R07W,WM	296	8.8	1.6	4.0	2.0	HCC	MS
96501	THIN TIM	2	S20,T32S,R12W,WM	215	7.8	1.4	1.0	6.0	HCC/HSM	S
96502	BLACK TOAST	1	S22,T33S,R13W,WM	228	8.3	1.5	2.5	1.0	HCC/HSM	S
96503	DRAIN RIDGE	2	S10,T32S,R10W,WM	125	5.2	0.9	1.0	7.0	HCC/HSM	S
96504	BARK & BRAY	2	S29,T32S,R12W,WM	125	5.2	0.9	0.0	2.0	HCC/HSM	S
96505	CEDAR LOCK	2	S29,T32S,R11W,WM	143	5.2	0.9	0.0	6.0	HCC/HSM	S
96506	OTTER END	1	S04,T32S,R13W,WM	140	7.3	1.3	2.0	6.0	HCC/HSM	S
96000	SMALL SALES, FOREST-WIDE				1.7	0.3				
FY 96	Subtotal			6,354	160.0	28.7	34.1	67.0		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
97101	BEAR CR. BASIN TWO	16	S18,T41S,R11W,WM	380	15.6	2.8	1.0	1.0	HCC/HSM	S
97102	MEADOW CREEK	12	S24,T37S,R13W,WM	677	9.1	1.6	2.0	2.0	HCC/HSM	S
97201	BASIN FINALE	8	S05,T36S,R07W,WM	136	4.3	0.8	1.7	2.0	HCC	MS
97202	REFRIED ONION	11	S32,T36S,R08W,WM	117	2.6	0.5	1.4	1.0	HCC	MS
97203	HOWARD	6	S33,T34S,R09W,WM	181	6.4	1.1	2.5	1.0	HCC,HSH	S
97204	BUTCHERKNIFE	8	S13,T37S,R08W,WM	168	4.1	0.7	1.8	1.0	HCC	MS
97205	STEP DADDY	11	S31,T35S,R08W,WM	85	2.1	0.4	0.9	1.0	HCC	S
97301	LAKESIDE	3	S31,T34S,R12W,WM	394	6.1	1.1	0.7	3.0	HCC/HSM	S
97302	BATTLE	6	S24,T35S,R11W,WM	235	12.5	2.2	1.5	5.0	HCC/HSM	S
97303	CRAYFISH	3	S23,T34S,R13W,WM	319	9.7	1.7	0.5	3.0	HCC/HSM	S
97304	HILL	5	S08,T36S,R13W,WM	167	3.9	0.7	1.1	2.0	HCC/HSM	S
97305	FIRE WATER	4	S27,T34S,R12W,WM	278	7.8	1.4	0.9	5.0	HCC/HSM	HEC
97306	LAST VALLEY	3	S17,T34S,R13W,WM	256	5.8	1.0	0.4	3.0	HCC/HSM	S
97401	BOLAN II	20	S26,T40S,R06W,WM	92	3.1	0.6		1.0	HCC,HCR	MS
97402	LOWER ELDER	19,20	S20,T40S,R07W,WM	370	13.7	2.5	3.1	3.0	HCC	MS,S
97403	CRAZY	19	S16,T18N,R05E,HM	96	2.5	0.4	2.5	1.0	HCR,HSC	S,HEC
97404	SIXIE	10	S26,T37S,R09W,WM	310	4.8	0.9		1.5	HCC	MS
97405	BRUSHY	19	S15,T18N,R04E,HM	110	3.3	0.6	2.3	1.5	HCC	MS,S
97501	BUTLER SKY	1	S25,T32S,R14W,WM	200	8.3	1.5	3.5	3.0	HCC/HSM	S
97502	HANGING KNOB	2	S29,T33S,R11W,WM	200	10.4	1.9	2.0	7.0	HCC/HSM	S
97503	RUSTY SAW	1	S22,T32S,R13W,WM	100	4.2	0.8	0.5	10.0	HCC/HSM	S
97504	DRY HICKEY	2	S21,T32S,R12W,WM	178	8.3	1.5	1.0	15.0	HCC/HSM	S
97505	LOST BERRY	1	S21,T33S,R13W,WM	100	4.7	0.8	0.5	5.0	HCC/HSM	S
97506	SOUTH SUNSHINE	1	S24,T33S,R14W,WM	100	3.6	0.6	2.0	2.0	HCC/HSM	S
97000	SMALL SALES, FOREST-WIDE				3.1	0.6				
FY 97	Subtotal			5,249	160.0	28.7	33.8	80.0		

Table C-1. Ten-Year Action Plan (Continued)

Fiscal Year	Sale Name	Planning Basin No.	Legal Description Sec. Twn. Rng.Mer.	Acres	Net MMBF	Net MMCF	Road Miles C	Road Miles R	Harvest Method	Yarding System
98101	EAST FORK PISTOL	12	S11,T38S,R13W,WM	500	8.3	1.5	1.0	1.0	HCC/HSM	S
98102	BASIN CREEK	13	S06,T39S,R11W,WM	431	5.5	1.0	1.0	2.0	HCC/HSM	S
98103	MIDDLE CHETCO	13	S21,T38S,R12W,WM	352	5.5	1.0	0.0	1.0	HCC/HSM	HEC/S
98104	UPPER WHEELER CREEK	16	S35,T39S,R12W,WM	418	5.7	1.0	0.0	1.0	HCC/HSM	HEC
98201	BRIGGS SHADOW	11	S23,T36S,R09W,WM	92	2.4	0.4	2.3	0.0	HCC	MS
98202	DUTCHY	11	S13,T36S,R09W,WM	123	4.4	0.8	1.8	1.0	HCC	MS
98203	EAST GALICE	8	S15,T35S,R08W,WM	174	4.6	0.8	0.5	2.0	HCC	MS
98204	PURPLE HAZE	6	S31,T34S,R09W,WM	60	2.1	0.4	0.6	1.0	HCC	MS
98205	SALT WATER	8	S29,T36S,R07W,WM	266	6.2	1.1	2.5	2.0	HCC,HSH	MS
98301	SHASTA COSTA 2	4	S31.T34S.R10W,WM	381	8.7	1.6	5.4	20.0	HCC/HSM	S
98302	BUGS	6	S30,T35S,R11W,WM	139	4.2	0.8	0.0	7.0	HCC/HSM	S
98303	NORTH FORK	6	S25,T35S,R11W,WM	225	11.9	2.1	0.0	4.0	HCC/HSM	S
98304	ELK HAVEN	6	S27,T35S,R11W,WM	277	13.0	2.3	0.0	4.0	HCC/HSM	S
98305	ROCK	9	S36,T35S,R12W,WM	201	4.2	0.8	1.0	5.0	HCC/HSM	S
98306	WESTERLY	12	S10,T37S,R13W,WM	362	6.4	1.1	2.5	3.0	HCC/HSM	S
98401	PANTHER	20	S10,T40S,R06W,WM	60	2.0	0.4			HCC,HFR	MS
98402	WHISKERS	20	S05,T41S,R06W,WM	143	4.9	0.9			HCR	MS,S
98403	WESTON TWO	20,19	S12,T41S,R07W,WM	205	6.2	1.1	1.4		HCR,HSH	MS,S
98404	KESTER	20	S21,T40S,R06W,WM	92	3.7	0.7			HCC	MS
98405	SKAGG HOPE TWO	19	S12,T41S,R08W,WM	472	7.7	1.4	5.5		HCC,HSH	MS
98406	LIMESTONE	20	S21,T40S,R06W,WM	65	2.3	0.4	0.2		HCR,HSH	MS
98501	JOHN ROCK	2	S14,T33S,R12W,WM	134	6.3	1.1	0.5	8.0	HCC/HSM	S
98502	CLEARWOOD	2	S17,T32S,R10W,WM	110	6.3	1.1	1.0	2.0	HCC/HSM	S
98503	PUSSYCAT	2	S34,T32S,R11W,WM	100	5.2	0.9	0.5	10.0	HCC/HSM	S
98504	CAMP 2	2	S27,T31S,R11W,WM	300	3.1	0.6	1.0	10.0	HCC/HSM	S
98505	PEARSE PK.	1	S23,T33S,R14W,WM	230	8.4	1.5	2.5	8.0	HCC/HSM	S
98506	MULTI IRON	2	S10,T32S,R12W,WM	160	4.2	0.8	2.0	18.0	HCC/HSM	S
98507	SAND TRAP	2	S11,T32S,R12W,WM	100	5.2	0.9	1.5	6.0	HCC/HSM	S
98000	SMALL SALES, FOREST-WIDE				1.4	0.3				
FY 98	Subtotal			6,172	160.0	28.7	34.7	116.0		
	Decade Total			57,300	1,602.0	287.4	483.0	884.1		

APPENDIX D

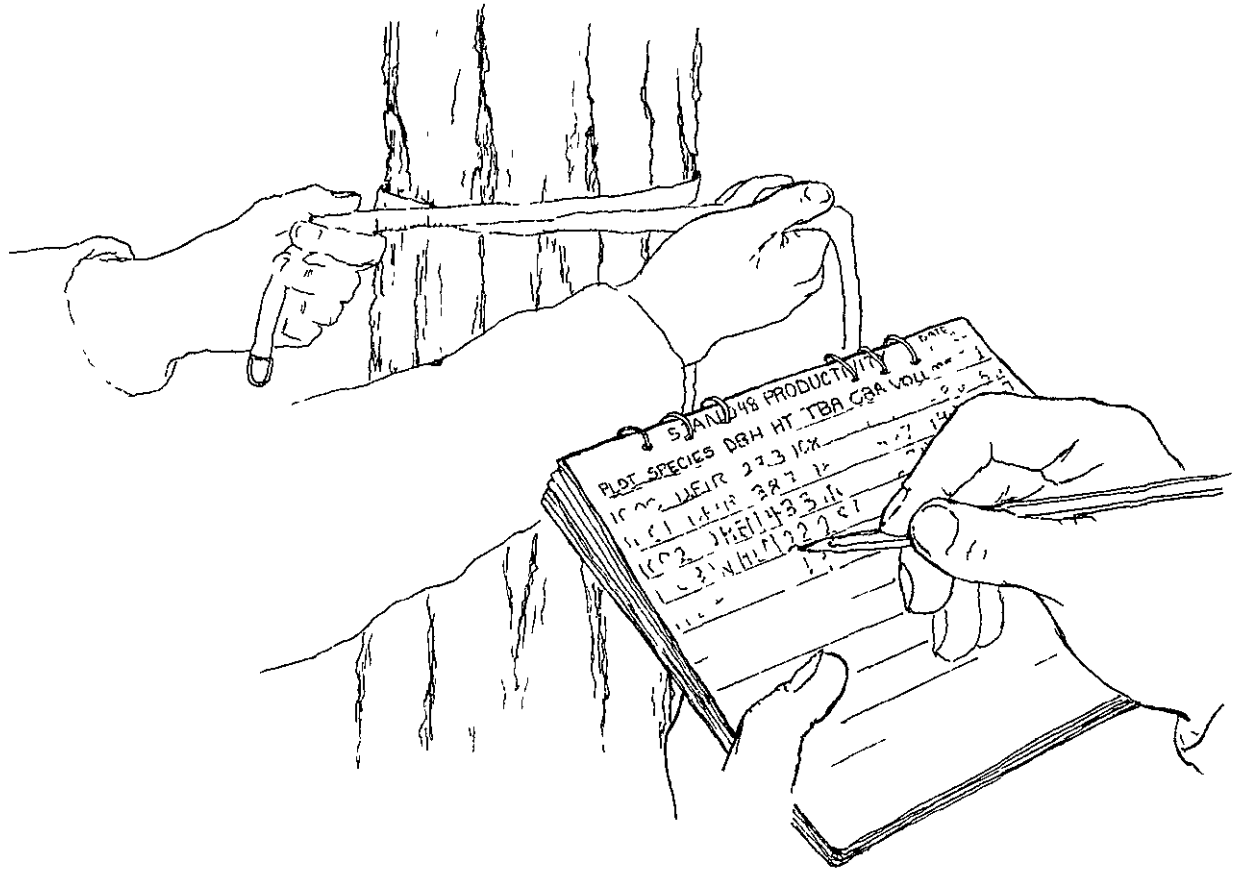
MONITORING AND EVALUATION

PROGRAM BACKGROUND

INTRODUCTION

The Monitoring Plan is the control system for implementation of the Land and Resource Management Plan (LRMP). The Monitoring Plan, which is composed of a series of Resource Elements, will determine if the LRMP is being implemented as specified in the Standards and Guidelines (S&G's). The Monitoring Plan also serves as a check to see if the effects of implementation are as predicted

A description of each Resource Element follows. The alphanumeric code preceeding the Resource Element name represents the appropriate activity code used in the Forest budget process For example, *annual monitoring costs identified for Resource Element - AN121(a) Recreation (Undeveloped) are $5,000* This amount is included in Table B-1 of Appendix B under Recreation Resource Administration having the activity code AN12. For a summary of all Elements in the Monitoring Plan, refer to Table V-1.



Resource Element - All Elements

ISSUE

Implementation of management direction as described in the LRMP, Chapter IV.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Insure that management direction is identified and applied in project planning and implementation

MANAGEMENT AREA

Management Areas 1 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

1	X	1	=	1
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Ensure that applicable S&G's are incorporated into project-level planning and implementation.
2. Ensure that unavoidable deviations from S&G's, along with appropriate mitigative measures, are identified in project-level NEPA planning, and that mitigative measures are carried through to implementation.

MONITORING PURPOSE

Compliance with management direction.

THRESHOLD OF CONCERN/VARIABILITY

1. Any deviation from S&G's which, through the project-level National Environmental Policy Act (NEPA) process, is not identified and for which mitigation is not prescribed.
2. Any instance where mitigative activities prescribed in the project planning were not implemented on the ground.
3. Instances where management direction was apparently applied in an appropriate manner, but did not produce the desired effect on-the-ground.

SAMPLING AND RESPONSIBILITY

Suggested Sampling Method	Responsibility
In all project-level NEPA processes identify: (1) applicable S&G's, (IDT) and Deciding Officer, (2) expected deviations from the S&G's, and (3) appropriate mitigative measures. Prepare a summary report of the items above and forward to Forest Planning Staff.	Project Interdisciplinary Team

Conduct post-implementation reviews on selected projects to confirm that the S&G's and mitigative measures were properly identified and applied on-the-ground. Prepare a summary report of the items above and forward to the Forest Planning Staff.	Deciding Officer, IDT, and Staff
Compile periodic, Forest-wide reports on compliance with the S&G's at both planning and implementation stages.	Forest Planning Staff Officer
With the the Forest Management Team, conduct periodic reviews of compliance with the S&G's. Identify areas of success and areas needing improvement.	Forest Supervisor

EXPECTED PRECISION AND RELIABILITY

Precision is moderate and the reliability is high

RESPONSIBILITY

District Rangers and Forest Supervisor's Office (SO) Staff.

ANNUAL MONITORING COST

Elements	**$/Year**
Preparation of project-level reports	5,000
Compiling Forest-wide reports	1,500
On-the-ground management reviews	12,000
Forest Management Team reviews	3,000
TOTAL ANNUAL COST	21,500

MANAGEMENT REVIEWS

Compliance with the Forest-wide Standards and Guidelines (S&G's) for the following resource areas:

* Developed recreation
* Dispersed recreation
* Visual resource
* Cultural resource
* Threatened, endangered, and sensitive species
* Deer/elk habitat
* Salmonid habitat
* Dead and down tree habitat
* Timber management practices
* Soil productivity
* Best Management Practices
* Cumulative effects
* Air quality
* Land acquisition
* Special uses
* Land lines
* Minerals
* Transportation planning
* Fire management
* Silvicultural practices

Compliance with the Management Area Prescriptions. The following is a list of the 14 Management Areas on the Forest:

* Wilderness
* Wild River
* Research Natural Areas
* Botanical
* Unique Interest
* Backcountry Recreation
* Supplemental Resource
* Designated Wildlife Habitat
* Special Wildlife Site
* Scenic/Recreational River
* Riparian
* Retention Visual
* Partial Retention Visual
* General Forest

In addition, those S&G's that are particularly important to resolving Planning Problems, as stated in Chapter III (e.g., mineral development, management of sensitive plants, preservation of old growth, etc.), need to be monitored.

Resource Element - All Elements (Forest Programs and Budgets)

ISSUE

Are funding levels received by the Forest adequate to support planned outputs?

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The management of the Forest has the budget necessary to achieve the projected outputs while progressing to the desired future condition as stated in the Forest Plan

MANAGEMENT AREA

Management Areas ? through 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Is the management of the Forest achieving planned outputs?
2. Are funding levels for capital investments adequate to achieve projected improvements?
3. Are the major variable costs used in the analysis consistent with actual implementation costs?

MONITORING PURPOSE

1. *Compliance with management direction.*
2. Achievement of output objectives.
3. Consistency with cost projections.

THRESHOLD OF CONCERN/VARIABILITY

1. Individual outputs achieved are + or - 20% projected in this Forest Plan (as displayed in Table IV-1).
2. Funding for fisheries, soil, and watershed capital investments + or - 20% of projected needs to 3 consecutive years.
3. Funding for wildlife habitat capital investments + or - 20% of projected needs for 3 consecutive years.
4. Funding for recreation capital investments + or - 20% of projected needs for three consecutive years.
5. *Variable costs incurred for the timber management program + or - 20% of analysis costs for 3* consecutive years.
6. Road costs incurred are + or - 20% of analysis costs for 3 consecutive years.

SUGGESTED SAMPLING METHODS

Use existing accomplishment reporting systems, e.g., MARS and PAMARS. Compare annual budgets with projected capital investments. Compare TSPIRS data with variable costs used in the analysis.

EXPECTED PRECISION AND RELIABILITY

Both precision and reliability are rated as high

RESPONSIBILITY

1. All Staff Officers
2. Fish and Wildlife, and Watershed Staff Officers
3. Fish and Wildlife Staff Officer
4. Recreation Staff Officer
5. Timber Staff Officer
6. Forest Engineer

ANNUAL MONITORING COST

$400.

Resource Element - AN121(a) Recreation (Undeveloped)

ISSUE

Affect of management direction on recreation opportunities in Backcountry Recreation.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to provide an array of recreation opportunities within the Primitive, Semi-primitive Motorized, and Semi-primitive Non-motorized Recreation Opportunity Spectrum (ROS) categories

MANAGEMENT AREA

Management Areas 6 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

$$\frac{1}{\text{(Cost of Error)}} \times \frac{1}{\text{(Likelihood of Error)}} = \frac{1}{\text{(Risk Index)}}$$

MONITORING QUESTIONS

1. Are the setting indicators of access, non-recreation management impacts, social encounters, facilities, and visitor management maintained at levels sufficient to provide Primitive and Semi-primitive (Motorized and Non-motorized) recreation opportunities?
2. Is resource degradation occurring as the result of sanctioned Off-road vehicle (ORV) use?

MONITORING PURPOSE

The objective of monitoring the ROS inventory categories is to track the effects of management activities, to determine if the management objectives and recreation setting required for the Primitive and Semi-primitive ROS categories are being met during the planning and implementation stage of resource management projects.

1. Compliance with management direction.
2. Achievement of output (goods and services) objectives.

THRESHOLD OF CONCERN/VARIABILITY

1. Five percent variance from LRMP objectives for Primitive and Semi-primitive Non-motorized recreation opportunities in Backcountry Recreation.
2. Visible degradation to soil, water, or vegetation resources on trails or in other areas open for ORV use.

SUGGESTED SAMPLING METHODS

1. Annual field observations and analysis of the effects of management activities within or adjacent to the management areas during project planning.
2 Inventory update every five years.
3. Projects planned in the various management areas currently categorized as primitive, semi-primitive non-motorized or motorized would be monitored in order to assess the effects of planned projects on the recreation setting in the area and the appropriate ROS category after project implementation.
4. Planned harvest units and attendant road systems will be recorded on the appropriate TRI/GIS (Total Resource Inventory/Geographic Information System, a computer/microfilm/map base

system) after the project analysis and documentation is completed and the decisions are made (District responsibility). This information will be overlayed with ROS and shifts from one opportunity spectrum to another will be determined at least every other year (Forest Landscape Architect responsibility).

5. Annual field observations of 33 percent of designated ORV areas and 100 percent of all ORV mitigation measures for review of effectiveness

EXPECTED PRECISION AND RELIABILITY

Data for ROS categorizing, as well as impacts to areas or trails open to use by ORV's, is collected with a large degree of accuracy. The data will have a high level of reliability.

RESPONSIBILITY

Recreation Staff, District Rangers, and Forest Landscape Architect.

ANNUAL MONITORING COST

$1,000/District X 5 Districts = $5,000.

Additional monitoring is included in project costs

Resource Element - AN121(b) Wild .and Scenic Rivers

ISSUE

Protection of wild and scenic river resources

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

In the wild sections of the rivers, the goal is to provide a Primitive or Semi-primitive recreation experience in an essentially undisturbed forest setting as prescribed in the S&G's, or in the objectives of the applicable Wild and Scenic River Management Plan (River Management Plan) River Management Plans, for rivers subsequently designated, will be written following the designation?

In the recreation and scenic sections of the rivers, the goal is to provide a high quality river recreation experience in a natural or near natural forest setting as prescribed in the S&G's, or in the objectives of the applicable River Management Plan.

MANAGEMENT AREA

Management Areas 2 and 10.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	1	=	3
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Is the protection and management of the Forest's Wild and Scenic Rivers consistent with the Wild and Scenic Rivers Act and the management objectives identified in the applicable River Management Plan?
2. Are the facilities and improvements scheduled in the LRMP being accomplished?
3. Do management activities within the Rogue River corridor meet inventoried or allocated Visual Quality Objectives?
4. Does Partial Retention in middleground distance zones satisfy the user demand for scenic quality within the Rogue River corridor?

MONITORING PURPOSE

1. Compliance with management direction.
2 Achievement of output (goods and services) objectives.
3. Satisfaction of user demand for scenic quality.

THRESHOLD OF CONCERN VARIABILITY

1. Visible degradation of the setting within or adjacent to the Wild River corridors
2. Any visible evidence of human intrusion causing a reduction in the existing character of the landscape within or adjacent to the Wild River corridor of the Illinois.
3 Any activity in a viewshed adjacent to the Recreation/Scenic River corridors, which would result in visual quality below the objectives either inventoried or allocated to the area

SUGGESTED SAMPLING METHODS

Annually observe the length of each Wild River corridor to inventory the effects of recreation use on the following

1. Campsites - Vegetative disturbance due to compacted soils, tent pads, or other activities Individual sites should be photographed and effects of use measured and recorded for annual comparison Limits should be established and use restricted as limits are reached. Other effects of use include human waste and garbage, the presence of permanent structures including fire rings, tent poles, drying poles, hitching posts, rails for stock, etc Any structural improvements to campsites within a Wild River corridor should be removed or broken up (See S&G's).
2. Social factors - Solitude for travelling and campsites. Conflicts between visitors with different travelling methods (hikers and rafters typically). Conflicts regarding party size, noise, or others that may be identified.
3. Evidence of humans - Discarded debris such as old tires, cans, plastic, raft accessories, paper, human waste, etc. (remove where possible).
4. Assessment of past and planned management activities against recommended levels of harvest for the various visual objectives through the Rogue River Visual Management Plan. Assessment will include:
   (a) Roads
   (b) Harvest units that have not achieved a 20' tree height in regenerated stands Units in approved EA's that are planned for harvest within 5 years.
   Impacts are assessed against recommended rates of harvest for each VQO These are
   Retention - 4 percent harvest within viewshed/decade Eight percent disturbance at any time
   Partial Retention - 8 percent harvest within viewshed/decade Sixteen percent disturbance at any time.
   Modification - 13 percent harvest within viewshed/decade Twenty-seven percent disturbance at any time.
5. Monitoring user feedback to District managers

Formal review of compliance with the LRMP and the applicable River Management Plan every 2 years

EXPECTED PRECISION AND RELIABILITY

Data for impacts to the lands within or adjacent to the Wild and Scenic River corridors is collected with a large degree of accuracy. The data will have a high level of reliability

RESPONSIBILITY

Recreation Staff, District Rangers, Forest Landscape Architect.

ANNUAL MONITORING COST

$10,000 (for all five designated rivers).

Additional monitoring is included in project administration costs

Resource Element - AV121 Visual

ISSUE

Protection of forest scenic values through Visual Resource Management.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The goal of the Forest is the maintenance of a natural or near natural forest setting in areas allocated to Retention and Partial Retention Visual Quality Objectives (VQO's) In areas allocated to General Forest, the VQO's will be to maintain a modified forest setting

MANAGEMENT AREA

Management Areas 12, 13, and 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Are planned or programmed management activities implemented within the constraints identified for the Retention and Partial Retention VQO's?
2. Are the allocated VQO's being achieved?

MONITORING PURPOSE

Compliance with management direction.

THRESHOLD OF CONCERN/VARIABILITY

Five percent increase over recommended levels of impact/decade in Retention, Partial Retention, and Modification VQO's.

SUGGESTED SAMPLING METHODS

1. As part of day-to-day project work in sensitive viewsheds, project plans and environmental documents are continuously monitored to verify that scenic values are adequately protected. For all projects planned in sensitive viewsheds, a field review will be conducted to verify that mitigation measures have been carried through project planning to on-the-ground implementation. In addition, all projects planned in areas allocated to General Forest will be field reviewed to verify that modification objectives have been met.
2. Post sale project reviews will include a comparison of anticipated and actual effects after project implementation.
3. Impacts to visual resources in sensitive viewsheds will be assessed on a project-by-project basis *and recorded by size (acres) and estimated time of release (year) in the TRI/GIS When the results* and recommendations of the management review team have been evaluated and made available to the appropriate resource managers, they will be stored in TRI/GIS Management reviews and reports will be made at least annually.

EXPECTED PRECISION AND RELIABILITY

Data for impacts to visual resources within viewsheds is collected with a large degree of accuracy. The data will have a high level of reliability. Projects are assessed using computer plots and can only be verified after implementation. Results in the past have been acceptable

RESPONSIBILITY

Recreation Staff, District Rangers, Forest Landscape Architect.

ANNUAL MONITORING COST

$1,000/District X 5 Districts = $5,000.

Additional monitoring in included in project administration costs.

Resource Element - AW121 Wilderness

ISSUE

Maintenance of wilderness character.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The goal of the Forest is to maintain the existing character of each designated Wilderness Frequent monitoring will assess the effects of all human related impacts on a wilderness environment, and to *determine if a wilderness character is being adequately maintained.*

MANAGEMENT AREA

Management Area 1.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

Are the physical/biological, social, and managerial settings of each Wilderness Recreation Spectrum (WRS) class maintained within the levels outlined in the S&G's and R-6 Supplement No. 81 to Forest Service Manual (FSM) 2320, as included in the LRMP?

MONITORING PURPOSE

1. Achievement of output (goods and services) objectives.
2. Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

Five percent of Wilderness acres in a condition assessed as lower than Semi-primitive. Eighty percent of estimated capacities for WRS classes occurs.

SUGGESTED SAMPLING METHODS

1. Implement the Limits of Acceptable Change (LAC) concept in order to insure that management objectives are met and that wilderness character and related values are identified and adequately protected. Field observations should be made annually in areas of heavy use. Levels of use, party *size, numbers of encounters, and degradation due to recreation use will be reported by wilderness* guards and other field-going personnel in order to prevent resource degradation and maintain the characters of the Wilderness.
2. Data from administrative studies, other wilderness plans, and past management practices will be used by the review team as input for their review. Once results and recommendations of the *management review team have been evaluated and made available to appropriate resource* managers, they will be stored in TRI/GIS.
3. Management reviews and reports will be made at least annually Field reports will be done continuously throughout the year.

EXPECTED PRECISION AND RELIABILITY

Data for human related impacts is collected with a large degree of accuracy The data will have a high level of reliability.

RESPONSIBILITY

Recreation Staff, District Rangers, Forest Landscape Architect

ANNUAL MONITORING COST

$2,000/District X 5 Districts = $10,000

Resource Element - CF121 Fish Habitat

ISSUE

Provide and maintain salmonid habitat.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Provide and maintain fish habitat with diversity and quality, capable of maintaining or enhancing populations of resident and anadromous salmonid game fish species.

Salmonid rearing, spawning, and migration habitat capability will be improved across the Forest Riparian prescriptions will maintain or lower summer water temperatures, with additional protection of the fisheries habitat occurring in designated Supplemental Resource and Special Wildlife Sites. Habitat improvement projects will increase habitat diversity and maintain stream channel stability.

MANAGEMENT AREA

Management Areas 1 through 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. What are the cumulative effects on fish habitat capability?
2. Is fish habitat and smolt production being maintained or improved as predicted by the LRMP Final *Environmental Impact Statement* (FEIS)?
3. Is the quantity and quality of rearing pools being maintained?
4. Is the fish population changing in terms of numbers, species composition, or age structure?
5. Is large woody material being retained in the stream channel for fish habitat?
6. Is stream temperature being maintained or decreased as predicted by the LRMP FEIS?
7. Is sediment affecting stream habitat?
8. What are the effects of fish habitat improvement structures on stream channel configuration, large woody material, and fish populations?
9. What is the lifespan of stream habitat improvement structures?

MONITORING PURPOSE

1. Achievement of output (goods and services) objectives.
2. Maintenance of environmental quality (effects) as projected.
3. Resource mitigation measures are employed.

THRESHOLD OF CONCERN/VARIABILITY

1. Monitoring Questions 1, 2, 3, and 8: A ten percent decline in overall pool volume, area, or average maximum depth by Class I or II stream.
2. Monitoring Questions 1, 2, 4, and 8: Declining trend (three years or more) in juvenile salmonid populations with overall population reduction of greater than 25 percent for age 1+ steelhead or 50 percent for age 0 chinook (as monitored at established critical reach stations).

3. Monitoring Questions 5 and 8: A ten percent management related decline in the amount of large woody material located in stream channels.
4. Monitoring Question 6: Increasing trend in stream temperatures on monitored Class I and II streams by basin (Exceeding State Water Quality Standards).
5. Monitoring Question 7: Fine sediment component that increased by twenty percent above background levels as monitored at established critical reaches by basin.
6. Monitoring Questions 6 and 7. A one scale-class reduction in the community tolerance quotient for macroinvertebrates as measured at established critical reach stations by basin
7. Monitoring Question 9: Functional or structural failure rate of habitat improvement structures that exceeds 25 percent. Minor maintenance of structures is expected and would not be considered failure.

SUGGESTED SAMPLING METHODS

1. Monitoring Questions 1, 2, 3, 4, 5, 8, and 9: Develop baseline data to determine changes in fish habitat capability based on standard Region 6 method developed by Hankin and Reeves Initially survey all Forest streams during a three year period. Approximately five percent of the stream miles will be resurveyed annually. These stream miles will be well distributed and should focus on the sensitive low gradient habitat. The remainder of the stream miles will be resurveyed at the rate of 20 percent per year.

2 Monitoring Questions 1, 2, 4, and 8: In addition to the summer surveys outlined in the Hankin and Reeves Hankin methodology, if Chinook are present, the stream miles that are surveyed annually should also have spawning ground counts and spring surveys for juvenile Chinook abundance There is an opportunity to mesh these areas with the Oregon Department of Fish and Wildlife (ODFW) index streams.

3 Monitoring Questions 6 and 7: Develop baseline stations for aquatic invertebrate sampling. Approximately 50 stations will be established. These stations should be tied to the streams that will be surveyed annually. Aquatic invertebrate sites will be monitored annually.

4 Monitoring Question 6: See monitoring item FW121(a) Water Resources for pre- and post-harvest effective stream shade canopy monitoring.

5. Monitoring Question 6: Monitor temperatures in fish bearing streams during the summer with thermographs. Approximately 15 streams will be monitored. Sites should be near aquatic invertebrate sampling stations (in cooperation with the Watershed Element). See monitorin item FW121(a) Water Resources for additional water temperature monitoring.

6 Monitoring Question 7: Establish baseline sediment data on selected streams using freeze core samples. These sites should be spawning areas and tied to the invertebrate, temperature and stream survey areas. Approximately 50 sites will be established. These sites will be monitored at the rate of 20 percent per year. If aquatic invertebrate sampling indicates damage is occurring then the sampling frequency will be increased.

7 Monitoring Question 9: Monitor all habitat improvement projects in the first year following project completion to evaluate structural and functional success. Monitor at least 20 percent of the structures annually.

EXPECTED PRECISION AND RELIABILITY

The monitoring will provide information that will be moderately to highly precise and reliable. It will provide excellent information on fish habitat quality, quantity, and trends.

RESPONSIBILITY

District Rangers and Forest Staff.

ANNUAL MONITORING COST

Stream surveys and fish populations. Years 1-3 - $88,000/year; years 4-10 - $61,000/year.

Aquatic invertebrate sampling: Years 1-10 - $10,000/year.

Stream temperature monitoring Thermographs: Year 1 - $16,000; years 2-10 - $7,500.

Stream gravel Sediment Monitoring: Year 1 - $24,000; years 2-10 - $5,000

Habitat structure monitoring: Years 1-10 - $2,500.

TOTAL ANNUAL COST - $86,000 to 113,000

A one-time baseline inventory cost of $160,000 will be incorporated into the normal Forest program.

Resource Element - CT121(a) Endangered [E], Threatened [T], Sensitive [S], Unique [U] Animals

ENDANGERED OR THREATENED SPECIES

American Peregrine Falcon [E-ORegon and CAlifornia], Bald Eagle [T-OR, E-CA]

SENSITIVE SPECIES

Sensitive species include the Siskiyou Mountain Salamander [S-OR], Western Spotted Frog [S-OR], Western Pond Turtle [S-OR], Northern Spotted Owl [S-OR/CA] Northern Goshawk [S-CA], Willow Flycatcher [S-CA], Townsend's Western Big-eared Bat [S-OR], White-footed Vole [S-OR], California Wolverine [S-OR/CA], Fisher [S-CA], Pine Marten [S-CA]. Unique species include the Marbled Murrelet [U-OR], and the Gold Beach and Pistol River Pocket Gophers [U-OR]

Management of Endangered or Threatened species is governed by the federal Endangered Species Act, and is coordinated with the UDSI Fish and Wildlife Service. Sensitive species require special consideration; Regional Foresters are concerned about the population viability of sensitive species, the Forest is obligated to determine the distribution, status, and trend of sensitive species, and their habitat (FSM 2670 45)

The bald eagle, spotted owl, and pine marten are treated under their own elements (CT121[b], CT121[c], and CW121[b] respectively). Sensitive and Unique animals other than spotted owl and pine marten are treated in this element as species needing inventory rather than monitoring

A few Unique species of special interest are also included in this element. The marbled murrelet is not presently listed as sensitive, but the state of Oregon was petitioned in January 1988 to list the species as Threatened; the United States Department of Interior (USDI) Fish and Wildlife Service has also been petitioned (1988) to list the species under the provisions of the Endangered Species Act. Populations are judged to be relatively low in Oregon (Marshall 1988). The Gold Beach and Pistol River pocket gophers are listed as Category 2 species by the USDI Fish and Wildlife Service (status insufficiently known at present, but species could be proposed as threatened or endangered at some future date)

The costs for species inventories (Sensitive and Unique) have been ascribed to the Capital Investment schedule in Appendix B, rather than to the Monitoring Plan (Monitoring is part of the operations budgets in CT1 and CW1 [Table B-1, Appendix B]).

ISSUE

Maintaining habitat for these species.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Meet or exceed the recovery levels established in Pacific Coast Recovery Plan for the American Peregrine Falcon (Pacific Population) (USDI Fish and Wildlife Service 1982). For inventory species, maintain viable populations.

MANAGEMENT AREA

Potentially all management areas.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is high because species are thought to be in low numbers on the Forest. Likelihood of error is moderate for all species: (a) except for the murrelet and vole, the best habitat is located within land allocations without programmed timber harvest, (b) populations of the murrelet and vole are thought to be large enough to be reasonably resistant to short-term habitat change. Loss of habitat to natural catastrophe is low to moderate, depending on the species

MONITORING QUESTIONS

PEREGRINE FALCON

1. Are existing nest sites producing young as anticipated?
2. Are surveys being completed to locate new or previously unknown nest and roost sites?
3. Are potential sites being protected?

OTHER SPECIES

Are habitat inventories and surveys being completed as scheduled?

MONITORING PURPOSE

1. Compliance with management direction
2. Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

PEREGRINE FALCONS

1. Active nest sites do not produce young two years in succession.
2. Surveys not completed on schedule.
3. Non-compliance with S&G's.

OTHER SPECIES

Surveys not completed on schedule.

SUGGESTED SAMPLING METHODS

PEREGRINE FALCON

1. Annual monitoring of active nest sites. For each site set up a minimum yearly schedule during the breeding season to determine nesting chronology and success.
   a. Make one or two visits as needed during April to determine occupancy and nesting chronology (consider nest site unoccupied if birds are not present by April 30).
   b. After nesting chronology is determined, return every two weeks to check on progress
   c. Sometime during late May to mid-June (depending on chronology) band young and collect eggshell fragments and prey remains.
   d. After step (c) is completed, check progress of nesting attempt one or two times, then make one last visit check for post-fledging survival (between June 15 and July 15)

2 Field survey of potential sites. Field review sites at 2 year intervals. Investigate specific reports of peregrine falcons.
3 Road building or timber activities in the vicinity of identified potential nest sites will be addressed in site specific environmental analyses. Manage activities in accordance with S&G's. Review project plans for any management activities which may affect active or potential nest sites. Monitor management activities during and after implementation to insure adherence to S&G's.

OTHER SPECIES

Use appropriate survey methods. Fisher habitat will be surveyed as part of the Pine Marten Element Goshawk and willow flycatcher habitat will be surveyed in California only See Cooperrider and others (1986) for a summary of inventory and monitoring methods.

EXPECTED PRECISION AND RELIABILITY

PEREGRINE FALCON

Precision is moderate because known nest sites will be monitored, but we may not be aware of other active nest sites. Reliability is high because direct counts will be made

OTHER SPECIES

No estimates (information garnered from surveys and inventories may be used to set up monitoring schemes)

RESPONSIBILITY

All items - District Rangers Forest Staff coordinates sampling methods, compilation of data, and Forest report.

ANNUAL MONITORING COST

PEREGRINE FALCON

Item 1: 16 days per year per active site (3 existing), plus expenses for analyses of eggshell fragments and prey remains ([16 x $100] + 200 = $1,800 per site or $4,800 for 3 sites). Item 2: The Forest contains approximately 40 sites which should be inventoried every other year (2 days per site) (20 x 2 x $100 = $4,000) Annual SO administration costs for items 1 and 2 = $400. Item 3 costs will be borne by other functions (ET113 support to timber, etc).

Annual cost for peregrine falcon monitoring = 4,800 + 4,000 + 400 = $9,200.

OTHER SPECIES

Costs associated with Monitoring Elements C1 through C8 and peregrine falcon (part 1 of C9) are included as budget items under support to the Wildlife (CW) or Endangered/Threatened/Sensitive (CT) programs However, costs listed for the species below are for survey and inventory, rather than monitoring For budgeting purposes, these costs have been included in the Forest Capital Investment Program (see schedule Appendix B) and are not costs of the Forest Monitoring Plan.

The following costs are listed for information purposes only.

Species	Fiscal Year (M $) 1	2	3	4	5
Siskiyou Mountain Salamander [S]				2 0	
Spotted Frog [S]				1 0	
Western Pond Turtle [S]			3 0	3 0	
Marbled Murrelet [U]	13 0				13 0
Spotted Owl [S]	7.5	7 5	7.5	7 5	7 5
Northern Goshawk [S]		1 0		1 0	
Willow Flycatcher [S]		1 0		1 0	
Townsend's Western Big-eared Bat [S]			3 0		
White-footed Vole [S]		10 0	10 0		
Gold Beach/Pistol R Pocket Gophers [U]	2.0		2 0		
California Wolverine [S]		3 0		3 0	
Fisher [S]		See Pine Marten Element			
Pine Marten [S]		See Pine Marten Element			

REMARKS

Revise S&G's for OTHER SPECIES as data becomes available. Work with State and Federal Fish and Wildlife agencies, universities (research), and conservation groups to develop census methods and determine effectiveness of existing S&G's.

