United States
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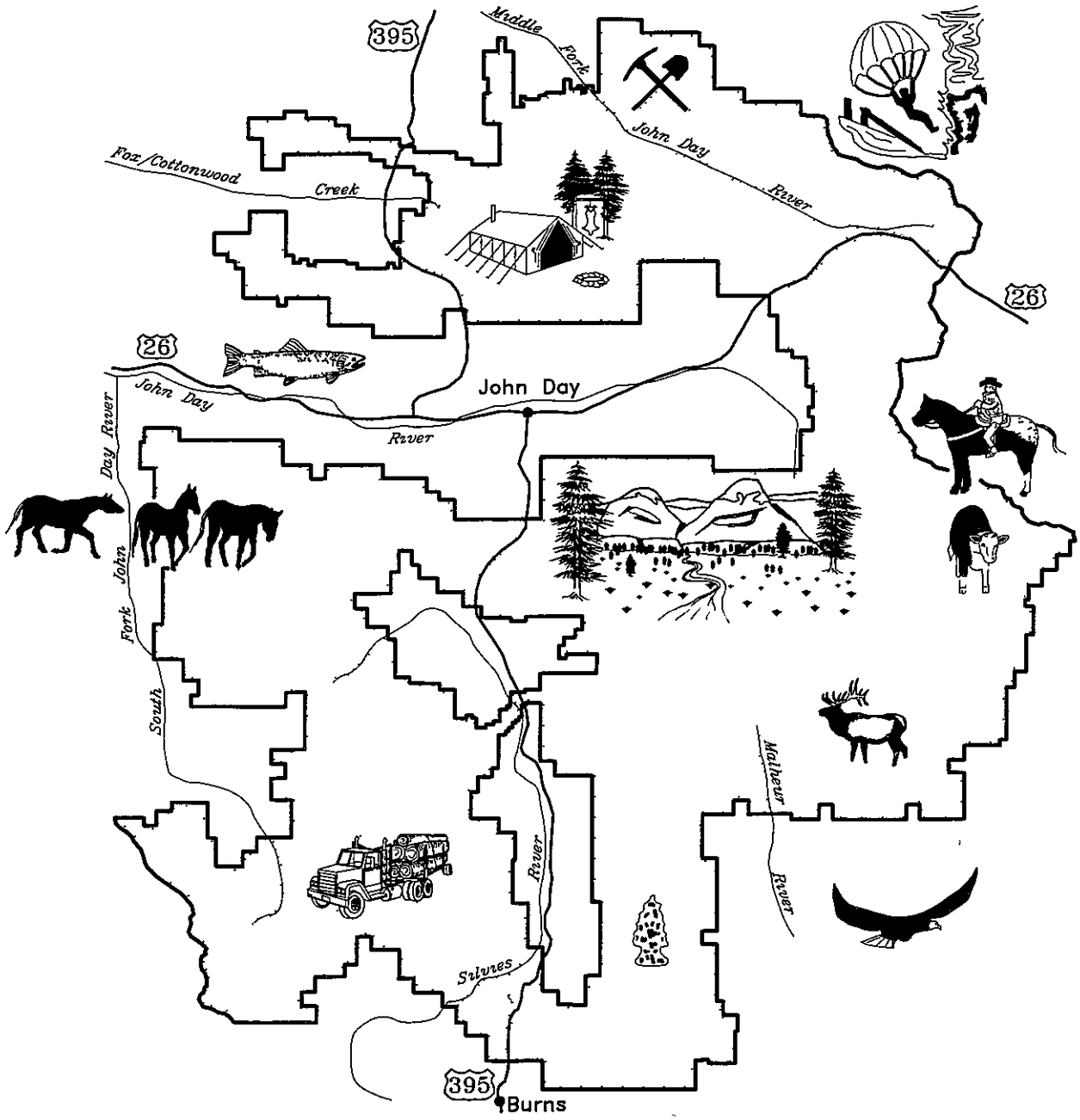
Appendices - Final Environmental Impact Statement

Land and Resource Management Plan

Malheur National Forest



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Appendix A

ISSUES, CONCERNS AND OPPORTUNITIES

APPENDIX A ISSUES, CONCERNS, AND OPPORTUNITIES

A. ISSUES, CONCERNS, AND OPPORTUNITIES IDENTIFICATION

Forest planning is an issue-driven process As such, the process is based on responsiveness to changing conditions of the land and resources and changing social and economic demands of the American people

The first step in the planning process is the identification and evaluation of public issues, management concerns, and resource use and development opportunities For this Forest, that step ultimately resulted in the five issues described in Chapter I of this document

The lengthy process of arriving at those five issues is detailed in this appendix and the results summarized in Table A-1.