A January 14, 1988 letter from USDI Office of Environmental Project Review contains suggestions for monitoring of peregrine falcons. This letter is FEIS comment number 1789.

Resource Element - CT121(b) Bald Eagle

ISSUE

Maintaining Habitat for Bald Eagles.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Meet or exceed recovery levels established in Pacific Bald Eagle Recovery Plan (USDI Fish and Wildlife Service 1986).

MANAGEMENT AREA

Management Areas 1 to 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is high because the species is in low numbers on the Forest (Threatened status in Oregon). Likelihood of error is moderate because the best habitat is located within land allocations without programmed timber harvest; existing sites are easily identified and monitored. We may not be aware of other active nest sites or eagle activity. There is also a moderate likelihood of catastrophic loss of nest trees to wildfire or wind. Thus risk index is moderate.

MONITORING QUESTIONS

1. Are existing nest sites producing young as anticipated?
2. Are potential sites being protected (are areas identified as prime in the FEIS actually being protected)?
3. Are surveys being completed to locate new or previously unknown nest and roost sites?

MONITORING PURPOSE

1. Compliance with management direction.
2. Resource mitigation measures are employed

THRESHOLD OF CONCERN/VARIABILITY

1. Active nest site unoccupied for two years in succession.
2. Not less than 90 percent of the potential sites are suitable for occupancy at any given time
3 Non-compliance with S&G's.

SUGGESTED SAMPLING METHODS

1. Annual Interagency survey of nest sites ODFW annually conducts a mid-summer productivity survey on known active nest sites.
2 Field survey of potential sites. Sites reviewed at 5-year intervals
3. Survey for new bald eagle nest sites during osprey surveys (see CW121(c) Osprey Element) Participate in midwinter (country-wide) bald eagle count in cooperation with ODFW and the National Wildlife Federation. District personnel will keep accurate, up-to-date, complete records of bald eagle sightings. Specific reports of bald eagle nesting activity will be investigated Sighting information should be gathered from commercial jet-boat or raft float pilots.

EXPECTED PRECISION AND RELIABILITY

Precision is moderate because known nest sites and concentration areas will be monitored, but we may not be aware of other active nest sites or eagle activity. Reliability is high because direct counts will be made

RESPONSIBILITY

Item 1 - Forest Staff; Items 2, 3 - District Rangers. Forest Staff coordinates sampling methods, compilation of data and Forest report.

ANNUAL MONITORING COST

Item 1 - no cost. Item 2 - 5 days every 5 years ($100 x 10 days {2 people} = $1,000) Item 3 - three person days per year (one 2-person field day for mid winter survey, 2 office days for coordinating sighting information, etc. -- 100 x 4 = $400).

Depending on year, total annual cost is 1,000 + 400 + 300 + 150 = $1,850, or 400 + 300 + 150 = $850

REMARKS

Nest site surveys currently are coordinated with the state agencies. Coordinate winter monitoring efforts with other monitoring efforts of the ODFW, Pacific Bald Eagle Working Team, and National Wildlife Federation.

A January 14, 1988 letter from USDI Office of Environmental Project Review contains suggestions for monitoring of bald eagles. This letter is Forest plan comment number 1789.

Resource Element - CT121(c) Spotted Owl

ISSUE

Maintaining Habitat for Spotted Owls

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain a viable population of spotted owls as per S&G's established in the Final Supplement to the Environmental Impact Statement for an Amendment to the Pacific Northwest Regional Guide - Spotted Owl Guidelines, 1988 (FSEIS). Maintain network of Spotted Owl Habitat Areas (including connections to habitat in wilderness and other reserved areas). Spotted owls, pileated woodpeckers, and pine marten are ecological indicators for other species that use or depend upon mature and older aged timber stands.

MANAGEMENT AREA

Management Area 8, plus portions of other land allocations where they serve as part of the established habitat network for spotted owls, or where inventories need to be conducted.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is high because ineffective S&G's could result in a decline of the species population to the point of being listed as threatened or endangered by the USDI Fish and Wildlife Service. Likelihood of error is moderate because acres of old growth required per pair on the Forest is unknown; on balance, the option to designate more habitat per Spotted Owl Habitat Area (SOHA) is available at most sites for at least the next 5 years. Thus risk index is moderate. There is some risk to habitat areas from wildfire.

MONITORING QUESTIONS

Determine pair occupancy and reproductive status of spotted owls within SOHA's or Random Sample Areas.

1. Are SOHA's occupied by a pair of reproductively successful spotted owls in any given year?
2. What are the trends in pair occupancy, breeding status, and reproductive success of SOHA's through time?
3 How correct are the assumptions and expected outcomes of implementing the S&G's detailed in the FSEIS for spotted owls?
4. What are the general population trends of the spotted owl (random sample areas)?
5. Are SOHA's being managed as required by S&G's?
6. Is potential habitat being surveyed for spotted owls?

MONITORING PURPOSE

1. Compliance with management direction
2. Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

1 through 4. Thresholds set as part of the Regional monitoring program.
5 and 6. Non-compliance with Forest S&G's

SUGGESTED SAMPLING METHODS

1 through 4. Use methods detailed in the Region 5/Region 6 Spotted Owl Inventory and Monitoring Handbook.

5. Review plans for all projects occurring within or adjacent to SOHA's to determine if areas are being maintained and that S&G's are being followed (very few projects, other than an occasional road, should affect the Designated Wildlife Habitat area). Projects will be reviewed as they occur.

6. Inventory habitat outside of SOHA's affected by proposed projects; as a guide, use techniques outlined in the Handbook.

Monitor SOHA's throughout the life of the LRMP. Approximately 75 percent of the SOHA's (19) will be monitored annually. Up to 31 Random Sample Areas will be monitored annually. Inventory areas will be surveyed as necessary.

EXPECTED PRECISION AND RELIABILITY

Precision is high because all Designated Wildlife Habitat areas will be monitored, and reserved areas will be sampled. Although each SOHA will be monitored at regular intervals, reliability is moderate.

RESPONSIBILITY

District Rangers are responsible for District monitoring; Forest Staff coordinates sampling methods, compilation of data and Forest report.

ANNUAL MONITORING COST

Costs for items 1-4 are listed below (and include all associated costs, such as Forest coordination); costs for item 5 and 6 will be borne by other functions (ET113 support to timber, CT1 Operations, etc).

Monitor 19 SOHA's at a cost of $1,950 each	= $37,050
Monitor 31 RSA's at a cost of $1,950 each	= $60,450
ANNUAL COST	= $97,500

REMARKS

See description of Management Area 8 for details on habitat requirements (Chapter IV)

Cooperate with ODFW. Apply research findings as they become available, amend or supplement Forest Plan as necessary.

The Forest will assist the Regional Office in meeting the terms of the 1988 Interagency agreement on spotted owls. The four agencies (USDA Forest Service, and USDI Fish and Wildlife Service, Bureau of Land Management, and National Park Service) have agreed to cooperate in an effort to maintain population viability for spotted owls.

Resource Element - CT121(d) Sensitive Plants

ISSUE

Maintenance of Sensitive Plant Populations.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Provide and maintain diverse high quality habitats capable of maintaining viable populations of all sensitive plant species. Selected locations will be monitored to determine population trends of sensitive plant species. Concentration areas of sensitive plants will be sampled and management activities will be reviewed as a gauge on the effectiveness of S&G's.

MANAGEMENT AREA

Management Areas 1 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is moderate because small areas would be affected at one time, rather than large areas. Likelihood of error is moderate because much information on occurrence and habitat requirements still needs to be gathered. Risk Index is thus moderate.

MONITORING QUESTIONS

Are sensitive plant populations being maintained?

MONITORING PURPOSE

1 Compliance with management direction.
2 Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

Twenty percent decline in the size of a population at a monitoring site.

SUGGESTED SAMPLING METHODS

Fifty plots will be monitored long-term. The 20 percent threshold will trigger a review of management activities which may be responsible for these changes. If management reviews show that sensitive plants are being detrimentally affected by ground-disturbing activities, this will trigger a review of S&G's See REMARKS section for details on example monitoring procedures.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are both considered moderate. A very small portion of the sensitive plant resource will be monitored, but the resource is reasonably well insulated from wholesale detrimental change

RESPONSIBILITY

District Rangers are responsible for District monitoring, Forest Staff coordinates sampling methods, selects monitor sites, compiles data, and produces Forest report.

ANNUAL MONITORING COST

Monitor 50 permanent plots - ten per year.

During the **First** visit to a site (first five years of LRMP) permanent plots will need to be set up, which will require 1 day of field work and 1/2 day office work per site, or 1.5 days x 10 sites x 2 people (GS-7) x $100 per day = **$3,000.** During **Subsequent** visits to a site (after first five years of Plan), 1 site can be monitored per day including office work, or 1 day x 10 sites x 2 people x $100 per day = **$2,000.** After the second-visit regime begins in the sixth year, we expect one site per year to drop below the 20 percent threshold; the subsequent management review will cost **$1,000.** Each year the Forest Botanist (GS-11) will need to spend three days analyzing data and preparing a report

First five years:	$3,000	+	$0	+	$450	=	$3,500
	(Field Surveys)	+	(Review)	+	(Compilation/report)	=	(Annual Cost)
Thereafter	$2,000	+	$1,000	+	$450	=	$3,500
	(Field Surveys)	+	(Review)	+	(Compilation/report)	=	(Annual Cost)

Two Forest Service employees cost $100 per day per person (GS-7) plus expenses for vehicle and per diem). There are no extra costs associated with review of S&G's in conjunction with management reviews of ground-disturbing activities. A database will be established during the first two years

REMARKS

Coordinate work on federal candidate species with the USDI Fish and Wildlife Service Coordinate work on sensitive species with the Oregon Department of Agriculture and Oregon Natural Heritage Data Base. Coordinate research needs with Oregon State University, University of Oregon, and Southern Oregon State College

Detailed Suggested Monitoring Plan

For monitoring, one-fifth of the selected plots will be evaluated annually. Plant indicator species will be grouped by habitat (e.g., will be "plant indicator groups" or more precisely "indicator habitats", rather than indicator species). At least ten sites each in plant groups 1 through 4 will be monitored (2 or 3 species at one location counts as 1 site). Where possible, sites selected will be those with the most potential for resource conflicts (timber harvesting, road building, mining, recreation, or areas where unauthorized digging of sensitive plants may occur). If possible, those plants prefixed by a 1/ in the table below should be represented in the sample plots. Most of the plants listed below are considered sensitive; a few are monitor or watch list species.

Permanent photo plots or transects should be set up at all sites. Each site will be monitored every fifth year. Small populations will be individually counted, plant numbers in large populations will be estimated systematically (Regional Ecologist's techniques for photo plots should be used; consult Forest Ecologist)

Indicator Species Groups - Plants (# known sites)

Bog and wet/moist places, serpentine subgroup

Cypripedium californicum (30)
Darlingtonia californica (114) 1/
Gentiana bisetaea (19) 1/
Hastingsia bracteosum (2) 1/
Viola lanceolata ssp. occidentalis (3)

Bog and wet/moist places, non-serpentine subgroup

Bensoniella oregana (47) 1/
Gentiana setigera (1)
Erigeron cervinus (18)
Lilium vollmeri (19) 2/
Lilium wigginsii (2) 1/
Salix tracyi (2)
Smilax californica (1)

Rocky Places (serpentine/non-serpentine)

Dry

Arabis koehleri var. stipitata (12)
Arabis mcdonaldiana (2) 1/
Arctostaphylos hispidula (4)
Calochortus howellii (7)
Dicentra formosa ssp. oregana (18) 1/
Eriogonum pendulum (7)
Fritillaria glauca (6)
Lewisia leana (3)
Lomatium engelmannii (2)
Microseris howellii (13)
Monardella purpurea (8)
Pedicularis howellii (8+) 1/
Poa piperi (6)
Sedum laxum ssp. heckneri (10)
Streptanthus howellii (3) 1/
Thlaspi montanum var siskiyouense (13) 1/

Moist

Lewisia cotyledon var cotyledon (6)
Lewisia cotyledon var. howellii (?) 1/
Lewisia cotyledon var purdyi (?) 1/
Lewisia oppositifolia (7) 1/

Open slopes, fields, meadows, and woods (serpentine/non-serpentine)

Allium bolanderi (6)
Balsamorhiza sericia (B. platylepis) (5)
Brodiaea ida-maia (5)
Epilobium rigidum (11)
Erythroniun howellii (8)
Frasera umquaensis (2) 1/
Lathyrus delnorticus (14)
Kalmiopsis leachiana (3 outside of wilderness)
Mimulus douglasii (2)
Ribes marshallii (6)
Senecio hesperius (3)
Sophora leachiana (10) 1/
Sidalcea setosa ssp. querceta (1) 1/
Vancouveria chrysantha (8)

1/ Plants should be represented by at least two sites (unless only one is known).
2/ A large population of *Lilium vollmeri* on the Gold Beach Ranger District should be monitored, it is the largest known population of this species (see TRI/GIS Sensitive Subsystem for details).

Resource Element - CW121(a) Pileated Woodpecker

ISSUE

Maintain Pileated Woodpecker Habitat.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain habitat effectiveness of the 63 (45 outside of wildernesses) pileated woodpecker habitat areas designated to meet management direction. These sites (including SOHA's) provide mature and old-growth forest habitat to insure the Forest will maintain a well distributed viable population of pileated woodpeckers Pileated woodpeckers are ecological indicators of other species that use or depend upon mature and older aged timber stands.

MANAGEMENT AREA

Management Area 8.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is moderate because this species is widespread on the Forest and much habitat is available outside of Designated Wildlife Habitat areas Likelihood of error is moderate because site specific territorial requirements are not known for the Forest; pileated woodpeckers may require more than 300 acres of mature/old-growth forest per pair (Mellen 1987). Thus the risk index is moderate There is some risk to habitat areas from wildfire.

MONITORING QUESTIONS

1. Are the areas suitable habitat for pileated woodpeckers?
2. Is there evidence of pileated woodpeckers (diggings, cavities, birds)?
3. Are the number of areas identified in the plan being maintained?
4. Are the areas occupied and productive?

MONITORING PURPOSE

1. Compliance with management direction.
2. Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

1. Habitat suitability less than minimum standards.
2. Decline of more than 15 percent in detected presence.
3. Habitat area numbers and distribution less than minimum requirements.
4. Decline of more than 20 percent in occupancy or reproduction success (nest failure)

SUGGESTED SAMPLING METHODS

1. Examine 50 or 25 percent of the habitat areas annually (depending on year) to sample for maintenance of habitat effectiveness for pileated woodpeckers (include both the 300 acres of Designated Wildlife Habitat and 300 acres of foraging habitat). Establish permanent plots for sampling habitat capability; use Habitat Suitability Index Model (Schroeder 1982) or another

credible suitability index A potential sampling scheme may consist of randomly selecting four permanent transects (or equivalent plots) per habitat area. At 500 foot intervals along each transect characterize habitat for pileated woodpeckers (use standard resource inventory plot size) Along transect route, observer will also note feeding cavities, nest/roost cavities, and actual sightings Monitoring of spotted owl areas will include incidental gathering of pileated data, as SOHA's also qualify as pileated woodpecker habitat areas (pileated areas will also be sampled for pine marten habitat data - see pine marten element). Record sightings and sign of other wildlife species noticed along the transects.

2. Sampling method 1 will also serve to answer monitoring question 2
3. Examine those sites where natural occurrences such as windthrow or fire may have affected the sites. Examine affected habitat areas within a year after the event.
4. Examine 10 percent of habitat areas annually to sample for occupancy and productivity of pileated woodpeckers. Use tape recorded territorial calls and drummings to elicit responses from pileated woodpeckers Search areas for nests to determine productivity (see Mellen 1987 for methods)

EXPECTED PRECISION AND RELIABILITY

Precision is considered moderate, because credible models will be used to assess habitat capability (see citation above). Reliability is considered moderate, because all designated habitat areas will be monitored; conversely, actual territorial requirements on the Forest are not well understood Over the short term this habitat resource is reasonably well insulated from significant detrimental change

RESPONSIBILITY

District Rangers are responsible for District monitoring; Forest Staff coordinates sampling methods, compilation of data and Forest report.

ANNUAL MONITORING COST

Monitor 63 pileated woodpecker areas throughout the life of the LRMP. Half of the sites will be monitored in each of the first two years, 25 percent in each year thereafter. A database will be established during the first two years. Costs for sampling methods 1, 2, and 5 are listed below. Costs for sampling methods 3 and 4 will be borne by other functions (ET113 support to timber, etc).

A. First 2 years (items 1 and 2):

63 areas x .5(%) = 32 areas monitored per year. On the average it will take two people 1 day to monitor one area.

32 areas x $100 per day x 2 persons	=	$6,400	
32 areas x 4 track plates x $10	=	1,300	(see pine marten element)
1 day each SO & RD Admin. x $150	=	300	
ANNUAL COST	=	$8,000	

B Every year thereafter (items 1 and 2):

63 areas x 25 (%) = 16 areas monitored per year. On the average it will take two people 1 day to monitor one area

16 areas x $100 per day x 2 persons	=	$3,200	
16 areas x 4 track plates x $10	=	650	(see pine marten element)
1 day each SO & RD Admin x $150	=	300	
ANNUAL COST	=	$4,150	

C. Every year (occupancy and productivity monitoring -- item 5):

63 areas x .10 (%) = 6 areas monitored per year. On the average it will take two people 5 days to monitor one area.

6 areas x $100 per day x 2 person x 5 days	=	$6,000
1 day each SO $ RD Admin. x $150	=	300
ANNUAL COST	=	$6,300

Total Cost of Monitoring

First 2 years = A + C = 8,000 + 6,300	=	$14,300
Year 3 and beyond = B + C = 4,150 + 6,300	=	$10,450

REMARKS

See description of Management Area 8 for details on habitat requirements (Chapter IV)

Data on pine marten (and fisher) will be collected in pileated woodpecker habitat areas.

Research is needed to establish habitat requirements for pileated woodpeckers on the Forest (how many acres of mature/old-growth Forest is required). Habitat requirements may be significantly different in three separate areas of the Forest: eastside, south coast, north coast. Revise S&G's for pileated woodpecker habitat areas as data becomes available. Work with State and Federal Fish and Wildlife agencies, universities (research), and conservation groups to develop census methods and determine effectiveness of S&G's.

Various methodologies for sampling the snag component in habitats of the Blue Mountains or Oregon are currently being evaluated by Evelyn Bull, Pacific Northwest Research Station, LaGrande, Oregon Information from her investigation should be available in the next few years, and may be useful in developing sampling schemes for pileated woodpecker habitat areas.

Resource Element - CW121(b) Pine Marten

ISSUE

Maintain Pine Marten Habitat.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain habitat effectiveness of the 85 (66 outside of Wildernesses) pine marten habitat areas designated to meet management direction. These sites (including spotted owl and pileated woodpecker areas) provide mature and old-growth forest habitat to insure the Forest will maintain a well distributed viable population of pine marten.

MANAGEMENT AREA

Management Area 8

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	3	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is moderate because marten habitat is widespread on the Forest, with much habitat available outside of Designated Wildlife Habitat areas. Likelihood of error is moderate because of incomplete habitat relationship information and lack of site specific habitat information for the Forest. Thus the risk index is moderate. Marten are ecological indicators of other species that use or depend upon mature and older aged timber stands There is some risk to habitat areas from wildfires.

MONITORING PURPOSE

1. Compliance with management direction
2 Maintenance of environmental quality (effects) as projected.

MONITORING QUESTIONS

1. Are the areas suitable habitat for pine martens?
2. Is there evidence of pine marten (scat, tracks, animals)?
3. Are the number of areas identified in the plan being maintained?

THRESHOLD OF CONCERN/VARIABILITY

1. Habitat suitability less than minimum standards.
2. Decline of more than 25 percent in detected presence (after all areas visited and analyzed--after database developed for all sites--set at 25 percent because of expected difficulty in gathering information).
3. Habitat area numbers and distribution less than minimum requirements

SUGGESTED SAMPLING METHODS

Monitor 85 pine marten areas throughout the life of the LRMP. Half of the sites will be monitored in each of the first 2 years, 12.5 percent in each year thereafter.

1. a. Depending on year, examine 50 or 12 5 percent of habitat areas annually to sample for maintenance of habitat effectiveness for pine marten Establish permanent plots for sampling

habitat capability, use Habitat Suitability Index Model (Allen 1982) or other acceptable suitability index. A potential sampling scheme may consist of randomly selecting four permanent transects (or equivalent plots) per habitat area. At 500 foot intervals along each transect characterize habitat for pine marten (use standard resource inventory plot size). Along transect route, observer will also note any marten sign or sightings. One track plate (baited aluminum platforms coated with carbon black) or hair trap will be placed per transect to monitor for the presence of marten Winter track counts may be another option to consider

b. In pine marten areas look along the transect route for signs of pileated woodpeckers (diggings, cavities, birds) Technically, marten areas do not serve as pileated areas, however, very little extra effort will be needed to collect this additional information on habitat use by pileated woodpeckers, and it may prove useful when this LRMP is revised in 10-15 years. Record sightings and sign of other wildlife species noticed along the transects. Monitoring of SOHA's and pileated areas will include incidental gathering of marten data, as both spotted owl and pileated woodpecker habitat areas also qualify as pine marten habitat areas

2 Sampling method 1 will also serve to answer monitoring question 2.

3. Examine those sites where natural occurrences such as windthrow or fire may have affected the sites. Examine affected habitat areas within a year after the event.

EXPECTED PRECISION AND RELIABILITY

Precision is considered moderate, because acceptable models will be used to assess habitat capability (see citation above). Reliability is considered moderate, because all designated habitat areas will be monitored; conversely, actual territorial requirements on the Forest are not well understood Over the short term this habitat resource is reasonably well insulated from detrimental change.

RESPONSIBILITY

District Rangers are responsible for District monitoring, Forest Staff coordinates sampling methods, compilation of data, and Forest report.

ANNUAL MONITORING COST

Costs for sampling methods 1 and 2 are listed below. Costs for sampling method 3 will be borne by other functions (ET113 support to timber, etc.). A database will be established during the first two years.

A First 2 Years·

85 areas x .5 (%) = 43 areas monitored per year. On the average it will take two people 1 day to monitor one area.

43 areas x $100 per day x 2 persons	=	$ 8,600
43 areas x 4 track plates x $10	=	1,720
1 day each SO & RD Admin. x $150	=	300
ANNUAL COST	=	$10,600

B. Every year thereafter:

85 areas x .125 (%) = 13 areas monitored per year. On the average it will take two people 1 day to monitor one area

13 areas x $100 per day x 2 persons	=	$2,600
13 areas x 4 track plates x $10	=	520
1 day each SO & RD Admin. x $150	=	300
ANNUAL COST	=	$3,520

REMARKS

Data on fisher will be collected in pine marten areas.

See description of Management Area 8 for details on habitat requirements (Chapter IV).

Revise S&G's for pine marten habitat areas as data becomes available. Work with State and Federal Fish and Wildlife agencies, universities (research), and conservation groups to develop census methods and determine effectiveness of standards.

Resource Element - CW121(c) Osprey

ISSUE

Maintain Habitat for Osprey

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain viable population of osprey as per S&G's Osprey are ecological indicators for other species that use or depend upon habitat along major rivers

MANAGEMENT AREA

Management Areas 1 to 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is moderate; the osprey is not numerous on the Forest, but most nest sites are located in areas which have no programmed timber harvest. Likelihood of error is moderate because nest sites are relatively easy to locate and monitor. We may not be aware of all active nest sites or osprey activity Thus risk index is moderate. There is also a moderate likelihood of catastrophic loss of nest trees to wildfire or wind.

MONITORING QUESTIONS

1. Are existing nest sites occupied and productive?
2. Are surveys being completed to locate new or previously unknown nest and roost sites?
3 Are potential habitat sites being maintained, as specifically described in the S&G's?

MONITORING PURPOSE

1. Compliance with management direction.
2 Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

1. A 25 percent decline in active (reproductively successful) osprey nest sites over a three year period.
2 Surveys not completed in two successive years.
3 More than 10 percent of the identified potential nest sites are unsuitable for occupancy at any given time

SUGGESTED SAMPLING METHODS

1 Survey of nest activity and productivity: There are three options available for monitoring osprey populations. At a minimum, option A should be implemented. If the data gathered under options A or B shows a 25 percent decline in the current (1988) number of active osprey nests for two successive years, then option C should be implemented for the third year to verify the perceived decline *If the three year decline is the result of management activities on the Forest, S&G's for* osprey will be revised as necessary to prevent the current number of active nests from declining further (if a remedy for the decline is within the purview of the Forest Service, it will be implemented)
a Survey of nesting activity - boat and vehicle. Conduct a nesting activity survey once each year on the Rogue River by Forest Service boat during May/June (it may be possible to do the osprey

survey as part of regularly scheduled river patrols). Surveys along the Coquille, Illinois, and Chetco Rivers will be conducted by vehicle (or on foot as necessary).
b. Survey of nesting activity - aircraft and vehicle. Conduct a nesting activity survey once each year on the Rogue River by helicopter or fixed wing aircraft during May/June (this activity will be occasionally conducted by the ODFW) Care will be taken not to disturb the osprey. Surveys along the Coquille, Illinois, and Chetco Rivers will be conducted by vehicle (or on foot as necessary).
c Survey of nesting productivity - helicopter (primarily). Conduct helicopter survey of osprey nests throughout the breeding season to determine population trends and fledging success Nests need to be visited 4 times· early April, mid to late April, and twice during the last week of July through the first 3 weeks of August (see page 117, Jackman and Scott 1975).

2. Done at the same time as sampling method 1.
3. Field survey of potential sites. Each site reviewed at five-year intervals.

EXPECTED PRECISION AND RELIABILITY

Precision is moderate because known nest sites (active/inactive) will be monitored, but undiscovered nest sites probably exist. Reliability is high because direct counts will be made.

RESPONSIBILITY

District Rangers are responsible for District monitoring; Forest Staff coordinates sampling methods, compilation of data, and Forest report.

ANNUAL MONITORING COST

Sampling methods 1 and 2: annual costs (a survey of the Rogue by two observers takes a full day, the other three rivers can be checked in one day [combined total] by single [separate] observers) .

A. 4 person days per year - field time	4 x $125	=	525	(including vehicle)
1 person day per year - office	1 x $100	=	100	
Forest Service Jet Boat		=	100	
1 day SO Administration	1 x $150	=	150	
TOTAL		=	$ 875	per year
B. 4 person days per year - field time	4 x $125	=	525	(including vehicle)
1 person day per year - office	1 x $100	=	100	
Forest Service contract helicopter		=	1,000	(2 5 hours/ $400)
1 day SO Administration	1 x $150	=	150	
TOTAL		=	$1,775	per year

C. 16 person days per year - field time	16 x $125	=	$2,000	(including vehicle)
3 person day per year - office	3 x $100	=	300	
Forest Service contract helicopter		=	4,000	(2 5 hours x $400 x 4)
1 day SO Administration	1 x $150	=	150	
TOTAL		=	$6,450	per year

Sampling method 3: it will take a wildlife biologist approximately 10 days every fifth year to survey the potential nest sites described in the S&G's and write Forest report 10 days x $125 = **$1,250 every fifth year.**

REMARKS

Nest site surveys currently are coordinated with the state agencies. Work with State and Federal Fish and Wildlife agencies, universities (research), and conservation groups to develop census methods and determine effectiveness of standards.

The 25 percent threshold of concern for osprey (item 1) may seem high, but year to year fluctuations in population level are common. This is due in part to variations in counting techniques (different observers, intensity or thoroughness of survey, weather, new nest sites not discovered), the 25 percent threshold will trigger a review of management activities which may be responsible for these changes A 25 percent reduction is significant and a reasonable trigger point for reviewing S&G's for osprey.

Resource Element - CW121(d) Woodpeckers

ISSUE

Maintain Woodpecker Habitat (Primary Cavity Excavators)

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain number, size, and distribution of green trees and snags to meet habitat capability objectives as shown by snag management area in the Siskiyou Wildlife Tree (Snag) Guidelines

MANAGEMENT AREA

Management Areas 10 to 14.

All forested areas will have habitat capability objectives levels prescribed but only those where timber harvest or fuelwood gathering is permitted will be significantly affected

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)		(Likelihood of Error)	=	(Risk Index)

Cost of error is high because once the dead tree component is gone from an area it may be many years before adequate replacement trees are available. Loss of this habitat component would have serious adverse affects on timber productivity due to the relationship of birds to insects that damage trees The likelihood of error is moderate because detrimental change would occur at a relatively slow pace across the landscape. Thus the risk index is moderate. Risk index could be high if the Forest has problems reserving dead trees due to pressure from wood cutting or for safety reasons; this is not expected.

MONITORING QUESTIONS

1. Are snags and replacement trees being left in the right numbers, sizes, and distribution on lands available for timber removal?
2. Are snags and replacement trees being maintained as planned on all other lands?
3. Are management indicator species (primary excavator guild) occupying the habitat?

MONITORING PURPOSE

1 Compliance with management direction.
2. Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

1. More than 10 percent of the surveyed areas have less than 90 percent of the prescribed trees and snags.
2. More than 10 percent decrease in snag numbers shown in consecutive forest-wide Timber Inventories (done every 10 years).
3. Cavities are not being created to support a viable population of secondary cavity users

SUGGESTED SAMPLING METHODS

1. Timber sale activities will be monitored to determine trends in habitat capability for woodpecker species (as a group - see: Brown 1985)
   a. Examine habitat on 20 percent of timber sales within 1 year of sale closure per district Analyze snags numbers, dispersion, and use by primary excavators (woodpeckers) Annually.
   b. Establish and measure transects to measure longevity in areas where fuelwood is gathered Once every 2 years.
2. Evaluate resource inventory plot data each 10-year period. 10-year interval
3. See methods under item 1.

RESPONSIBILITY

District Rangers are responsible for District monitoring; Forest Staff responsible for 10-year inventory (item 2), coordination of sampling methods, compilation of data, and Forest report

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are considered moderate because accepted methods will be used to access habitat capability (see citation above). Although only 20 percent of each district's timber sales will be monitored annually, this level of analysis should provide a clear picture of the effectiveness of S&G's for wildlife tree habitat.

ANNUAL MONITORING COST

Variable but less than $5M per year

Some data entry and collection will be accomplished as part of routine scheduled work, the analysis below includes costs associated strictly with monitoring.

A. Annually. Items 1(a) and 3 (20 percent of sales analyzed). Each District will need 5 person days (4 at GS-5/7 {@$100} and 1 day at GS-9/11 {@$125}) Compiling and analyzing the data for the Forest will require 2 days (GS-11) (@$150).

(20 x $100) + (5 x $125) + (2 x $150) = $3,000 (Approximated per year)

B. Every other year. Items 1(B) and 3 (fuelwood areas) Each District will need 2 person days (@$100). Compiling and analyzing the data for the Forest will require 1 day (@$150).

(10 x $100) + $150 = $1,150

C. Once per Decade. Item 2. Compiling and analyzing the data for the Forest will require 2 days (@$150), or $300

Years 1, 5, 7, 9 = $3,000.
Years 2, 4, 6, 8, 10 = $3,000 + $1,150 = $4,150.
Year 3 = $3,000 + $1,150 + $300 = $4,450 (1991)

REMARKS

Research is needed to establish habitat relationships and population levels by physiographic province May use local conservation groups to establish and read transects to determine use by cavity nesters Work with State and Federal Fish and Wildlife agencies, universities (research), and conservation groups to develop census methods and determine effectiveness of standards.

Additional detail for suggested methods (items 1 and 3). Record wildlife tree data for each sale, store data on TRI/GIS. Map general locations of wildlife trees/snags on the TRI/GIS project area map (R6-2200-32, ground vegetation activity record) Count wildlife trees (individuals and clumps) when they are first designated and after management activities cease (following sale closure). Trees serving as streamside cover can serve as snags only if they are surplus to those needed to shade the watercourse Develop methods to display wildlife tree data for the reviews and document recording of snag data

Resource Element - CW121(e) Blacktail Deer and Roosevelt Elk

ISSUE

Maintain Deer and Elk Habitat.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Maintain or increase habitat capability to support populations identified in this Plan

MANAGEMENT AREA

All Management Areas.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

Cost of error is high because of the considerable demand for big game. Likelihood of error is moderate because of some uncertainty of the quantity of thermal cover needed by big game, especially in southwest Oregon. There is virtually no chance of deer and elk populations being suppressed by timber management activities to levels approaching minimum viable.

MONITORING QUESTIONS

1. Are the populations being maintained as predicted in the FEIS?
2. Are the S&G's being followed as required to meet established habitat capability goals?

MONITORING PURPOSE

Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

1. Populations are more than 20 percent below or above the FEIS objective for a five year period.
2. Habitat capability is more than 20 percent below the objective in any given management unit; measure at five year intervals ("given management unit" may equate to Oregon Department of Fish and Wildlife (ODFW)/California Department of Fish and Game (CDFG) game management units, or the Forest may be treated as a single management unit, or new management units may be established as part of a Forest-wide deer and elk management plan to be developed within three years after implementation of this LRMP).

SUGGESTED SAMPLING METHODS

1. a Use ODFW and CDFG census records. Summarize every five years. Data from state trend routes will be used to monitor deer/elk herd populations.
   b. Elk range expansion will be monitored through collection of sighting/sign data by Forest personnel and other observers. Complete and accurate elk sightings will be kept by district personnel. This will help identify elk concentration and calving areas, as well as minimum population sizes. Summarize each five years.
2. a. Model cover types to determine rate of compliance with set of habitat criteria furnished by the ODFW (ODFW 1985). As they occur, assess timber sales and other projects which affect habitat capability ratings Summarize every 5 years.

b. Monitoring habitat criteria (ODFW 1985). The TRI or GIS systems will be used to gauge the effectiveness of criteria provided by the ODFW for management of deer and elk habitat. Timber stands will be categorized by age, which will in turn be converted to feeding, hiding, and thermal cover zones. The ODFW has established year-round cover/forage requirements for elk and deer: a total of 50 percent in well distributed thermal cover stands (of which at least 25 percent is optimal thermal cover) and about 20 percent in forage areas (ODFW 1985). For further guidance on cover requirements, see Brown (1985). Road densities per unit area (open roads) will be included in the analysis.

c. Monitoring S&G's. Timber sale reviews will be used to gauge the effectiveness of S&G's established for deer and elk. Evaluation procedures will be developed. If necessary, S&G's will be revised to meet stated objectives.

RESPONSIBILITY

District Rangers are responsible (all or in part) for all items except 1a. Forest Staff are responsible for coordination of sampling methods, compilation of data, and Forest report (includes Item 1a.).

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are considered low, because the data collected will provide relatively crude indices for interpreting habitat changes Conversely, the viability of the Forest deer and elk herds is not expected to be in question under any reasonable timber management scheme.

ANNUAL MONITORING COST

Ranger Districts. For item 2a., $200 per project (5-10 projects per year per District), or 5 projects x 5 RD x $200 = $5,000 annual cost.

SO Staff. First year start-up cost for item 1a = $500.

Ranger District and SO combined cost of summary at 5-year intervals = $1,000.

REMARKS

Will rely on ODFW and CDFG for census data. Need additional research on habitat relationships. Wisdom and others (1986) may serve as a source document for evaluation of elk habitat.

Monitoring for deer and elk is based on fluctuations in habitat capability, not populations. A given area of habitat can support a theoretical maximum number of individuals of a specific species. This ability of habitat to support a maximum number of individual animals is termed "Habitat Capability". The habitat capability rating calculated for a specific area at a specific moment in time does not necessarily equate to the number of individual animals actually present

Resource Element - DN121 Range

ISSUE

Range Condition and Utilization.

FOREST GOAL, DESIRED FUTURE CONDITION, OUTPUTS

Utilize transitory range economically on an environmentally sound, sustained yield basis Provide Range for 3000 AUM's annually.

MANAGEMENT AREA

Management Areas 4 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

1	X	1	=	1
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Is vegetation condition and trend being maintained or improved? Have areas in unsatisfactory condition improved?
2. Is available range being fully utilized?

MONITORING PURPOSE

1 Achievement of output (goods and services) objectives
2 Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

1. Greater than 20 percent of any allotment shows a downward trend of forage quality or site integrity Areas of unsatisfactory condition exhibit further deterioration.
2. Any additional range utilization without authorization. Utilization more than 20 percent below authorized use levels

SUGGESTED SAMPLING METHODS

1. Establish permanent, intensive transects on all ranges and monitor 33 percent annually In addition, extensive transects will be established and monitored annually.
2. Actual head counts will be made on 20 percent of range allotments annually.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are both considered high. This sampling intensity reports an accurate representation of range condition and utilization

RESPONSIBILITY

District Ranger, Lands and Recreation Staff.

ANNUAL MONITORING COST

$50/allotment X approximately 11 allotments = $550.

Resource Element - ET121(a) Port-Orford-cedar

ISSUE

Is Port-Orford-cedar threatened in regard to its economic and non-economic uses? Is it threatened as a functioning part of the Forest ecosystem in its native range?

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to maintain Port-Orford-cedar as a viable, functioning member of the Forest ecosystem by reducing the rate of spread of Port-Orford-cedar root rot disease, *Phytophthora lateralis*. Desired future condition will be to maintain healthy (disease-free) stands of Port-Orford-cedar.

MANAGEMENT AREA

Management Areas 1 through 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	3	=	9
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Which stands of Port-Orford-cedar are disease-free and which are infected?
2. Is the rate of spread of the disease increasing or decreasing?
3. Are management strategies effective in controlling the rate of spread?

MONITORING PURPOSE

1. Compliance with management direction.
2 Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

The threshold of concern relates to whether the spread of the disease is increasing or decreasing. If spread accelerates, concern will be heightened. If spread decreases, it could be an indication that control strategies are effective.

SUGGESTED SAMPLING METHODS

Aerial photography will identify healthy and diseased stands which will be mapped. Intensive sampling of infected road systems occur at least every three years These observations will indicate the extent of Port-Orford-cedar root rot disease along transportation routes and will be compared to determine the rate of spread of the disease over time.

Regularly scheduled reforestation surveys after the first, third, and fifth growing seasons will indicate performance in plantations. Aerial photography will continue to occur on an as-needed basis.

Aerial detection surveys, valuable indicators of spread along streams and roads and within forest stands, will occur at least every two years.

Research will be implemented to measure genetic diversity, develop trees that are resistant to the disease, and evaluate methods of control. Summaries of disease status will be made for all control activities as they

are completed and a Forest summary will be completed annually to coincide with the interregional summary and report.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability will be moderate, though sufficient to show effectiveness of management strategies in decreasing the rate of spread of the disease.

RESPONSIBILITY

Forest and District Silviculturists are responsible for developing, monitoring, and reporting control strategies.

ANNUAL MONITORING COST

Aerial detection surveys, research, and seed collection for genetics study will cost about $150,000 for the first year. Continued research for the next three years will be about $65,000 annually and $35,000 annually thereafter.

Resource Element - ET121(b) Destructive Insect and Disease Organisms

ISSUE

Are effects from insects and disease resulting in unacceptable damage and/or growth loss?

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to have a healthy ecosystem with timber stands performing at optimum levels without significant damage from insects or disease.

MANAGEMENT AREA

Management Areas 1 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

Are insects and disease creating significant damage and growth reductions on the Forest?

MONITORING PURPOSE

1. Compliance with management direction.
2. Maintenance of environmental quality (effects) as projected.
3. Resource mitigation measures are employed.

THRESHOLD OF CONCERN/VARIABILITY

Insect and disease populations are analyzed in regard to their potential effects. If damage or growth loss is anticipated, both management practices and predicted outputs will be evaluated.

SUGGESTED SAMPLING METHODS

Insects and diseases are monitored as part of stand examinations and reforestation surveys. Aerial detection surveys are conducted annually or bi-annually depending upon need.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability will be moderate, though sufficient to show effectiveness of management strategies in decreasing the effects of insects and disease.