The process of identifying issues, concerns, and opportunities for the planning effort began in December 1980 when 36 preliminary issue questions were presented to the public for their comments The list was developed by the Forest planning team from previous public input to Forest unit plans, the Timber Resource Plan, appeals, the Regional Guide, Resource Planning Act, RARE II, and from correspondence.

These potential issues were written questions that needed to be resolved through the planning process and were grouped under the major Resource Planning Act elements

Four public meetings were held to present the planning process and to provide opportunities for citizens to express their opinions These meetings were held according to the following schedule

Burns, Oregon	January 12, 1981
John Day, Oregon	January 13, 1981
Long Creek, Oregon	January 14, 1981
Prairie City, Oregon	January 15, 1981

These meetings were attended by approximately 90 people. Meetings were also held for all Forest employees

A response form was distributed displaying the original 36 possible issues, and approximately 260 responses were received

When the interdisciplinary team evaluated these responses, it became apparent that many similar concerns were expressed so those topics were grouped together and "tied" to an original issue by interdisciplinary team members. Then each response was screened against the following five criteria.

1 Is the response within the legal responsibilities of the Forest Service?

2. Should this response be addressed by another Federal, State, or local government agency?

3. Can this response be best resolved at the National, Regional, or Forest level?

4. Can this response be resolved effectively in the Forest planning process?

   a. Does it affect Forest land use patterns?

   b. Will it have an effect on the quality, quantity, or type of products, goods, or services produced (or that could be produced) from the Forest?

5. Can this response be more effectively resolved through management processes that already exist (environmental assessment, Forest Service Manual policy statements)?

The 36 original preliminary issue questions and responses were then evaluated by both the Forest's management team and interdisciplinary team. Based on common elements and the interrelationship of the responses, the 36 original preliminary issue questions were grouped into 13 preliminary issues which incorporated both public issues and management concerns and opportunities.

Following is Table A-1 which displays the 36 preliminary issues and the disposition of each in the beginning of the planning process

TABLE A-1

DISPOSITION OF PRELIMINARY ISSUES, CONCERNS, AND OPPORTUNITIES

Preliminary Issue Number	Subject	Disposition
1	Undeveloped/Primitive recreation	Roadless Area Issue
2	Off-road vehicle recreation	Standards
3	Developed recreation	Alternative Resolution
4	Quality of wilderness experience	Deferred to wilderness planning
5	Management of fire, insects, and disease in wilderness	Deferred to wilderness planning
6	Management of habitat	Habitat Issue
7	Diversity	Not designated as an issue; this will be evaluated as an effect of each alternative
8	Road closures	Habitat Issue
9	Habitat of Threatened and Endangered Species	Standards
10	General wildlife habitat management	Standards
11	Old-growth Management	Alternative Resolution
12	Anadromous fisheries habitat	Riparian Area Issue
13	Riparian area management	Riparian Area Issue
14	Forage allocation	Habitat Issue
15	Range allotment management	Riparian Area Issue
16	Timber harvest level	Timber Management Issue
17	Intensive timber management	Timber Management Issue
18	Allocation of forest land	Timber Management Issue
19	Departure from nondeclining flow	Timber Management Issue
20	Wood residue utilization	Timber Management Issue
21	Water quality	Riparian Area Issue
22	Water quantity	Riparian Area Issue
23	Mineral resource management	Not designated as an issue, the effects of each alternative on the availability of mineral resources will be evaluated
24	Dependent community stability	Community Stability Issue
25	Social impacts	Community Stability Issue
26	Role of fire	Standards
27	Role of integrated pest management	Standards
28	Role of law enforcement	Standards
29	Use of pesticides and herbicides	Standards
30	Landownership adjustment	Project-level planning
31	Intermingled ownership	Project-level planning
32	Public access	Standards
33	Soil resource protection	Standards
34	Level of road management	Standards
35	Trails management	Standards
36	Management of Pine Creek	Roadless Area Issue

During the summer of 1981, various mining companies with local interests were contacted because they had not been part of the original mailing

In late August 1981, the 13 preliminary issues were approved by the Regional Forester. These issue questions were then used as the basis for further planning activities.

In October 1982, the United States Court of Appeals for the Ninth Circuit upheld a lower court's decision that the environmental impact statement for the Roadless Area Review and Evaluation (RARE II) was inadequate. The Assistant Secretary of Agriculture at that time, John Crowell, decided that the Forest Service should evaluate future management possibilities, including wilderness, for the areas that had been previously evaluated in the RARE II process.

In October 1983, the planning regulations were revised to direct reevaluation of those roadless areas In February 1984, a Forest Plan Report from this Forest was sent to all addresses on the mailing lists of the Malheur, Umatilla, Ochoco, and Wallowa-Whitman National Forests in order to reach as many interested people as possible with this new issue This report provided a review of the 13 preliminary issues, and introduced the new issue of roadless area evaluation Information and a map on each of the 20 areas on the Forest were included Recipients were asked to comment about the specific roadless areas and to submit any other comments they wished to make About 500 responses addressed the 14 preliminary issues and provided detailed information about the 20 roadless areas on the Forest.

The Oregon Wilderness Act was passed on June 26, 1984, designating 2 of the 20 roadless areas as a part of the National Wilderness System and "releasing" the rest of the areas from further consideration as wilderness with one exception. The exception to this is the Pine Creek Further Planning Area which meets the criteria for wilderness and which was not evaluated in the RARE II process.

On May 1, 1984, the 14 preliminary issues were consolidated into 9 "planning topics " These planning topics were (1) timber management, (2) range management, (3) social and economic impacts, (4) recreation, (5) transportation system management, (6) riparian area and fisheries habitat management, (7) habitat, (8) old-growth forest, and (9) undeveloped area management. These nine planning topics provided the framework within which alternatives were formulated

During May 1987, the nine planning topics were reviewed again Five of these planning topics were determined to be the key issues which drove alternative formulation. The other four planning topics were not significant factors in alternative formulation, however, the topics they represent are addressed through the range of alternatives presented in this Final Environmental Impact Statement The various ways of addressing these topics in the alternatives reflected the management emphasis of the individual alternative For example, an alternative which emphasized retention of unroaded areas would also emphasize dispersed recreation and old-growth habitat management

The five key planning issues are described below

Economic Stability: How will management of Forest resources affect local communities?

The Malheur National Forest comprises about 39 percent of Grant County's acreage and 5 percent of Harney County's acreage, as well as small acreages in Baker and Malheur counties. Because of the substantial acreages, distinct economic ties, and the peoples' use patterns, the Forest's primary zone of influence has been determined to be Grant and northern Harney counties.

Malheur National Forest policies have a direct impact on local, dependent industries which in turn affect business income, wages, employment, and revenues to the counties. The principal industries in the Forest's zone of influence are wood manufacturing, agriculture (i e , ranching), and retail trade These three industries account for about half of all employment in the area Another large part of the economy is government employment, and much of that is also based on timber and livestock management.

Forest management activities and the resulting outputs influence job opportunities, incomes, and the way of life of the approximately 15,000 residents in local communities Changes in Forest outputs and activities will affect the social and economic life of the local population

Economic stability is acknowledged to be very important, and social stability is strongest when the local industries are healthy Many people (e.g , mill employees, government officials, business owners) equate stability with a *sustained supply of Malheur National Forest timber adequate to meet the demands of* local industry Some individuals or groups (e g , preservationists, conservationists, the Chambers of Commerce, retailers) also think that the counties have been too dependent on timber manufacturing, and that a more diversified economy should be cultivated, including growth in tourism Currently, most tourism occurs during the fall hunting season

The Malheur National Forest also plays a role in county finances through payment of 25 percent of its revenues to the counties This money, of which 99 percent is from timber-generated receipts, has a significant effect on the finances of county schools and roads In 1986, Grant County received $8 0 million and Harney County received $2.1 million from resource utilization on the Malheur National Forest.