RESPONSIBILITY

Forest and District Silviculturists will work together to summarize and evaluate the potential for damage.

ANNUAL MONITORING COST

Part of the ongoing program. No additional costs anticipated.

Resource Element - ET121(c) Land Suitability

ISSUE

Only lands suitable for timber production should be harvested to accomplish timber output goals; timber harvest levels should be computed based on only the suitable land base. Also harvest levels should be computed on the land capability and inventory condition.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Particularly relates to Forest Goals 1, 2, and 3. Directly connected to the level of timber outputs.

MANAGEMENT AREA

Management Areas 10 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

Monitor changes in the land base, or proposed changes as a result of new information, that could have implications for adjusting levels of activities or outputs. This includes potential changes in the lands suitable for timber production (36 CFR 219.12 (k)(5)(ii).

MONITORING PURPOSE

Compliance with management direction.

THRESHOLD OF CONCERN/VARIABILITY

Change of more than 15,000 acres in productivity class or vegetation class beyond that expected to result from planned activities; more than 10,000 acres proposed for change of suitability classification; or in the case of land suitability, at intervals not to exceed 10 years. These thresholds would have implications for an approximate five percent difference in timber outputs.

SUGGESTED SAMPLING METHODS

1. Summarize changes in productivity class, vegetation class, and proposed changes in land suitability resulting from project inventories. Also compare the results of the resource inventory scheduled for 1989 and 1990.
2. Frequency: Summarize annually.

EXPECTED PRECISION AND RELIABILITY

As information is updated from field inventory work done in conjunction with project planning, land suitability changes should be mapped to units as small as one acre and changes in productivity or vegetation condition classes should be mapped to 10 acres. The data would be verified as the project inventory work is completed; reliability would be high due to the intensive field surveys, however, only a fraction of the Forest would be examined in any one year.

The resource inventory will cover the entire Forest, but the field data collection will be less intensive resulting in less reliability for individual areas. Continued monitoring as project implementation inventories are completed will still be needed.

RESPONSIBILITY

Districts periodically update TRI/GIS. Forest Planning Staff extracts TRI/GIS data to summarize changes.

ANNUAL MONITORING COSTS

$2,000.

Resource Element - ET121(d) Acres and Timber Volume Harvested

ISSUE

Are timber outputs consistent with those projected by this Forest Plan? (36 CFR 219.12(k)(1)

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Projected timber volume outputs are achieved as planned and long term harvest levels are feasible.

MANAGEMENT AREA

Management Areas 10 to 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	1	=	2
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

Are actual timber outputs comparable to those projected in this FEIS?

MONITORING PURPOSE

1. Compliance with management direction.
2. Achievement of outputs (goods and services) as projected.

THRESHOLD OF CONCERN/VARIABILITY

Total acres harvested Forest-wide varies more than ten percent from projected harvest acres. The timber inventory was designed to have a ten percent confidence interval. If more than a ten percent variance in the proportion of acres or volume is observed, an evaluation will be made to determine the source of the deviation.

SUGGESTED SAMPLING METHODS

Districts report for each timber sale the acres scheduled for harvest by planning basin by management area. Also estimate the volume by planning basin by management area (This data could also be used as part of the watershed cumulative effects monitoring). Sale volumes will be compiled to make certain that Forest-wide goals are achieved.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability will be moderate, though quite adequate for measuring how well actual outputs compare to predictions.

RESPONSIBILITY

Timber Staff (Ranger District Timber Management Assistants will submit data).

ANNUAL MONITORING COST

$2,000.

Resource Element - ET121(e) Harvest Unit Size Limit

ISSUE

Monitor harvest unit size to determine if maximum size limits should be continued (36 CFR 219.12(k)(5)(iii).

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to vary harvest unit size to fit site-specific conditions and requirements, but to avoid exceeding the 60 acre size limit in most cases. Future unit size will relate to overall diversity on the Forest as well as other resource needs.

MANAGEMENT AREA

All areas managed for timber outputs.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

$$\frac{1}{\text{(Cost of Error)}} \times \frac{1}{\text{(Likelihood of Error)}} = \frac{1}{\text{(Risk Index)}}$$

MONITORING QUESTIONS

Is the Forest exceeding the 60-acre size limit?

MONITORING PURPOSE

1. Compliance with management direction.
2. Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

If ten percent or more of the harvest units sold exceed 60 acres in size, the need to continue the size limitation should be evaluated.

SUGGESTED SAMPLING METHODS

A summary of the harvest units exceeding 60 acres will be compiled annually from TRI/GIS. Report will include Environmental Assessments for all units exceeding the 60-acre size limitation.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability will be high.

RESPONSIBILITY

Forest Silviculturist.

ANNUAL MONITORING COST

$1,000.

Resource Element - ET121(f) Reforestation and Intensified Forest Management Practices

ISSUE

Are regeneration harvested acres reforested within five years after cutting? Is plantation tree stocking, growth, and yield at a level that will support projected outputs?

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to reforest harvested units within five years after cutting at a stocking level, with growth and yield, that will achieve projected outputs (successful reforestation).

MANAGEMENT AREA

All areas managed for timber outputs.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

$$\frac{2}{\text{(Cost of Error)}} \times \frac{1}{\text{(Likelihood of Error)}} = \frac{2}{\text{(Risk Index)}}$$

MONITORING QUESTIONS

1. What is the elapsed time between harvest of acres and successful reforestation?
2. What proportion of the acres certified stocked with no additional work planned, are above minimal stocking, but below the recommended stocking level that would produce full yield?
3. How many acres are carried with excess stocking that may result in reduced growth and yield?
4. How many acres impacted by vegetation competition where yield may be reduced or delayed?
5. How many acres received fertilizer treatment?
6. Are stands growing at a rate that will produce the predicted yields?

MONITORING PURPOSE

Achievement of output (goods and services) objectives.

THRESHOLD OF CONCERN/VARIABILITY

1. Ten percent or more of the acres having reforestation lag time greater than five years
2. Ten percent or more of the acres being certified stocked with less than the recommended stocking level
3. Ten percent or more of the acres with excess stocking at age 15 need precommercial thinning, but are not being treated.
4. Ten percent or more of acres prescribed for release not receiving treatment within three years of the prescribed need.
5. Ten percent or more of the acres prescribed for fertilization do not receive treatment
6. Timber volume outputs are ten percent more or less than predicted

SUGGESTED SAMPLING METHODS

First-, third-, and fifth-year surveys will be utilized to assess accomplishment for elements 1 through 4 Accomplishment reporting will serve as a basis for validating element 5 A summary will be prepared

annually for all elements. Managed stand inventory (as part of the revegetation inventory) will provide actual growth data to be measured initially in 1989 (or 1990) and then, once every 10 years

EXPECTED PRECISION AND RELIABILITY

Precision and reliability will be high Determination of whether the standards are met will be straight-forward and obvious.

RESPONSIBILITY

District Silviculturists gather and submit data Forest Silviculturist summarizes and analyzes data

ANNUAL MONITORING COST

No additional costs anticipated.

Resource Element - ET121(g) Biological Diversity

ISSUE

Biological Diversity touches many planning issues. Issues related to forest structure and distribution over time potentially relate to Biological Diversity, such as the amount and distribution of old-growth forest, the conversion of hardwood-dominated stands to conifer-dominated stands, the amount and rate of timber harvested, the amount, quality, and distribution of animal habitat, and the structure of our streams Other issues are more commonly related to species composition concerns. Sensitive plant and animal species, management indicator species, and species diversity are examples. On the other hand, issues such as long-term forest productivity, management of logging residues, species viability, and forest fragmentation relate to the functions of the forest as an ecosystem. Most of these issues are covered by specific monitoring elements.

Management indicator species are monitored in various ways. Most are monitored by tracking their habitat For example, deer and elk habitat, particularly critical habitat, will be tracked and efforts are being made to learn more about population dynamics Occasionally direct observation is used, as is the case with spotted owls Sensitive plant species habitat is being monitored and inventories are continually being initiated (species not yet surveyed) and updated (species with a completed survey) Resource inventories are being used to track traditional variables such as existing vegetation, volume growth, standing volume, and condition classes. They will be used to measure less traditional variables such as successional stages, stand structure, and edge contrast Ecosystem functions are more difficult to track However, soil productivity monitoring and site organic material management cover the issue of long-term site productivity quite well. Analysis of this data will help to refine thresholds and feedback into future S&G's Most of the variables needed to evaluate species and habitat diversity are being measured by a variety of inventories (timber inventory, stand exams, vegetation management exams, reforestation exams, staked tree evaluations, ecology plots, and specific monitoring).

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest goal is to maintain native and desirable introduced or historic plant and animal species and communities. Provide all seral stages of terrestrial, aquatic, and edaphic plant associations in a distribution and abundance to assure species diversity and viability. Species/habitat relationships (habitat requirements) have not been established. The spotted owl is an example of one of the most studied species, yet we are only beginning to determine firm habitat needs. A desired future condition is to establish the local needs of management indicator species, rare species, and the proportion of seral stages that allows for natural diversity Continued long-term monitoring will be necessary to establish critical relationships and thresholds for the abundance of the various seral stages, their distribution, and specific species requirements for sensitive species

MANAGEMENT AREA

Monitoring will be Forest-wide Future monitoring may be more local. Ultrabasic areas that support many rare species, for example, may have to be monitored and analyzed separately Although they are not managed for consumptive use and stand little chance of disturbance, they may need to be evaluated as a unit since few established inventories cover the areas.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

1. Critical Habitat: The loss of critical habitat is of concern The worst case could result in extinction if the amount or quality of habitat falls below viable levels A loss of species would be a high cost, but the likelihood of extinction is low

3	X	1	=	3
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

2. Diversity: A loss of diversity is also of concern. A reduction in the abundance or evenness could occur for species or plant associations Overall impact of losses in abundance of species or plant associations is low as long as they are maintained above viable levels However, it is certain some seral stages of specific plant associations will be reduced

3	X	1	=	3
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. What is the present distribution and proportion of seral stages by plant association (FEIS, Chapter III, Table III-37)?
   a. How do they compare to past distributions?
   b. What distribution and proportion is expected in the future?
   c What are the trends?
   d. Does the distribution, proportion, and absolute amount provide viable habitat for management indicator species, rare species, and biological diversity?
2. Has habitat capability changed?
3. What is the present status of sensitive species?
   a. What are the population numbers?
   b. What is the distribution of known sites?
   c. Is there a trend in population density?
4 What are the trends in overall species diversity on the Forest?
   a. Are there trends in species richness?
   b. Are there relationships to management practices and direction?
   c. Are there relationships with natural processes or events?
5. Can species/habitat relationships be established from present data?

MONITORING PURPOSE

Maintenance of environmental quality (effects) as projected

THRESHOLD OF CONCERN/VARIABILITY

There are no established thresholds for biological diversity on the Forest. Thresholds and requirements of individual species (such as fish, woodpecker, and spotted owl) have been established and will be monitored. Management direction has been set in some cases such as for fish habitat improvement, meadow maintenance and enhancement, and maintenance of early seral stages for wildlife forage and cover Present proportions of the seven benchmark seral stages can be used to compare changes in the amounts of seral stages on the Forest (FEIS, Chapter III, Table III-17). However, Forest-wide averages are only an indication of general trends. The percent of mature stage varies from 27 in the Kalmiopsis, to an average of 70 in the other wildernesses combined. The seedling/sapling stage varies from about one

percent in wilderness to about 17 percent in non-wilderness As we accumulate information, planning basins may be used to evaluate the trends in biological diversity.

SUGGESTED SAMPLING METHODS

1. Use the resource inventory (Chapter IV, Resource Inventories) to determine plant association and seral stage and assess the presence/absence of selected common wildlife species
2. Continue to use RESURV, stake tree plots, stand exams, silvicultural visits, unit exams, and ecoplots to map plant associations and existing seral stages. These exams are ongoing and used to update databases. With the installation of the TRI/GIS the process will be streamlined and can be efficiently used to display distribution of seral stages The Forest wildlife biologist, ecologist, silviculturist, and botanist will be responsible parties.
3. The Forest botanist will use rare plant surveys to evaluate population abundance and trends in density
4. Information combined from the above sources on species abundance and distribution will be used by the Forest wildlife biologist and ecologist to evaluate the trends in species richness and evenness.
5. Records will be kept in TRI/GIS to compare trends at least every 5 years

EXPECTED PRECISION AND RELIABILITY

At least two cycles of monitoring will be necessary to evaluate the process. The first cycle will determine whether particular measures are adequate measures of habitat, and species diversity. The second cycle will help to establish appropriate comparative processes for evaluating trends

RESPONSIBILITY

Coordinated by the Forest Staff.

ANNUAL MONITORING COST

$40,000.

Resource Element - ET121(h) Social and Economic Setting

ISSUE

Has the social and economic setting changed significantly and can the management of the Forest enhance or mitigate?

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The management of the Forest is responsive to the needs of local and national social and economic conditions.

MANAGEMENT AREA

Management Areas 1 through 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)
2	X	1	=	2

MONITORING QUESTIONS

1. What is the average yearly unemployment rate for Josephine, Jackson, Coos, and Curry Counties?
2. What is the demand for timber?
3. What is the demand for recreation?
4. What are the social and economic trends in local communities? (Trends in fisheries demand is not a question because the demand greatly exceeds supply Fisheries outputs are not sensitive to changes in demand.)

MONITORING PURPOSE

1. Compliance with management direction.
2. Achievement of output (goods and services) objectives

THRESHOLD OF CONCERN/VARIABILITY

1. >15 percent average yearly unemployment for the four county area.
2. <1:2 ratio of bid price divided by the advertised rate. The bid premium applied to ineffective purchaser credit will be excluded from the bid price and added to the advertised rate.
3. >80 percent of carrying capacity in primitive or developed recreation areas
4. +/- 15% change in local average income levels, corrected for inflation.
5. Significant changes in local community lifestyle, attitudes, beliefs, or values (This does not include subtle or temporary shifts in trends)
6. +/- 20% change in annual payments to counties.

SUGGESTED SAMPLING METHODS

1. State of Oregon Labor Statistics.
2. Annual Bid Monitoring Report.
3. RIM data.
4. U.S. census, State publications, County and local agency reports, etc.
5. Interview with and observation of key public and community opinion leaders
6. Payment to counties report.

EXPECTED PRECISION AND RELIABILITY

High.

RESPONSIBILITY

Planning Staff, Timber Staff, and Recreation Staff.

ANNUAL MONITORING COST

$700.

Resource Element - ET121(i) Economics (Cash Flow)

ISSUE

The management of the Forest realizes positive cash flows in the timber program as predicted by the Forest Plan.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The management of the Forest results in conditions as predicted by the FEIS

MANAGEMENT AREA

Management Areas 11 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	1	=	2
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTION

Are the predicted net values for the timber program accurate or do the actual values for the Forest require a change?

MONITORING PURPOSE

1. Compliance with management direction.
2. Achievement of output (goods and services) objectives.

THRESHOLD OF CONCERN/VARIABILITY

A negative annual cash flow for the timber program.

SUGGESTED SAMPLING METHODS

Annual TSPIRS report.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are both rated as high.

RESPONSIBILITY

Timber Staff.

ANNUAL MONITORING COST

$50.

Resource Element - FA121 Suspended Particulate

ISSUE

Total suspended particulate (TSP) production from prescribed burning

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

TSP production from planned ignitions should not exceed 7,300 tons on an annual Forest-wide basis

MANAGEMENT AREA

Management Areas 1 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)
1	X	1	=	1

MONITORING QUESTIONS

Does TSP produced from planned ignitions exceed 7,300 tons Forest-wide annually?

THRESHOLD OF CONCERN/VARIABILITY

TSP in excess of the 7,300 ton baseline on an annual Forest-wide basis.

SUGGESTED SAMPLING METHODS

Emissions from 100 percent of planned ignitions will be tracked utilizing data developed for the Oregon State Smoke Management Plan and emissions models being developed by the Pacific Northwest Forest and Range Experiment Station

EXPECTED PRECISION AND RELIABILITY

Anticipate high precision and reliability.

RESPONSIBILITY

Fire Staff Officer.

ANNUAL MONITORING COST

$650.

Resource Element - FW121(a) Water Resources

ISSUE

Best Management Practices (BMP's) and S&G's implementation and effectiveness.

Maintenance of the beneficial uses (fisheries, domestic water supplies, white-water rafting, etc) of water.

Compliance with State requirements in accordance with the Clean Water Act (CWA) for protection of the waters of the State of Oregon and California, including the State of Oregon's anti-degradation policy for high quality waters and Wild and Scenic Rivers

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

1. Maintain or enhance water quality in all forest streams to maintain the beneficial uses of water
2. Maintain stream channel stability and favorable conditions of stream flow.
3. Comply with State requirements in accordance with the CWA for protection of the waters of the Rogue and South Coastal Basins in the State of Oregon, and the North Coast Basin in the State of California.
4. The desired future condition/outputs are water quality and channel condition sufficient to support at least the current levels of beneficial uses

MANAGEMENT AREA

Management Areas 2, 7, 10, 11, 12, 13, and 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Are water resource-related BMP's being implemented?
2. Are water resource-related S&G's and BMP's effective for:
   a. Maintaining or enhancing water quality and the beneficial uses of water?
   b. Allowing compliance with State water quality requirements, such as Oregon's Anti-degradation policy for high quality waters and National Wild and Scenic Rivers.

MONITORING PURPOSE

1 Maintenance of environmental quality (effects) as projected.
2 Resource mitigation measures are employed.

THRESHOLD OF CONCERN/VARIABILITY

1. Monitoring question 1: BMP's are not being implemented.
2. Monitoring question 2a. Water quality and channel condition is insufficient to maintain existing beneficial uses of water.
3. Monitoring question 2b: S&G's and BMP's are not maintaining water of sufficient quality to comply with the requirements set forth in the State of Oregon and California water quality regulations

SUGGESTED SAMPLING METHODS

Monitoring question 1 (BMP Implementation): The field implementation of site-specific BMP's will be monitored to some extent for each project, by either watershed specialists, fish biologists, timber sale administrators, road construction engineering representatives, foresters, or others This information will be documented in a check list and/or narrative format and stored in the project records.

Management and activity reviews will be used to assess the implementation of BMP's on a forest-wide basis. A yearly summary for the Forest will be compiled by SO watershed personnel The summary will be made available to the public/agencies for information and review.

Monitoring question 2 (BMP Effectiveness):

The effectiveness of BMP's will be monitored by using: visual observations/measurements, water quality monitoring, and beneficial uses monitoring.

1. Visual Observations and Measurements.
   a. Surveillance Monitoring - Visual: Periodic visual observations of constructed roads, harvest units, etc. will be used as the initial method of measuring the effectiveness of site-specific BMP's Visual observations during storm periods will be used to decide where to take grab turbidity samples
   b. Stream Shading: Before and after-harvest stream shading measurements will be made in from 10 to 20 percent of the Class I, II, and III streams in from 2 to 4 timber sales per District. The information will be used to verify whether the stream shading goal in the site-specific riparian BMP's was met.
      (1) Channel Condition. See monitoring items CF121 Fish Habitat Monitoring and FW 121(c) Cumulative Watershed Effects.
      (2) Soil Surface Cover: See monitoring item FW121(b) Soil Productivity.
2. Water Quality Sampling.
   a. Surveillance Monitoring - Turbidity· Discrete grab samples will be taken at selected project sites on each District. From 3 to 8 sites will be sampled for each district in any one year Potential sites will be identified during Surveillance Monitoring - Visual, as described above. Sampling will generally be taken "above" and "below" the selected activity. However, grab turbidity samples may, in some cases, be taken by "pulse," when samples are taken at two or more pre-determined sites at the same time. Sampling will be designed to measure and document:
      (1) The turbidity of water from harvest units, newly constructed roads, existing roads, and other areas of soil disturbance.
      (2) The turbidity of water leaving selected watersheds with active timber sales.
      (3) Time/turbidity recovery trends for timber harvest, road construction, and other management activities.
   b. Automated Turbidity Sampling:
      (1) Wild and Scenic Rivers and Tributaries. Automated turbidity samplers will be installed in up to two locations, or up to six total locations, on the Illinois River, Elk River, and Chetco River or at the mouths of selected, managed tributaries flowing into the Wild and Scenic Rivers
      (2) Other Forest Streams and Rivers: Automated turbidity samplers will be installed at up to three additional locations per district, or up to 23 additional locations on the Forest (includes 8 samplers for the duration of Silver Fire Recovery, Galice/Gold Beach). The samplers will be used to measure base-line turbidity, stream turbidity below timber harvest and road construction, and turbidity "above" and "below" timber harvest and road construction A primary factor in selecting sites for automated turbidity sampling will be the safety and feasibility of collecting samples and servicing the equipment.
   c *Water Temperature:*
      (1) Extensive - Maximum/minimum thermometers will be placed at from 4 to 10 selected stream locations per district, where automated temperature data-loggers are not installed

(2) Intensive - Automated temperature data-loggers would be installed at from 3 to 5 sites per district, or from 15 to 35 sites for the Forest (includes 10 sites for the Silver Fire Recovery Project, Galice/Gold Beach). The streams will be chosen based on their value as fish habitat. Some sites will be located on Wild and Scenic Rivers

3. Beneficial Uses Monitoring Fish habitat and population monitoring is discussed under CF121 Fish Habitat Monitoring

EXPECTED PRECISION AND RELIABILITY

By using a combination of (a) visual observations and measurements, (b) instream water sampling, and (c) instream beneficial uses sampling, we expect the precision and reliability to be good. We expect that the monitoring information to be adequate to document and verify implementation and effectiveness of the BMP's, as well as providing a basis for modifying practices if necessary

RESPONSIBILITY

Forest/District Hydrologists and District Rangers

ANNUAL MONITORING COST

Monitoring Area	Project-Related Percent	Project-Related Dollars	Plan-Related Percent	Plan-Related Dollars
BMP Implementation	94	27,000	6	1,800
BMP Effectiveness				
Surveillance Monitoring/Visual	94	18,000	6	1,200
Soil Surface Cover (See Monitoring Item FW121(b), Soil Productivity Soil Surface Cover)				
Channel Condition (See Monitoring Item FW121(c), Cumulative Watershed Effects)				
Stream Shading	94	12,000	6	750
Surveillance Monitoring/Turbidity	94	12,000	6	750
Automated Turbidity Sampling	56 1/ 55 2/	33,250 1/ 12,000 2/	44 1/ 45 2/	26,250 1/ 10,000 2/
Water Temperature	60 1/ 60 2/	18,750 1/ 10,500 2/	40 1/ 40 2/	12,500 1/ 7,000 2/
Beneficial Uses (See Monitoring Item CF121 Fish Habitat Monitoring)				
TOTALS (Average Percent)	74 1/ 81 2/	121,000 1/ 91,500 2/	26 1/ 19 2/	43,250 1/ 21,500 2/

1/ First year initial cost
2/ Recurring cost.

Resource Element - FW121(b) Soil Productivity

ISSUE

Maintenance of productivity at levels capable of supporting the Forest resources. This issue centers on the ability to maintain chemical, biological, and physical soil properties at levels capable of supporting a wide variety of forest resources.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Forest productivity in the future decades equivalent to present (1988) conditions.

MANAGEMENT AREA

Acreage selected as suitable for timber production in Riparian, Partial Retention Visual, and General Forest Management areas.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	2	=	4
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Are soil and site organic matter and nutrient levels being maintained following timber harvest and site preparation?
2. Are soil physical properties being maintained following timber harvest and site preparation?
3. Is growth of trees being maintained at satisfactory rates?

MONITORING PURPOSE

1. Achievement of output (goods and services) objectives.
2. Maintenance of environmental quality (effects) as projected.
3. Resource mitigation measures are employed.

THRESHOLD OF CONCERN/VARIABILITY

1. When organic residues and biological and chemical properties are detrimentally altered by timber harvest and site preparation, resulting in reduced soil productivity.
2. When mineral soil exposure is greater than 40 percent for low to moderate erosion soils, 30 percent for high erosion hazard soils, and 15 percent for very high erosion hazard soils.
   a. When compaction, displacement, puddling, or severely burned conditions exceed 15 percent of the activity area, including roads.
3. When tree growth is less than acceptable levels:
   a. Short-term productivity monitoring will be correlated with standards developed through analysis of tree growth measured by reforestation surveys.
   B. Long-term productivity monitoring will be compared to appropriate growth curves for that site at fifth and tenth year, and at 10-year intervals through at least one rotation.

SUGGESTED SAMPLING METHODS

Current productivity research on the Forest by scientists of the Pacific Northwest Forest and Range Experiment Station and Oregon State University will be continued. Methods for monitoring the effects of organic residues on soil biological and chemical properties will be developed by the same scientists along

with Forest personnel. Seedling and tree growth will be measured at one, three, five, and ten year intervals with formal surveys monitoring plots for crop and non-crop species.

EXPECTED PRECISION AND RELIABILITY

Monitoring the physical and chemical properties has good precision and accuracy and would be quite reliable. Determining the implications of changed soil/site properties on seedling and tree growth has less precision and accuracy and as a result would be reliable in the long-term, but less reliable in the short-term

RESPONSIBILITY

Soil scientists, silviculturists, ecologists, and geologists at the District and Forest level are responsible for developing monitoring strategy and plans, making collecting field data, and writing reports. The Forest Watershed and Timber Staff are responsible for review and recommendations.

ANNUAL MONITORING COST

1. $25,000 annually for first two years to establish monitoring sites and make initial measurements
2. $10,000 annually thereafter to collect, analyze, and report results.

Resource Element - FW121(c) Water Resources

ISSUE

Cumulative Watershed Effects

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

1. Provide favorable conditions of stream flow in Forest streams and rivers, by maintaining channel stability, channel capacity, and watershed condition.
2. Maintain or enhance current levels of the beneficial uses of water.
3 Minimize the potential for off-Forest downstream cumulative effects by implementing/monitoring BMP's on a Forest-wide basis
4. The desired Future Condition/Outputs of streams, rivers, watersheds, and levels of beneficial uses are at or above the condition described in the Soil, Water, and Fish sections of Chapter III of the FEIS.

MANAGEMENT AREA

Management Areas 2, 7, 10, 11, 12, 13, and 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Are the timber harvest basin constraints for scheduling timber harvest in the Planning Basins and Watershed Analysis Areas (WAA's):
   a. Being applied according to the S&G's? (WAA's only)
   b. Adequate for minimizing the potential for adverse cumulative effects* (on/off Forest) on: (1) Stream channels and (2) water quality and the beneficial uses of the water? (Some examples of adverse cumulative effects are: channel aggradation, loss of riparian vegetation and stream bank stability, and reduction in fish habitat)
2. Are the effects within the range predicted in the FEIS?

THRESHOLD OF CONCERN/VARIABILITY

Monitoring question 1:

1 After the first five years of implementation, actual harvest acres in any basin are greater than 70 percent or less than 30 percent of the projected basin harvest acreage constraint per decade (see below).

Basin Number and Name	Basin Harvest Constraint/Decade (Percent)
01 Elk and Sixes	12
02 South Fork Coquille River	12
03 Lobster Creek	12
04 Upper Rogue River	16
05 Lower Rogue River	15
06 Indigo Creek	11 1/
07 Silver Creek	7 1/
08 Galice and Slate Creeks	14
09 Lower Illinois River	14
10 Upper Illinois River	17
11 Briggs Creek	16
12 Pistol River	12
13 Lower Chetco River	9
14 Upper Chetco River	-
15 Rough and Ready and Josephine Creeks	17
16 Winchuck River	15
17 North Fork Smith River	17
19 East and West Fork Illinois Rivers	12
20 Sucker Creek	17

1/ Reflects first decade reduction for Silver Fire

2. Any quantifiable (management-related) loss of favorable conditions of stream flow (see above examples of cumulative effects) on Forest streams and rivers; cumulative effects outside the range predicted in the FEIS.
3. Loss of downstream, off-Forest favorable conditions of stream flow that can be attributed to Forest resource management activities, cumulative effects outside the range predicted in the FEIS
4. Measurable increase in the frequency of management-related landslides (see monitoring element FW121(d)).
5. Decline in on/off forest levels of beneficial uses when the loss can be attributed to Forest resource management activities.

SUGGESTED SAMPLING METHODS

Monitoring question 1:

1 Harvest Scheduling

Planning Basins. Harvest records will be used to verify that timber harvest within planning basins is within the levels specified in the Forest-wide S&G's

Watershed Analysis Areas (WAA's) When more than 20 percent of a WAA is proposed to be harvested in a decade, a more detailed cumulative effects analysis is required. From 20 to 50 percent of these reports will be reviewed to ensure that the intent of the S&G's are met

2. Harvest Scheduling Effectiveness:

   On-Forest: Photo-points - Develop a network of photo-points (up to 20 per basin) for critical streams in selected Planning Basins. The photo-points will be re-photographed every other year, or in the summer following a flood event with at least a 10-year return period The long-term, photo-point record will complement information on pool habitat, bank stability, and macroinvertebrate studies from fish habitat stream surveys (CF121 Fish Habitat).

   Pool Volume Change - Pool volume trends will be monitorined as part of the Hankin and Reeves fish habitat capability surveys (CF121 Fish Habitat)

   On-Forest/Off-Forest· Aerial photo analysis stream condition - An aerial photo survey will be used to evaluate the downstream effects of Forest practices on stream channels, this will supplement other field monitoring. Selected stream reaches will be re-evaluated every 4 years when new aerial photos are available

   Landslide inventory: See monitoring item FW121(d) Soil Inventory, slope stability and cumulative effects.

   Beneficial Uses/Water Quality: See monitoring items:
   CF121 Fish Habitat Monitoring
   FW121 Watershed Resource Monitoring

Monitoring question 2:

Cumulative Effects Within the Range Predicted in FEIS

Review/Analysis of monitoring data: Forest and district resource specialists (fish, water, soil, and geology) will annually evaluate and summarize cumulative effects monitoring data and determine whether effects are within the range predicted Activities will be modified if necessary to meet S&G's.

EXPECTED PRECISION AND RELIABILITY

The precision and reliability of the monitoring data is expected to be good and useful for determining whether the harvest basin dispersion constraints are adequate for preventing cumulative effects

RESPONSIBILITY

Forest Hydrologist/Geologist/Fish Biologist, District Specialists, and District Rangers.

ANNUAL MONITORING COST

Monitoring Area	Project-Related Percent	Project-Related Dollars	Plan-Related Percent	Plan-Related Dollars
Harvest Scheduling	-	-	100	1,500
Harvest Scheduling Effectiveness	-	-	-	-
Photo-points	-	-	100	500 1/
Pool Volume Trends (See CF121 Fish Habitat)				
Aerial Photo Analysis	-	-	100	2,000
Stream Condition				
Landslide Inventory (See FW121(d) Soil Inventory - Slope Stability)				
Beneficial Uses and Water Quality (See CF121 Fish Habitat Monitoring and FW121 Watershed Resource Monitoring)				
Review/Analysis of Monitoring Data	-	-	100	1,000
TOTAL	-	-	100	3,500 2/
	-	-	100	500 to 3,500 3/

1/ Most of the work and cost will be covered by FW121 Fish Habitat Monitoring
2/ First year initial cost
3/ Recurring cost

Resource Element - FW121(d) Water Resources

ISSUE

Slope Stability and Cumulative Watershed Effects.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The Forest Goal is to obtain a current inventory of landslide frequency under natural, roaded, and harvested conditions to be used for:

1. Landslide hazard and risk zonation.
2 Selecting coefficients for sediment-yield predictive models
3. Selecting coefficients for models predicting loss of soil productivity due to landslides
4 The desired future condition is no significant difference in the rate of landsliding under both managed and unmanaged (natural) conditions.

MANAGEMENT AREA

Management Areas 11 to 14

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

2	X	3	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. What are the sizes and frequencies of landslides that have occurred on different soil and rock types under natural versus managed conditions from 1976 to 1986?
2 What volume of sediment has been delivered to streams from 1976 to 1986?
3. How many acres and what percentage of land has experienced a loss of soil productivity due to landslides resulting from roading or timber harvest over the last ten years (1976 to 1986)?
4. What will be the future size and frequency of landslides occurring on managed lands in comparison to that under natural conditions?
5 What is the rate of management versus natural landsliding on other ownerships (Federal, State, County, and Private) within planning basins with substantial managed Forest acreage?

MONITORING PURPOSE

Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

1. When the observed landslide frequency exceeds the frequency predicted in project cumulative watershed effects analyses
2 When landslide frequencies begin to correlate positively with the cumulative area roaded and harvested and.
   a. Create the potential for degrading the beneficial uses of water.
   b. Threaten to result in an irretrievable loss in soil productivity.
3. When the rate of management-related landsliding on non-Forest Service managed lands threatens channel stability/beneficial uses, and reduces management options for Forest lands.

SUGGESTED SAMPLING METHODS

Monitoring questions 1-5: Landslide Inventory - Aerial Photo: Landslide inventories will be completed for planning basins once every four years by inventorying about one-quarter of the basins each year The initial landslide inventory will include an interpretation of the 1973 Infra-red, 1979, and 1986 aerial photography Special aerial photo coverage will be flown for selected basins following storms with a return frequency of at least 25 years. The inventory data will be stored in TRI/GIS Future updates will use the most recent aerial photography.

Where aerial photo coverage of non-National Forest lands exists, extensive aerial photo survey of natural versus activity-related landslides will be made every four years. The aerial photo interpretation will only be done if critical downstream beneficial use exist. Inventory data will be used in cumulative effects analyses.

Monitoring questions 1-4: Landslide Inventory - Field Verification: A minimum of ten percent of the landslides identified on the aerial photographs will be field checked to verify size and cause information obtained from aerial photo interpretation.

Landslides discovered during field surveys of timber sales will be added to the database

EXPECTED PRECISION AND RELIABILITY

Moderate precision due to inability to detect small landslides on aerial photos. High reliability due to training of aerial photo interpreters on Forest.

RESPONSIBILITY

Forest Resource Geologist in conjunction with other Geologists and Soil Scientists

ANNUAL MONITORING COST

Aerial Photo Inventory

$ 9,500	Initial Inventory: First four years of initial inventory and database entry. 2 weeks per photo date per planning basin = 16 weeks = 4 months
4,000	Subsequent years: Subsequent years of update inventory. 2 weeks per planning basin = 8 weeks = 2 months.
4,000	Ground Checking
$17,500	TOTAL

REMARKS

Initial inventory is completed and entered into TRI/GIS for Elk-Sixes. Inventory partially complete for Silver Planning Basin (need slide area and volume measurements and database) Other initial inventories will be completed during normal project planning (e.g., Upper Rogue covered by Illahe and Shasta Costa projects).

Additional efficiency could be gained by using the analytical stereoplotter to locate and measure landslides and store database attributes. Need for Forest Planning Basins to have bridging for control files work completed in order to take advantage of this potential efficiency

Resource Element - FW121(e) Acres Burned

ISSUE

Acres burned by wildfire.

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

The expected acres burned by fire size class per decade should not exceed the fire frequency and size distribution for the Forest as presented in the Fire Management Action Plan

MANAGEMENT AREA

Management Areas 1 through 14.

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

$$\frac{1}{\text{(Cost of Error)}} \times \frac{1}{\text{(Likelihood of Error)}} = \frac{1}{\text{(Risk Index)}}$$

MONITORING QUESTIONS

Do acres burned by fire size class per decade exceed the frequency and size distribution as presented in the Fire Management Action Plan?

THRESHOLD OF CONCERN/VARIABILITY

1. When the actual acres burned per decade exceeds the expected acres burned per decade
2. When the actual acres burned in any single year is more than 50 percent of the expected acres burned per decade.

SUGGESTED SAMPLING METHODS

The data necessary to complete the analysis will be extracted from the Individual Fire Report (FS-5100-29), which is completed for each wildfire occurrence. These reports will be compiled into a Forest-wide summary.

EXPECTED PRECISION AND RELIABILITY

Anticipate high precision and reliability

RESPONSIBILITY

Forest Fire Staff Officer.

ANNUAL MONITORING COST

$650.

Resource Element - GM121 Minerals

ISSUE

Mineral resources will be developed in coordination with other resource management concerns

FOREST GOAL, DESIRED FUTURE CONDITION, AND OUTPUTS

Facilitate mineral exploration and development while protecting surface resources and environmental quality Maintain at least 89 percent of Forest lands, excluding legislative withdrawals, for location and leasing

MANAGEMENT AREA

Management Areas 1 through 14, except locations specifically withdrawn from mineral entry

RISK ASSESSMENT (Low = 1, Medium = 2, High = 3)

3	X	2	=	6
(Cost of Error)	X	(Likelihood of Error)	=	(Risk Index)

MONITORING QUESTIONS

1. Are the S&G's for mineral operations reasonable and effective?
2. Are the rehabilitation S&G's reasonable and effective?

MONITORING PURPOSE

1. Achievement of outputs (goods and services) objectives.
2. Maintenance of environmental quality (effects) as projected.

THRESHOLD OF CONCERN/VARIABILITY

Field review reveals surface resources and environmental quality declines in excess of the thresholds of concern described for (FW121(a) and CF121) Fish Habitat and Water Quality, AW121 Wilderness, CW121(a) through (f) Wildlife, and CT121(a) and (b)/(FW121(b) and (c) Soil/Water. Rehabilitation activities are not being performed, or are below the standards described in approved operating plans.

SUGGESTED SAMPLING METHODS

Field review and evaluation of 100 percent of current operating mineral projects annually.

EXPECTED PRECISION AND RELIABILITY

Precision and reliability are both considered high.

RESPONSIBILITY

District Ranger, Lands and Recreation Staff

ANNUAL MONITORING COST

$10 00/operating plan X approximately 276 operating plans = $2,700.

APPENDIX E

OFF-ROAD VEHICLE MANAGEMENT PLAN

SUMMARY

The majority of the Siskiyou National Forest is available for off-road vehicle (ORV) use. The total area open to ORV use is approximately 828,800 acres, which includes some areas that are subject to temporary or seasonal closures. However, the actual area used is by ORV's is far less. The nature of the terrain, vegetative cover, and resource management requirements place restraints on the amount of area that is actually suitable.

Area	Acres	
Permanent Yearlong Area Closures Affecting Off-Road Vehicle Use		
Kalmiopsis Wilderness	179,850	
Wild Rogue Wilderness	26,708	1/
Grassy Knob Wilderness	17,200	
Red Buttes Wilderness	3,414	2/
Siskiyou Wilderness	5,323	2/
Other Areas	30,985	
TOTAL	263,480	

1/ BLM addition - 9,392 acres
2/ Siskiyou portion

The other permanent yearlong closure areas include Research Natural Areas, Botanical Areas, and sensitive sites such as meadows

There are approximately 450 miles of trail on the Forest Approximately 44 percent of the total trail system will be affected by some type of restriction All Wilderness trail systems are closed to motorized use and bicycles. All or a portion of seven trails which traverse about 31 miles outside Wilderness are permanently closed to motorized use based on concerns for public safety, resource protection needs, and law.

Estimated Trail Miles Closed or Restricted to ORV use follows·

Trail	Miles	
Kalmiopsis Wilderness	153	
Grassy Knob Wilderness	0	
Wild Rogue Wilderness	6	
Red Buttes Wilderness	8	
Siskiyou Wilderness	8	
Illinois River	26	1/
Rogue River	15	1/ 2/
Mt Elijah	1	
TOTAL	217	

1/ Some of this mileage is within the Wilderness
2/ Closed to horses and ORV use

INTRODUCTION

The purpose of an ORV plan is to provide Forest Service managers with the framework to coordinate ORV use with other resource management objectives. A second purpose is to insure, over time, the continued availability of ORV recreation opportunities on the Forest. A third purpose is to provide public users of the Siskiyou National Forest with trip planning information.