The alternatives affect the local communities differently by supplying various mixes of Forest commodity outputs Some alternatives provide high levels of timber to support jobs and lifestyles dependent on the lumber and wood products industries Other alternatives emphasize recreation, visual resource quality, and wildlife and fish habitat, resulting in employment reductions in the local area The alternatives vary in economic value and efficiency depending on the mix of resource outputs. The following indicators are used to evaluate the responsiveness of the alternatives to this planning topic changes in jobs and income, and payments to counties

Timber Management: What level of sustained annual yield of timber products should the Forest provide while still maintaining Forest productivity and meeting local, regional and national needs? How much timber land should be managed for wood fiber production; what species should be favored; and what management methods should be used to achieve the desired harvest level and species mix?

The Forest has been providing timber products to the local and national market for over 70 years. The average annual volume of timber sold over the last 10 years (1980-1989) has been 227 million board feet per year During this period, the goal of the timber sale program on the Forest has been to gradually increase the annual volume sold to reach 270 million board feet by 1990 in order to have an average annual sell volume of 230 million board feet over the decade 1980-1990 (Malheur National Forest 1979 Timber Resource Management Plan). This planned increase has been within the physical ability of the Forest to produce timber

An analysis of the Forest's ability to purely produce timber indicates that the Forest could supply up to 59.1 million cubic feet (about 326 million board feet for the first decade) per year on a nondeclining flow harvest schedule.

The ability to increase future timber supply levels could have future implications for the local timber industry which is almost totally dependent on the Forest for its supply of raw material. Resource Planning Act National and Regional projections show increasing demand for timber in future decades. This National and Regional increase in demand for timber could increase demand for Malheur National Forest timber

The primary timber-producing species are ponderosa pine, Douglas-fir, western larch, true firs, and lodgepole pine In the past, the majority of the volume sold has been from mature, open, ponderosa pine stands (approximately 70 percent of the total volume sold), especially those found in fairly level, easily roaded areas. Local mills are currently maintaining a competitive market position by producing a quality ponderosa pine product Available areas for timber harvest are increasingly found in steeper areas forested predominantly with Douglas-fir, western larch, white fir, and grand fir. As timber stands are brought under forest management, trees of all species would be harvested at ages ranging from 50-150 years to maximize the utilization of the wood fiber production potential of the Forest. Most trees currently harvested are over 200 years old

Management of the timber resource interacts with every other resource on the Forest. The interrelationships are sometimes complementary, sometimes competitive, and sometimes mutually exclusive. Rising demands for other resource uses are increasing the complexity of timber management. The desire for old-growth habitat by groups such as Izaak Walton League, Audubon Society, Oregon Department of Fish and Wildlife, Oregon Natural Resources Council, and Grant County Conservationists to meet the needs of specific plants and/or animal species or for other reasons would reduce the timber volume available to respond to National and Regional demands and to maintain or expand the wood products industry in the community

The management methods which would provide the largest amount of wood fiber to meet national demands would provide this wood fiber primarily in smaller-diameter mixed conifer species Although the local and sub-regional timber industry is anticipating and planning for this shift in product, some industry members express concerns because their mills are currently set up to process larger-diameter trees and they have a more favorable market position with ponderosa pine. Local residents, hunters, and Forest visitors desire the appearance of mature, ponderosa pine stands and express concerns about the appearance and success of clearcuts on the Forest. County and State officials and private landowners emphasize the need for intensive management of the existing mixed conifer understory, particularly to reduce the losses related to western spruce budworm and other insect damage.

Competing demands for Forest resources are exemplified by the demand for wilderness and roadless areas which preclude timber management. This is described in a separate issue.

The relationship between big-game habitat and timber management is very complex. This is also described in a separate issue.

The amount of wood that can be offered for sale each year is based upon the amount of land suitable for timber production, the volume that the land is physically capable of producing, and the other resource objectives that must be met. Alternatives were developed that explored different ways of producing volumes of timber One approach was to allow harvesting on the maximum amount of suitable land while meeting minimum management requirements for wildlife, fish, and water Another approach was to increase the annual timber offerings by departing from a nondeclining evenflow level of harvest The extent to which the alternatives are responsive to this topic can be evaluated by the following factors: allowable sale quantity (ASQ), number of acres suitable for timber production, ponderosa pine volume offered, average annual acres clearcut, and average annual acres receiving overstory removal harvests and uneven-aged management prescriptions.

BIG-GAME HABITAT MANAGEMENT· What level of big-game habitat must be provided to meet the needs for desirable big-game herd levels?

Elk populations prior to 1970 were relatively stable, but low. During the past decade populations have steadily increased to a current summer population of about 6,600 elk, about one-third of these elk winter on the Forest. Management of big-game herd levels is the responsibility of the State of Oregon Department of Fish and Wildlife (ODF&W), while the USDA Forest Service manages the habitat occurring on the Forest. Mule deer populations have fluctuated during the past 40 years and are currently on a downward trend in 2 of the 7 game management units which include the Forest. The limiting habitat factor on big-game populations is winter range. Management of big-game winter range for elk is thought to provide for the wintering needs of mule deer as well since available mule deer winter range is minimal and overlaps with elk winter range

Most of the winter ranges have adequate forage (grass and grass-like species) to carry both the present number of livestock and the present number of wintering elk Ranchers on private land adjacent to the Forest are concerned about the movement of elk off the Forest to winter and spring range on private land. The increased potential of the Forest to carry larger populations of elk will also increase the potential for more elk to winter on private land. The State management objective for big-game populations for Game Management Units which occur on the Malheur National Forest is to supply winter habitat for approximately 2,865 elk.

The wildlife issue of most concern to the public deals with elk habitat for elk hunting opportunities. Much of the Forest's recreation use occurs during the deer and elk hunting seasons. Most local, and many regional and state residents and hunter's groups are concerned about Forest management activities and their effect on elk numbers and hunting opportunities. Most hunters are not concerned specifically about population numbers, but are more concerned about the length of the hunting season, opportunities for success, and whether hunting will be on a limited entry basis that would reduce their hunting freedom

To meet the needs of a given population of big game, habitat quality is determined by the appropriate mix and quality of cover, forage, and road density (security from disturbance) Timber management activities since 1970 have improved the balance and distribution of cover and forage on many areas of the Forest, and with adequate road management, the elk population is expected to increase. However, in other areas, the habitat conditions have not been improved.

Oregon Department of Fish and Wildlife population objectives for the elk herds, hunter success rates, and the need to limit hunting opportunities in certain units, are related to the anticipated effects of Forest management of the habitat. For example, in addition to total population objectives, Oregon Department of Fish and Wildlife has objectives for bull-to-cow ratios for each herd at the end of the hunting season. To ensure that not too many bulls get harvested, the Forest Service must limit access (by closing roads) or Oregon Department of Fish and Wildlife must keep the success rates at a level that will meet their population objectives by limiting the number of hunters. The Forest activity that most affects the management actions of ODF&W (to meet its population objectives) is the control of access for hunters using motorized vehicles.

The alternatives vary in their management of habitat The indicators used to evaluate the responsiveness to this planning topic are the wildlife user days produced, the cover/forage ratios, the potential elk population carrying capacity in winter and summer, the miles of road remaining open, and the acres of winter range maintained and/or enhanced

Riparian Area: What effect will Forest management activities have on riparian areas? What level of fisheries habitat productivity should be maintained; what level of timber harvest is compatible with riparian values; and what level of livestock grazing can be provided while managing for riparian dependent resources?