Executive Order 11644, as amended May 25, 1977, requires Federal land management agencies to adopt regulations to ensure that ORV use is controlled and directed to protect resources, promote safety of all users, and minimize conflicts among the various users of public land Land and resource management planning direction requires that each National Forest establish locations where ORV use will be allowed, restricted to some degree, or prohibited. The Code of Federal Regulations (CFR) provides the authority and process to restrict motorized use on Federal land In addition, the Kalmiopsis, Wild Rogue, Grassy Knob, Siskiyou, and Red Buttes Wildernesses have been closed to motorized use by National legislation

The review and analysis has been completed for the Siskiyou National Forest This document is the result of the combined input from interested members of the public and Forest Service administrators This Plan satisfies the requirements of 36 CFR 295 1. This Plan will be dynamic to meet changes in ORV use patterns and resource management situations

Prior to Executive Order 11644, problems and conflicts relating to ORV use were resolved as they occurred During the public involvement initiated as a result of the Executive Order, few new conflicts were identified and little dissatisfaction was expressed about the ORV regulations in effect on the Forest

Concerns identified during the public involvement process involved safety to hikers and horsemen, the noise level of motorized use, and providing opportunities for two, three, and four-wheel recreation vehicles Resource concerns identified on the Forest include water quality, soil stability, vegetative cover, deer and elk winter range, elk calving areas, and fragile environments.

Additional use opportunities will be provided by the estimated 45 miles of trail to be constructed in the next 10 years which may be suitable for ORV use. Construction activities related to resource management may make available trailhead and parking areas for ORV use Snow related ORV uses could be developed in suitable high mountain areas of the Illinois Valley Ranger District.

For much of the Forest, the heavily dissected ridge systems, which feature terrain steepness and dense vegetative cover, nearly precludes use by ORV's except on roads and trails. Use during the winter season by over-the-snow vehicles is also minor due to warm intense winter storms which result in poor snow conditions. However, the large blocks of serpentine-peridotite located on the south end of the Forest are far more conducive to ORV use This landtype is relatively gentle, with slopes being less steep and more rounded, the vegetation more "open," and the land surface more resistant to traffic impacts Much of the present ORV use occurs in these areas.

ORV OPPORTUNITIES

ORV use is a part of the overall travel management planning for the Forest In some places this use coexists with other road and trail uses The present trail system available for ORV use totals 171 miles This represents 74 percent of the current trail system on the Forest outside of Wilderness areas Within the next 10 years, there may be about 216 miles available for some form of ORV use. In addition, considerable area of the Forest has been allocated to Backcountry Recreation management (see Standards and Guidelines for Management Area 6 - Backcountry Recreation, in Chapter IV of the Land and Resource Management Plan). Some of these areas are specifically designed to accommodate motorized recreational uses Trail

systems planned in these motorized areas will be designed to include ORV's, including jeep type vehicles Interagency management plans, like the Rogue River Wild and Scenic River Plan, may affect the restrictions on certain areas. The Forest may accommodate over-the-snow vehicle use at certain times of the year in suitable locations

In addressing the problems relating to ORV use, this plan was prepared with the following criteria

1. There would be as few restrictions as possible based on present use and problems As new problems are identified, they will be resolved by revising this plan
2. Closures and restrictions should be clearly defined for the benefit of users and administrators
3. The needs of the Forest user will be met whenever possible.

CLOSURES AND RESTRICTIONS

In order to formulate management direction within the established criteria and mitigate the problem, ORV limitations can be identified in two ways: (1) on an area basis, and (2) by a specific road or trail These limitations also relate to season of use. In area closures, the roads and trails are open to ORV's unless they are posted and specifically closed.

There are permanent yearlong ORV closures for Wilderness, Research Natural Areas, Botanical Areas, and similar land allocations that carry a specific theme. Closures occur on trails within Wilderness and some trails serving as access to sensitive areas, and for roads on which long-term use is not desirable for some reason Long-term seasonal ORV restrictions apply primarily to trails and roads, and in some cases to campgrounds. There are instances where short-term temporary (up to several years duration) closures or restrictions will be applied to areas, trails, and roads found on the Forest Although they may be applied for a variety of resource protection and public safety reasons, they will have an effect on ORV use. Restrictions on ORV use may be applied in areas to resolve or eliminate conflicts with other user groups and resource management activities. Organized activities such as hill climbs, moto-cross, or timed speed events will not be permitted; these are not considered as part of the ORV recreation role of National Forest lands.

AREA CLOSURES

Closures involve a variety of considerations, including wildlife winter range, elk calving areas, fragile soils and meadows. Each of these considerations include elements of incompatibility with various kinds of ORV use. Ground cover, soil type, water table, wildlife habitat requirements, human needs and established patterns of use have all been considered in defining the boundaries for the area closures.

MOTORIZED TRAIL CLOSURE

Closures may be initiated based on management objectives on those trails where motorized use has caused a public safety hazard, contributed to serious soil erosion problems, is not compatible with designed standards, or has introduced use into a trail system closed by National legislation. A trail leading to an area (such as Oregon Caves National Monument) where ORV's are prohibited may be closed A trail designed by objective to accommodate horses may be closed to ORV use if such use present substantial hazards to horse travelers

Trails may be closed seasonally due to conflicts in patterns of use. For example, the Illinois River Trail where motorcycle and hiker conflicts occur during summer months, little conflict arises during the fall and winter period. Motorcycles have used this trail system during the "off-season" period for fishing and hunting access, with little hiker conflicts The trail may be closed to motorized use in the summer season only

ROADS

Roads may be closed in support of area closures, as well as to protect the road and adjacent areas from erosion damage. Some roads which appear to be closed may be available for use by ORV's less than 40 inches in width, if posted for such use.

FIRE AND PUBLIC SAFETY

Short-term closures may be applied to ORV use during high fire danger which limits vehicle use to only Forest development roads. Under extreme situations, all roads may be closed to all uses. Other short-term closures for public safety purposes may effect use of ORV's.

MANAGEMENT REQUIREMENTS

ENFORCEMENT

Closure orders will be issued by the Forest Supervisor Orders issued by the Forest Supervisor affecting ORV usage will become part of this plan Orders rescinded by the Forest Supervisor will be removed from this plan Currently there are numerous closure orders specific to certain roads Many of these closure orders may be replaced by a Forest-wide closure order in the future. Closures and restrictions will be enforced by the District Rangers on the Siskiyou National Forest

SAFETY

The Forest Service assumes the public to be responsible for prudent use and safe operation of ORV's on all National Forest System roads or trails open for motorized uses. Information specific to any trail or road system is available upon request

PUBLIC INVOLVEMENT

Plan updates may be scheduled periodically to incorporate ongoing public comment regarding the need to meet changing conditions Where conflicts arise involving ORV use and other resources, the public will be encouraged to participate in the resolution of differences.

PUBLIC NOTICE

All closures and restrictions will be posted on signs in a manner that will reasonably inform the public of the intended action. In addition, each Ranger District Office and the Supervisor's Office will post a copy of the regulations and a map showing the designated areas on the Forest

IMPLEMENTATION AND EVALUATION

Each Forest Service office on the Siskiyou National Forest will display a map identifying area, trail and road closures, and restrictions. The Forest Off-Road Vehicle Use Map is in the process of production and will be made available to the public Maps are available for review at the Forest Supervisor's and District Office

ORV use will be monitored. The ORV Plan will be reviewed annually and revised as new problems are identified.

SPECIFIC CLOSURES AND RESTRICTIONS

The following codes summarize ORV related Forest Closure Orders which are shown on Tables E-1 through E-4. Also included are some of the exceptions allowed.

CODES AND DESCRIPTIONS

Code	Description
1a	Permanent Yearlong Closure, any motor driven vehicle prohibited
1b	Permanent Yearlong Closure, any motor driven vehicle prohibited **on** meadow areas
1c	Permanent Yearlong Closure, any motor driven vehicle prohibited, **except** over-the-snow machines.
1d	Permanent Yearlong Closure, any motor driven vehicle prohibited **off** Forest Development Road(s) and or trail(s)
1e	Permanent Yearlong Closure, any motor driven vehicle prohibited **on** Forest Development Road(s) and or trail(s)
2a	Temporary Yearlong Closure, any motor driven vehicle prohibited.
2b	Temporary Yearlong Closure, any motor driven vehicle prohibited **on** meadow areas
2c	Temporary Yearlong Closure, any motor driven vehicle prohibited, **except** over-the-snow machines.
2d	Temporary Yearlong Closure, any motor driven vehicle prohibited **off** Forest Development Road(s) and or trail(s)
2e	Temporary Yearlong Closure, any motor driven vehicle prohibited **on** Forest Development Road(s) and or trail(s).
3a	Temporary Yearlong Closure, being **upon** area prohibited.
3b	Temporary Yearlong Closure, being **on** trail prohibited
3c	Temporary Yearlong Closure, being **on** road prohibited.
4	Seasonal Closure to motorized use from May 15 through September 15
5a	Seasonal Closure (restriction) when signed for closure.
5b	Seasonal Closure (restriction) when gate closed/locked.
6a	Trail also closed to bicycle use.
6b	Trail also closed to bicycle, and saddle, pack, and draft animal use.
7a	Lake closed to motor boat use.
7b	River bar speed restriction for any motor driven vehicle (5 mph or less)
8	Trailer prohibited **off** Forest Development Road(s)

Table E-1. Area Closures Managed under 36 CFR 261.16 - Legislative

Wilderness	Area Affected	Closure Acreage	Code
Grassy Knob	Entire	17,200	1a, 7a
Kalmiopsis	Entire	179,850	1a, 7a
Red Buttes (Siskiyou NF portion)	Entire	3,414	1a, 7a
Siskiyou (Siskiyou NF portion)	Entire	5,323	1a, 7a
Wild Rogue (BLM area - 9,392 acres)	Entire	26,708	1a, 7a

Table E-2. Area Closures Managed under 36 CFR 261.56 - Administrative

Area Name	Approximate Acreage Effected	Closure Codes	Closure Order Number	Location Description
Babyfoot Botanical Area	208	1d	-	T.38S., R.9W., W.M., Sec's. 30, 31, 32, as shown on establishment map outside Kalmiopsis Wilderness.
Bear Camp Botanical Area	630	1d	-	T.34S., R.10W., W.M., Sec's. 11, 12, 13, 14, as shown on establishment map.
Big Craggies Botanical Area	859	1d	-	As shown on establishment map outside Kalmiopsis Wilderness.
Bigelow Lakes Botanical Area	411	1d	-	As shown on establishment map.
Bigelow Lakes	160	1d	1105-1	T.40S., R.6W., W.M., SW1/4NE1/4,SE1/4NW1/4, NW1/4SE1/4,NE1/4SW1/4 Sec. 14
Big Tree Botanical Area	127	1d	-	As shown on establishment map.
Bolan Lake	7	7a	1104-1	T.41S., R.6W., W.M., NW1/4 Sec. 7
Bolan Lake Botanical Area	297	1d	-	As shown on establishment map.
Burnt Ridge/Sugarloaf Mtn/ Fishhook Peak area	1,950	2e	1103-11	T.34S., R.10W., W.M., Sec. 31; T.35S., R.10W., W.M., Sec's. 5, 6, 7, 8, 17, 18, 19, 20; T.35S., R.10 1/2W., W.M., Sec's. 6, 7; as shown on closure map.
Cedar Log Flat Research Natural Area	441	1d	-	T.38S., R.8W., W.M., Sec's. 35 and 36, as established.
Chrome Ridge Botanical Area	589	1d	-	As shown on establishment map.
Coquille River Falls Research Natural Area	480	1d	1105-1	T.33S., R.11W., W.M., S1/2 Sec. 17, SW1/4 Sec. 16
Craggy Peak Research Natural Area	101	1d	-	T.40S., R.6W., W.M., Sec's. 25 and 36, Siskiyou N.F. portion as established.
Days Gulch Botanical Area	1,252	1d	-	As shown on establishment map.
Eight Dollar Mountain Botanical Area	2,738	1d	-	As shown on establishment map.
Elko Campground	10	5a	1103-1	T.37S., R.13W., W.M., SW1/4 NE1/4 Sec. 19
English Cabin Meadow	40	1c	1102-6	T.35S., R.8W., W.M., S1/2 SW1/4 SW1/4 Sec. 13 NOTE: SEE CLOSURE ORDER 1102-8.
Flat Top/Bald Mtn area	10,600	2a	1102-7	T.36S.; R.9W., R.9W., R.10W., and R.11W., W.M. as shown on closure map.

Table E-2. Area Closures Managed under 36 CFR 261.56 - Administrative (Continued)

Area Name	Approximate Acreage Effected	Closure Codes	Closure Order Number	Location Description
Fly Catcher	720	1d	1105-1	T.37S., R.13W., W.M., Sec. 19; NE1/4 NW1/4 Sec. 30; NW1/4 NW1/4 Sec. 29, Unsurveyed
Foster Bar	12	5a	1103-1	T.34S., R.11W., W.M., Lot 5 Sec. 17, S1/2 NE1/4 Sec. 18
Fox - Fry Timber Sale area	4,200	2e	1103-13	T.35S., R.11W., W.M., Sec. 31; T.35S., R.12W., W.M., Sec's. 13, 14, 23, 24, 25, 26, 33, 35, 36; T.36S., R.12W., W.M., Sec's. 1, 2, 3, 4, 5, 9, 10; as shown on closure map.
Game Lake Campground	3	5a	1103-1	T.36S., R.12W., W.M., SW1/4 NW1/4 Sec. 26
Grayback Mountain Botanical Area	197	1d	-	As shown on establishment map.
Hardscrabble/Deep Purple/ Blue Indigo Timber Sale area	11,100	2e	1103-14	T.35S., R.10W., W.M., Sec's. 17, 19, 20, 29, 30, 31, 32; T.35S., R.10 1/2W., W.M., Sec. 31; T.35S., R.11W., W.M., Sec's. 25, 26, 34, 35, 36; T.36S., R.10W., W.M., Sec's. 4, 5, 6, 7, 8, 9; T.36S., R.11W., W.M., Sec's. 1, 2, 3, 4, 10, 12, 13, 14, 15, 16, 22, 23; as shown on closure map.
High Prairie	4,320	1b	1101-7	T.38S., R.12W., W.M., Sec's. 1, 2, 3, 10, 11, 12
Hobson Horn Timber Sale area	3,200	2a	1102-1	T.34S., R.9W., and T.35S., R.10W., W.M. shown on closure map.
Hoover Gulch Research Natural Area	1,290	1d	-	T.38S., R.9W., W.M., Sec's. 2, 3, 10, 11, 12, 13 and 14, as established.
Horse Creek Meadow	40	1c	1102-6	T.36S, R.8W., W.M., SE1/4 SW1/4 SW1/4 Sec. 8; SE1/4 SW1/4, Sec. 8; N1/2 SW1/4 SE1/4 SE1/4 Sec. 8; NE1/4 NW1/4 NW1/4 Sec. 17
Illahe Campground	20	5a	1103-1	T.34S., R.11W., W.M., Lot 3 Sec. 19
Indigo Prairie	80	1d	1105-1	T.35S., R.10 1/2W., W.M., S1/2 SW1/4 Sec. 19
Iron Mountain Botanical Area	1,866	1d	-	As shown on establishment map.
Josephine	280	1d	1105-1	T.38S., R.8W., W.M. NW1/4 Sec. 30; T.38S., R.9W., W.M., NE1/4 NE1/4, SE1/4 NE1/4, NE1/4 SE1/4 Sec. 25
Lawson Saddle Timber Sale area	1,350	2e	1103-11	T.36S., R.12W., W.M., Sec's. 21, 22, 27, 28, 33, 34; T.37S., R.12W., W.M., Sec. 4; as shown on closure map.
Lemmingsworth Gulch Research Natural Area	849	1d	-	T.41S., R.11W., W.M., Sec's. 2, 3, 4, 9 and 10, as established.

Table E-2. Area Closures Managed under 36 CFR 261.56 - Administrative (Continued)

Area Name	Approximate Acreage Effected	Closure Codes	Closure Order Number	Location Description
Lobster Creek Picnic Ground	5	5a	1103-1	T.35S., R.13W., W.M., Lot 8 Sec. 19
Lobster Grove Botanical Area	534	1d	-	As shown on establishment map.
Long Ridge	1,120	1b	1101-7	T.38S., R.12W., W.M., Sec. 24; SE1/4 Sec. 22; E1/2 Sec. 27; NE1/4 Sec. 34
Miller and Nook river bars	47	7g	1101-7	T.39S., R.12W., W.M., Sec's. 30, 31
Oregon Mountain Botanical Area	2,623	1d	-	As shown on establishment map.
Page Mountain Grove Botanical Area	64	1d	-	As shown on establishment map.
Pine Point Picnic Ground	1	5a	1103-1	T.37S., R.13W., W.M., SW1/4 NE1/4 Sec. 18
Port Orford Cedar Research Natural Area	1,120	1d	1105-1	T.32S., R.12W., W.M., Sec. 35; E1/2 Sec. 34; E1/2 SW1/4, SW1/4 SW1/4, SW1/4 SE1/4 Sec. 26
Quosatana Campground	37	5a	1103-1	T.35S., R.13W., W.M., Lots 4, 5, and 6 Sec. 34
Red Flat	640	1b	1101-7	T.37S., R.13W., W.M., Sec. 31, Unsurveyed
Red Flat Botanical Area	53	1d	-	As shown on establishment map.
Red Mountain	240	1b	1101-7	T.39S., R.11W., W.M., NW1/4 SW1/4, NE1/4 SW1/4, SE1/4 SW1/4, S1/2 S1/2 SE1/4 Sec.8; N1/2 NE1/4 Sec. 17
Redwood Groves Botanical Area	511	1d	-	As shown on establishment map.
Redwood river bar	12	7g	1101-7	T.39S., R.12W., W.M., Sec's. 20, 29
Rough and Ready Flat Botanical Area	1,499	1d	-	As shown on establishment map.
Sam Brown Meadow	40	1c	1102-6	T.36S., R.8W., W.M., E1/4 W1/2 SE1/4 NE1/4 Sec. 18 NOTE: SEE CLOSURE ORDER 1102-8.
Sapphire/So. Indgo Timber Sale area	2,250	2e	1103-11	T.35S., R.10W., W.M., Sec's. 6, 7, 18, 19, T.35S., R.10 1/2W., W.M., Sec's. 7, 18, 19, 30, 31; T.35S., R.11W., W.M., Sec's. 24, 25, 26; as shown on closure map.
Snaketooth Redwood Botanical Area	21	1d	-	As shown on establishment map.

Table E-2. Area Closures Managed under 36 CFR 261.56 - Administrative (Continued)

Area Name	Approximate Acreage Effected	Closure Codes	Closure Order Number	Location Description
Snow Camp	2,240	1b	1101-7	T.37S., R.12W., W.M., Sec's. 19, 30 Unsurveyed; T.37S., R.12 1/2W., W.M., Sec's. 24, 25
Snow Camp Botanical Area	1,041	1d	-	As shown on establishment map.
Sourgame Botanical Area	571	1d	-	As shown on establishment map.
Turner Tract	37	8	1103-2	T.35S., R.13W., W.M., Lots 7 and 8 Sec. 33, as shown on closure map.
Vulcan Botanical Area	133	1d	-	As shown on establishment map.
Wheeler Creek Research Natural Area	320	1d	1105-1	T.40S., R.12W., W.M., Unsurveyed SW1/4 Sec. 15; SE1/4 Sec. 16
Wild Horse	240	1d	1105-1	T.36S., R.12W., W.M., NW1/4, N1/2 SW1/4 Sec. 18
Wildhorse Campground	11	5a	1103-1	T.36S., R.12W., W.M., SE1/4 NW1/4 Sec. 18

Table E-3. Trail Closures Managed under 36 CFR 261.55(b) - Administrative

Trail Name	Trail Number	Beginning Mile Point of Closure	Miles Closed	Closure Codes	Closure Order Number	Termini of Trail Closure
Snowcamp	1103	0.0	8.2	1a, 6a	1101-5	T.37S., R.12W., W.M., Sec. 30 into T.37 1/2S., R.12W., W.M., Sec. 32
Redwood Nature	1111	0.0	11.0	1a, 6b		from Section 18, T.40S., R.13W., W.M., to its termini in Section 18, T.40S., R.18W., W.M.
Tincup 1/	1117	0.0	5.2	1a, 6a	1101-5	T.38S., R.12W., W.M., Sec. 11 into T.38S., R.12W., W.M., Sec. 6
Mislatnah 1/	1119	0.0	3.5	1a, 6a	1101-5	T.38S., R.12W., W.M., Sec's. 1, 11, 12; T.38S., R.11W., W.M., Sec. 6
Illinois River 2/	1162	0.0	26.0	1a	1104-2	From its junction with Road 4103 in Section 6, T.37S., R.9W., W.M., to its junction with local road (33)-272 Section 29, T.35S., R.11W., W.M.
Rogue River 3/	1163	0.0	15.0	1a, 6b	1103-6	From the National Forest Boundary in Section 9, T.33S., R.10W., W.M., to County Road 375 in Section 18, T.34S., R.11W., W.M.
Fish Hook	1180	0.0	1.5	3b	1103-12	From its junction with Road (2308)-076 in Section 8, T.35S., R.10W., W.M., to end in Section 17, T.35S., R.10W., W.M.
Mount Elijah	1206	0.0	1.0	1a	1104-2	From Oregon Caves National Monument in Section 15, T.40S., R.6W., W.M., to its junction with the spur trail to local road (4611)-070 in Section 15, T.40S., R.6W., W.M.

1/ Access to Kalmiopsis Wilderness
2/ Access to and through Kalmiopsis Wilderness (total miles shown)
3/ Access to and through Wild Rogue Wilderness (total miles shown)

Table E-4. Road Closures Managed under 36 CFR 212.7 - Administrative

Road Name	Road Number	Beginning Mile Point of Closure	Miles Closed	Closure Codes	Closure Order Number	Beginning location of Road Closure
Chetco Ranger District						
Mill Creek	(1205)-010	0.0	0.8	4	-	T.40S., R.12W., W.M., NW1/4 Sec. 19
Redwood CG	(1376)-100	0.0	0.5	4	-	T.39S., R.12W., W.M., SW1/4 Sec. 20
Lower Quail	(1917)-040	0.0	1.6	1e	1101-4	T.38S., R.12W., W.M., SW1/4 Sec. 34
Long Ridge Seed	(1917)-090	0.0	0.8	1e	1101-4	T.38S., R.12W., W.M., NE1/4 Sec. 27
Long Ridge CG	(1917)-110	0.0	0.2	1a	-	T.38S., R.12W., W.M., SE1/4 Sec. 23
Quail Prairie Mtn	(1917)-180	0.0	0.4	1e	1101-4	T.38S., R.11W., W.M., NE1/4 Sec. 30
Galice Ranger District						
Little Lazy	(2300)-441	0.0	2.1	1c	1102-5	T.34S., R.9W., W.M., SW Sec. 19
Hobson Horn	2411	1.3	2.9	3c	1102-1	Gate in T.34S., R.9W., W.M., SW Sec. 34
A-Spur	(2411)-013	0.0	0.6	3c	1102-1	T.34S., R.9W., W.M., SW Sec. 34
B-Spur	(2411)-021	0.0	1.1	3c	1102-1	T.34S., R.9W., W.M., SW Sec. 33
Breezy Creek	(2411)-027	0.0	2.6	3c	1102-1	T.35S., R.9W., W.M., NW Sec. 4
Breezy Wren	(2411)-039	0.0	0.7	3c	1102-1	T.35S., R.9W., W.M., SE Sec. 5
Watery Rye	(2411)-501	0.0	0.8	3c	1102-1	T.35S., R.9W., W.M., NW Sec. 4
Indigo Wren	(2411)-509	0.0	0.4	3c	1102-1	T.35S., R.10W., W.M., NE Sec. 12
Upper Ramsey	(2500)-225	0.0	1.3	1c	1102-5	T.36S., R.8W., W.M., SE Sec. 34
Onion Basin	(2500)-226	0.3	1.0	1c	1102-5	T.37S., R.8W., W.M., SE Sec. 34
Ramsey Basin	(2500)-235	0.2	1.9	1c	1102-5	T.37S., R.8W., W.M., SW Sec. 3
Upper Clear Creek	(2500)-256	0.0	3.6	1c	1102-5	T.37S., R.8W., W.M., NW Sec. 15
Taylor Ridge "B"	(2500)-510	0.0	1.3	1c	1102-5	T.35S., R.8W., W.M., SW Sec. 12
Knob	(2500)-516	0.0	1.3	1c	1102-5	T.35S., R.8W., W.M., SW Sec. 14
Pit	(2500)-522	0.0	0.9	1c	1102-5	T.35S., R.8W., W.M., SE Sec. 15

Table E-4. Road Closures Managed under 36 CFR 212.7 - Administrative (Continued)

Road Name	Road Number	Beginning Mile Point of Closure	Miles Closed	Closure Codes	Closure Order Number	Beginning location of Road Closure
Upper Minnow	(2509)-015	0.0	1.1	1c	1102-5	T.36S., R.8W., W.M., NW Sec. 4
Onion Lookout	(2509)-055	0.1	0.7	1c	1102-5	T.36S., R.8W., W.M., SE Sec. 11
Flat Top	2512	8.0	1.8	3c	1102-7	Gate in T.36S., R.9W., W.M., NE Sec. 20
Dutchy Creek	(2512)-016	0.0	0.6	1c	1102-5	T.36S., R.8W., W M., NW Sec. 18
Bald Mountain	(2512)-091	0 0	6.1	3c	1102-7	T.36S , R.9W., W M., SW Sec. 20
Chrome End	(2512)-620	0 0	0.6	1c	1102-5	T.36S., R.9W., W.M , NE Sec. 27
Phillips Creek	(2512)-634	0.0	0.7	3c	1102-7	T.36S., R 9W., W.M., SW Sec. 20
Mud Springs	(2512)-640	0.0	1.3	3c	1102-7	T.36S., R.9W., W.M., NW Sec. 20
Chinaman Hat	(2512)-642	0.0	4.0	3c	1102-7	T.36S., R.9W., W.M., NE Sec. 19
Philips Ridge	(2512)-663	0.0	0.2	1c	1102-5	T.36S., R.9W., W.M., NE Sec. 18
Philips Creek	(2512)-665	0.0	1.2	1c	1102-5	T.36S., R.9W., W.M., NE Sec. 18
No Glory	(2512)-675	0.0	0.5	3c	1102-7	T.36S., R.9W., W.M., NE Sec. 30
Spalding Mill	2524	4.6	0.5	1c	1102-5	T.37S., R.9W., W.M., NE Sec. 24
Gold Beach Ranger District						
Sugar	(2308)-076	0.0	2.7	3c	1103-12	T.34S., R.10W., W.M., SE Sec. 31
Candy	(2308)-081	0.0	0.4	3c	1103-12	T.34S., R.10W., W.M., SW Sec. 31
Dentine	(2308)-082	0.0	0.8	3c	1103-11	T.35S., R.10W., W.M., NW Sec. 6
Dentine	(2308)-082	0.0	0.8	3c	1103-12	T.35S., R.10W., W.M., NW Sec. 6
Eclair	(2308)-084	0.0	0.7	3c	1103-12	T.35S., R.10W., W.M., SE Sec. 6
Fudge Sickle	(2308)-085	0.0	0.2	3c	1103-12	T.35S., R.10W., W.M., SE Sec. 6
Sapphire	(2308)-100	0.0	0.8	3c	1103-12	T.35S., R.10 1/2W., W.M., SE Sec. 6
Indigo Prairie	(2308)-150	0.0	-	3c	1103-11	T.35S., R.10W., W.M., Sec. 6
Indigo Prairie	(2308)-150-2	0.0	-	3c	1103-14	T.35S., R.10W., W.M., Sec. 6

Table E-4. Road Closures Managed under 36 CFR 212.7 - Administrative (Continued)

Road Name	Road Number	Beginning Mile Point of Closure	Miles Closed	Closure Codes	Closure Order Number	Beginning location of Road Closure
Gold Beach Ranger District (Continued)						
No. Fk. Indigo	(2308)-151	0.0	1.9	3c	1103-11	T.35S., R.10W., W.M., SW Sec. 6
Blue Sugar	(2308)-153	0.0	1.0	3c	1103-11	T.35S., R.10 1/2W., W.M., NE Sec. 19
Fishhook Camp	(2308)-154	0.0	0.8	3c	1103-11	T.35S., R.10 1/2W., W.M., NE Sec. 19
Fishhook Camp	(2308)-154	0.0	1.8	3c	1103-12	T.35S., R.10W., W.M., SW Sec. 7
Fishhook Camp	(2308)-154	0.0	2.6	3c	1103-14	T.35S., R.10 1/2W., W.M., NE Sec. 19
Snail Basin-F Spur	(2308)-483	0.0	0.1	3c	1103-12	T.34S., R.10W., W.M., SE Sec. 31
Sugar-A Spur	(2308)-501	0.0	0.9	3c	1103-12	T.35S., R.10W., W.M., NE Sec. 6
Goshawk	(2308)-761	0.0	-	3c	1103-11	T.35S., R.10 1/2W., W.M., Sec. 30
SE5	(2308)-762	0.0	-	3c	1103-11	T.35S., R.10 1/2W., W.M., Sec. 30
Brook	(2308)-767	0.0	-	3c	1103-11	T.35S., R.10 1/2W., W M., Sec. 30
Gully	(2308)-768	0.0	-	3c	1103-11	T.35S., R.10 1/2W., W.M., Sec. 30
Cooper	(2308)-769	0.0	-	3c	1103-14	T.35S., R.10 1/2W., W.M., Sec. 31
Nail Keg	(3318)-080	0.0	4.9	3c	1103-13	T.35S., R.12W., W.M., NW Sec. 33
-	(3318)-088	0.0	-	3c	1103-13	T.35S., R.12W., W.M., Sec. 23
Pebble Hill	(3318)-120	0.0	4.2	3c	1103-13	T.35S., R.12W., W.M., NW Sec. 34
Sevenmile Camp	(3318)-121	0.0	0.5	3c	1103-13	T.35S., R.12W., W.M., NE Sec. 34
Seven Frys	(3318)-122	0.0	1.8	3c	1103-13	T.35S., R.12W., W.M , SE Sec. 34
-	(3318)-123	0.0	-	3c	1103-13	T.36S., R.12W., W.M., Sec. 3
-	(3318)-124	0.0	-	3c	1103-13	T.35S., R.12W., W.M., Sec. 36
-	(3318)-125	0.0	0.1	3c	1103-13	T.35S., R.12W., W M., SE Sec. 25
-	(3318)-126	0.0	0.3	3c	1103-13	T.35S., R.12W., W.M., SE Sec. 25
-	(3318)-127	0.0	0.4	3c	1103-13	T.35S., R.12W., W.M., NE Sec. 36
-	(3318)-129	0.0	0.4	3c	1103-13	T.36S., R.12W., W.M., NW Sec. 3

Table E-4. Road Closures Managed under 36 CFR 212.7 - Administrative (Continued)

Road Name	Road Number	Beginning Mile Point of Closure	Miles Closed	Closure Codes	Closure Order Number	Beginning location of Road Closure
Gold Beach Ranger District (Continued)						
Lawson Creek	(3318)-310	0.0	12.0	3c	1103-13	T.37S., R.13W., W.M., NW Sec. 1
Noswal	(3680)-407	0.0	2.2	3c	1103-11	T.36S., R.12W., W.M., SE Sec. 33
Elddas	(3680)-408	0.0	-	3c	1103-11	T.36S., R.12W., W.M., Sec. 33
-	(3680)-409	0.0	-	3c	1103-11	T.36S., R.12W., W.M., Sec. 27
Saddle Horn	(3680)-491	0.0	3.8	3c	1103-11	T.36S., R.13W., W.M., Sec. 35
Stirrup	(3680)-492	0.0	0.1	3c	1103-11	T.36S., R.12W., W.M., Sec. 33
-	(3680)-493	0.0	-	3c	1103-11	T.36S., R.12W., W.M., Sec. 27
Illinois Valley Ranger District						
None.						
Powers Ranger District						
-	(3343)-070	0.0	0.4	1e	1105-2	T.33S., R.11W., W.M., Sec. 20
-	(3343)-080	0.0	1.0	1e	1105-2	T.33S., R.11W., W.M., Sec's. 19, 20
April	(3348)-272	0.0	0.8	1e	1105-2	T.32S., R.10W., W.M., Sec. 5
Bolivar Creek	(3348)-300	0.6	0.8	1e	1105-2	T.32S., R.10W., W.M., Sec. 10
Fuller Creek	(3348)-320	1.5	0.8	1e	1105-2	T.32S., R.10W., W.M., Sec's. 2, 3
-	(3358)-XXXA	0.0	0.3	1e	1105-2	T.32S., R.11W., W.M., Sec. 16
-	(3358)-XXXB	0.0	0.4	1e	1105-2	T.32S., R.11W., W.M., Sec.14
-	(3358)-XXXC	0.0	0.1	1e	1105-2	T.32S., R.11W., W.M., Sec. 28
Elk Falls	(3358)-091	0.0	0.5	1e	1105-2	T.32S., R.11W., W.M., Sec. 8
Upper Hillis	(3358)-185	0.1	0.5	1e	1105-2	T.32S., R.11W., W M., Sec 22
Clay Hill	(5520)-050	1.3	0.2	1e	1105-2	T.33S., R.11W., W.M., Sec. 22
Kitty-Buck	(5520)-160	0.0	0.4	1e	1105-2	T.32S., R.11W., W.M., Sec. 35
No More	(5521)-120	0.0	0.2	1e	1105-2	T.33S., R.11W., W.M., Sec. 24

APPENDIX F

BEST MANAGEMENT PRACTICES

INTRODUCTION

DEFINITIONS

Nonpoint Sources refer to diffuse or unconfined sources of pollution where wastes can either enter into, or be conveyed by the movement of water to, public waters (Oregon Water Quality Standards, OAR 340-41-007(17)). Silvicultural sources, such as erosion from a harvest unit or surface erosion from a road are considered nonpoint sources.

Best Management Practices are defined as "methods, measures or practices selected by an agency to meet its nonpoint source control needs BMP's include, but are not limited to, structural and nonstructural controls, operations, and maintenance procedures. BMP's can be applied before, during, and after pollution-producing activities to reduce or eliminate the introduction of pollutants into receiving waters (EPA Water Quality Standards Regulation, 40 CFR 130 2)."

Usually BMP's are applied as a system of practices rather than a single practice BMP's are selected on the basis of site-specific conditions that reflect natural background conditions and political, social, economic, and technical feasibility (EPA 1985)

BMP's are basically a preventative rather than an enforcement system BMP's are a whole management and planning system in relation to sound water quality goals, including both broad policy and site-specific prescriptions.

SUMMARY

Best Management Practices are the primary mechanism to enable the achievement of water quality standards (EPA 1987) BMP's will be selected and tailored for site-specific conditions to arrive at the project level BMP's for the protection of water quality The process for determining appropriate BMP's and for ensuring their implementation at both the Forest Plan and project level is described

Following is a description of the methods and procedures that will be used to control or prevent nonpoint sources of pollution from resource management activities, and to ensure compliance with the.

Clean Water Act of 1972, as Amended (1977 and 1987). Section 319 of the Clean Water Act Amendments of 1987 requires that the States determine those waters that will not meet the goals of the Act, to determine those nonpoint source activities that are contributing pollution, and to develop a process of determining BMP's to reduce such pollution to the "maximum extent practicable." This Appendix is designed to fulfill the intent of the requirements of Section 319

Oregon Administrative Rules (OAR 340-41-001-975). Department of Environmental Quality (DEQ) Oregon's Administrative Rules contain water requirements for the protection of identified beneficial uses of water.

Memorandum of Understanding. The Oregon Department of Environmental Quality and USDA, Forest Service (February 12, 1979, and December 7, 1982), and "Attachments A and B" referred to in this MOU (Implementation Plan for Water Quality Planning on National Forest lands in the Pacific Northwest 12/78 and Best Management Practices for Range and Grazing Activities on Federal lands, respectively).

California Porter-Cologne Water Quality Control Act (California Water Code, Division 7) The Water Quality Control Plan for the North Coast Region was approved by the North Coast Regional

Water Quality Control Board on April 28, 1988 It is pending approval by the State Water Resources Control Board and the U S. Environmental Protection Agency

The Draft North Coast Regional Water Quality Control Plan contains water quality objectives that are considered necessary to protect those present and probable future beneficial uses of water

Memorandum of Understanding The State Water Resources Control Board, State of California, and USDA, Forest Service, Pacific Southwest Region, 1981

The EPA has certified the Oregon Forest Practices Act as BMP's The State of Oregon compared Forest Service practices with these State practices and concluded that Forest Service practices meet or exceed State requirements As State practices change, comparisons are made to ascertain that Forest Service practices meet or exceed these changes Monitoring and evaluation will determine the need for changes in BMP's and/or State standards.

Forest Service management practices will meet, as a minimum, the substantive State BMP requirements, and other considerations required by the National Forest Management Act (NFMA), and other authorities, for the protection of the soil and water resource.

The general BMP's described herein are action initiating mechanisms which call for the development of detailed, site-specific BMP prescriptions to protect beneficial uses and meet water quality objectives They are developed as part of the NEPA process, with interdisciplinary involvement by a team of individuals that represent several areas of professional knowledge, learning, and/or skill appropriate for the issues and concerns identified. BMP's also include such requirements as Forest Service Manual direction, contract provisions, environmental documents, and Forest Plan Standards and Guidelines. Inherent in prescribing project-level management requirements is recognition of specific water quality objectives which BMP's are designed to achieve.



BMP IMPLEMENTATION PROCESS

In cooperation with the State, the primary strategy for the prevention and control of nonpoint sources is based on the implementation of BMP's determined necessary for the protection of the identified beneficial uses

The objective is to identify the most practical means of attaining water quality objectives Water quality objectives include water quality measures that adequately reflect the needs of identified beneficial uses

The Forest Service Nonpoint Source Management System consists of:

1. Selection and design BMP's based on site-specific conditions, technical, economic and institutional feasibility, and the water quality standards of those waters potentially impacted

2. Implementation and enforcement of BMP's

3. Monitoring to ensure that practices are correctly applied as designed.

4 Monitoring to determine the effectiveness of practices in meeting design expectations and in attaining water quality standards.

5. Evaluation of monitoring results and mitigation where necessary to minimize impacts from activities where BMP's do not perform as expected.

6 Adjustment of BMP design standards and application when it is found that beneficial uses are not being protected and water quality standards are not being achieved to the desired level Evaluation of the appropriateness of water quality criteria to reasonably assure protection of beneficial uses Consideration of adjustment of water quality standards

BMP SELECTION AND DESIGN - STEP 1

SCOPING

Potential concerns and major issues are identified, e g , water quality, as part of the NEPA process for environmental analysis. Public notices are dispersed inviting comment and participation in the process Alternatives are developed to address the major issues and potential problems, and to accomplish project objectives.

ENVIRONMENTAL ANALYSIS

Each alternative is evaluated for its potential effect on different resources, including water. From this analysis, a preferred alternative is identified, along with the measures (BMP's) needed to reduce risk and increase the potential for success

DOCUMENTATION

When an Environmental Assessment (EA) or Environmental Impact Statement (EIS) is prepared to document the analysis; these documents include the management requirements and mitigation measures, including the site-specific BMP's. A Finding of No Significance (FONSI) and Decision Notice or, in the case of an EIS, a Record of Decision is issued which identifies the selected alternative, the rationale for the decision, and accompanying measures (BMP's).

On many projects, water quality is an important environmental component. The analysis and comparison of possible alternatives are disclosed in the required documents (EA or EIS); the description of the affected

environment and evaluation of potential activity effects on water quality are included. BMP's are incorporated into the design of the alternatives to avoid or minimize potential adverse water quality problems The selected alternative, as described in the decision, occasionally is accompanied by additional water quality mitigations (BMP's) to meet management goals and improve overall protection of the resources. Water quality standards are used as objectives towards which practices are designed to protect beneficial uses.

More specifically, appropriate BMP's are selected for each project by an interdisciplinary team BMP selection and design are dictated by water quality objectives, soils, topography, geology and landform, channel morphology, vegetation, climate, economics, institutional constraints, etc. Environmental effects and water quality protection options are evaluated and a range of practices considered A final set of practices are selected that not only protect beneficial uses, but meet other resource needs These final selected practices constitute the BMP's.