Although they occupy only about five percent of the Forest's land base, riparian areas are the most productive and biologically diverse areas on the Forest These areas provide important fish and wildlife habitat and often produce the most lush forage crops, and timber stands Within mineralized portions of the Forest, placer gold deposits are located in riparian areas Their gentle topography makes riparian areas attractive for road location and, in the semiarid west, the combination of water and riparian vegetation attracts recreationists Because of the variety and sometimes conflicting nature of these concentrated uses, they are also the areas with maximum potential for resource use conflicts on the Forest

National environmental groups (Izaak Walton League, Audubon Society, Sierra Club, etc.) believe that overgrazing and unregulated livestock use of these areas results in a loss of streamside vegetation, increased water temperature, excessive bank erosion, and accelerated sedimentation of gravel fish-spawning areas These groups have raised riparian management concerns to a national level, often calling for elimination of grazing They urge that these areas receive special attention in land management planning This is reflected in the special mention of riparian area management in the NFMA regulations

Locally, environmental groups, Indian tribes and the Columbia River Inter-tribal Fish Commission, and other agencies such as Oregon Department of Fish and Wildlife and the Environmental Protection Agency share these concerns to varying degrees, along with concerns regarding placer mining activities

Riparian area forage production and livestock access to water are critical to the grazing allotments on the Forest Degraded riparian areas do not benefit the permittees. On the other hand, local ranching operations would be adversely affected by significant reductions in permitted grazing levels The Grant County Resource Council and the Oregon Watershed Improvement Coalition also recognize the importance of healthy riparian areas and advocate coordinated uses of these areas, one of which includes grazing

The majority of riparian areas on the Forest are in a condition which will meet the needs of the riparian dependent resources However, approximately 235 stream miles have been inventoried as being in a less than desirable condition Less than desirable characteristics of these streams include extensive areas of unstable eroding streambanks, lowering of the water table, and lack of adequate stream surface shading. Although uncontrolled logging practices, roads adjacent to streams, insect outbreak, and fire can influence shading and streambank stability, the largest impacts on stream temperature and stability on the Malheur National Forest appear to be due to a reduction of hardwoods caused by ungulate grazing. With few exceptions, the majority of the gullies on the Forest are also the result of the loss of the stabilizing root system caused by a reduction in the hardwood community

There is generally a consensus that improving streams and watersheds which are in a less than desirable condition is beneficial for all resources and user groups; the cause of the decline, the specific methods and treatments used for improving the health of the stream systems, and the rate of improvement are some of the areas of contention and controversy. There are opportunities for increasing the rate of improvement in riparian zones; however, these are generally perceived as reducing the amount of forage available for livestock grazing and in reducing timber outputs

The alternatives vary in their management of riparian areas, which primarily determines the condition of the fisheries habitat The indicators used to evaluate the responsiveness of the alternatives to this topic are the livestock management strategy proposed for unsatisfactory riparian areas, the expected increases in anadromous fish production, and the average annual animal unit months of livestock grazing permitted

Roadless Areas: Should some or all of the Forest's roadless areas remain roadless, be opened to roaded development, or be recommended to Congress for wilderness classification?

The Forest currently has 18 separate undeveloped areas comprising 180,948 acres Some people enjoy the recreation experience available in areas which have many characteristics of wilderness but fewer restrictions. Such areas can be characterized as providing semiprimitive (nonmotorized or motorized) recreation opportunities Maintaining the undeveloped character would mean excluding such areas from regulated timber harvest and road construction. In areas providing for motorized use, off-road vehicle use may continue Mineral exploration and extraction could continue in both types of area.

Areas maintained in an undeveloped condition would also be eligible for future wilderness consideration National and regional environmental groups such as the Wilderness Society, Native Plant Society, and Oregon Natural Resources Council are philosophically opposed to development of these areas, stating that in many cases there is no need for development and they should remain undeveloped rather than foreclose on future wilderness possibilities. One of these areas, Pine Creek, must be evaluated at this time for potential inclusion in the National Wilderness System because it was designated for further planning review by the RARE II Final Environmental Impact Statement. These same groups, as well as local environmental groups, some hunters, and some local residents; favor roadless management of these areas because they believe it protects sensitive plant species, wildlife habitat, and water quality better than management geared toward consumptive uses.

Others; such as the mining and timber industry associations and businesses, many local residents, and local governments; state that the management of these areas has been in limbo long enough. They want to access and develop the resources in these areas to end the uncertainty about their availability. They state that the resources in these areas need to be managed so that they can contribute to local industrial and economic needs. They believe that wildlife habitat can be improved and the vegetation will be in a more vigorous condition if the resources are managed for consumptive uses (primarily wood fiber production)

There are 119,950 of these acres which are forested and capable of producing an annual long-run sustained yield of 4 4 million cubic feet (25.1 million board feet for the first decade) These same areas provide 92,408 acres of old-growth habitat. The resolution of these discussions will not come easily, and the disposition of these areas in an alternative will affect the social environment as much as the biological one

Maintaining areas in an undeveloped condition benefits resources such as recreation, fish and wildlife habitat, and research values The alternatives include various areas and amounts of land to be managed in an undeveloped condition. The indicators used to evaluate the responsiveness of the alternatives are the acres of unroaded areas retained in an unroaded condition and the management planned for the Pine Creek Further Planning Area.

B. PUBLIC INVOLVEMENT BETWEEN DRAFT AND FINAL

The Proposed Forest Plan and Draft Environmental Impact Statement were made available to the public on August 14, 1987 Approximately 1,800 copies of the Proposed Forest Plan and Draft Environmental Impact Statement "Overview" and 900 copies of the documents were distributed to individuals and organizations Copies were also available for review in public and college libraries in Burns, Bend, Ontario, Eugene, Corvallis, and La Grande, and at Forest Service offices throughout Oregon The deadline for submission of written comments was November 14, 1987. This was later extended to December 14, 1987.

Four public meetings were held during September 1987 in John Day, Burns, Prairie City, and Long Creek, Oregon to present the Proposed Plan and Draft EIS and to answer questions Approximately 100 people attended these meetings There were six meetings held for Malheur National Forest employees In addition to these planned activities, 21 meetings, interviews, and presentations were conducted with various interest groups, media, and individuals

The Malheur National Forest received written input from 3,563 people, organizations, and agencies in the form of letters, questionnaires, petitions, coupons, and form letters The majority of input (96 percent) was from individuals An input of 25 percent was from respondents living in Grant and Harney counties; 68 percent was from respondents living in other Oregon counties Most of the input received were form letters (78 percent)

In March 1988 the Forest invited all those who commented on the Proposed Forest Plan and Draft EIS to participate as a member of a "Citizens Working Group " The purpose of the working group was to bring together a group of interested and affected publics representing a variety of viewpoints regarding the management of the Malheur National Forest to discuss the Forest Plan

The first meeting was held in April, 1988 with over 50 people attending The objectives of the meeting were to (1) build rapport among participants, (2) clarify understanding of public comments of the draft planning documents, (3) update the planning process, and (4) identify a smaller group to meet for a two day meeting in May.

A second "Citizens Working Group" meeting was held in May 1988 with a group of 21 who were chosen by the larger group at the first meeting The objectives of this second meeting were to. (1) continue to build rapport among participants, (2) review preliminary results of the analysis of issues, (3) review information about issues developed at the first meeting, (4) explore potential areas of agreement among participants; and (5) narrow the scope of and/or clarify areas of continuing disagreement

Recommendations presented to the Regional Forester by the Forest were formulated using information and suggestions developed by the working group.

A detailed description of the public involvement process for the development of the Forest Plan can be found in Chapter V, of this Final Environmental Impact Statement.

C. ADDITIONAL ISSUES IDENTIFIED BETWEEN DRAFT AND FINAL EIS

The passage of time between the first step taken to identify Forest planning issues and the public review period of the plan, logically brought about changes in the condition of the land and changes in the social and economic demands of the American people

These changes were exemplified in the concerns expressed by the public during the public review process Numerous concerns were expressed and these concerns were summarized and organized into issues. These comment summaries and the corresponding Forest Service response can be found in Chapter V of the Final Environmental Impact Statement

In reviewing the public comments, additional key issues were identified as having significant importance to the Forest planning process. These additional issues, as well as other public concerns, were addressed between the issuance of the Draft Environmental Impact Statement and the Final Environmental Impact Statement through analysis and alternative development These issues played a valuable role in the development and identification of Alternative I as the preferred alternative These additional key issues are as follows·

Timber Management

1 Uneven-aged management. The public expressed a dislike for even-aged management in general and clearcutting in particular They also expressed a belief that uneven-aged management better protects all resources

2 Species mix There was concern expressed about the shift in species mix from a mostly ponderosa pine to a mixed conifer forest over the next 80-100 years.