The selected BMP's, an estimate of their effectiveness, and a plan for monitoring them is included in the project EA or EIS. The site-specific BMP prescriptions are normally included in project implementation plans (analysis files), but may also be included in the body or appendix of a project environmental document.

BMP IMPLEMENTATION AND ENFORCEMENT - STEPS 2 AND 3

The site-specific BMP prescriptions are taken from plan-to-ground by a combination of project layout and resource specialists (hydrologists, fisheries biologists, soil scientists, foresters, geologists, etc) Final adjustments to fit the BMP prescriptions to the site conditions and needs are made before implementing the resource activity.

When the resource activity (e.g., timber harvest or road construction) begins, timber sale administrators, engineering representatives, resource specialists, and others ensure that the BMP's are implemented according to plan. A similar implementation process is used for other resource activities (range treatments, mining exploration and development, etc) on National Forest lands

BMP implementation monitoring is done before, during, and after resource activity implementation This monitoring answers the question: Did we do what we said we were going to do? Some examples of implementation monitoring for a streamside management unit BMP prescription may be·

BEFORE PROJECT

Checking Streamside Management Units (SMU's) to see if timber sale layout meets the objectives of the BMP prescription, or if the road crossing of a stream is properly located and designed relative to the estimate of potential environmental effects made during the environmental analysis Items reviewed in the sale layout often include which trees are selected in the "individual tree marking" of the SMU, and location of the SMU's upper unit boundary.

DURING PROJECT

During timber felling, the timber sale administrator checks to see if the timber fallers understand the marking prescription for timber to be felled in the SMU The timber sale administrator also observes on-going harvest operations to see if the activity meets the objectives defined in the environmental document and accompanying project plan.

AFTER PROJECT

Measuring stream shade canopy to determine if the amount specified in the BMP prescription was retained, or monitoring a beneficial use of the water to determine a change or trend in use

Enforcement is carried out primarily through internal project reviews and during contract administration, i e , assuring that timber sale contract, grazing or special use permit, etc , are adhered to and accomplished per agreement

Contract enforcement is a more formal method used to achieve desired results Normally, each project is assigned to a contracting officer For timber sales, that person is called a "timber sale administrator " The project is routinely monitored to ensure that practices are being carried out in the manner and method prescribed in the contract, permit, etc. When a contractor or permittee is not in compliance, they can be held in breech with penalties (e.g., bond forfeiture) until remedies are implemented.

Often during the course of an activity, adjustments are made if it is determined that unsatisfactory results are occurring or may occur from continued operation This often requires that the contract be modified to resolve or minimize the problem (as in the case of a timber sale). Under some conditions where resolution of a problem is not possible, contract termination could result. While this is used very sparingly, the provisions to do so are within the contract.

BMP MONITORING - STEP 4

Once BMP's have been implemented, further monitoring is done to evaluate their effectiveness BMP "effectiveness monitoring" answers the question: Are BMP's effectively meeting management objectives for protection of water quality?

Water quality standards are the "yardstick" against which the effectiveness is tested If through objective monitoring BMP's do not meet the prescribed objectives, then information is available to modify either the BMP's for future management application, or the objectives, or both

The natural variability of water quality under undisturbed conditions is an important factor that will be considered during the monitoring and evaluation. Additionally, effectiveness monitoring will include measurement against land management objectives as well as water quality objectives

Some examples of the types of BMP effectiveness monitoring to be conducted are.

1. Measuring stream temperatures to see if the riparian prescriptions in a watershed are maintaining water temperature

2. Surveillance monitoring of a road system during storms to see if road rocking is effectively preventing road surface erosion.

The monitoring and evaluation section of the Forest Plan (Chapter V and Appendix D) provides that monitoring will be done on a appropriate sample basis. Once a specific project is designed, a site-specific monitoring plan may be developed.

Results of monitoring should be shared with State and local agencies, as well as made available to the public. Monitoring design, sampling, and laboratory analyses will be coordinated

BMP EVALUATION AND ADJUSTMENT - STEPS 5 AND 6

The technical evaluation/monitoring described above will determine how effectively BMP's protect and/or improve water quality. If the evaluation indicates that water quality objectives are not being met and/or beneficial uses do not appear to be receiving adequate protection, corrective action will consider the following three components.

1. **The BMP:** Is it technically sound? Is it really best, or is there a better practice which is technically sound and feasible to implement?

2 **The implementation program or processes:** Was the BMP applied entirely as designed? Was it only partially implemented? Were personnel, equipment, funds, or training lacking which resulted in inadequate or incomplete implementation?

3. **The water quality standards:** The water quality standards are established to protect the beneficial uses of water. They include numeric and narrative criteria that, when exceeded, are assumed to indicate detrimental impacts on beneficial uses. They are intended to provide a benchmark for evaluating harm to beneficial uses

Assessing the applicability of the standards is a responsibility of the State. The Forest Service will provide information to the State to address the following types of questions·

1. Do the standards describe the conditions necessary for protecting beneficial uses?

2 Are standards higher or lower than that necessary for protecting beneficial uses?

3. Do the standards reflect the natural variability occurring within the natural and human-affected ecosystem?

4 Do the parameters and criteria that constitute water quality standards adequately reflect (are they sensitive enough) human-induced changes to water quality and beneficial uses?

To made this assessment, "validation" monitoring may be needed. The purpose of validation monitoring is to answer the question whether standards, coefficients, requirements, and guidelines are appropriate to meet objectives, e.g , to protect the established beneficial uses

Examples: (1) Did the change in water temperature impact the fish population?
(2) Did the soil compaction affect tree growth?

Validation monitoring will need to be closely coordinated with or, in some cases, conducted by research. It may require the establishment of permanent plots or administrative studies This kind of monitoring will be generally quite limited and will require good coordination to properly select projects that will have broad application and prevent duplication of efforts. Only those coefficients and standards that are not reasonably validated by existing research or documentation should be candidates for this monitoring.

Corrective action may be initiated once the reason for failing to achieve the management objectives is determined The management practice may have to be changed; the water quality objectives modified, or both

TRAINING

National Forest personnel involved with project planning and location, design, layout, administration, and maintenance activities will receive BMP training. The training will consist of BMP awareness, accompanied by the more technical aspects such as planning, implementation, monitoring and evaluation.

GENERAL BEST MANAGEMENT PRACTICES AND EXAMPLES

Individual general Best Management Practices are described in:

California

Water Quality Management For National Forest Systems Lands in California - Best Management Practices, Chapter 10, Draft Soil and Water Conservation Handbook, Pacific Southwest Region, San Francisco, March 1988

Oregon

General Water Quality Best Management Practices, Pacific Northwest Region, November 1988

Siskiyou National Forest Best Management Practices, Siskiyou National Forest Planning Records, October 1988

Included in the General Water Quality Best Management Practices document is a description of the process and limitations and use of these BMP's. This document, while providing guidance, is not considered direction.

A Forest-wide evaluation of effectiveness and ability to implement each general BMP is contained in the Siskiyou National Forest Best Management Practices document More specific evaluations at the project level are made following site-specific prescriptions The sensitivity of the project determines whether the site-specific BMP prescriptions are included in the environmental documents (EA or EIS) or in the sale project plan (or analysis files)

Evaluations of the ability to implement and estimated effectiveness are most appropriately made at the project level At the project level, the greatest level of precision in the expected effectiveness of a BMP can be made as site-specific conditions are essentially "knowns" (i e , the chance of significant variance in the estimate is greatly reduced).

For the more general BMP, the effectiveness and ability to implement can be estimated with some degree of precision. However, as the BMP is applied to larger areas or outside the physiographic areas for which it was developed, the rating of effectiveness and ability to implement is more a professional estimate that encompasses the many variables under which it would be applied. For Forest Plans, this estimate is fairly reliable as resource conditions are well defined; any substantial variation in conditions would likely be accompanied by either an additional BMP, or accounted for in the BMP prescription when applied at the project level. Criteria for rating the "ability to implement" and "effectiveness" of general BMP's is included at the end of this appendix.

Not all of the general BMP's listed will normally apply to a given project, and there may be specific BMP's which are not represented by a general BMP in this document. During the monitoring activity, reference should be made to the Forest Plan monitoring resource element (Appendix D) - "Water Resource Monitoring."

FORMAT OF BMP'S AT FOREST PLAN AND PROJECT LEVELS

Each general and site-specific Best Management Practice (BMP) consists of the Title, Objectives, Explanation, Implementation and responsibility, Ability to implement, Effectiveness, and Monitoring Each section with a brief description follows·

Title: Includes the sequential number of the practice and a brief title

Objective Describes the objectives of the Best Management Practice (BMP) and the desired results for protecting water quality

Explanation: Further defines the brief title, and describes under what conditions and how the practice is applied. Criteria or standards are described when applicable This section contains a description of the range of site-specific water quality protection measures to be implemented.

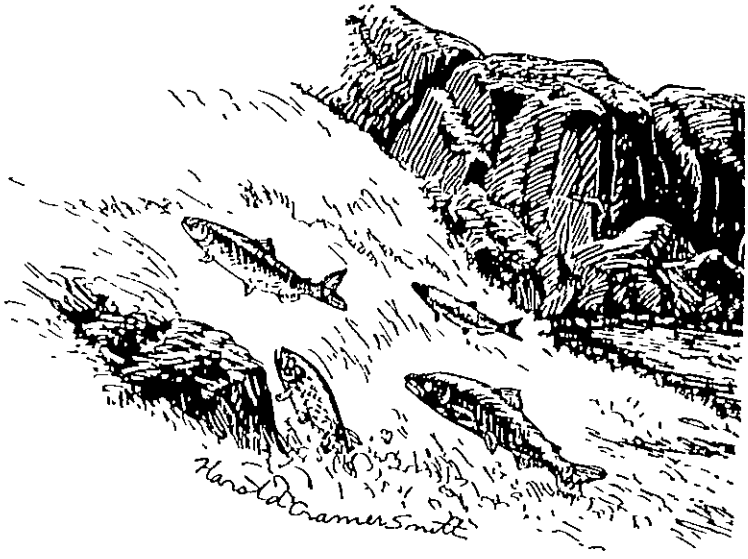
Implementation and Responsibility: Describes how the practices are expected to be applied and identifies the person(s) responsible for implementing the BMP.

Ability to Implement: Provides a qualitative estimate of the ability of the Forest Service to implement the BMP. The estimate is made at either the project level or Forest Plan level (see Siskiyou National Forest Best Management Practices for general BMP rating). Criteria for rating the "ability to implement" general BMP's is included at the end of this appendix

Effectiveness Provides a qualitative assessment of the expected effectiveness that the applied measure will have on preventing or reducing impacts on water quality and beneficial uses. The effectiveness of each BMP will be evaluated with an index that rates the effectiveness of each BMP at either the project level or Forest Plan level (see Siskiyou National Forest Best Management Practices for general BMP rating) Criteria for rating "effectiveness" of general BMP's is included at the end of this appendix.

Monitoring. Either describes how the site-specific practices for this BMP will be monitored, or lists the appropriate section of the Forest Plan Monitoring Plan (see Appendix) that would verify implementation and/or effectiveness

Following is an example of a general BMP, as described in the Siskiyou National Forest Best Management Practices, along with an example of a site-specific BMP which is developed at the project level.



GENERAL BMP EXAMPLE

T-5. Title· Limiting the Operating Period of Timber Sale Activities

Objective To ensure that the Purchaser conducts their operations in a timely manner, within the time period specified in the Timber Sale Contract (TSC)

Explanation. The TSC specifies a Normal Operating Season, during which, operations may generally proceed without resource damage Operations are permitted outside the Normal Operating Season only when they can be conducted without damage to soil, water, and other resources. Where determined to be necessary through the environmental analysis, the TSC will limit operations to specific periods or weather conditions. Operations are not permitted to continue if damage will occur

Implementation and Responsibility: Limited operating periods are identified and recommended during the timber sale planning process by the interdisciplinary team and followed through the life of the timber sale primarily by the Sale Administrator

Ability to Implement: High

Effectiveness: High

Monitoring: During implementation of timber sale activities by the Sale Administrator, Forest Service Representative (FSR), engineers, and watershed specialists

SPECIFIC BMP EXAMPLE

T-5. Title: Limiting the Operating Period of Timber Sale Activities

Objective· To ensure that the Purchaser conducts their operations in a timely manner, within the time period specified in the Timber Sale Contract (TSC)

Explanation: The Ship Mountain Timber Sale contains sensitive soils that are subject to soil compaction during tractor skidding, and a non-surfaced road that is not suitable for wet weather haul The normal operating season for the Forest will be enforced for the Ship Mountain Timber Sale All operations off Road FR 10 (non-surfaced) will be halted at the onset of wet weather to prevent erosion and damage to the road. Tractor skidding on Units 1-5 will be restricted if soil moisture is above the level established by the soil scientist Other operations can continue outside the normal operating season if they can be conducted without damage to soil, water, and other resources.

Implementation and Responsibility: For the Ship Mountain Timber Sale the normal operating season for the Forest will be enforced. All operations off of Road FR 10 (non-surfaced) will be halted at the onset of wet weather to prevent erosion and damage to the road. Other operations can continue outside of the normal operating season if they can be conducted without damage to soil, water, and other resources The Forest watershed specialists will work with the timber sale administrators to evaluate the potential for resource damage if operating outside of the normal operating season.

Ability to Implement: High

Effectiveness: High

Monitoring: During implementation of timber sale activities by the Sales Administrator, Forest Service Representative (FSR), engineers, and watershed specialist

CRITERIA FOR RATING "ABILITY TO IMPLEMENT" AND BMP "EFFECTIVENESS"

Forest-wide ratings of both the "ability to implement" and "effectiveness" for each general BMP are located in the Siskiyou National Forest Forest Plan planning records. These estimates are general, given the range of conditions throughout the Forest More specific estimates are made at the project level when the specific BMP's are developed.

Ability to implement: Provides a qualitative estimate of the ability of the Forest Service to implement the BMP The following index is used to rate the ability to implement as either **High, Moderate,** or **Low**:

High: Almost certain the BMP can be implemented as planned
Moderate: Greater than 75% certainty the BMP can be implemented as planned.
Low: Less than 75% certainty the BMP can be implemented as planned.

Effectiveness: Provides a qualitative assessment of the expected effectiveness that the applied measure will have on preventing or reducing impacts on water quality and beneficial uses. The effectiveness of each BMP will be evaluated with an index that rates the effectiveness of each BMP as either **High, Moderate,** or **Low** The index is:

Effectiveness of the BMP as indicated by literature & research, administrative studies, and professional experience

High: Practice is highly effective (> 90%) and one or more of the following types of documentation are available.

a Literature/Research - must be applicable to area
b Administrative studies - local or within similar ecosystem
c Experience - judgment of an expert by education and/or experience
d. Fact - obvious by reasoned (logical) response

Implementation and effectiveness of this practice will be monitored and the practice will be modified if necessary to achieve the objective of the BMP

Moderate: Documentation shows that the practice is effective less than 90% of the time, but at least 75% of the time.

or

Logic indicates that this practice is highly effective, but there is little or no documentation to back it up

Implementation and effectiveness of this practice will be monitored and the practice will be modified if necessary to achieve the objective of the BMP

Low: Effectiveness unknown or unverified, and there is little or no documentation

or

Applied logic is uncertain in this case, or the practice is estimated to be less than 75% effective.

This practice is speculative and needs both effectiveness and validation monitoring

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Forest Service

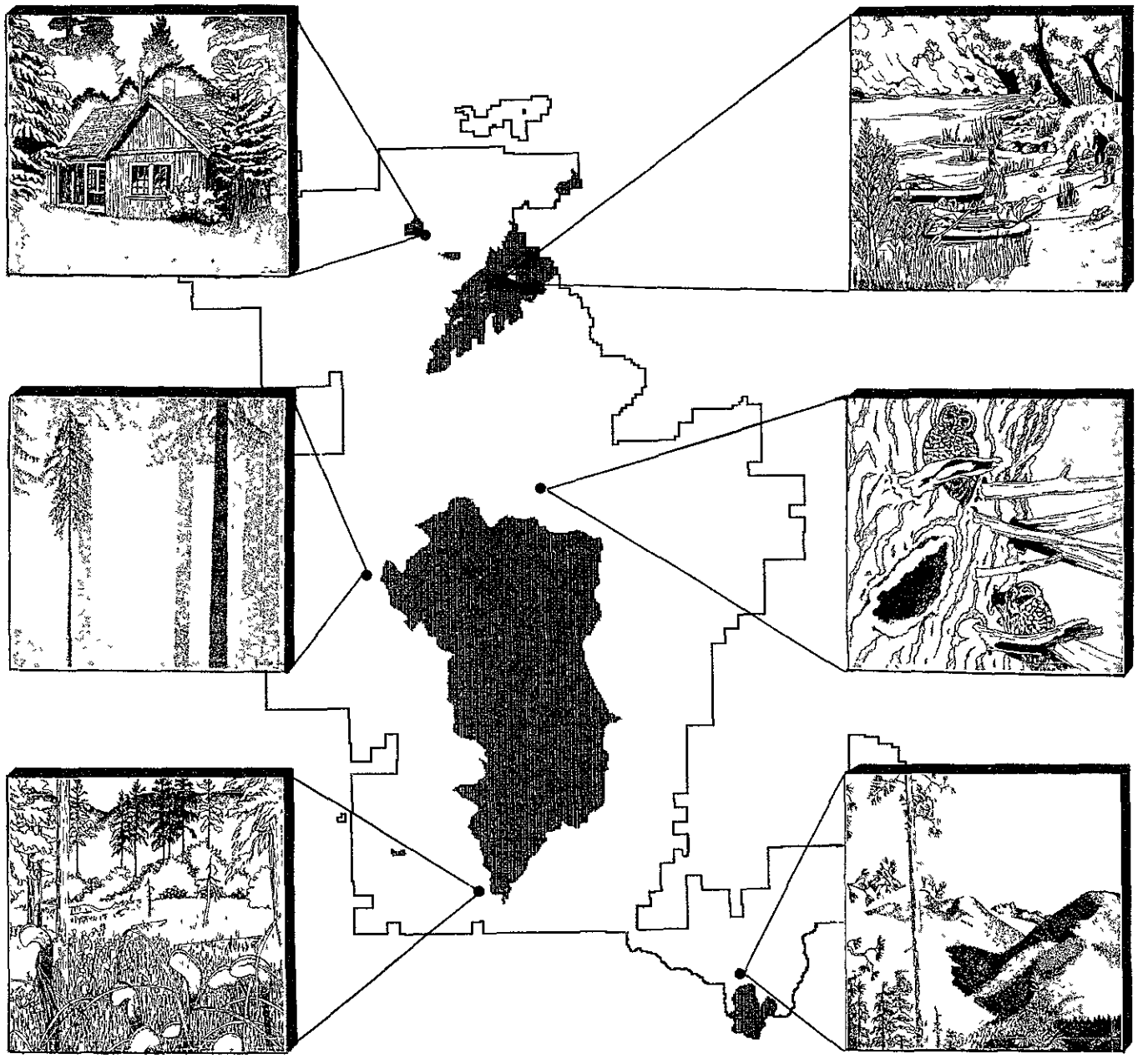
**Pacific
Northwest
Region**

1989

Record of Decision

Land and Resource Management Plan

Siskiyou National Forest



RECORD OF DECISION

SISKIYOU NATIONAL FOREST

Land and Resource Management Plan
Final Environmental Impact Statement

Curry, Coos, and Josephine Counties in Oregon
Del Norte County in California

March 10, 1989

RECORD OF DECISION

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Chapter I - INTRODUCTION

This Record of Decision documents my decision and rationale for selecting an alternative for the Land and Resource Management Plan (Forest Plan) for the Siskiyou National Forest After careful consideration of all available information, my decision is to implement Alternative S, as modified (hereafter called the Selected Alternative), as the Forest Plan to guide management of the Forest for the next 10 to 15 years Alternative S is described in the Final Environmental Impact Statement (FEIS) Modifications made to Alternative S in developing the Selected Alternative are described in this Record of Decision (For a detailed description of changes from Alternative S to the Selected Alternative, refer to "The Selected Alternative in Chapter IV of this Record of Decision.)

This first chapter, "Introduction," is offered as background information. Reviewers desiring immediate review of the Decision are directed to Chapter II.

PURPOSE AND NEED

The purpose of the Forest Plan is to provide direction for all natural resource management activities on the Forest. Preparation of the Forest Plan is part of the long-range resource planning process established by the Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976 (NFMA), and its associated National Forest System Land and Resource Planning Regulations (36 CFR 219).

The Forest Plan puts in place a dynamic management system for future decision making It establishes goals and objectives for forest management, and Standards and Guidelines for management activities. It is not a plan for the various administrative activities needed to carry on the Forest Service's day-to-day internal operations. For example, the Plan does not address personnel matters, law enforcement, fleet equipment, or internal organization changes. It is a plan for managing this National Forest in an environmentally sound manner to produce goods and services in a way that maximizes long-term public benefits.

The preparation of an Environmental Impact Statement (EIS) that discloses the environmental consequences of this proposed action and its alternatives is required by the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality's (CEQ) regulations for implementing NEPA (40 CFR 1500 et seq), and the implementing regulations of NFMA (36 CFR 219). For purposes of disclosure under NEPA, the FEIS and the accompanying Forest Plan are treated as combined documents, along with the associated Planning Records.

The EIS is required because the implementation of the Forest Plan is a major Federal action significantly affecting the quality of the human environment. It provides decisionmakers with an environmental disclosure sufficiently detailed to aid in the selection of management direction for the Forest. Equally important, it makes information on the environmental impacts of alternatives available to the public, and encourages public participation in the development and refinement of that information

The Forest Plan is part of the 50-year framework for long-range resource planning established by the RPA. The Forest Plan period covers the next 10 to 15 years. The alternatives presented in the FEIS contain management direction for the Plan period Within that period, conditions on the Forest will be reanalyzed at least every five years and, under certain circumstances, the Forest Plan may be amended or revised. (For further discussion of amendments or revisions to the Forest Plan, see Chapter VI of this document.)

The Forest Plan analysis considers a 150-year planning horizon to ensure that management plans can be implemented over the long term, and to aid in the disclosure and evaluation of long-term environmental consequences. The projection of effects and attributes of the alternatives beyond the Plan period are provided only to broadly indicate the anticipated consequences of each Plan alternative if that alternative

were selected to continue into the future The Forest Service is required to revise the Plan within 15 years of its adoption; this revision may establish different long-term goals with different projected effects and outputs.

The emphasis of the Plan is not on site-specific decisions or specific resource outputs. Rather, the emphasis is on applying various general management practices at various intensities to areas of land to achieve multiple-use goals and objectives in the most cost efficient manner To respond to changing needs and opportunities, Congressional land designations, catastrophic events, new information and inventories, or major new management or production technologies, the Plan may have to be amended or revised If there is a significant change to the Plan, it must be altered by a procedure identical to that used in the development and approval of the original Plan If the change does not significantly affect the Plan, the Forest Supervisor may amend it through a less extensive procedure, however public notification will be required.

All proposals in the Plan can be accomplished from a physical, biological, economic, social, and legal perspective; however it is not certain that these proposals will be accomplished. The outputs proposed by the Plan are estimates, targets, or projections based on available inventory data and assumptions; and are subject to the annual budget. The Plan is implemented through various site-specific projects, such as the building of a road, development of a campground, or the sale of timber. If the budget changes for any given year covered by the Plan, the projects scheduled for that year may be rescheduled However, the goals and land activity assignments described in the Plan would not change unless the Plan itself were changed. If budgets change significantly over a period of several years, the Plan may have to be amended and, consequently, would reflect different target outputs and environmental conditions.

TIERING

As required by NEPA, RPA, NFMA, and the related implementing regulations cited above, the Forest Service uses a multi-level, integrated planning process. At the National level, the RPA Program establishes long-range resource objectives that are based on the present and anticipated supply of, and demand for, various resources Portions of each of the National resource objectives included in the RPA Program are distributed to each of the nine Forest Service Regions

At the Regional level, a Regional Guide is developed. This guide distributes the Region's portion of RPA National objectives to each National Forest within the Region. The Regional Guide also establishes Regional management Standards and Guidelines. The Pacific Northwest Regional Guide (USDA-Forest Service, 1984) provides this direction for the Siskiyou National Forest. Standards and Guidelines for management of spotted owl habitat are established in the Final Supplement to the EIS for an Amendment to the Pacific Northwest Regional Guide (USDA 1988). The EIS for Managing Competing and Unwanted Vegetation (USDA 1988) provides direction for vegetation management for the Pacific Northwest Region.

At the Forest level, a Forest Plan is prepared. Ranges of different resource objectives form the basis for alternatives considered in the EIS for the Plan. One of these alternatives incorporates the RPA Program resource objectives displayed in the Regional Guide. The Forest Plan includes direction provided by RPA, NFMA (including the implementing regulations), and the Regional Guide.

A schedule of proposed and possible projects is contained in the Forest Plan appendices Project development will be accomplished in accordance with NEPA requirements, including site-specific analysis and documentation. The Forest Plan can be changed as monitoring and evaluation of the results of the future project level decisions indicate such a need; changes are to be expected. The Forest Plan, itself, however, does not include the project level decisions.

As a long-range strategy for the Forest, the Plan and accompanying EIS are programmatic. During implementation, when the various projects are designed, more site-specific analyses will be performed

These analyses may result in environmental assessments, environmental impact statements, or categorical exclusions and, possibly, an amendment or revision of the Plan The Forest Plan and FEIS will be used for "tiering" pursuant to 40 CFR 1508 28 Tiering means that environmental analyses conducted for site-specific projects being implemented under the direction of the Forest Plan will refer to the FEIS, Forest Plan, and associated documents. Information from them will be used to help narrow discussions and concentrate on issues pertinent to the project. Scoping, public and other agency involvement, and the ensuing environmental analyses will then be able to focus on issues specific to those projects and site conditions

EXISTING PLANS

The Forest is currently managed through direction provided within the Chetco-Grayback, Rogue-Illinois, Rogue, and Mt. Butler-Dry Creek Land Management Plans, the Powers and Illinois Valley District Multiple Use Plans, the Timber Management Plan, and other sources, including the Forest Service Manual, Regional Guide, and numerous environmental documents, laws, regulations, and Executive Orders These documents call for a blend of land and resource uses. Fish and wildlife, developed and dispersed recreation, and wilderness resources are emphasized along with timber and minerals resources. Other values associated with visual quality, old growth, soil, water, and sensitive plants and animals also receive considerable attention.

The plans previously in effect do not provide the direction to appropriately meet the intent of NFMA. They also do not adequately respond to or have the ability to resolve many of the newer issues and concerns. Therefore, the EIS and Forest Plan have been prepared with direct involvement of other agencies and the public to provide totally integrated and detailed management direction with land allocations which are complementary to the intent of multiple-use.

The regulations guiding the development of Forest Plans state, "...if in a particular case, special area authorities require the preparation of a separate special area plan, the direction in any such plan may be incorporated into the Forest Plan without modification " For this reason the Rogue National Wild and Scenic River Management Plan (Federal Register, July 7, 1972), and the Illinois Wild and Scenic River Management Plan (1985), were incorporated, unchanged, into all Forest Plan alternatives. The Forest Plan replaces all previous resource management plans prepared for the Forest, subject to existing rights, contracts, and specific direction for special areas such as Wild and Scenic Rivers, Wilderness, and Research Natural Areas

OVERVIEW

The Draft Environmental Impact Statement (DEIS) and Proposed Land and Resource Management Plan were released August 28, 1987. The Proposed Forest Plan was developed around the DEIS Preferred Alternative, Alternative K The DEIS analyzed and disclosed the environmental consequences of implementing each of 13 alternatives

After a 150-day public review period lasting until January 25, 1988, comments were evaluated and the FEIS and accompanying Forest Plan were prepared. The FEIS analyzes and discloses the environmental consequences of implementing each of 12 alternatives. Two alternatives that were fully developed in the DEIS were not included in the FEIS. Alternative S, the FEIS Preferred Alternative, was developed after reviewing public and other agency comments on the DEIS. (For more information on the alternatives, see Chapter IV of this document and FEIS, Chapter II.) The Selected Alternative is a modification of Alternative S. Differences between Alternative S and the Selected Alternative are discussed in this document The Forest Plan contains direction for implementing the Selected Alternative.

1987 FIRES

On August 30, 1987, at the beginning of the public review period for the DEIS, lightning ignited numerous fires in southwestern Oregon. Several of the fires burned together, forming the Silver, Galice, and Longwood Fire Complexes. These fires burned more than 110,000 acres on the Siskiyou National Forest. (For more information on these fires, see FEIS, Chapter III, "1987 Fires.")

As part of the Silver Fire Recovery Project's environmental analysis, a major on-the-ground effort was made to verify existing resource inventories and to determine what changes had occurred because of the fire. Similar efforts were made in the environmental analyses for the Longwood and Galice Fires. This updated inventory has been used in completing the Forest Plan.

Minor inventory adjustments as a result of the 1987 fires have been included in the Forest Plan. It was not necessary to modify each of the alternatives in the FEIS. The implications of the inventory changes are addressed in Chapters II and IV of the FEIS.

I have considered the effects of the Silver Fire and of the Silver Fire Recovery Project, as well as those of the other 1987 fires and associated salvage harvests, in selecting a management direction for the Forest, and especially for the inventoried North Kalmiopsis Roadless Area. The Silver Fire Recovery Project FEIS and Record of Decision are incorporated by reference into the Forest Plan FEIS. The Record of Decision for the Silver Fire Recovery Project included rehabilitation of burned area outside the wilderness through recovery of approximately 157 million board feet of burned timber from approximately 9,500 acres. Also included are decisions for road construction, reforestation, monitoring other resources, and deferral of future green timber harvest in the fire area until it has recovered Copies of the Silver Fire Recovery Project EIS and the Record of Decision are available from the Siskiyou National Forest, P.O. Box 440, Grants Pass, Oregon 97526.

WILD AND SCENIC RIVERS

The Omnibus Oregon Wild and Scenic River Act of 1988 was enacted in October 1988, shortly before completion of the FEIS and Forest Plan. The Chetco, North Fork Smith, and Elk Rivers were designated as Wild and Scenic Rivers by this Act. The Congressionally designated rivers are accurately represented in the Selected Alternative; they are treated differently in each of the alternatives due to the timing of the legislation.

Management plans for the three newly designated rivers will be prepared. Any management activity in the interim will be planned to meet the objectives for maintenance of the Wild and Scenic River characteristics and values for which they were established. (For more information on Wild and Scenic Rivers, see sections headed "Wild and Scenic Rivers," FEIS, Chapters II, III, and IV.)

PUBLIC PARTICIPATION

Identification of the major issues, concerns, and opportunities (ICO's) to be used in developing the Forest Plan began in 1979. A potential list of ICO's was developed from previous public comments on Forest management problems and several Forest Service employee and public meetings. In 1980, the ICO's were published as a Forest Plan Report and sent to a wide variety of interested citizens and groups, and county, state, and Federal agencies in Oregon and California. The ICO's have changed with time. As new events occurred and local, regional, and National goals and policies changed, the ICO's were modified accordingly.

On August 28, 1987, the DEIS and Proposed Forest Plan were formally released to the public. In addition, a 40-page "Reviewer's Digest" was distributed to hundreds of individuals. A slightly condensed version

titled "An Invitation to Comment" was printed and 62,000 copies were circulated through the local newspapers

The comment period was originally scheduled to end on November 27, 1987. Two days after the DEIS and Proposed Forest Plan were released, lightning ignited fires which lasted for several months. Forest personnel and local communities were unable to carry out a timely review of the DEIS and Proposed Forest Plan as resources were committed to the fire-fighting effort. The comment period was extended to December 24.

During the review period, the Proposed Forest Plan was the featured topic at 37 open meetings attended by more than 600 people. Briefings were held in Washington, D.C., for Congressional aides, professional societies, and special interest groups. The Planning Team worked with many individuals and groups to answer requests for information, share knowledge, discuss issues, and resolve questions.

In response to several requests that more time was needed to fully analyze the draft documents and formulate comments, the formal review period was extended an additional 30 days. After 150 days of review, the public input period ended on January 25, 1988.

Public participation in the Forest planning process also included three working groups on issues of public concern: the Eight Dollar Mountain Consensus Group, the Port-Orford-Cedar Coordinating Group, and the Wet Weather Timber Haul Working Group. I have considered the results of these work groups as described in the following paragraphs, and management direction contained in the Forest Plan is consistent with their findings and recommendations.

Eight Dollar Mountain is one of the most significant botanical sites in Oregon. It provides diversified habitat for 11 plant species which are under review by the USDI Fish and Wildlife Service for listing as threatened or endangered. The Eight Dollar Mountain Consensus Group was formed in 1984. The group consisted of private citizens, The Nature Conservancy, the Forest Service, the Bureau of Land Management, Josephine County, the Division of State Lands, and the Eight Dollar Mountain Landowners Association The consensus group developed five alternative approaches for management of the area. These approaches have all been considered during the Forest planning process. (For more information on Eight Dollar Mountain and the Consensus Group, see FEIS, Appendix F.)

The Forest Service in Oregon and California established the Port-Orford-Cedar Coordinating Group out of a concern from within the Forest Service, and as expressed by interest groups, that there be a coordinated effort to control Port-Orford-cedar root disease (*Phytophthora lateralis*). The group made recommendations on inventory and monitoring, research, public involvement and education, and management policy. ("The Port-Orford-Cedar Root Disease Action Plan" is available at the Siskiyou National Forest Supervisor's Office.)

Members of both timber industry and environmental groups were concerned that road management was inadequate, either unduly restricting logging operations or allowing them to degrade resource values The Forest used a workshop made up of members of the public, timber sale contract holders, and Forest Service employees to develop solutions. (The report, "Resolution of Wet Weather Timber Haul on the Powers Ranger District," is available at the Siskiyou National Forest Supervisor's Office.)

PUBLIC RESPONSE TO THE DEIS

During the review period for the DEIS and Proposed Forest Plan, the Forest received a total of 16,983 responses with 17,277 signatures. Approximately 100,000 comments were identified. Types of responses included resolutions, petitions, form letters and coupons, and written letters and postcards.

Public response analysis described what the public had said, as completely and directly as possible. It did not assign any weights or policy recommendations. The analysis process was designed to provide decisionmakers with an awareness of the range of values and opinions expressed, and to indicate what the public considers to be major areas of concern. Public response to the DEIS was not a voting process, the number of comments alone does not prescribe agency decisions

DEMOGRAPHICS

Responses came from 49 states, the District of Columbia, and five foreign countries The majority of the responses came from Oregon (10,469), followed by Illinois (1,601), Texas (1,592), Wisconsin (877), and California (649).

The bulk of the responses were from individuals acting for themselves (99 percent). The next largest groups of responses were from environmental or conservation groups (36 responses), the timber industry (27 responses), and city and municipal officials (13 responses).

Form letters made up more than 90 percent of the responses. One group of form letters (9,155) expressed support for a proposal to create a National Park A campaign by the Southern Oregon Timber Industry Association (SOTIA) generated 5,479 form letters in support of their proposed Evergreen Alternative, which emphasized a higher allowable sale quantity (ASQ) than the Proposed Forest Plan.

AREAS OF CONCERN

The majority of those responding were concerned with several aspects of the Forest Plan The following is a summary of the areas of concern.

Fisheries

Broad agreement existed among nearly all the commenters that anadromous fisheries are vital to the Siskiyou National Forest and must be carefully managed

Some comments supported the capital expenditures for fish habitat improvements, some recommended even higher levels. Others questioned the effectiveness of improvement projects and implied they are used in the analysis to mitigate impacts of other management activities.

Some commenters maintained that the Siskiyou's streamside lands, fish habitat, and water resources need much greater protection. There were charges that the Forest Plan does not contain the necessary measures to insure that logging activities will meet the requirements of the Clean Water Act There was also concern, however, that the Forest Plan is too restrictive, specifically regarding buffers on some perennial streams Comments suggested that a monitoring and evaluation program for determining compliance with water quality objectives be established

Recreation

Many of those responding expressed general interest in developing the area's potential for recreation and tourism to diversify and bolster the local economies Many also wanted more emphasis on visual management than was proposed in the DEIS Preferred Alternative

Timber

Viewpoints on this issue were polarized, supporting either increased or decreased timber harvest

Numerous ways to increase harvest levels were offered, from relaxing policy constraints to technical changes in the analysis Some of those responding felt that the ways or means of meeting Management

Requirements (MR's) for the protection of fish, watershed, and wildlife resources were formulated without public involvement and are unduly restrictive on the timber resource.

Other comments stated that the Forest is harvesting at a rate that cannot be sustained, causing environmental damage, as well as a future timber shortage.

Roadless Areas

Some commenters felt that the designation of Custodial (Roadless) Management Areas violated the release/sufficiency language of the Oregon Wilderness Act of 1984. On the other side, many commenters suggested that the Forest Service protect all of the roadless area resources from logging and road building.

Wild and Scenic Rivers

Support was expressed for the designation of the Chetco and North Fork Smith as Wild and Scenic Rivers. Additionally, other rivers, including the Elk, Pistol, Winchuck, South Fork Coquille, and Sixes were suggested for study and possible inclusion in the National Wild and Scenic River System.

National Park Proposals

Various National Park proposals were raised during the planning process. Viewpoints on these proposals were polarized. (For more information on National Park proposals, see Chapter IV of this document and FEIS, Chapter II, "Alternatives Considered, But Eliminated From Detailed Study.")

Those in favor of a National Park emphasized protection of roadless or Wilderness areas. Support of a park was often tied to support for Alternative M, which would provide high levels of protection for old growth and roadless areas

Comments opposing a National Park asserted that the process for considering formation of a National Park is separate from the Forest planning effort These commenters felt that including a National Park alternative in the FEIS would be illegal

Wildlife

Some responses stated that management direction for game species was deficient. Comments recommended inclusion of information on peregrine falcons and marbled murrelets in the EIS.

Threatened, Endangered, and Sensitive Plants

Many of those responding described the Proposed Forest Plan as exceptional in its recognition of the importance of the Siskiyou National Forest in terms of rare plant protection and habitat. Comments supported the proposed establishment of additional Research Natural Areas and Botanical Areas in the Preferred Alternative. They also called for establishment of even more Botanical Areas, and suggested that more botanical inventory be done to provide the information needed for management of rare species. Some also suggested development of interpretive sites.

Biological Diversity

Comments called for a separate, comprehensive discussion of biological diversity. Some suggested changes in land allocations to achieve a better distribution of protected areas.

Minerals

Some of those commenting expressed concern that Forest Service direction on mineral exploration and development is placing minerals in a role subordinate to all other resources. Prescriptions were viewed as being overly restrictive to access and development of the mineral resource.

Monitoring

Some who commented felt that the monitoring and evaluation program on the Siskiyou would be inadequate and may have little likelihood of actually being implemented without assured funding

Information Adequacy

A large number of comments stated that information in the DEIS was inadequate Many also felt that the information was inaccurate, not clearly defined, contradictory, and difficult for the public to understand.

Regional Direction

Some comments expressed concern that there was no apparent relationship between the Forest Plan, the EIS for Managing Competing Unwanted Vegetation, and the Final Supplement for an Amendment to the Pacific Northwest Regional Guide for Spotted Owl Habitat Management.

The majority of the responses, even those expressing dissatisfaction with parts of the EIS or Forest Plan, included a commendation for the Siskiyou staff and Planning Team. Many of those responding felt that the Forest staff sincerely encouraged and facilitated public participation, showed an awareness and sensitivity for the management of the Siskiyou National Forest, and did a professionally competent analysis

PLANNING PROBLEMS

A list of major issues and concerns was developed from public comments on Forest management, and from several meetings of Forest Service employees and the public. Many of the issues and concerns are interrelated; having more of one thing often requires having more or less of something else, whether desired or not Nine "Planning Problems" were developed from the issues and concerns. These Planning Problems were addressed through the development and evaluation of the alternatives. (For a more complete discussion of the Planning Problems, see Chapter III of this document and Appendix A and Chapter I of the FEIS. The Planning Problems are listed below:

1. How Much Timber Should the Forest Produce?

2. How Much Old-Growth Forest Should be Preserved?

3. How Can the Forest's Fish Habitat, Water Quality, and Soil Productivity be Maintained or Improved?

4. How, and to What Extent, Should Lands In and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?

5. How Should Sensitive Plant Resources be Managed?

6. How, and to What Extent, Should Forest Scenic Values be Protected through Visual Resource Management?

7. How Should Wildlife Habitats on the Forest be Managed?

8. How Will Management Direction Affect Recreation Opportunities in the Wilderness and Unroaded Areas?

9. How Should Mineral Resources of the Forest be Developed in Coordination With Management of Other Resources?

Chapter II - DECISION

My decision is to implement Alternative S of the FEIS with some modifications to· reduce the allocations to the Backcountry Recreation Management Area by approximately 67,000 acres, place the bulk of these areas in an administrative study classification, adjust the boundary of the Fall Backcountry Recreation area, change the Butler and Copper areas from the Backcountry Recreation Management Area to the Supplemental Resource Management Area, and include the inventory changes that resulted from the timber killed in the 1987 fires and the field information collected in conjunction with the environmental analysis for the Silver Fire Recovery Project. These changes and the rationale for them are described further in the following sections and have been incorporated into the Forest Plan and accompanying map The changes in environmental consequences expected during the Plan period from these modifications are very minor, but a slightly different management emphasis is provided. Alternative S thus modified is termed the Selected Alternative in this document, and will become the basis for the Forest Plan to guide the management of the Forest over the next 10 to 15 year period

The Selected Alternative addresses the desires of a wide range of user groups and interests, continues to supply goods and services vital to the maintenance of local and National economic development, while maintaining a healthy diverse ecosystem. This requires that the Forest capitalize on the multi-product nature of land allocations that minimize tradeoffs between goods and services

In implementing the Forest Plan, I am making the decisions regarding the following (which are discussed in further detail below):

1. Forest multiple-use goals and objectives, including an identification of the quantities of goods and services that are expected to be produced.

2 Multiple use prescriptions and associated Standards and Guidelines for each Management Area on the Forest, including proposed and probable management practices.

3 Identification of land that is suitable for timber production.

4. Determination of the allowable sale quantity for timber and the associated sale schedule.

5. Allocation of certain roadless areas to multiple-use management prescriptions with scheduled timber harvest and road construction that will result in these areas being roaded during the Plan period.

6. Monitoring and evaluation requirements

Taken together, these items establish general and specific goals for the Siskiyou National Forest and a set of standards and guidelines to follow in pursuit of these goals. In addition, they establish a monitoring process to help determine how well the standards and guidelines are working and whether the goals remain appropriate during the period when the Forest Plan is implemented.

GOALS

The Forest Plan will be designed to achieve the following Forest-wide goals:

1. Provide a balance of resource management that will maintain a healthy Forest ecosystem, and help to supply local, regional and National social and economic needs.

2. Provide a sustained yield of resource outputs at a level that will promote the stability of local communities.

3. Maintain a healthy, diversified, and visually pleasing forest setting that enhances local tourism and provides an attractive visual backdrop to surrounding communities.

4. Fully implement the National Recreation Strategy through the development of partnerships with other local and federal agencies (e g , counties and states), and other groups and individuals. Support local economic development strategies that focus on increased recreation and tourism.

5. Recognize special areas and resources for their unique values and manage them to protect and perpetuate those values.

6. Provide diverse, high quality water and fish habitat capable of maintaining or enhancing populations of game fish species with emphasis on anadromous fish habitat.

7. Maintain viable populations of existing native animal and plant species. Maintain or improve all existing seral stages of terrestrial and aquatic plant associations in a distribution and abundance to accomplish this goal.

8. Provide habitat to contribute to the recovery of threatened and endangered plant and animal species in accordance with approved recovery plans.

9. Recognize and promote the intrinsic ecological, social, and economic value of wildlife and wildlife habitat Provide sufficient quantity and quality of wildlife habitat to ensure diversified recreational use and public satisfaction.

10. Offer a wide range of dispersed recreation opportunities by providing recreational settings, access, facilities, and education necessary to meet public demand.

11. Protect and enhance identified, outstandingly remarkable values and free flowing condition of Wild and Scenic Rivers

12. Protect the values and character of designated Wildernesses.

13. Provide firewood for personal use in a fair and equitable manner.

14. Inventory and interpret significant prehistoric and historic cultural resources.

15. Plan, design, operate, and maintain a safe and economic transportation system to provide efficient access for the movement of people and materials involved in the use and protection of National Forest Lands

16. Protect and enhance resource values through cost-effective fire and fuels management programs, emphasizing fuel treatment through the utilization of prescribed fire.

17. Protect resource values through the practice of integrated pest management.

18. Facilitate mineral exploration and development while protecting surface resources and environmental quality.

19. Meet or exceed state and Federal requirements which provide protection to the air, water, and cultural resources of the Forest.

20 Provide water of sufficient quality and quantity for local and downstream beneficial uses.

21. Maintain health and function of riparian ecosystems (including stream channel stability) for the protection or enhancement of riparian-dependent resources.

22. Provide administrative sites and facilities that effectively and safely serve the public and accommodate the workforce

23 Provide for biological diversity and long-term productivity by maintaining ecosystem function, maintaining large woody material, and minimizing adverse impacts to the soil resource.

24. Perpetuate Port-Orford-cedar as a functioning part of the Forest vegetation throughout its natural range and maintain it for economic and noneconomic uses.

LAND ALLOCATION

A critical part in design of the Forest Plan is the land allocation. All lands are assigned to one of 14 "Management Areas " A Management Area is a category of land with the capability to respond to certain issues or to meet specific management objectives Management Areas may include some multiple uses, but often emphasize one or a few resources, resulting in a dominant use or management of selected resources for some areas. (For specific information on Management Areas, see LRMP, Chapter IV, "Management Prescriptions," and FEIS, Chapter II, Management Area Maps and Tables II-2 and II-3.)

Inventoried areas are used as the building blocks to create the land allocations by Management Area. Each inventoried area is a discrete unit that can be identified on the ground. Collections of these then become the Management Area which may be scattered over the Forest, but will be managed under the same direction.

With all of the potential land allocations, overlaps between inventoried areas are numerous Where Plan design results in overlap, the acres are assigned to the Management Area with the most restrictive management prescription. The lower numbered Management Areas are those with the greatest constraints.

For example, a Botanical area (Management Area 4) may exist within Wilderness (Management Area 1). The acres in the Botanical area are included as inventoried acres for both Management Area 1 and Management Area 4 However, the acres are assigned to Management Area 1 and will be managed under its more restrictive management prescription Because of this process, the acres listed for the assigned inventoried areas will seldom add up to the Management Area acres.

Land allocations showing inventoried and assigned acreages to each Management Area on the Forest.

Management Area			Inventoried Area
No	Acres	Name	Acres
1	232,495	Wilderness	232,495
2	5,029	Wild River	27,128
3	4,608	Research Natural Area	4,608
4	16,275	Botanical	19,632
5	2,015	Unique Interest	2,015
6	40,871	Backcountry Recreation	46,260
7	26,921	Supplemental Resource	30,930
8	50,287	Designated Wildlife Habitat	159,949
9	28,762	Special Wildlife Site	45,146
10	10,317	Scenic/Recreation River	23,931
11	96,623	Riparian	175,500
12	9,861	Retention Visual	40,407
13	133,931	Partial Retention Visual	202,700
14	434,307	General Forest	-

MANAGEMENT AREA 1 - WILDERNESS

The objective of the Wilderness allocation is to maintain the area's character in a natural condition and perpetuate the wilderness resource, while providing opportunities for solitude and recreation. These areas are managed to comply with the requirements of the Wilderness Act of 1964.

Management Area acres in Wilderness total 232,495 acres. Inventoried acres total the same amount There are five existing Wildernesses, as listed below:

Grassy Knob
Kalmiopsis
Red Buttes
Siskiyou
Wild Rogue

When Congress passed the California and Oregon Wilderness Act in 1984, it included language which stated that "the Department of Agriculture shall not be required to review the wilderness option prior to the revision of the [Forest] plans. .." There has been no designation on the Forest since 1984. Additional Wilderness can be designated only through Congressional action.

MANAGEMENT AREA 2 - WILD RIVER

The objective of the Wild River allocation is to maintain the natural, free-flowing, and primitive character of the immediate environment in Wild segments of Wild and Scenic Rivers.

The Illinois and Rogue Rivers are existing Wild Rivers. The Omnibus Oregon Wild and Scenic Rivers Act of 1988 designated segments of the Chetco, North Fork Smith, and Elk Rivers as Wild Rivers The Winchuck, Pistol, South Fork Coquille, South Fork Chetco, and South Fork Sixes Rivers were evaluated by Forest staff for Wild River status. None were found to be eligible for potential inclusion into the National Wild and Scenic River System.

Two additional sections have been inventoried as Wild but were not included in the Oregon Omnibus Act of 1988· (1) the two-mile section of the North Fork Smith River from Baldface Creek to the California Border and (2) the two-mile section of the Chetco River from Boulder Creek to Mislatnah Creek I intend to carry these two sections of rivers as Wild until a determination is made in future River Management Plans

Management Area acreage in Wild River is 5,029 acres (27,128 total, but many acres are overlapped by Wilderness). Those rivers with Wild River segments are listed below:

Chetco
Elk
Illinois
Rogue
North Fork Smith

MANAGEMENT AREA 3 - RESEARCH NATURAL AREA

The objective of this allocation is to provide opportunities for research, observation, and study of ecosystems influenced only by natural processes.

There are three existing Research Natural Areas on the Forest. My decision is to recommend the addition of four new areas. Their establishment is subject to approval by the Chief of the Forest Service. Recommended for inclusion as Research Natural Areas are 2,651 acres (See FEIS, Appendix F) In the interim, these four additional areas will be managed as Research Natural Areas. The total Management Area will be 4,608 acres. The areas are listed below.

Cedar Log Flat
Craggy Peak
Lemmingsworth Gulch
Wheeler Creek (Existing)
Coquille River Falls (Existing)
Hoover Gulch
Port Orford Cedar (Existing)

MANAGEMENT AREA 4 - BOTANICAL

The objective of this allocation is to provide exhibits of plants, plant groups, and communities with exceptional botanical and ecological value

There are three existing Botanical areas on the Forest I am allocating an additional 19 Botanical areas comprising 15,157 inventoried acres (See FEIS, Appendix F). This will bring the acres of Botanical Areas to 19,632 with 16,275 acres in the Management Area (other acres are overlapped by higher order Management Areas). The Botanical areas are listed below:

Babyfoot (Existing)
Bear Camp
Big Craggies (Existing)
Big Tree
Bigelow Lakes
Bolan Lake
Chrome Ridge
Days Gulch
Eight Dollar Mountain
Grayback Mountain
Iron Mountain
Lobster Grove
Redwood Groves
Oregon Mountain
Page Mountain
Red Flat
Rough and Ready Flat
Snaketooth Redwood
Snow Camp
Sourgame
Vulcan
York Creek (Existing)

MANAGEMENT AREA 5 - UNIQUE INTEREST

The objective of this allocation is to provide opportunities for understanding the earth's unique geologic, historical, and archaeological features.

I am allocating 2,015 acres to this Management Area. I have decided to create the Unique Interest areas listed below:

Collier Butte
Devils Half Acre Ridge
Elk Creek Falls
Ferris Ford Cedar Log House
Gray Butte
Horse Sign Butte
Lawson Butte
Pyramid Rock
Quosatana Butte
Saddle Mountain
Signal Buttes
Silver Creek Falls
Stack Yards Rock
Taylor Creek Falls
Wheeler Creek Bomb Site

MANAGEMENT AREA 6 - BACKCOUNTRY RECREATION

The objective of this allocation is to provide opportunities for non-motorized and motorized recreation in an undeveloped setting, with the minimum management necessary for resource protection. Motorized access is permitted in areas with high potential for mineral development to reduce access restrictions and promote more efficient mineral exploration and development opportunities.

Alternative S, as described in the FEIS, included 16 Backcountry Recreation areas I have decided to allocate 40,871 acres in 12 areas to the Backcountry Recreation Management Area (46,260 total acres, but many are overlapped by higher order management areas) in the Selected Alternative. Below is discussion related to changes from Alternative S and the Selected Alternative. (For more information on these changes, see LRMP, Forest Plan Map)

Part of the Silver Backcountry Recreation area delineated in Alternative S will be allocated to General Forest (Management Area 14) to be managed as the Silver Fire Recovery Project Administrative Study Area in the Selected Alternative. Some uncertainty remains as to land suitability for timber production and feasibility of logging operations and road building in this part of the Silver Fire. Further evaluation will be completed to resolve these resource questions. No timber harvest is programmed for this area in the Plan period. Some helicopter salvage of areas contained in the Silver Fire Recovery Project FEIS (and included in subsequent timber sale contracts as "optional" salvage units) may be accomplished.

The major part of the South Kalmiopsis Roadless Area that would have been Backcountry Recreation as described in Alternative S will be allocated to General Forest to be managed as an administrative study area in the Selected Alternative. No timber harvest is programmed for this area although some timber may be removed to provide further information about uneven-aged management and harvesting on poor sites.

The southern boundary of the Fall Backcountry Recreation Area in Alternative S will be moved up to ridgelines to exclude areas not visible from the Illinois River or the Illinois River Road in the Selected Alternative.

The Butler and Copper Backcountry Recreation areas in Alternative S will be allocated to Supplemental Resource (Management Area 7) and called South Fork Sixes River and North Fork Elk River respectively in the Selected Alternative. Fisheries and watershed values are more evident than recreation attributes for these areas.

Of the 40,871 acres allocated to Backcountry Recreation areas 99 percent fall within inventoried roadless areas. (For more information about specific areas, see FEIS, Appendix C). The inventoried areas and associated roadless areas are listed below.

Backcountry Recreation areas associated with inventoried roadless areas.

	Backcountry Recreation Area			
Inventoried Roadless Area	Non-motorized	Acres	Motorized	Acres
North Kalmiopsis	Silver Glory Lower Lawson Lower Illinois Labrador Mislatnah	5,808 6,699 6,256 5,435 3,829	Dailey	3,600
Windy Valley			Windy Valley	2,363
Siskiyou	Chicago	629		
Kangaroo			High Divide	2,309
Packsaddle	Cedar Mountain	923		
South Kalmiopsis			Pearsoll Fall	1,333 1,611

MANAGEMENT AREA 7 - SUPPLEMENTAL RESOURCE

The objective of this allocation is to provide quality fisheries, water, wildlife habitat, and recreation opportunities in a largely undeveloped setting.

I have decided to modify Alternative S, as described in the FEIS, by changing the Butler and North Copper areas from the Backcountry Recreation to the Supplemental Resource Management Area and name them South Fork Sixes River and North Fork Elk River respectively. I am allocating 26,921 acres to the Supplemental Resource Management Area (30,930 total acres, but some are overlapped by higher order management areas). I have decided to create the Supplemental Resource areas listed below. These areas are all within inner gorge areas of major streams and rivers or their tributaries.

Emily Creek
Father Mountain
Horse Sign Creek
Illahe East
Indigo Creek
Lawson Creek
Lobster Creek
North Fork Collier Creek
North Fork Elk River
Purple Mountain
Quosatana Creek
Rogue River Visual
Shasta Costa Creek
Silver Creek
South Fork Chetco River
South Fork Sixes River
Winchuck River

MANAGEMENT AREA 8 - DESIGNATED WILDLIFE HABITAT

The objective of this allocation is to provide mature and old-growth habitat for dependent wildlife species

I have decided to designate wildlife habitat meeting management requirements (MR's) for spotted owl, pine marten, and pileated woodpecker. These MR's are consistent with direction contained in the Final Supplement for an Amendment to the Pacific Northwest Regional Guide (USDA 1988). There are over 100 of these areas I am allocating 50,287 acres to this Management Area (159,949 total acres, but many are overlapped by higher order management areas).

MANAGEMENT AREA 9 - SPECIAL WILDLIFE SITE

The objective of this allocation is to provide an array of unique plant and animal conditions that contribute to overall wildlife habitat diversity.

I am allocating 28,762 acres to this Management Area (45,146 total acres, but many are overlapped). There are several hundred of these areas I have decided to allocate to this Management Area the types of inventoried areas listed below

Botanical Sites
Dispersed Old-Growth
Elk Areas
Hardwoods
Lakes and Ponds
Meadow Buffers
Meadows
Osprey Nest Sites
Pigeon Areas
Rock Bluffs
Swamps, Springs, and Wet Areas
Tanoak Areas
Wildlife Areas

MANAGEMENT AREA 10 - SCENIC/RECREATION RIVER

The objective of this allocation is to provide river-oriented recreation in an area of high quality scenery and largely undeveloped shoreline in Scenic and Recreation segments of Wild and Scenic Rivers.

The Rogue and Illinois Rivers contain Scenic and Recreation segments. The Omnibus Oregon Wild and Scenic Rivers Act of 1988 designated segments of the Chetco and North Fork Smith Rivers as Scenic Rivers. The Act also designated segments of the Chetco and Elk Rivers as Recreation Rivers. The Winchuck, Pistol, South Fork Chetco, South Fork Coquille, and South Fork Sixes Rivers were evaluated by Forest Staff for Scenic and Recreation River status. None were found to be eligible for potential inclusion in the National Wild and Scenic River System. Management Area acres in Scenic/Recreation River total 10,317 acres (23,931 total acres, but many are overlapped by higher order management areas). Those rivers with Recreation River or Scenic River segments are listed below:

Recreation	**Scenic**
Chetco	Chetco
Elk	Illinois
Illinois	North Fork Smith
Rogue	Rogue

MANAGEMENT AREA 11 - RIPARIAN

The objective of this allocation is to protect the intrinsic values of ecosystems bordering bodies of water, streams, and wetlands, while providing limited multiple-use development opportunities, including programmed timber harvest.

The Riparian Management Area is defined by site specific conditions. It includes the riparian area along all Class I, II, and III streams and other bodies of water within lands suitable for timber production (traversing Management Areas 12-14). This area is identified as the land containing riparian vegetation, not to be less than a 100 feet wide strip along all Class I, II, and III streams. Using the average expected width of the riparian areas, there are 96,623 acres (70,086 suitable) in the Riparian Management Area. Riparian Management Areas will be managed under one of the following prescriptions assigned by planning basin:

Prescription B

This prescription allows a moderate level of vegetation removal from riparian areas. It is designed to maintain existing water temperatures within planning basins, and meets the MR's for riparian area management and maintenance of water quality. I have decided to manage the riparian areas in the following planning basins (43,308 suitable acres) under Riparian Management Prescription B:

South Fork Coquille River
Galice and Slate Creeks
Upper Illinois River
Rough and Ready/Josephine Creeks
North Fork Smith River
Sucker Creek
Upper Rogue River
Lower Illinois River
Briggs Creek
Winchuck River
East and West Fork Illinois River

Prescription C

This prescription allows minimal removal of vegetative cover for stream shading, and is estimated to have a net effect of two degrees Fahrenheit reduction in summer water temperature over time. I have decided to manage the riparian areas in the following planning basins (26,778 suitable acres) under Riparian Management Prescription C.

Elk and Sixes Rivers
Lower Rogue River
Lower Chetco River
Indigo Creek
Lobster Creek
Pistol River
Silver Creek

Because of effects of the Silver Fire, I have decided to manage the Silver and Indigo Planning Basins under Prescription C for the first decade to allow for stream shade recovery. At the end of the first decade, they will be reevaluated and assigned the most appropriate prescription. (Upper Chetco River Planning Basin is entirely within the Kalmiopsis Wilderness so it is not included here.)

MANAGEMENT AREA 12 - RETENTION VISUAL

The objective of this allocation is to protect the scenic values of the Forest. It provides opportunities for multiple-use development, including a constrained level of programmed timber harvest, that are not visually evident to the casual Forest visitor.

I am allocating 9,861 acres to this Management Area (40,407 total acres, but many are overlapped by higher order management areas). The following viewsheds contain Retention acres:

Bolan Lake
Chetco
Elk River
Game Lake
Highway 199
Oregon Caves
Quail Mountain
Rogue-Illinois
Upper Illinois
Wheeler Creek
Winchuck River

MANAGEMENT AREA 13 - PARTIAL RETENTION VISUAL

The objective of this allocation is to protect the scenic values of the Forest. It provides multiple-use development opportunities, including a slightly reduced level of programmed timber harvest, that are visually subordinate to the characteristic landscape

I am allocating 133,931 acres to this Management Area (202,700 total acres, but many are overlapped by higher order management areas) The following viewsheds contain Partial Retention acres.

Babyfoot Lake
Bear Camp
Bob's Garden
Bolan Lake
Briggs Valley/Shan Creek
Chetco
Coquille River
Crazy Peak
Eden Valley
Elk River
Game Lake
Highway 199
Lawson Creek
Mt. Butler
Oregon Caves
Quail Mountain
Rogue-Illinois
Silver Trails
Sourdough
Upper Chetco
Upper Illinois
Winchuck River

MANAGEMENT AREA 14 - GENERAL FOREST

The overall objective of this allocation is to provide a full range of multiple-use development opportunities and produce a high yield of timber, subject to multiple-use constraints. I am allocating a total of 434,307 acres to this Management Area.

I am also designating "overlays", or sub-parts of the General Forest Management Area to lands for *Extensive Management* and some lands for *Administrative Study* areas Acreage for these areas is identified in the table below. The Extensive Management areas are distinctive in that they lack the operability to gain reasonable road access for intensive timber management and will be managed under a less intensive timber harvest schedule with no roading scheduled for this planning period.

The Administrative Study areas are in two locations. one is the Silver Fire Recovery Area which was burned in 1987 and is still recovering from the effects of the fire, the other is known as the South Kalmiopsis which is a large area of very poor soils and generally sparse vegetation. No timber harvest is programmed for

either of the Administrative Study areas areas. The goals for the Silver Fire Recovery administrative area are to allow time for recovery from the effects of the Silver Fire; to monitor the recovery process; reassess and further refine the operability and suitability of this area for timber production; provide for Primitive and Semi-primitive recreation opportunities; and provide habitat for many species of wildlife. The goals for the South Kalmiopsis area are to provide administrative studies of uneven-aged management, or other minimal entry timber management on low sites and poor soils; continue to provide mineral exploration and development opportunities; and provide opportunities for Semi-primitive Motorized recreation; and provide habitat for many species of wildlife.

Acres Allocated to General Forest Management Area.

Name (Acres)	Acres Management Area 14
Total	434,307
Extensive Timber Management (10,830)	(4,920)
Fall West (482)	
Lower Indigo (4,085)	
Mid Lawson (3,067)	
Mislatnah (1,120)	
Moores (978)	
Red Mountain (1,098)	
Administrative Study (65,544)	(47,782)
Silver Fire Recovery Project (10,975)	
South Kalmiopsis (54,569)	

STANDARDS AND GUIDELINES

As part of this decision, I adopt the system of Standards and Guidelines described in the Forest Plan (LRMP, Chapter IV, "Forest-wide Standards and Guidelines"). Management of the Forest is subject to all applicable laws and regulations; particular reference is made to the NFMA regulations which guide Forest Planning (36 CFR 219.27). The Standards and Guidelines are intended to help managers achieve Forest goals and objectives, while staying within constraints prescribed by law and constraints designed to provide environmental safeguards. The Standards and Guidelines address the following topics:

1. Recreation
2. Visual Resources
3. Cultural Resources
4. Fish, Wildlife, and Sensitive Plants
5. Range
6. Timber Management
7. Soil and Water
8. Air Quality
9. Lands
10. Minerals
11. Transportation Facilities
12. Fire and Pest Management
13. Biological Diversity

CAPITAL INVESTMENTS

Capital investments are dollars spent to provide or improve a facility or product for future use. The Selected Alternative emphasizes fisheries and recreation. I have decided to include in the Forest Plan the following amounts (shown in millions of dollars) through Fiscal Year 1993 for the resources listed below. (For more information on capital investment projects, see LRMP, Appendix B.) Actual investments may vary depending on the amounts budgeted by Congress and allocations through the National Forest System.

Recreation	2,531.2	
Fish	1,760.0	
Soil and Water	1,155.0	
Threatened, Endangered, and Sensitive Wildlife and Plants	510.0	
Wildlife	1,820.5	
Trails	898.3	
Road and Bridge	7,628.0	
Buildings, Water, and Sewer	1,365 0	(through FY 95)

OTHER DECISION ELEMENTS

ALLOWABLE SALE QUANTITY

The Allowable Sale Quantity (ASQ) will be 28.7 million cubic feet (MMCF) of timber (including salvageable dead volume) under this plan This is an average annual quantity not to be exceeded for the decade. Volume sold in any one year may vary depending on funding, environmental conditions, economic conditions, and other factors. The ASQ is based on projection of a non-declining flow harvest schedule for future decades, with stands not scheduled for final harvest until generally reaching culmination of mean annual increment (CMAI).

The ASQ will be tracked and controlled on a cubic foot measure. The board foot volume associated with the cubic volume (i.e , board foot/cubic foot conversion ratio) varies from stand to stand depending on the size and form of the trees. The mosaic of stand conditions on the Siskiyou, and the need to make site specific decisions on harvest unit design, combine to make the identification of a precise board foot volume to be associated with the cubic foot ASQ impossible. While the harvest will primarily come from mature stands, actual harvest units often have small inclusions of other stand conditions. The need to disperse the harvest will also result in programming some otherwise low priority stands to avoid creating a scheduling problem for future decades. The stands expected to be harvested in the Plan period will yield approximately 160 million board feet (MMBF) associated with the 28.7 MMCF. This will be used as a goal in the early part of the Plan period; the transition from use of board foot measure to use of cubic foot measure should be made during this Plan period.

It was not possible to resolve all of the concerns surrounding the issues of inventory and yield tables before the release of the Forest Plan. Studies to answer the remaining questions will continue and will be completed within 12 months following the release of the Forest Plan. Forest personnel are also presently engaged in planning and implementing a new total Forest resources inventory. As these analyses and inventory are completed, the Forest ASQ will be examined in light of the new data. If warranted, the Forest Plan will be revised or amended as appropriate (see section "Amendment and Revision" in Chapter IV of this document).

The ASQ is also dependent on the application of intensive timber management practices including thinning and fertilization which are subject to budgets. The condition of young timber stands will be monitored to verify that stands are receiving cultural treatments when needed. If it is determined that these treatments

are not being carried out sufficiently to support the ASQ, this would also be cause for the Forest Plan to be revised or amended

SELECTED SUITABLE LANDS

Through the land allocations described above for the Selected Alternative, I have designated 510,000 acres of land as suitable for timber production. As a result of Forest Plan implementation, final harvest is expected to occur on an approximately 4,700 acres per year, on the average, during the first decade.

TRANSPORTATION SYSTEM

New roads will be constructed as needed during the planning period to achieve the objectives specified in the Forest Plan. This is highly variable from year to year; the locations and extent of roading will be determined through site specific analyses at the project level.

ROADLESS AREAS

A total of 284,245 acres (143,406 tentatively suitable for timber) are currently inventoried as roadless (For more information on inventoried roadless areas, refer to FEIS, Appendix C.) Acres allocated to Management Areas 1 through 9 total 91,555, or about 32 percent These acres have no programmed timber harvest and will remain undeveloped. The remaining 192,690 acres are allocated to Management Areas 10 through 14; suitable acres in these management areas (106,240) have programmed timber harvest, with the exception of the administrative study areas.

Approximately 70 MMCF, or about 25 percent of the timber harvest scheduled for the first decade is in areas that are now inventoried as roadless. Of course this is approximate and may vary depending on site-specific analysis for timber sales, however it should be clear that my intent is for significant development to occur during the next decade in those portions of the roadless areas with programmed timber harvest.

Inventoried roadless areas showing acreage associated with Management Areas 1-9 and 10-14.

		Roadless Area Disposition (Acres)		
		MA's 1-9	MA's 10-14	
Roadless Area	Total Acres	Total	Total	Suitable
Grassy Knob	5,428	3,067	2,361	2,261
Copper Mountain	9,354	2,736	6,618	5,872
Mule Creek	352	169	183	128
Rogue	3,839	784	3,055	2,982
Potato Mountain	5,963	2,664	3,299	3,146
Shasta Costa	14,261	3,040	11,221	10,272
North Kalmiopsis	88,582	43,883	44,699	33,760
Quosatana	5,097	1,267	3,830	3,418
Briggs	5,544	1,131	4,413	3,115
Squaw Mountain	7,704	1,371	6,333	3,445
Windy Valley	10,214	3,615	6,599	5,595
Kalmiopsis Addition	1,166	32	1,134	1,024
Mount Emily	5,945	3,349	2,596	2,357
Siskiyou	3,284	1,354	1,930	960
Kangaroo	6,651	3,456	3,195	2,848
North Fork Smith	952	117	835	400
Packsaddle	5,289	3,120	2,169	1,222
South Kalmiopsis	104,620	16,400	88,220	23,435

SILVICULTURAL SYSTEMS

Timber harvest systems will be decided on a site-specific level for each project. The Standards and Guidelines indicate the systems generally appropriate for given combinations of site and stand conditions and Management Area goals and objectives. The systems indicated as most appropriate for the broad categories presented should be those most often used; however, it is not intended that other systems should not be used when site-specific conditions warrant.

Clearcut, shelterwood, seed tree, single-tree selection, and group selection harvest methods are all available tools. Each of these systems will be used to some extent. Due to the particular combinations of environmental conditions and management objectives, even-aged systems will be the most commonly used, with clearcutting the most common method of regeneration in this group. Key factors in the determination of appropriate systems on this Forest are the intensity of vegetative competition commonly encountered, the difficulty of protecting residual trees through harvest operations on steep slopes, the desirability of perpetuating high proportions of shade intolerant species, and other resource objectives and environmental effects

Uneven-aged systems will be used more frequently on sites where the soil, climate, and other factors result in a natural tendency for uneven-age stands to develop; or where uneven-aged systems will best meet resource objectives. (For more information on silvicultural systems, see FEIS, Appendix G, "Description of Silvicultural Systems.")

BIOLOGICAL DIVERSITY AND SITE PRODUCTIVITY

Based on the most current scientific information, the Selected Alternative is designed to maintain a diverse and healthy ecosystem. The Selected Alternative maintains essential components of the ecosystem scattered throughout the Forest in allocations to: large Wilderness areas, Designated Wildlife Areas, hundreds of Special Wildlife Sites, Botanical areas, Research Natural Areas, large areas which are unsuitable for timber production, and Riparian areas with varying prescriptions. These areas comprise over half of the total acreage of the Forest.

I also recognize that biological diversity cannot be maintained through "set-aside" areas alone, but must be integrated into management activities. Standards and Guidelines have been updated to include consideration for biological diversity in a number of areas For example, basic to diversity is maintenance of the long-term productivity of the ecosystem. Management activities will be planned to maintain enough large woody material (dead and down) to maintain a healthy forest ecosystem. Forest-wide Standards and Guidelines provide direction for size and amount of woody material to be left on each site. Site-specific needs will be considered in environmental analyses. Another example in the Standards and Guidelines is consideration to be "given to regenerating and maintaining minor species, where appropriate for the site, as viable components of future stands, and for the enhancement of vegetative diversity."

LOGGING SYSTEMS

Logging systems will be matched to the site-specific conditions for each project. The system which meets the resource objectives at the least cost will be selected. Skyline systems will likely continue as the predominant means of harvest, due to environmental and feasibility concerns. All systems, including helicopter, are available and will be used where appropriate.

POTENTIAL DEFERMENT OF ACTIVITIES DUE TO CUMULATIVE EFFECTS

Based on site-specific analysis, activities, including timber harvest and road building, may be adjusted in areas where practices on private or other lands have recently or are currently adversely affecting water quality or other forest resources, and where activities on the National Forest may contribute to adverse cumulative effects.

ELK RIVER STATE SCENIC WATERWAY

The State of Oregon has included portions of the Elk River in the State Scenic Waterway system and will be completing a management plan in cooperation with the Forest Service. Recommended management of the river corridor will be identified in that plan. In the interim, the Forest Service will manage the corridor to protect visual and water quality values.

WILDERNESS FIRE MANAGEMENT PLANS

The extent of prescribed fire programs in Wilderness areas will be determined by future Wilderness Fire Management Plans. My intent is to use planned and unplanned ignitions to: (1) reduce the risks and consequences of wildfire within the Wilderness, or escaping from the Wilderness and (2) allow fire to play its natural ecological role in Wilderness areas.

FERTILIZATION

I have decided to use a fertilization program on the Forest The results of fertilization have been considered in calculating the ASQ, and are expected to increase ASQ by .8 MMCF per year. The area of application *and specific constraints will be identified through the project design in site-specific project level analysis.* Accomplishment of the fertilization program is subject to budget, if adequate funding is not available to accomplish fertilization, amendment or revision of the Plan may be necessary as determined through monitoring.

HARDWOOD CONVERSION

I have decided that conversion of mixed hardwood stands to managed commercial stands will be limited to no more than 7,500 acres per decade, subject to market conditions and site specific analysis (including consideration for maintaining species diversity).

MITIGATION AND MONITORING

As part of this decision, I adopt the mitigation measures, including the Best Management Practices (BMP's), and Monitoring Plan discussed in the Forest Plan, Appendices D and F, and in Chapters VII and VIII of this document.

Chapter III - RATIONALE

SUMMARY

The National Forests in the Pacific Northwest Region are composed of similar resources; however, each has its own unique mix of resources and values that sets it apart from its neighboring Forest. The Siskiyou National Forest offers southwest Oregon and the Nation a distinctive set of economic benefits and social values.

I have reviewed summaries of the condition of the natural resources on the Siskiyou National Forest, the current land management situation, and a synopsis of public response to the DEIS. I have also driven roads, hiked trails, and floated the Rogue River on this Forest It is clear to me that the key attributes of the Siskiyou are.

*** The productive capacity of the Forest to provide wood resources**

*** Extremely valuable spawning and rearing habitat for salmon and steelhead**

• Botanical, biological, and geological diversity far beyond the ordinary

*** The many rivers on this Forest and their associated recreation values**

The challenge is to develop a management plan that recognizes and utilizes these values, while protecting and perpetuating them and other associated resources. Developing that special combination appropriate for this National Forest is a key objective

The Forest Supervisor, his Management Team, and Land Management Planning Interdisciplinary Team closely analyzed the public response to the DEIS. I have reviewed the results, along with their suggested changes to the proposed Forest Plan accompanying the DEIS.

A new National Forest Plan will have an effect on the economic structure and social fabric of surrounding communities. I am fully aware of this effect. I have made a strong effort to have developed and selected an alternative that maximizes net public benefits, and provides a basis for local communities to predict and manage any change set in motion by the decisions in this Plan.

This information and perspective led me to select Alternative S, with some modifications. This "Selected Alternative" recognizes the solid productivity of the Forest and its importance in supplying Southern Oregon with a sustained supply of wood for a variety of products and uses. The Selected Alternative also recognizes the equal importance of water quality, fisheries, and outdoor recreation values, as well as the unique geologic and biologic features. It is my judgement that the Selected Alternative is well balanced, sensitive to both economic and environmental values, and will provide optimum net public benefits. It is appropriate direction for the Siskiyou National Forest for the next decade.

RESPONSE TO ISSUES, CONCERNS, AND OPPORTUNITIES

The great diversity of Forest resources and multiple uses produces an extremely complex management situation. The variety of uses leads to competition for the limited resources. Land allocations, which emphasize various uses, also generate tradeoffs between conflicting interests. The range of possible solutions to these management challenges is reflected in the responses to the Planning Problems which characterize each alternative.

The Selected Alternative responds positively and thoroughly to public issues raised during the planning process, and to management concerns. It is not possible to totally resolve all, as many are in direct conflict.

I have examined each issue both independently and in context of any conflicting issues. Following is my evaluation of how the Selected Alternative responds to each issue or concern (Planning Problems).

1. **How Much Timber Should the Forest Produce?**

The lands of the Siskiyou National Forest have demonstrated their capacity to produce timber. Timber supply is critical to the communities of southwest Oregon The amount of timber supplied by the Forest has been and will continue to be an important part of the economic picture. Timber production also contributes to the National economy, generates receipts to Oregon counties, and contributes to the overall economic health of the Nation The Selected Alternative, with an ASQ of 28.7 MMCF (including salvage), achieves an appropriate and realistic balance between protection of the land and resources and the economic needs of the communities and the Nation.

Timber management is intertwined with almost every other issue. While some uses are compatible with timber production, others such as primitive recreation are not. In many places it is necessary to constrain timber harvests to protect other values such as fish habitat or scenic vistas. It is a difficult judgement that I must make, but I have examined the alternatives and determined that Alternative S, as modified, achieves the best balance between preservation and environmental protection at one end of the scale, and development at the other.

The Selected Alternative takes all appropriate measures to mitigate the effects of other resource allocations and prescription constraints on the timber resource. Land allocations that preclude timber management are carefully evaluated to minimize the effects on ASQ For Example, Designated Wildlife Habitat areas in mature and old-growth forest stands are located first in areas not available for timber management such as Wilderness and Wild Rivers; then additional acres needed are located in areas not suitable for timber management; areas that would otherwise have reduced yields are taken next; finally, only areas that can not be satisfied by one of these low tradeoff categories are taken out of the General Forest area. Allocations to Backcountry Recreation are also carefully designed with consideration given to the suitability of the lands for timber management, and the economic and operational implications associated with timber management of each specific area. Backcountry Recreation allocations are made primarily in areas where Semi-primitive recreation opportunities exist, and where a low proportion of land would be suitable for timber management. Frequently, high economic and environmental costs of harvesting in the these areas make them less desirable for timber management than other parts of the Forest.

The Selected Alternative also mitigates the effects on the timber resource by using management prescriptions designed to protect critical resource values while still providing for timber harvests, though at reduced levels. Prescriptions for Retention visual quality corridors and riparian area management are examples where this is done The riparian areas of the Siskiyou are some of the most productive sites on the Forest Riparian management prescriptions are designed to allow multiple uses, including timber management, to occur to the extent practical in light of the over-riding need to protect the soil, water, and fisheries resources

The ASQ of the Selected Alternative is based on the use of intensive timber management practices to culture stands for wood products in those areas with programmed timber harvest. Practices to be applied where applicable include: reforestation through planting and natural processes, release as consistent with the FEIS for Managing Competing and Unwanted Vegetation, precommercial thinning, commercial thinning, and fertilization. The management prescriptions provide for producing a high yield of harvestable wood consistent with the multiple-use goals and objectives associated with each Management Area. The use of intensive management practices allows society to receive the most from the productive capacity of the Forest in the form of both wood products and other resource uses and benefits.

The ASQ calculations include the use of fertilization in managed stands to increase the yield of wood products This program accounts for 0.8 MMCF (approximately 4 MMBF) of the ASQ. The increases

projected are supported by field trials on the Siskiyou using comparisons of treated and untreated stands. The rationale for the adoption of intensive timber management practices above also applies to fertilization. The availability of fertilizer has been of some concern; however, there is no shortage at the current time and if at some future time the program can not be accomplished, the monitoring plan will trigger a re-evaluation and recomputation of ASQ.

The Selected Alternative provides for the sale of timber on a non-declining flow schedule. I have decided not to depart from non-declining yield in part because of recent timber supply studies which indicate that the availability of timber will not improve for the next few decades. Accelerating the harvest now could contribute to an even greater shortfall in the future, in addition to making it more difficult to produce the other resource benefits desired from the Forest.

2. **How Much Old-Growth Forest Should be Preserved?**

It is important to have old growth as part of a diverse and healthy forest if the myriad of benefits the National Forest is capable of producing is to be realized. Old growth provides habitat critical for certain species of wildlife, contributes to recreational experiences through the aesthetic quality of large old trees and forests, and constitutes an important element in the natural ecology of the Forest. The protection of and management for old growth directly competes with the need to produce timber. The decisions to manage areas for old growth are carefully weighed against the impacts on the timber resource. In my judgement, the proper balance is achieved in the Selected Alternative.

The design of the Selected Alternative results in 174,293 acres having mature and old-growth characteristics being reserved in Management Areas 1-9 with no programmed timber harvest. Another 5,444 acres with mature and old-growth characteristics are retained on lands unsuitable for timber production scattered within Management Areas which provide timber opportunities. In addition, Class I and II rivers and larger streams are considered "managed" old-growth stands and will retain old-growth characteristics over time. Approximately 320,000 acres will exhibit old-growth characteristics by the end first decade; an estimated 235,000 acres will remain by the end of the fifth decade.

Many of the old-growth acres reserved are in areas that would not be programmed for harvest because of some other resource values. Some areas are allocated to management specifically to protect or foster the perpetuation of the old-growth stage. Designated habitat for mature and old-growth associated wildlife is the most significant of these with 50,287 acres reserved in this category. Special groves of old-growth, particularly redwood, have also been set aside to preserve some unique and magnificent examples for recreational and aesthetic enjoyment. These old-growth groves total 1,321 acres.

The inventory information available for the Forest was not developed to specifically identify old growth. Available data on the vegetation condition has been used to assess the location and extent of old growth on the Forest. This data does not have the resolution to stratify stands with old growth characteristics from other mature stands. This results in some acres classed as old growth that do not exhibit old-growth characteristics. I am fully aware of this aspect of the analysis. I also recognize that there are inclusions within the mature and old-growth wildlife habitat that do not exhibit old-growth characteristics. These limitations in the data do not cloud the decisions made here. The areas identified for mature and old-growth wildlife habitat are predominately old growth; small inclusions of other classes do not render them unsuitable as old-growth wildlife habitat. The areas identified for management to preserve unique stands for recreational and aesthetic values are not identified from inventory data. During implementation of the Forest Plan, site-specific project inventory and field reconnaissance has and will continue to identify unique stands of trees with old-growth characteristics. Relative to the wide-scale ecology and biological diversity considerations, significant acreage in older age classes will be in reserved areas distributed around the Forest.

It is important to perpetuate stands in the old-growth stage distributed around the Forest to create and maintain biological diversity. The Selected Alternative has the balance of allocations reserving old growth which is most appropriate for the Siskiyou. The variation in size and spatial distribution is appropriate with large blocks reserved in the Wildernesses and Backcountry Recreation allocations and smaller, yet substantial, blocks distributed across the Forest in Designated Wildlife Habitat, RNA's, Botanical Areas, and Wild Rivers. Supplemental Resource areas along the major streams and Class I and Class II rivers and streams also significantly contribute by maintaining corridors of old growth through the General Forest.

As noted, several small areas of very special groves of old growth that are readily accessible for the enjoyment by recreationists have been assigned to Botanical Areas. These comprise 1,321 acres, and represent little impact on the Forest's potential to produce timber. The most significant of these areas are the 720 acres of redwood groves. The Siskiyou National Forest contains the northern-most natural redwood stands and few acres of old-growth remain It is important to retain the significant remaining old-growth stands at the fringe of the species range to avoid losing the diversity they contribute. (Less significant stands and younger age classes of Redwood, particularly those intermixed with other species, will continue to be managed as part of the Forest's General Forest land base.)

3. **How Can the Forest's Fish Habitat, Water Quality and Soil Productivity be Maintained or Improved?**

The Siskiyou National Forest contains extremely valuable salmon and steelhead habitat. The commercial fishing industry is very important to the coastal communities The social and economic value provided by sport fishing is also very important. It is critical to maintain the fisheries resource and manage the other resources in a manner that does not degrade the habitat. In some cases this means foregoing or curtailing opportunities for timber production.

Fish habitat will be improved through land allocations that minimize soil disturbance and reduce summer water temperatures Watershed conditions will be maintained in pristine areas and improved in areas presently degraded. Of the total riparian habitat, approximately 102,803 acres will be afforded complete protection by prohibiting site-disturbing activity Much of this area is included in allocations such as Wilderness or Wild River, however some areas not overlapped by such allocations deserve special management to assure that fish and watershed values are not degraded. The Selected Alternative allocates 26,921 acres of these critical inner-gorge areas along streams and rivers with high fish values to the Supplemental Resource Management Area. These inner gorge environments are generally steep and often contain large areas of unstable slopes where potential for risk of impacts associated with activities would be high. The values along these major streams for recreation, wildlife habitat and protection of fish habitat and riparian ecosystems are not quantifiable. In my judgement, the inherent values of these resources exceed the potential value that could be derived if these riparian corridors were allocated to management that includes timber harvest.

Riparian areas intermingled with Management Areas which provide timber harvest opportunities will be managed under either Riparian Prescription B or C These prescriptions and their associated effects are viewed on a basin-wide scale and provide standards to guide the management of activities within the riparian areas of each specific Planning Basin. Site-specific prescriptions will be developed in project level planning. The direction communicated through Riparian Prescriptions B and C establishes the upper limits for allowable change within the riparian environment; neither prescription requires that activities, such as timber harvest, take place if fish habitat and water quality cannot be maintained.

Riparian Prescriptions B and C vary in the degree of modification of the riparian environment allowed Prescription B continues current direction and is designed to maintain watershed and fisheries values. Prescription C allows less modification of the riparian environment and, over time, will result in net increases in fish habitat capability as regrowth of riparian vegetation exceeds the rate of vegetation removal. The *selection of a riparian prescription for each Planning Basin is influenced by several factors specific to each*

basin. These factors include the fisheries values, risk to fish habitat as influenced by soil landtypes and management activities, the condition of the entire drainage relative to past, present, and relatively foreseeable practices and events, and public and agency input

The seven Planning Basins assigned to Riparian Prescription C are generally the coastal streams with high fish values and steep stream banks where greater restriction of activities will have the greatest payoff in terms of improved fish production. Another reason for tighter restrictions in some basins is the treatment of riparian areas on other ownerships within the watersheds. This activity of others has substantially increased the potential for adverse cumulative impacts. This is a major factor in both Lobster and Pistol Planning Basins. Silver and Indigo Creeks do not fit the same rationale as the other Prescription C basins The Silver and Indigo Planning Basins are allocated to the more restrictive prescription for this planning period to facilitate recovery of the riparian and terrestrial ecosystems impacted by the Silver Fire of 1987.

The Winchuck River is a coastal stream with high fisheries value not allocated to Prescription C. There are two reasons why it is different. First, the Winchuck Planning Basin is predominantly National Forest land and lacks the same potential for cumulative impacts associated with practices on other ownerships Second, the geology poses less risk and thus better opportunities to utilize the timber resources of the riparian areas without adversely affecting the other riparian and watershed values

A high level of capital investment ($581,000 per year) for fish habitat and watershed improvement is scheduled in the Selected Alternative. An annual investment of $350,000 will be used for fish habitat improvement structures. No substantial tradeoffs in terms of other resources are associated with this program. The costs are justified by the improvements in habitat that can be attained and the subsequent economic values associated with increased fish production I am aware that not all instream structures will be effective, however success of the program does not depend on all of the structures functioning as envisioned. We will continue to improve the design and provide corrective maintenance of instream structures to achieve a high rate of success. I would also like to dispel the misconception that the Forest Plan will allow for degradation of fish habitat through adverse impacts of activities, and then plan to compensate for this degradation by assuming large increases in habitat capability through capital investments. This is simply not the case. Standards and Guidelines are provided to protect fish habitat through controls placed on location, design, and implementation of management activities (e.g , timber harvest, road construction). Additional road-related capital investments will provide for both the proper functioning of road crossings of streams in respect to fish passage with improvement in habitat capability over the current level. Some restoration of habitat degraded from past activity will occur, but this work will be evaluated and implemented at the project level. Many of the structural improvements will be funded in association with timber sales

To avoid the risks of cumulative impacts that might occur as a result of road construction and timber harvest, it is essential that these activities be distributed over time and space. The analysis of the Interdisciplinary Team has resulted in a process for modeling which limits by decade the acres of timber harvest within each specific Planning Basin (i.e., the timber harvest dispersion constraints). The factors used in modeling Alternative S are highly specific to each Planning Basin and are based on the sensitivity of the watersheds, impacts of past practices and scheduled activities, impacts of past and expected practices on adjacent ownerships, and the impacts of the 1987 fires. These constraints are carefully designed to assure that dispersion of activities can be achieved with minimal impact on timber outputs. Implementation of the Forest Plan will be monitored to assure that levels of activity remain within these levels. If project scheduling results in the prescribed level being exceeded in any Planning Basin, a cumulative effects analysis will be completed specific to that basin prior to implementation of the activities. These precautions are necessary to assure that watersheds will not be adversely affected by cumulative impacts.

4 **How, and to What Extent, Should Lands in and Adjacent to River Corridors be Managed to Protect, Preserve, and Enhance Wild and Scenic River Attributes?**

When the scoping was done for the Forest Plan EIS, the Rogue and Illinois Rivers were in the National Wild and Scenic River System, the Chetco and North Fork Smith Rivers were inventoried for possible inclusion, and the other rivers on the Forest not evaluated for eligibility. The alternatives in the DEIS were designed to evaluate the options for allocations or recommendations of the two inventoried rivers, and the options for management of lands adjacent to the both the inventoried and designated Wild and Scenic River river corridors In response to the DEIS, commentors suggested that other rivers on the Siskiyou should also be reevaluated for possible inclusion into the Wild and Scenic River System as the original determination of eligibility was based on criteria that had since been revised. In July of 1988, the Elk, South Fork Coquille, South Fork Sixes, Pistol, South Fork Chetco, and Winchuck Rivers were evaluated for potential eligibility. Of these, only the Elk River was determined to contain "outstandingly remarkable values" related to its quality anadromous fishery, the Elk was added to the list for possible inclusion.

Shortly before the FEIS was to go to print, Congress passed the Omnibus Oregon Wild and Scenic River Act of 1988 The Elk, Chetco, and North Fork Smith were designated National Wild and Scenic Rivers, precluding the need for a decision or recommendation for these rivers. Alternative S (and this Selected Alternative) include the corridors (1/4 mile either side) of both these new rivers and the existing corridors along the Rogue and Illinois Rivers in the appropriate Management Areas for the classified Wild, Scenic, and Recreation segments.

In response to public comments, several sections of rivers were reassessed for Wild characteristics. Two sections were determined appropriate for classification as Wild River, but were not included in the Oregon Omnibus Act of 1988 They are: (1) the two-mile section of the North Fork Smith River from Baldface Creek to the California Border and (2) the two-mile section of the Chetco River from Boulder Creek to Mislatnah Creek. These inventoried sections will be managed as Wild until a determination is made in future River Management Plans.

Several other land allocations coincident to Wild and Scenic River assignments complement management of the Wild and Scenic River values. Most compatible are the Supplemental Resource and Backcountry Recreation Management Areas. In key areas, these allocations provide additional protection of water quality, fish habitat, and recreational settings under which the five rivers were Nationally designated.

Allocation of Visual Quality Objectives (VQO's) for the viewsheds in the canyons surrounding the Wild and Scenic River corridors also contributes to the quality of the recreational setting. In examining the tradeoffs associated with such allocations and evaluating the options, the fact that a river is in the National Wild and Scenic River System does not weigh heavy in the decisions for surrounding lands. The decisions are driven by the demand for, and character of, the recreation opportunities of the specific area. The Rogue and Illinois Rivers offer exceptional recreation opportunities. The viewsheds of these rivers are allocated to the inventoried or higher VQO's to protect the scenic quality and recreational experience.

The scenic quality of the Rogue River is very important to the many recreational users and for the local tourist industry. The allocation of the foreground seen area to the Supplemental Resource Management Area with no programmed timber harvest is done to assure the protection of the scenic quality for these recreation opportunities and the established tourist industry in this area. It has been suggested that the middleground seen area also be allocated to the more restrictive Retention category instead of the inventoried VQO of Partial Retention. In my judgement, the Partial Retention allocation will adequately provide for protection of the scenic quality in this area. The added assurance that the more restrictive allocation provides does not justify the opportunity cost in lost timber production. Specific monitoring in this area will provide information to determine if Partial Retention management adequately satisfies the need for scenic quality associated with the recreation use and, if warranted, provide the basis for adjustment.

5. **How Should Sensitive Plant Resources be Managed?**

The Siskiyou National Forest is one of the most floristically diverse areas in the Nation. The wide range of geology and climate, coupled with the unique pattern of development throughout time, have resulted in large numbers of species inhabiting a relatively small area, many of which are endemic to the Forest and surrounding area Habitat for many of these species is protected in allocations such as Wilderness. Numerous habitat areas are distributed across many other parts of Forest. The Interdisciplinary Team has carefully evaluated each area in light of the timber, mineral, and plant resources, as well as consideration of public comments. A number of areas with unique plant habitat or outstanding examples of plant communities exist where their intrinsic values exceed that which could be derived by developing these areas for commodity goods. The Selected Alternative allocates these special places as Botanical Areas. Nineteen new Botanical Areas are allocated which add 15,157 acres to the inventory of 4,475 acres in the three existing Botanical Areas.

The Selected Alternative also recommends that four new Research Natural Areas (RNA's) totalling 2,651 acres be added to the three existing RNA's. These areas are needed to fill cells in a National network oriented to research and educational purposes. It is important to preserve physical and biological units where natural processes are maintained to provide a base for comparison with lands under different types of management. The benefits for education and research, and the preservation of gene pools for typical as well as rare plants and animals, has greater value than that which might be derived from development of these areas.

The distribution of RNA's and Botanical Areas across the Forest also significantly contributes to maintenance of biological diversity. Coupled with the Standards and Guidelines designed to protect the unique plant communities and habitats, these allocations serve to perpetuate the species and types across the range of natural variability, particularly those near the ends of the range which may be most sensitive to change. This is particularly important in its contribution to the resiliency of the forest, or the capacity of the forest to withstand and adapt to changing conditions.

There are many areas of sensitive plant habitat not included on the special allocations that preclude development activities. The sensitive plant resources in these areas will be managed under the Standards and Guidelines which require that an evaluation be done for any project where sensitive species are found, and that habitat be managed to maintain viable populations throughout their existing range. In most cases, projects can be designed or successfully mitigated to be compatible with perpetuating sensitive species and their habitat.

In my view, the Selected Alternative contains the best balance of allocations to preserve special habitats and emphasize protection of sensitive plants and their habitat throughout the Forest during project planning. The best examples and most unique habitats are allocated to Botanical Areas and RNA's. In other areas where plant resource values are lower and the opportunity costs in terms of timber would be higher, the sensitive plant resources will fully considered and managed according to the Standards and Guidelines in project planning, implementation, and monitoring.

6. **How, and to What Extent, Should Forest Scenic Values be Protected through Visual Resource Management?**

The Forest contains some fine scenery, particularly along the rivers and in the higher country. It also contains many acres of productive timber land which lack quality scenery. These areas receive only light recreation and hunting use In my judgement, it is most appropriate to manage the higher use recreation areas and special places on the Forest to meet the Visual Quality Objectives (VQO's) of Retention and Partial Retention However, there are many areas of the Forest where these allocations are not warranted in view of their opportunity costs and limited recreation use. The Selected Alternative contains a good balance of visual allocations with Retention and Partial Retention on the highly used travel routes such as the Oregon Caves and Redwood Highways, and the Rogue and Illinois Rivers. Partial Retention is assigned to the less heavily used, but popular recreation routes. The remainder of the Forest in General Forest is managed with less emphasis on visual quality.

Some specific areas have been the subject of considerable debate and are worthy of mention here. The Bear Camp Road is used by numerous recreationists travelling back from raft trips down the Rogue River; it is developing into a major cross-Forest travel route The west portion of this road leaving the river area affords the traveler some vistas of natural appearing landscapes; as the east end of the road is approached, there are many more roads and activities evident; then the route leaves the National Forest and disturbance to the landscape is predominate. In my judgement, the allocation of Retention along the western portion of this route with a transition to Partial Retention along the eastern portion approaching the Forest boundary is the most appropriate management scheme.

The rivers are the focus of many of the recreation opportunities on this Forest Visual management in the canyons surrounding the Rogue and Illinois Rivers was included with the discussion of Wild and Scenic Rivers above. Other rivers do not receive nearly the degree of river traffic, but roads along these river corridors are frequently major routes for recreationists. The road along the South Fork Coquille River and up through Agness Pass over to the Rogue River at Illahe has been suggested for Retention visual management This road traverses mixed ownership along the South Fork Coquille River which greatly limits our ability to control the visual quality along the route. Considering the opportunity cost of the Retention allocation, the relatively light recreational use, and our limited ability to control the visual quality along this route, the assignment of Partial Retention is most appropriate in my judgement.

The route along the Chetco River which continues on to access the western edge of the Kalmiopsis Wilderness will have Retention in the foreground seen area along the route. Partial Retention in selected locations complements the Retention foreground allocation for much of the viewshed based on heavier river recreation use in the lower reaches of the Chetco, and user sensitivity relative to the Wilderness access and other key scenic features along these routes.

Many small areas with special values for recreation and scenic views are allocated to combinations of Retention and Partial Retention depending on the quality of the view and the use the area receives. These areas include such locations as Bolan Lake, Game Lake, and Wheeler Creek where, in my judgement, the values for recreation and scenic quality outweigh the opportunity costs of the visual allocations. Areas not allocated to Retention or Partial Retention management will still be required to meet minimum levels of visual quality as specified by the Standards and Guidelines and management area prescriptions.

7. **How Should Wildlife Habitats on the Forest be Managed?**

Various species of wildlife have differing habitat requirements. The requirements of different species often conflict; what is good for one may be detrimental to another. Some species need old-growth forest, others require openings. Some need snags or down logs, some need seclusion. Several species, such as deer and elk, find optimum conditions where there are both openings for forage and forest stands for protection and hiding cover. Two basic objectives drive my approach to the wildlife question. One is to provide habitat

to maintain viable populations of all species across their current range on the Forest, the other is to maintain an appropriate balance and diversity of habitat across the Forest for all species considering the opportunity costs of special allocations While the Forest Service manages the habitat on the National Forest, it should be noted that the states of Oregon and California are responsible for management of the wildlife populations (e g., setting of hunting seasons, bag limits, etc.).

Most species do not need extraordinary attention to maintain viable populations across the Forest. Special emphasis must be given to species requiring mature or old-growth conifer habitat and those that require snags for nesting or foraging. Habitat will be maintained for the spotted owl, pine marten, and pileated woodpecker through Designated Wildlife Habitat areas. The management requirements for spotted owl are consistent with direction contained in the Final Supplement for an Amendment to the Pacific Northwest Regional Guide (USDA 1988). The habitat network designed for the mature and old-growth indicator species will provide the necessary habitat Forest-wide. Coincident allocations such as Supplemental Resource, Backcountry Recreation, and existing Wilderness and Wild Rivers also provide habitat for these and associated species in addition to the network designed to meet Management Requirements With this spatial distribution of mature and old-growth habitat areas of various sizes, it is my judgement that additional allocations are not warranted given the associated opportunity costs.

The effects of management activities on species dependent on snags or down woody material for breeding or foraging will be mitigated by the application of Standards and Guidelines designed to provide these materials across the Forest. Areas that remain undeveloped will continue to contain their natural levels of snags and down trees. Areas managed for commodity production will have snags and down trees capable of sustaining populations of woodpeckers and other dependant species, even though at somewhat less than the maximum population densities for any given land area. In my judgement, this is the appropriate management strategy, increasing the requirement for woodpecker habitat to near the maximum density is not warranted, and decreasing much below the 60 percent level of the Selected Alternative would unnecessarily increase the risk that some species might not be well distributed across areas capable of supporting habitat.

Habitat for deer and elk is largely a function of timber harvest and disturbances such as fire. These disturbances create openings in the forest canopy and stimulate the growth of forage plants, but also reduce the available cover. The best balance through time will be achieved by distributing harvest activities across the Forest. The Selected Alternative provides the framework for this through dispersion of activities to minimize the potential for cumulative watershed effects. The primary variable in the alternatives with potential to increase or decrease the habitat capability for deer and elk is the amount of the land base under timber management. Increasing the areas allocated to timber production beyond that of the Selected Alternative for the purpose of producing big game forage is not warranted.

The Selected Alternative also allocates numerous small areas to be managed as Special Wildlife Sites. Many of these areas have special value as unique habitat niches or high producers of mast or other forage, but the greatest value in allocation of these sites is their contribution to biological diversity. These areas, in general, have minor opportunity costs since many are either unsuitable for timber production, contain low volume, or are in locations difficult to access. The land allocations of the Selected Alternative, which include large blocks of undeveloped areas in Wilderness and various size areas in Wild Rivers, RNA's, Botanical Areas, Designated Wildlife Habitat, Backcountry Recreation, Supplemental Resource, and the Special Wildlife Sites, combine to create tremendous diversity across the forest and, in my judgement, provide the best balance of wildlife habitat considering the other resource values involved.

8. **How Will Management Direction Affect Recreation Opportunities In the Wilderness and Unroaded Areas?**

Opinions on management of roadless areas remain strongly polarized. Many people commenting on the DEIS support management of the roadless areas in an undeveloped state. Such allocations, however, have

significant opportunity costs in terms of timber production that many others feel are unacceptable This controversy has been hotly contested for decades, and unfortunately is no less controversial today. The management of these areas over the next decade is a critical decision and one that I have weighed carefully for some time.

Factors of this decision include the values associated with managing any particular area to maintain the roadless character such as: Primitive and Semi-primitive recreation opportunities offered, uniqueness of the area, and contribution to complementary allocations. The demand for Primitive recreation is expected to exceed the capacity of the Forest within the next few decades This is of particular interest relative to the cross-Forest trails in the North Kalmiopsis area which provide recreation experiences where substitute opportunities rarely exist. Some of the unroaded areas also have the potential to provide Semi-primitive Motorized recreation opportunities on existing trails and primitive roads that were constructed for mining access in the past There are some unroaded areas adjacent to Wild segments of the river corridors where the recreation experiences are high. Others in the Siskiyou high country offer their own special qualities. Unroaded areas also have the potential to contribute to other resource values such as increased old-growth protection, and reduced risks to watershed and fisheries.

The consideration of opportunity costs to timber production are no less important. These areas contain significant acreage of high volume timber stands. However, many of the areas that remain roadless tend to be more difficult to access and manage than the roaded portions of the Forest. Some have very high percentages of their acreage classed as unsuitable for timber production. The opportunity costs to timber necessarily includes consideration of the suitability and operability of the area in question. This is not to say that decisions will be based on management difficulty, but rather that the tradeoffs are taken in a somewhat different light where the expenses associated with management and operation are high. This is further compounded where the potential for environmental risks are also high due to steep slopes and unstable soils.

North Kalmiopsis. The inventoried North Kalmiopsis Roadless Area has been the focus of controversy. This was heightened when a large part of the area was impacted by the large wildfire in 1987. The fire-killed mature and old-growth trees equated to substantial volumes of timber being subjected to either rapid salvage or decay. Under the Silver Fire Recovery Project, the resource situation was evaluated and conditions within the fire area reinventoried. Much of the fire area was within this unroaded area. The intensive field investigation of this heretofore difficult-to-access unroaded area revealed significantly more area of both highly sensitive soils and lands unsuitable for timber management. In addition, the project analysis indicated that the locations of the Illinois River Trail (along Bald Mountain Ridge) and the Hobson Horn-Silver Peak Trail to be the only feasible locations for roads to access fire killed timber. These irreplaceable trail systems are valuable east-west, cross Forest trails offering various recreational opportunities for hiking and other user experiences.

These findings, plus the marginal economics of timber salvage associated with extensive road construction, led to the Forest Supervisor's selection of Alternative I-Modified in the Silver Fire Recovery Project Record of Decision and accompanying FEIS (1988). Much of the suitable area is now accessed through the Silver Fire salvage timber sales and is currently being salvage logged, much of it by helicopter. This portion will remain in General Forest and be managed for timber production as well as other uses Those areas not selected for access in the Silver Fire Recovery Project have generally higher values for recreation and high percentages of unsuitable land making them more logical candidates for other allocations.

Some of these are clearer choices than others. The area in the Silver Creek canyon around Silver Falls contains little land suitable for timber production and has recreation opportunities associated with Silver Falls and trails in that locale. The areas near the Illinois River in the lower Silver Creek drainage and across the river in Horse Sign and Lawson Creeks contribute to the quality of an unblemished recreational setting of the Wild segment of the Illinois River. Again, much of this land has a high percentage of unsuitable land.

In my judgement, the values associated with the recreation and other noncommodity uses in these areas exceed the potential benefits for timber production, particularly in view of the environmental risks that would accompany development. Therefore, these specific areas are allocated to the Backcountry Recreation Management Area.

Management for the area on the north face of Bald Mountain is not quite as clear. There is still considerable controversy as to the suitability and operability of these areas For this reason, I have modified Alternative S of the FEIS to change this area from the Backcountry Recreation Management Area to an "Administrative Study" overlay in General Forest. The purpose of the administrative study is to allow time for recovery from the effects of the Silver Fire, and to refine and verify the suitability and operability of the area. In this interim period, this area will continue to provide Primitive and Semi-primitive recreation opportunities, with the environmental consequences being the same as those projected for Alternative S of the FEIS. No timber harvest is programmed for this area during the planning period. These modifications of Alternative S, including the areas allocated to Backcountry Recreation and Silver Fire Administrative Study, are shown on the map titled "Land and Resource Management Plan."

North Kalmiopsis and South Kalmiopsis along Illinois River. The area along the Illinois River east of the Kalmiopsis Wilderness is noteworthy. This is beautiful river country with ample opportunities for unique recreation experiences. It is one of the prime areas identified to provide recreation opportunities in conjunction with the economic comeback strategy of the southwestern Oregon counties which emphasizes tourism. Parts of the North Kalmiopsis and South Kalmiopsis Roadless Areas are in this river canyon and border the Kalmiopsis Wilderness. Much of this area contains serpentine soils that are very low in productivity; much is unsuitable for timber production. In my judgement, the areas identified in Alternative S that are adjacent to the river corridor and are visible from both the river and the road from Selma have far greater value for recreation and watershed protection than the opportunity costs to timber production. They are appropriately allocated to the Backcountry Recreation Management Area In the Selected Alternative, I have adjusted the boundary in what is described as the Fall Backcountry Recreation area. In the vicinity of MaCaleb Ranch, an area within the lower reach of Fall Creek has been placed into General Forest This area is screened from view from the river and road by topographic features.

North Kalmiopsis along the Chetco River. There is some unroaded area on the west side of the Kalmiopsis Wilderness along the Chetco River that has high value for recreation and for contributing to maintenance of the outstanding qualities of the classified and allocated Wild River segment of the Chetco Wild and Scenic River. Road access and logging feasibility has been examined in depth for this area within the last decade. Opportunities for efficient and environmentally acceptable projects within this Mislatnah area are quite limited and strongly cost deficit. The area has several access trail routes into both the Wilderness and established Big Craggies Botanical Area. Designated Wildlife Habitat and Special Wildlife Sites cover the landscape above the Wild and Scenic River corridor. It is my judgement that the composite of these values outweigh the opportunity costs and associated potential adverse impacts if the area was to be further developed. The complementary assignment of the balance of this area to Backcountry Recreation is appropriate.

South Kalmiopsis. This is a large area with only primitive roads that were constructed for old mining operations. Much of the area exhibits soil conditions where chemical imbalances inhibit plant growth. A large portion of this serpentine area is classed as unsuitable for timber production. Vegetation tends to be sparse with widely scattered conifers, although there are some isolated stands of trees suitable for timber management. Parts of the area have special values represented in the unique and rare plant resources; these sites have been allocated accordingly. Due to the more open nature and gentler topography, both motorized and non-motorized recreation use exists. Access, both on existing trails and cross country travel, is far less restricted by vegetation than most areas on the Forest. Scenic quality is unusual and outstanding in its own right; it is far different than what may normally be expected in the National Forest System

Alternative S would have allocated a large portion of the area to the Backcountry Recreation Management Area to be managed for Semi-primitive Motorized recreation. I have changed this to General Forest with an Administrative Study overlay. For this planning period, this will allow Forest personnel and others to evaluate the feasibility of timber management, including uneven-aged management, in this area. This does not preclude use of the area for Semi-primitive Motorized recreation, but proposes that the administrative studies will help determine if some low level of timber management is compatible with maintaining the the recreation opportunities

Packsaddle The area consists of the lower Cedar Creek watershed immediately abutting the Wild River segment of the Smith Wild and Scenic River corridor. The area has virtually no land suitable for timber production, but does have the potential for minerals associated with the serpentinite-peridotite geology. Additionally, unique and rare plants are frequent; the southern boundary of the recommended Lemmingsworth RNA forms the common boundary for this area. My decision, based on the intrinsic values within the area and lack of conflicting uses, is to allocate this land to Backcountry Recreation. Coupled with the Wild River corridor and Lemmingsworth RNA, the area and its environs should enhance the river recreation and botanical values present

Siskiyou and Kangaroo. These areas contain spectacular high country associated with the Siskiyou Mountains Rock bluffs and glades, and open vistas across high ridges dotted with numerous small mountain peaks contributed to one of the finer recreational settings in southern Oregon and northern California. This high divide country is partly subalpine, and provides a perfect opportunity for continued recreation emphasis Local people utilize the area for a day's adventure and relief from the hot valley; visitors to the adjacent Oregon Caves National Monument frequently hike the trail systems, including the National Recreation Trail. Several Botanical areas and a recommended RNA occupy this cooler environment These selected portions of the unroaded areas contain only small areas of land suitable for timber production; reforestation success at these high elevations in the Siskiyou Mountains have proved difficult. The area has only minor tradeoffs associated with other commodity resources such as grazing and minerals

In my judgement, these areas have significant scenic and recreation values and are appropriately allocated to the Backcountry Recreation Management Area The Forest Supervisor and District Ranger have carefully located the boundary of the Backcountry Recreation area in both the inventoried Kangaroo and Siskiyou Roadless Areas to assure that lands with a good reforestation and timber production potential remain in the timber base while lands with less opportunity cost and higher recreation and scenic value are included in the Backcountry Recreation area and other complementary allocations

Windy Valley. This unroaded valley is an anomaly for the Siskiyou in that the terrain is moderately gentle and a large meadow exists within the bowl of the small headwater area. While much of the land is suitable for timber production, the Snow Camp Botanical Area caps the northern border, Designated Wildlife Habitat covers a good share of the basin, and Special Wildlife Sites (such as the meadow) inhabit non-forested parts. The recreation attributes are largely unknown and not frequented by visitors from afar However, it is well used by local people for hunting and day hikes. Windy Valley was prescribed to special management in the past for the above values, and is well supported by residents of the adjacent communities. Therefore I see it appropriate to assign this area to Backcountry Recreation.

Grassy Knob and Copper Mountain Alternative S would have allocated parts of these areas to the Backcountry Recreation Management Area. Due to their relatively small size, isolation from other unroaded and unique areas, character of the terrain, and limited recreation opportunities, they do not match other Backcountry Recreation assignments. However, they do contribute significantly to the protection of the watershed values and extremely fine salmon and steelhead fish habitat of the Sixes and Elk Rivers. For these reasons, I have changed the allocation of the two areas proposed for Backcountry Recreation to Supplemental Resource Management Area in the Selected Alternative.

Other Roadless Areas. I have carefully considered the allocation and management of each of the inventoried roadless areas on the Siskiyou National Forest Appendix C of the FEIS provides me with an indepth description and analysis of the specific area attributes associated with management under a roaded or unroaded scenario. The areas not specifically discussed above have been allocated predominately to management areas which include programmed timber harvest as part of the multiple-use prescription, although many areas with special value for purposes such as wildlife habitat, sensitive plant habitat, or watershed and fisheries protection have been allocated to those uses. Areas with significant timber values have been kept in the timber base unless protection and enhancement of other values to be gained from other allocations outweigh the opportunity cost to timber.

Some areas that have poor accessibility and poor operability have been kept in the General Forest Management Area under the Extensive Management prescription with a slightly reduced yield. This provides for utilization of the timber opportunities without requiring roading for intensive management and investments that would not be practical.

The range of allocations in the Selected Alternative is tremendously varied and provides a strong array of multiple-resource opportunities. The inventoried roadless areas have been analyzed in-depth, received considerable public involvement and review, and the specific areas accordingly evaluated and allocated to a mix of Backcountry Recreation, General Forest-Administrative Study, General Forest-Extensive Management, other special areas or unique sites, or management with programmed timber outputs In my judgement, these Management Area allocations and accompanying prescriptions and Standards and Guidelines provides the best balance of resource uses for the inventoried roadless areas

9. **How Should Mineral Resources of the Forest be Developed in Coordination With the Management of Other Resources?**

The Siskiyou National Forest contains deposits of a number of minerals of commercial value, including significant amounts of the strategic minerals such as nickel, cobalt, and chrome. It is essential that the mineralized areas be keep open to exploration and development for the values they may contribute to the communities and Nation in the future. At the same time, it is important to have assurances that other resources are managed to protect associated values. Some areas have competing resource values that cannot reasonably be protected through mineral development and are withdrawn from mineral entry. Current withdrawn areas total approximately one-fourth (267,000 acres) of the Forest.

Implementation of the Selected Alternative will facilitate mineral exploration and development by retaining nearly three-fourths of the Forest in an accessible category. Approximately six percent will have high restrictions to protect other values; these restrictions may effectively preclude some mining opportunities. However, these higher level restrictions are only applied to a very limited portion of the Forest, and on even less area with a high potential for mineral development.

I fully recognize the relative importance of the mineralized areas of the Siskiyou to the State and Nation. I also realize and appreciate the role of those in the mineral exploration and development industry. In my judgement, the Selected Alternative provides the appropriate balance associated with; keeping the largest part of the Forest open for mineral activities, and yet providing protection for other resources commensurate with the values involved.

RESPONSE TO PUBLIC COMMENTS

The Forest received extensive comments from the public, other agencies, and the Governor of Oregon. Numerous suggestions for improvement were incorporated throughout the analysis, various documents, design of the FEIS Preferred Alternative S, and Selected Alternative. The Forest continued to work with individuals, groups (timber industry, environmental and other interest groups), and the State of Oregon representatives to further refine elements. We have a better product as a result of the excellent public

participation. My decision of the Selected Alternative is based on this valuable input as well as technical, resource, and legal factors The following discussion highlights some of the changes made in the design of Alternative S and the Selected Alternative as a result of the public response (See Appendix K of the FEIS for discussion of comments made to the Draft documents and the Forest Service response to those comments.)

Numerous comments were received pointing out the high values of the Forest's fishery resource which is supported by the water resource and stream habitat, and the social and economic importance of this resource to local communities. Alternative S increases the allocation of high fish value Planning Basins from one to seven (of the 19 total basins) to be managed under the Riparian Prescription C, affording additional protection to the stream shade and a net improvement in fish habitat capability. Allocations to Supplemental Resource areas were also increased along major streams in Alternative S and again through the Selected Alternative to give additional stream protection.

Dispersion of harvest units is modeled through the use of basin constraints. Harvest within each Planning Basin on the Forest will be limited to a percentage of the area of each basin. These timber harvest dispersion constraints were criticized as imposing an unwarranted opportunity cost to timber. Many respondents to the DEIS felt that the computer modeling used in calculating basin constraints could be improved. In response to these comments, the model was refined to correct an inconsistency in the analysis and adjust the individual basin constraints to be more specific to individual basins in Alternative S than in Alternative K.

Fertilization was not considered in the alternatives developed in the DEIS. Many respondents felt that this ignored a feasible and desirable opportunity. In response to these comments, the fertilization was included as one of the management practices available to the FORPLAN model in the design of Alternative S. Fertilization accounts for 0 8 MMCF of the ASQ for the Selected Alternative.

There is tremendous support for maintaining more of the Forest in an undeveloped condition to provide Primitive and Semi-primitive recreation opportunities, as well as reserves of old-growth conifer forest and other values associated with large undeveloped areas Additionally, people are concerned that this not be a "preservation" category so the emphasis has been changed from "Custodial (Roadless)" to Backcountry Recreation A large increase in Backcountry Recreation areas was made in the design of Alternative S. This total amount was reduced in the Selected Alternative (as described in Chapters II and III of this Record of Decision). But there are still considerably more Backcountry Recreation areas in the Selected Alternative than was previously proposed in the Draft. To accommodate historic use described in public comments, specific Backcountry Recreation areas will be managed for Semi-primitive Motorized recreation to allow four-wheel drive and motorbike travel on primitive roads and trails existing in these areas.

Forest scenic values will be managed to complement high recreation use travel corridors and viewsheds. In response to public concern, several areas of Retention and Partial Retention that were not included in the Preferred Alternative in the DEIS have been added to Alternative S. These include the Bear Camp Road viewshed, a major Forest road that receives heavy recreational use

Comments received from the public and other agencies reflect a great deal of interest in tourism and recreation. The counties in southwestern Oregon have identified "tourism" as the focus for their strategy as part of the Oregon Comeback. In response, Alternative S programs higher levels of capital investments to complement the emphasis of State and local governments and private industry. In addition, some land allocations have been increased, such as the visual and Backcountry Recreation allocations mentioned above, that are complementary to this emphasis.

A number of people expressed concern about the appropriateness of intensive timber management and road development in some areas with very steep slopes and rocky soils Such areas were reassessed and are designated in Alternative S for "extensive" management. These areas are in within General Forest

Management Area, keeping them in the timber management base, but a less intensive management schedule and logging by helicopter or skyline without road development is planned. Others were interested in further refinement of suitability, the possibilities for uneven-age management, and fire-recovery. "Administrative study" areas are designed into the Selected Alternative for these purposes

There are many people interested in maintaining the biological diversity of the Forest and do more to protect diversity including the rich botanical resources. Biological diversity was highlighted in the documents, Forest-wide Standards and Guidelines were updated, and more consideration given diversity in the design of Alternative S. More Botanical Areas were allocated in Alternative S to give added protection to sensitive and rare plant habitat.

The Draft proposal studied, but did not recommend, designation of the Chetco or North Fork Smith Rivers for inclusion in the Wild and Scenic River system. Public comments on the DEIS greatly favored recommendation of these two rivers for designation. Additionally, many respondents felt that several other rivers should be included for study. The Oregon Omnibus Wild and Scenic River Act of 1988 designated the Chetco, Elk, and North Fork Smith Rivers which is reflected in Alternative S.

Many people pointed out that the level of mineral restrictions proposed in the DEIS went beyond the intent of mining legislation. This issue was re-evaluated; the level of access restrictions was reduced, and no additional mineral withdrawn is proposed in Alternative S.

A number of technical suggestions were made to improve the the analysis. And many were incorporated, e.g., harvest dispersion constraints and the board foot to cubic foot ratio (see Appendix B in the FEIS for detailed discussion). These technical discussions have proven valuable for better analysis and will continue in the future. I recognize we will be in a continuing process of updating as better information and analysis is made.

Chapter IV - ALTERNATIVES

ALTERNATIVES ANALYZED IN THE FEIS

The FEIS displays 12 alternatives that provide a broad range of options. These options serve as a basis for identifying the alternative that best maximizes net public benefit (NPB) through responding to public issues. Each alternative emphasizes the resolution of one or more Planning Problems through a combination of land allocations and capital expenditures. The distribution of National Forest land to one of 14 Management Areas establishes management practices and activity schedules. These provide unique combinations of resource outputs, land uses, and environmental effects (For more information on the alternatives, see FEIS, Chapter II)

Following the evaluation of alternatives, I have identified a Selected Alternative for the Forest Plan Alternative S, as modified in this Record of Decision, is selected as the alternative that best maximizes NPB's while responding to the Planning Problems.

ALTERNATIVE NC - NO CHANGE

The "No Change" alternative has been developed as a no-action alternative representing current management plans. The purpose of Alternative No Change is to continue the levels of goods and services as set out in plans formulated and approved prior to the passage of the National Forest Management Act, specifically the 1962 Timber Management Plan. This alternative does not comply with all provisions of NFMA, and could not be implemented or used in future management of the Forest under the Forest Plan without Congressional and/or Secretary of Agriculture action to change the law.

ALTERNATIVE A - CURRENT DIRECTION

This is the "no action" alternative required by the National Environmental Policy Act. It would continue the present course of action established in plans and policies formulated and approved prior to passage of the NFMA that are consistent with present laws and regulations Relatively high levels of timber production, combined with maintenance of inventoried Visual Quality Objectives and moderate levels of fish and wildlife, are emphasized in this alternative.

ALTERNATIVE A-Departure

Using the same land allocations and management direction as Alternative A, timber production is further emphasized through a harvest scheduling plan that departs from the policy of nondeclining yield. This maintains the current timber program for the next two decades. Average annual timber harvest levels in subsequent decades would decline.

ALTERNATIVE B-RPA

This alternative is designed to meet the RPA production targets displayed in the Regional Guide. Very high levels of timber production are emphasized through departures from nondeclining yield during the first two decades. Large capital expenditures in fisheries improvements are necessary to realize program objectives Big-game wildlife objectives are achieved using the forage that results from timber harvest activity.

ALTERNATIVE C

Timber management opportunities are emphasized in this alternative. It produces current levels of timber volume on a nondeclining yield basis. Under implementation of NFMA regulations, Alternative C has the highest amount of land selected as suitable for timber production, and the highest long-term sustained

yield (LTSY) Hunting and roaded recreation opportunities are enhanced as a result of the timber program Land allocations for other resource objectives are among the lowest of the alternatives considered.

ALTERNATIVE D

Goods and services with established market prices are emphasized in this alternative. Intensive timber production would utilize 98 percent of the land tentatively suitable for the production of timber A moderate increase in anadromous fish is achieved by applying prescriptions that provide additional stream protection.

ALTERNATIVE D1

This alternative is identical to Alternative D, except timber harvest rotation lengths would be shortened. The culmination of mean annual increment (CMAI) requirement would be relaxed to allow harvest of trees that are as much as twenty years younger than the normal rotation age of 100 years. Average annual timber harvest volumes would increase approximately 10 percent, relative to Alternative D.

ALTERNATIVE E

Aesthetic values of the Forest are emphasized in this alternative It promotes goods and services which do not necessarily have established market values. Land allocations reflect the subordinate role of timber production in this alternative. Land allocations that benefit old growth, anadromous fish, Wild and Scenic Rivers, sensitive plants, visual quality, and roadless recreation are among the highest of any alternative considered. Former RARE II areas, for example, would remain unroaded.

ALTERNATIVE G

This alternative is designed to promote the health and productivity of the Forest's water-related resources, particularly rivers and streams associated with the Illinois drainage. Alternative G preserves many existing unroaded areas It favors management governed by high Visual Quality Objectives to maintain the area's natural beauty and to accommodate recreation-oriented industries. Low to moderate levels of timber production are provided by land allocations that emphasize wildlife diversity and travel corridors, preservation of old growth, enhancement of water quality for fisheries, and protection of sensitive plants.

ALTERNATIVE K

This alternative is designed to minimize the tradeoffs between competing goods and services by capitalizing on the multi-product nature of various land allocation possibilities. The preservation of aesthetic values, for example, is limited to areas of high recreational value, but is achieved by utilizing land allocations that provide some development opportunities. High levels of anadromous fish and protection of sensitive plants are provided, along with moderate levels of timber, old growth, and wildlife habitat.

ALTERNATIVE M

This alternative would preserve the Forest as it is today by limiting all development activities to those portions of the Forest currently under active management. Timber management would utilize rotation lengths of 250 years, and harvest activity would occur only on lands accessible from existing roads. Land allocations for this alternative yield the fewest development opportunities, and the greatest level of protection for old growth, Wild and Scenic Rivers, visual quality, and unroaded areas.

ALTERNATIVE S

This alternative is the Preferred Alternative in the FEIS. It is designed to minimize the tradeoffs between goods and services by capitalizing on the multi-product nature of land allocation possibilities. Alternative S was developed by modifying Alternative K, the Preferred Alternative in the DEIS, in response to public

comments. Recreation is emphasized through significant allocations to Backcountry Recreation. Intensive timber management, including fertilization, is practiced in areas with programmed timber harvest.

THE SELECTED ALTERNATIVE

The Selected Alternative is a modification of Alternative S, the Preferred Alternative in the FEIS. It is structured to feature the four key attributes listed under "Rationale" (see Chapter III of this Record of Decision). The Selected Alternative is designed to minimize the tradeoffs between goods and services by capitalizing on the multi-product nature of land allocation possibilities. The preservation of aesthetic values, for example, is limited to areas of high recreational value, but is achieved by using land allocations that provide some development opportunities High levels of anadromous fish and protection of sensitive plants are provided along with moderate levels of timber, old growth, and wildlife habitat. Recreation is emphasized through allocations to Backcountry Recreation in key areas. Intensive timber management, including fertilization, is practiced in areas with programmed timber harvest.

The Selected Alternative is very similar to Alternative S as described in the FEIS, but differs in the following ways:

1. Approximately 54,000 acres of Backcountry Recreation Management Area in Alternative S in the South Kalmiopsis area is an Administrative Study area within General Forest Management Area in the Selected Alternative. (Administrative Study areas have no programmed timber harvest.)

2 Approximately 11,000 acres of Backcountry Recreation area in Alternative S in the North Kalmiopsis area is in the Silver Fire Recovery Project Administrative Study Area in the Selected Alternative.

3 The southern boundary of the Fall Backcountry Recreation area in Alternative S was adjusted up to the ridgeline in the Selected Alternative The area not seen from the Illinois River is in General Forest in the Selected Alternative rather than in the Fall Backcountry Recreation area.

4. Alternative S Backcountry Recreation areas Butler and Copper did not have high recreation potential compared to their high value for fisheries and watershed. As a result these two areas are changed to Supplemental Resource Areas in the Selected Alternative

5. The reduction of acres allocated to the Backcountry Recreation Management Area, and the adjustment of the inventory information in the Silver Fire area have resulted in a slightly different number of suitable acres in the Selected Alternative. The net effect in the Selected Alternative has approximately 11,000 acres more suitable lands than did Alternative S. However, this acreage is for the most part in the administrative study areas with no programmed timber harvest.

6. The ASQ in Alternative S is 29.0 MMCF or 29.3 MMCF including salvageable dead. ASQ in the Selected Alternative is 28.7 MMCF (including salvageable dead) The reduction in ASQ for the Selected Alternative is due to the change in timber inventory adjustments reflecting the timber killed in the 1987 fires and the revised suitability information in the fire area (see Chapter III of the FEIS).

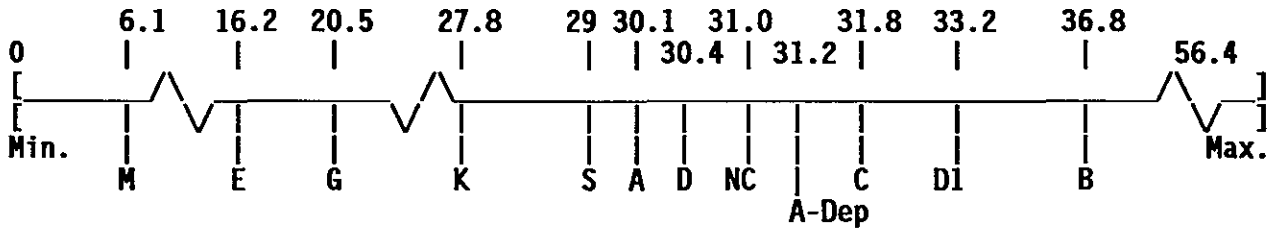
The environmental consequences of the Selected Alternative over the Plan period are essentially the same as described in the FEIS for Alternative S Any minor variations generally fall within the range between Alternative K and Alternative S.

RESPONSIVENESS TO PLANNING PROBLEMS

The following line graphs display several key indicators of the major planning problems that are part of the respective alternative design, land allocations, outputs, or effects. The graphs illustrate the range of alternatives considered in the FEIS and distribution through the decision space. Maximums and minimums for each key indicator reflect the concept of the decision space. Numbers along the line represent the values for the alternatives from the FEIS; the letters below the line identify each alternative. The relationship of the Selected Alternative to the alternatives in the FEIS is discussed for each indicator.

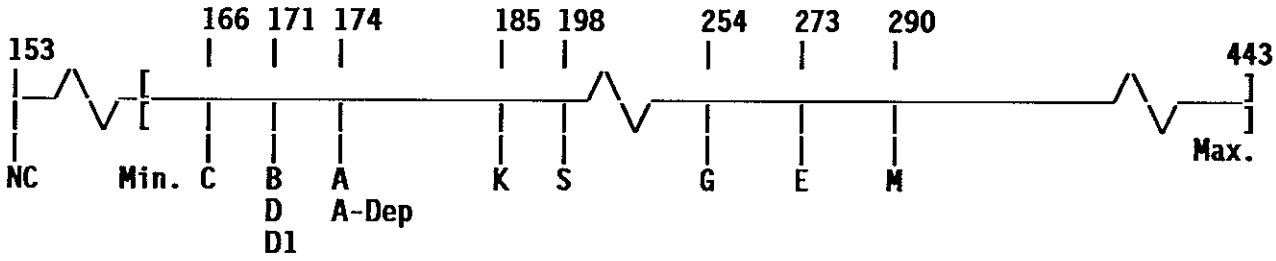
Average annual timber production for the first decade, measured in millions of cubic feet, is displayed below. Alternatives B and A-Departure are departures from non-declining even flow, and Alternative D1 has shortened rotations Alternative M has extended rotations of 250 years. Data provided in the timber production line graph does not include an estimated one percent of chargeable salvage harvest volume for each alternative. The Selected Alternative is equivalent to Alternative S, updated for the minor inventory changes resulting from the 1987 Fires. These changes result in the Selected Alternative having a value of 28.4 MMCF, or an ASQ of 28.7 MMCF including the one percent salvage.

Timber Production
(First Decade Volume, MMCF/Year)



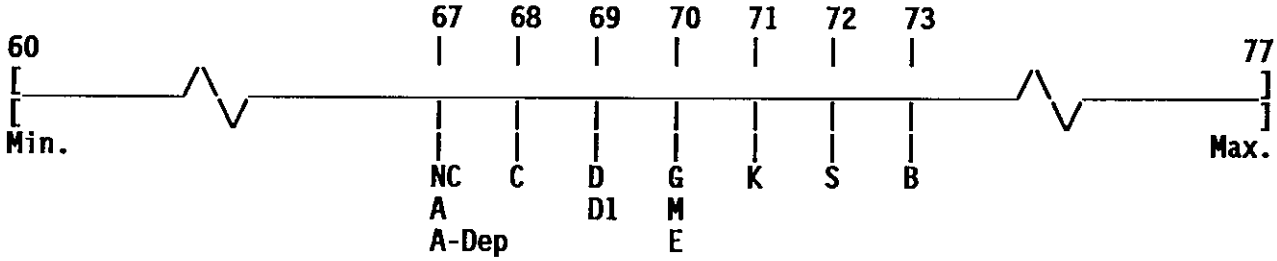
The number of acres, measured in thousands, of mature and old growth timber reserved from timber harvest is presented below. Reserved areas include Management Areas 1 through 9 and mature and old-growth stands unsuitable for timber production in Management Areas 10 through 14. The Selected Alternative has very similar allocations to Alternative S. The 1987 Fires reduced the oldgrowth in Management Areas 1 through 9 for all alternatives (approximately 16,000 acres for Alternative S). With the inventory update and the modifications made to Alternative S, the Selected Alternative has 180,000 acres of mature and old-growth timber in reserved areas Alternative NC has fewer acres than the minimum required since certain Management Requirements were not applied to the alternative.

Old Growth and Mature Reserved
(with Timber Characteristics, M Acres)



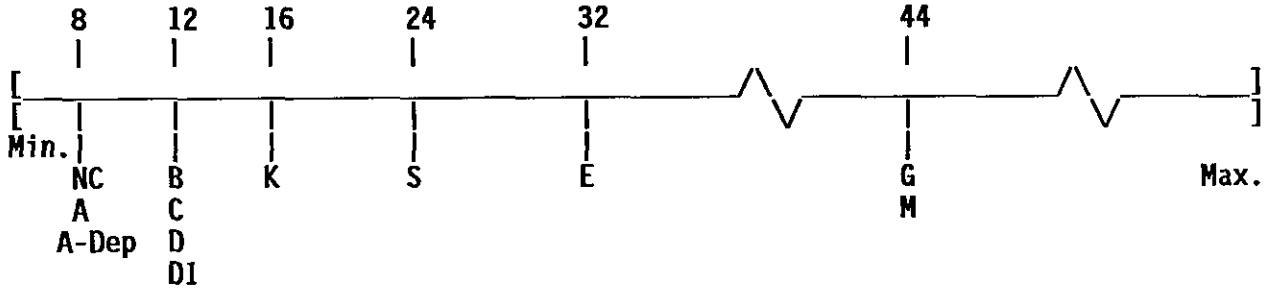
The projected number of average annual anadromous sport-fish user days, in thousands, for the first decade is displayed below. The data are primarily reflective of the functions of land allocations, riparian prescriptions, and capital investments. The Selected Alternative is identical to Alternative S.

Fisheries
(First Decade Use, M WFUD's)



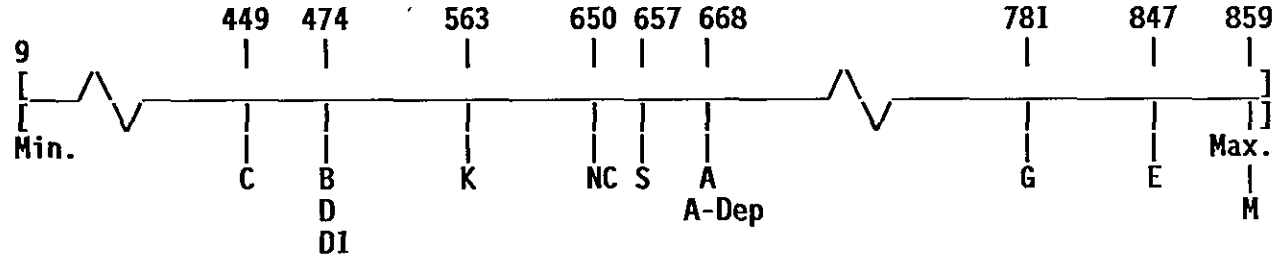
The number of acres, in thousands, of allocated Research Natural Areas and Botanical Areas is provided below as an indicator of sensitive plant habitat protection from site-disturbing activities. The Selected Alternative is identical to Alternative S.

Botanical and Research Natural Areas
(M Acres)



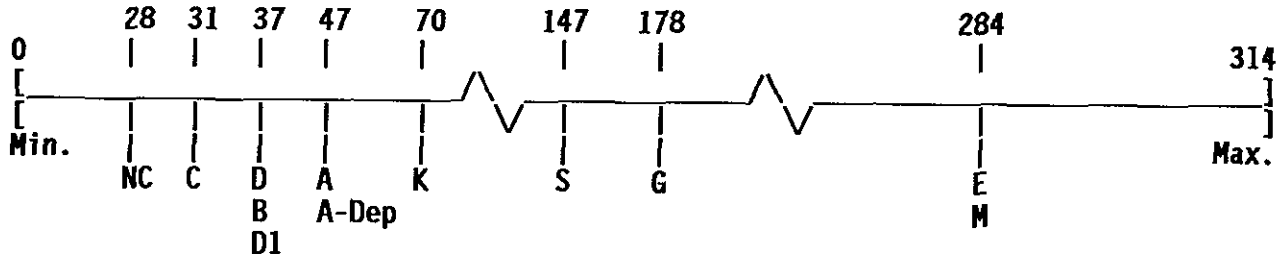
Visual resource management of Forest scenic values is reflected in the number of acres, in thousands, displayed below for areas assigned the Preservation, Retention, and Partial Retention Visual Quality Objectives. The Selected Alternative is very similar to Alternative S. Technically, the administrative study areas in General Forest are not counted in the higher Visual Quality Objective categories so the value for this display would be 605 thousand acres. However, the administrative study areas will have little development and the environmental consequences will be very similar to Alternative S

Visual Resources
(Preservation, Retention and Partial Retention VQO's, M Acres)



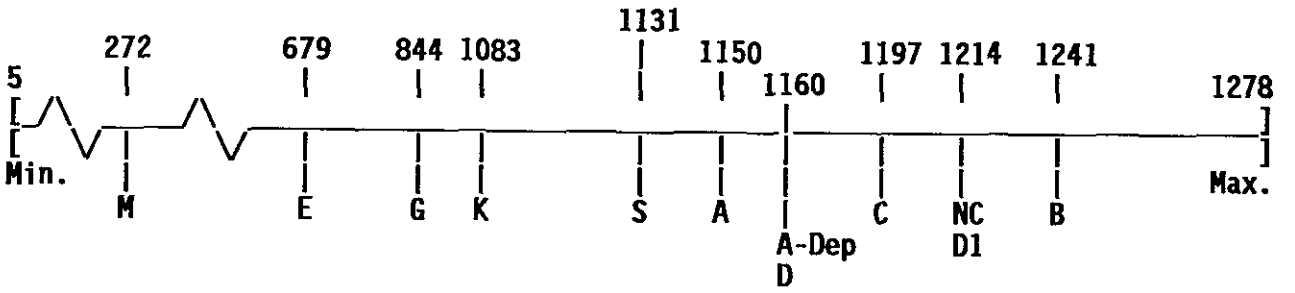
Unroaded recreational opportunities are reflected in the number of acres, in thousands, assigned to unroaded management prescriptions in Management Areas 1 through 9 as illustrated below The Selected Alternative is essentially the same as Alternative S, although the administrative study areas within Management Areas 10 through 14 of the Selected Alternative are not counted as unroaded. Acres in Management Areas 1 through 9 are 92 thousand, however the administrative study areas will remain largely unchanged from their existing condition in the next decade resulting in effects closer to Alternaitve S.

Inventoried Unroaded Areas Assigned to Unroaded Management Prescriptions (M Acres)



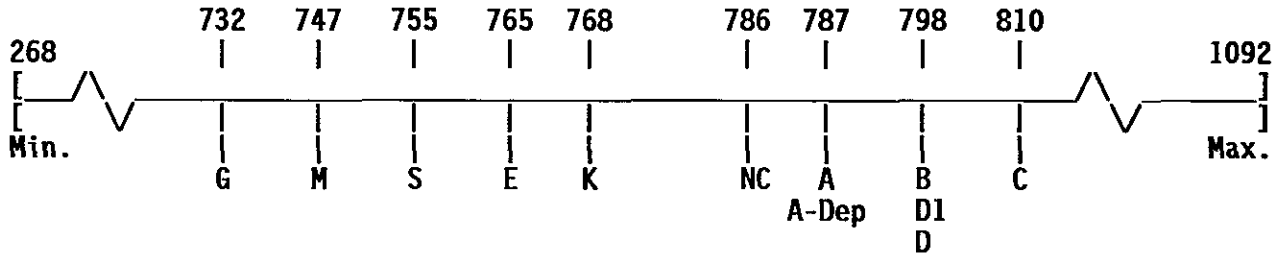
Present net value is an indicator of economic efficiency displaying the difference between discounted costs and discounted benefits, expressed in millions of dollars (MM $), over a 150-year planning horizon. A four percent annual discount rate was used. The Selected Alternative has similar economic consequences to Alternative S updated for the change in ASQ resulting from the 1987 Fires; present net value is 1,101 million dollars.

Present Net Value
(150 Year Planning Horizon, MM $)



Opportunities for mining activities are reflected in the acres of low and moderate accessibility restrictions and are displayed below with data expressed in thousands of acres. Mineral accessibility is primarily a function of the land area allocated to management categories where mineral restrictions apply. The only difference between Alternative S and the Selected Alternative in this measure results from the shift of Backcountry Recreation areas to the Supplemental Resource Management Area which is anticipated to be more restrictive This results in the Selected Alternative having 748 thousand acres in the low and moderate restriction categories.

Mineral Accessibility
(Accessible Areas with Low and Moderate Restriction, M Acres)



ALTERNATIVES CONSIDERED, BUT ELIMINATED FROM DETAILED STUDY

In addition to the alternatives discussed above, the Interdisciplinary Team evaluated other approaches to managing the Forest, but did not study all of them in detail. (For more information on these alternatives, see FEIS, Chapter II, "Alternatives Considered, But Eliminated From Detailed Study ")

DESIGNATED AREAS

Several areas of the Forest have received special designation by Congress or the Chief of the Forest Service. These include Wild and Scenic Rivers, Wildernesses, RNA's, and Botanical areas. An alternative could have been developed that proposed changing the management direction for some or all of these existing areas. Although there has been considerable public debate about some of the areas, there seems to be widespread support for the present designations

PARK ALTERNATIVES

Several alternatives have been proposed by individuals or groups for areas surrounding the Rogue, Illinois, and Smith Rivers for possible designation as National Parks. At one time, the National Park Service suggested study of a potential "Wild Rivers National Park," but later withdrew its proposal. These alternatives were considered, but eliminated from detailed study for a number of reasons

Although the CEQ regulations do provide for agencies to "include all reasonable alternatives not within the jurisdiction of the lead agency" (40 CFR 1502.14), alternatives which place lands currently administered by the Forest Service into the hands of other jurisdictions were not reasonable considering the scope of this Forest Plan proposal. The purpose of the Forest Plan is to "provide for multiple use and sustained yield of goods and services ." (36 CFR 219 1(a)). National Parks are, by law, not managed under the principles of multiple use and sustained yield.

Consideration of possible inclusion in the National Park System has been specifically assigned by Congress to the Secretary of the Interior; designation of a National Park requires Congressional action

In response to public comments, several aspects of what National Parks offer the public were seriously considered by the Forest Suggestions for increased emphasis in tourism and recreation have resulted in cooperative efforts with local government, State, and other Federal agencies Alternatives E and G include land allocations to Backcountry Recreation and other Management Areas that allow uses and activities similar to those encompassed in National Park proposals. Considerable unroaded area is allocated to Backcountry Recreation in the Selected Alternative. Increased emphasis is given to visual allocations along more heavily used recreation travel routes.

DEPARTURES

A departure from nondeclining yield would allow harvesting more timber in the near future with a reduction in timber harvest in decades three through five. Two alternatives which include a departure from nondeclining yield were evaluated. A third departure alternative, Alternative K-Departure, was developed in the DEIS, but was dropped from detailed consideration in the FEIS. Departure alternatives could have been developed for all of the alternatives, but none were identified that would have added to the resolution of the Planning Problems. Additionally, there was little public support expressed for creation of additional departure alternatives

SHORT ROTATIONS

Use of rotations shorter than culmination of mean annual increment (CMAI) of growth for intensively managed timber stands has been suggested by individuals and organizations. Timber would be harvested at a higher rate in the near future. However, instead of a reduction in future harvest levels, this option would schedule stands to be harvested at ages prior to CMAI to fill in the gap and maintain nondeclining flow

The NFMA requires the Forest Service to harvest, generally, only stands of trees that have reached CMAI. However, alternatives that incorporate exceptions to these standards can be analyzed "if it is reasonable to expect that the overall multiple use objectives would be better attained" (36 CFR 219.16).

Alternative D1 develops this option for detailed study and comparison purposes. Additional alternatives or variations were considered but eliminated from detailed study. Analysis of the use of short rotations has not clearly shown that overall multiple use objectives would be better attained. Developing alternatives in detail with variations of this option would not provide significant new information.

BENCHMARKS

A benchmark is an analysis reference point used to define the bounds within which an alternative can be formulated They were not developed with the intent that they be implementable. Several benchmarks were modified and are included as full alternatives. Others were dropped from further consideration The following benchmarks were used in the alternative development process:

Minimum Level. This benchmark proposed only maintenance of the basic resources of the Forest. This would be a "no activity" alternative, but was not considered to be the NEPA-required "No Action" alternative It was dropped from further consideration because Alternative M has a similar focus on nondevelopment, yet better satisfies the Planning Problems.

Maximum Present Net Value. This benchmark emphasized timber harvest activity. The results were similar to the timber benchmark.

Current Direction This benchmark was modified slightly to become Alternative A Alternative A is the NEPA-required "No Action" alternative.

Maximum Timber This benchmark was modified slightly to become Alternative C.

Recreation. This benchmark was modified to become Alternative E.

Wildlife. A preliminary alternative was developed based on this benchmark. It was dropped from further consideration because it was similar to Alternative G.

Fish. The elements of this benchmark which contribute to high quality fish habitat were incorporated into several alternatives.

PRELIMINARY ALTERNATIVES

The following alternatives were developed and evaluated, but subsequently dropped from detailed consideration

Habitat Diversity Alternative F: This alternative was developed from the wildlife benchmark. It was dropped from detailed study because it was similar to Alternative G.

Maximum Fish. Alternative H: This alternative was developed to produce high levels of fish outputs. It was dropped from detailed study because many of its elements were duplicated in other alternatives.

Selected Amenity. Alternative I: This alternative was developed to respond to a wide range of user groups and interests by concentrating undeveloped allocations in areas unsuitable for timber. This did not result in a logical delineation to respond to Planning Problem Eight, dealing with roadless areas, and offered little else not included in other alternatives.

Economic Efficiency. Alternative J: This alternative was developed to maximize present net value. It was similar to the Maximum Present Net Value and Maximum Timber Benchmarks and Alternative C.

Variations of Alternative K. Several minor variations of land allocations along the north boundary of the Kalmiopsis Wilderness were considered for Alternative K. They were dropped for the same reasons as the Selected Amenity Alternative

DEIS ALTERNATIVES

Two alternatives developed in detail in the DEIS were eliminated from evaluation in the FEIS

Alternative K-Departure Land allocations and management direction for this alternative are identical to Alternative K, except for the timber program. Timber harvest schedules depart from the policy of nondeclining flow. This alternative does not offer any better way to meet multiple-use objectives and did not receive broad public support.

Alternative L. This alternative received little public support, other than for its retention of unroaded areas. This element of Alternative L is represented with some modification in Alternative S.

ADDITIONAL WILDERNESS DESIGNATION

Another possible area for alternative development would have involved the proposal of additional Wilderness and higher levels of trail development within Wilderness. No alternatives proposing additional

Wilderness on the Forest were considered in detail. Alternatives such as E, G, K, and M provide the option for future Wilderness designation through the maintenance of existing roadless areas.

When Congress passed the Oregon Wilderness Act in 1984, it included language which stated that "the Department of Agriculture shall not be required to review the wilderness option prior to the revision of the [Forest] plans...." There has been no designation on the Forest since 1984.

Alternative levels of trail development are considered for the Wildernesses. Higher levels could have been considered, but there has been no expressed public interest in this type of wilderness development

ALTERNATIVES WITH MORE DETAILED IMPLEMENTATION

The planning process could have developed additional implementation direction, down to the project level, for the alternatives. The choice is to make this a programmatic FEIS. If project-level planning had been included, an already complex process would have become unwieldy.

Evergreen Alternative

This alternative was proposed by the Southern Oregon Timber Industries Association (SOTIA), and was supported by a large number of people who responded to the DEIS. All of the elements suggested as part of the Evergreen Alternative were considered in the development of Alternative S. Some of these elements are included in Alternative S and in the Selected Alternative. A number of elements are included in other alternatives.

Gregory Alternative

This alternative was developed by Gregory Forest Products, Inc., of Glendale, Oregon It is based on Alternative A of the DEIS. The elements of this alternative are found within the range of the alternatives; several are incorporated in Alternative S and the Selected Alternative.

State of Oregon Alternative

This alternative was developed by the State of Oregon with a public review process separate from the review conducted by the Forest Service. It includes suggested changes in land allocations. It also recommends a number of technical corrections and refinements to improve the analysis and reliability of resource output projections, and emphasizes intensification of timber management for areas where the management objectives include timber production.

Alternative S and the Selected Alternative have many similarities to the State of Oregon Alternative. Many of the recommendations are incorporated in the Selected Alternative and vary only by degree. A number of the technical corrections and refinements have been incorporated in the analysis. Other elements of this alternative are included in various forms throughout the range of alternatives.

Chapter V - REQUIRED COMPARISONS OF ALTERNATIVES

HIGHER PRESENT NET VALUE ALTERNATIVES

Net Public Benefit (NPB) is the overall long-term value of all benefits less all associated costs. Many priced benefits and all financial costs of management can be measured in dollars. However, other nonpriced public concerns, benefits, and negative effects cannot be fully valued in economic terms.

The future value to society of this Forest will depend upon the mix of economic and other values that are produced and the costs of managing the Forest to produce these values. In determining the most economically efficient alternative, the Forest uses an estimate of present net value (PNV). PNV is the sum of priced benefits minus the sum of costs for the 150-year planning horizon, discounted to the present.

Emphasizing responses to issues that focus on nonpriced outputs reduces net economic values, principally because of reductions in the timber production land base. Timber is the main component of PNV. Land allocations to the Backcountry Recreation, Supplemental Resource, Research Natural Area, Botanical, Unique Interest, and Designated Wildlife Habitat Management Areas reduce the area for programmed timber harvest.

The Selected Alternative has a PNV of 1,101 million dollars (MM$). The following Alternatives have higher PNV's than the Selected Alternative:

Alternative	PNV(MM$)
B	1,241
D1	1,214
NC	1,214
C	1,197
D	1,160
A-Departure	1,160
A	1,150
S	1,131

Although the Selected Alternative has a lower PNV than alternatives listed above, it provides greater overall Net Public Benefits. While recognizing the importance of the Siskiyou National Forest to local and National economies, it provides higher overall benefits recognizing the importance of non-priced values such as water quality, fish and wildlife habitat, scenic values, and biological diversity. The Selected Alternative is sensitive to both economic and environmental issues, striking an appropriate and realistic balance among commodity and amenity values.

The Selected Alternative is more responsive to public concerns expressed during the comment period than any of those alternatives having higher PNV's. It includes more acreage in the Backcountry Recreation Management Area, reducing its timber base, and consequently its PNV. Allocations to Backcountry Recreation were increased partly in response to numerous public comments on the DEIS.

Another issue that generated numerous public comments is riparian area management. The Selected Alternative addresses this concern through assignment of additional Planning Basins to a more restrictive Riparian Management Prescription. This reduces PNV through limiting timber harvest in those areas.

Alternative B has the highest PNV of all of the alternatives. It would result in higher levels of accelerated forest sedimentation than the Selected Alternative. It would also result in fewer acres of reserved old growth, and substantially fewer acres allocated to Backcountry Recreation, Botanical Areas, Unique Interest Areas, Supplemental Resource Areas, and Special Wildlife Sites than in the Selected Alternative.

Similar comparisons can be made between the Selected Alternative and each of the other alternatives with higher PNV's. The Selected Alternative strikes a balance between economic benefits and environmental concerns, as illustrated by these comparisons. (For more detailed comparisons of the alternatives, see FEIS, Chapter II, "Comparisons of the Alternatives Considered in Detail.")

The average timber sale sold on the Forest has revenues exceeding costs by approximately 1,000,000 dollars. (For more information, see the Planning Records.) However, there are some conditions where below cost sales may occur. These areas are characterized by a combination of factors such as low-valued species, low volumes of commercial species per acre, high logging costs, high site preparation and regeneration costs, and expensive road building for the initial entry. Cost reduction reviews, scheduling of sales, economic analysis, and organization of harvest units within sales are presently used to minimize the timber sale program costs

ENVIRONMENTALLY PREFERABLE ALTERNATIVES

Alternatives E and G are the environmentally preferable alternatives. "Environmentally preferable alternative" is defined by CEQ regulations as the alternative causing the least adverse impact to the biological and physical environment.

Alternative E emphasizes the aesthetic values of the Forest by promoting goods and services which do not necessarily have established market values. Alternative G emphasizes the health and productivity of the Forest's water-related resources.

I did not select either Alternative E or G because they fail to provide the balance between economic benefits and environmental concerns provided by the Selected Alternative. Implementation of Alternative E would result in a first decade ASQ of 16.2 MMCF; Alternative G in an ASQ of 20.5 MMCF. PNV's of Alternatives E and G are 679 million dollars and 844 million dollars, respectively.

Two of the goals of the Forest Plan are to "help to satisfy local, regional, and National social and economic needs" and to "provide a sustained yield of resource outputs at a level that will promote the stability of local communities...." The Selected Alternative does this with an ASQ of 28.7 MMCF and a PNV of 1,101 million dollars. Alternatives E and G fail to meet the economic needs of or promote the stability of local communities because of their emphasis on nonpriced outputs.

Chapter VI - IMPLEMENTATION SCHEDULE

SCHEDULE AND IMPLEMENTATION

The Forest Plan will be implemented through identification, analysis, selection, and scheduling of projects to meet the management goals and objectives provided by the Plan.

The schedule of proposed and possible projects for the first decade is contained in the appendices of the Forest Plan. Project schedules will be available for review at the Ranger District Offices and the Supervisor's Office Schedules of possible projects will routinely change as projects are implemented or are removed from the listings for other reasons, and as new projects take their place Adjustment to the schedule may be made based on results of monitoring, budgets, and unforeseen events

The Forest Plan provides direction in the form of goals and objectives, Standards and Guidelines, monitoring requirements, and probable scheduling of management practices. It does not cover projects on specific sites except in a broad manner. Each proposed project will be subject to site-specific analysis and documentation in compliance with NEPA. Considerations revealed through this process may result in a decision not to proceed with the proposed project, even though the project may be permissible under the Forest Plan.

The Plan's scheduled projects are translated into multiyear program budget proposals The schedule is used for requesting and allocating the funds needed to carry out the planned management direction. The Forest's current year tentative annual program of work will be derived from this process Upon approval of a final budget for the Forest, the annual work program will be updated and carried out.

The Forest work program will implement the management direction of the Forest Plan Outputs and activities in individual years may be significantly different from those shown in Chapter IV of the Forest Plan, depending on final budgets, new information derived from updated inventories and monitoring, and any future amendments or revisions of the Forest Plan.

The Forest Plan supersedes or incorporates all previous land and resource management plans prepared for the Siskiyou National Forest. Upon implementation of the Forest Plan, Forest management activities will comply with the Forest Plan. Appropriated budgets may alter the schedule of activities. In addition, all permits, contracts, and other instruments for the use and occupancy of National Forest System Lands and resource uses must be in conformance with the Forest Plan. Such documents will be revised where needed as soon as practicable, subject to valid existing rights. This updating will generally be done within three years.

All timber sales offered for sale after issuance of the Forest Plan will be in compliance with direction contained in the Plan. Timber sales now under contract will be administered under provisions of the existing contracts. Changes to existing timber sale contracts may be proposed on a case-by-case basis where overriding resource considerations are present.

The Forest Plan will be implemented 30 days after the Notice of Availability of the Forest Plan, EIS, and Record of Decision appears in the Federal Register.

AMENDMENT AND REVISION

This Forest Plan may be changed either by an amendment or a revision An amendment may become necessary as a result of many different situations. These could include:

1. Recommendations of the Interdisciplinary Team based on their review of monitoring results

2. The determination that an existing or proposed permit, contract, cooperative agreement, or other instrument authorizing occupancy and use are not consistent with the Forest Plan but should be approved.

3 Changes in proposed implementation schedules needed to reflect differences between funding levels assumed in the plan and funds actually appropriated.

4. Changes necessitated by resolution of administrative appeals.

5. Changes to correct planning errors.

6. Changes made necessary by altered physical, biological, social, or economic conditions

Based on an analysis of the objectives, guidelines, and other aspects of the Forest Plan, the Forest Supervisor shall determine whether a proposed amendment would result in a significant change to the plan. If the change is determined to be significant, the Forest Supervisor shall follow the same procedure as that required for development and approval of a plan. If the change is determined not to be significant, the Forest Supervisor may implement the amendment after appropriate public notice and compliance with the NEPA.

I will approve any significant amendments while the Forest Supervisor will approve non-significant amendments The determination of significance will be documented in a decision notice and would be appealable under 36 CFR 217.

With respect to revision, the NFMA requires revision of the Forest Plan at least every 15 years. However, it may be revised sooner if physical conditions or demands on the land and resources have changed sufficiently to affect overall goals or uses for the entire forest. If a revision becomes necessary, the procedures described in 36 CFR 219.12 will be followed The Chief, however, must approve the scheduling of such revision.

Because the timber issues on the Siskiyou National Forest remain polarized and emotionally charged, I will monitor personally the ongoing analyses and discussions in that area. One of the primary reasons I selected Alternative S, as modified, is the fact that it strikes the best balance between community stability and protection of the environment. The allowable sale quantity of 28.7 MMCF reflects that balance. However, outstanding technical questions continue to be raised.

We have already told the primary commenters that resolution of all technical questions is not possible prior to publishing the final plan, but that analysis of technical issues would continue thereafter. We have also indicated that the results of the new inventory may be used to change the final plan. Should the targeted allowable sale quantity change by five to ten percent, I would have to reconsider certain aspects of my decisions here.

Chapter VII - MONITORING AND MITIGATION

The Monitoring and Evaluation Program is the management control system for the Forest Plan. It will provide information on the progress and results of implementation. The results of the Program will be used to assess the need for amending or revising the Forest Plan. (For more information on the Monitoring and Evaluation Program, see LRMP, Chapter V, Table V-1 and Appendix D.)

The Interdisciplinary Team will use information from this program to check that the Standards and Guidelines established in the Plan are met. They will also evaluate the effectiveness of the Standards and Guidelines in meeting Forest Plan objectives, and in maintaining environmental quality.

Additionally, the information will be used to meet the following objectives:

Determine whether programs and activities are responsive to public issues and management concerns.

Determine whether work force, resource, and cost information in projecting output and impacts are correct.

Determine whether and how activities on nearby lands managed by other agencies or landowners are affecting management of the Forest.

Determine whether research, beyond that identified in Chapter II of the Forest Plan, is needed.

Mitigation measures are intended to cause an action to become less harsh or severe. These measures are an integral part of the Standards and Guidelines for each Management Area and, therefore, an essential part of the Forest Plan. Mitigation is extremely important in the design and implementation of all projects.

Implementation of the Forest Plan is guided by the Forest-wide Standards and Guidelines and the Management Area Prescriptions called for in Chapter IV of the Forest Plan. These management standards were developed through an interdisciplinary effort and contain measures necessary to mitigate or eliminate any long-term adverse environmental effects.

Also included in the Forest Plan as mitigation measures are the Best Management Practices (BMP's) (For more information on BMP's, see LRMP, Appendix F)

To the best of my knowledge, all practical mitigation measures have been adopted and are included in the Forest Plan.

Chapter VIII - APPEAL RIGHTS AND APPROVAL

This decision may be appealed in accordance with the provisions of 36 CFR 217 by filing a written notice of appeal within 90 days of the date of this decision. The appeal must be filed with the reviewing officer.

F. Dale Robertson, Chief
USDA Forest Service
P.O Box 2417
Washington, D.C. 20013

A copy must simultaneously be sent to the deciding officer:

James F. Torrence, Regional Forester
Pacific Northwest Region
USDA Forest Service
319 S.W. Pine
P O Box 3623
Portland, Oregon 97208-3623

The notice of appeal must include sufficient narrative evidence and argument to show why this decision should be changed or reversed (36 CFR 217 9)

Requests to stay approval of the Forest Plan under 36 CFR 217 will not be granted

No decisions on site-specific projects are made in this document. The schedule of proposed and possible projects for the first decade is contained in the appendices of the Forest Plan Final decisions on these proposed projects will be made after site-specific analysis and documentation in compliance with NEPA.

Planning Records contain the detailed information and decisions used in developing the Forest Plan and EIS as required in 36 CFR 219 12

If you would like more information on the Forest Plan or EIS, or would like to inspect the Planning Records, contact:

Ronald J. McCormick, Forest Supervisor
Siskiyou National Forest
200 N E Greenfield Road
P.O. Box 440
Grants Pass, Oregon 97526-0242
(503) 479-5301



JAMES F. TORRENCE
Regional Forester
Pacific Northwest Region
USDA Forest Service

3-10-89
Date

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