3 Forest character: The public generally supported the maintenance of the existing Forest character; including an emphasis on ponderosa pine

Road Management

1 Specific road policy There appeared to be significant concern about the lack of a specific policy for road management on the Forest

2. *Road densities* *Comments revealed a belief that road densities are too high*

3 Road closures There was a desire for more road closures

4 Construction· The public expressed a concern that road construction and maintenance standards are too high

5 Elk habitat There was concern about the effects of roads on elk habitat

6. Cumulative effects. There was specific concern about the cumulative effects of road building on water quality, late season flows, and sedimentation

Elk Habitat Management

1 Winter range There was concern about winter range management, timber yields from winter range, and winter range improvement practices

2 Minimum cover requirements There was public concern that minimum cover requirements for summer and winter range may be too low and the definition of thermal cover may not be sufficient

3. Road closure policy The public expressed concern over the lack of a specific road closure policy in both summer and winter range

4 Habitat modeling process There was concern about the habitat modeling process in general

5 Population goals There was a desire for population goals by winter range area.

D. CONSULTATION WITH OTHERS

1. Other Agencies and Indian Tribes

Consultation with other State and Federal agencies has been continuous throughout the planning process

Governor's Forest Planning Team Numerous, detailed discussions have been ongoing with this planning team, since the Draft EIS was released in 1987 The most frequent communication has been in discussing technical and analytical assumptions and resulting outputs as related to management strategies for the Malheur NF

Oregon Department of Fish and Wildlife The most frequent contact has been with the local offices to coordinate information on elk winter range boundaries, Department management objectives and concerns, old-growth management, snag management and the planning process. Numerous phone conversations and meetings have occurred with this agency

Oregon State Forestry: The local Oregon State Forestry representatives have met several times with the Forest planning team to discuss State goals and concerns and to discuss the data used to represent the timber resource in the FORPLAN model.

Oregon Department of Transportation: The Parks and Recreation Division of this State agency supplied the proposed location of the Pacific Crest-to-Desert Trail, particularly where it passes through the roadless areas on the Forest.

USDI, Bureau of Land Management The Vale District and Burns District have produced resource management plans which have been reviewed by the Forest and discussed with BLM planners. In addition, a Statewide Wilderness Study Review is being developed The Forest is monitoring the progress of this review, particularly regarding two specific areas adjacent to the Forest (Aldrich and Bluebucket Wilderness Study Areas) The Forest is also coordinating management of the Murderers Creek Wild Horse Territory with the BLM

Other Agencies: The following Federal agencies have sent letters to the Forest expressing their interest in Forest planning and/or mentioning specific plans that may be useful in estimating effects of alternatives or opportunities for coordination

USDI, Fish and Wildlife Service
Advisory Council on Historic Preservation
National Forest Recreation Association
USDI, Heritage Conservation and Recreation Service
(no longer in existence)

County Plans - State Land Use Goals: The Forest is located in four counties, Grant, Harney, Baker, and Malheur Under the Oregon Land Conservation and Development Commission (LCDC) regulations, counties are required to have comprehensive management plans prepared which carry out the state-wide planning goals and to incorporate the plans and programs of the various governmental agencies into a single plan for the area. These plans are reviewed by the LCDC for compliance with the goals. County plans recognize the National Forests as "Forest Land" for their timber capability and also recognize that these lands provide considerable forage for livestock grazing. Grant and Harney Counties make up 97 percent of the Forest and are the only county plans reviewed.

Indian Tribes· The preliminary consultation with Indian Tribes was a result of coordinated meetings held by the Regional Office at selected locations throughout the Region The comments generated at these meetings were forwarded to the Forest and included in the planning process The Malheur Forest Supervisor and Planning Staff Officer have continued personal contacts with the Confederated Tribes of the Warm Springs Reservation and the Confederated Tribes of the Umatilla Indian Reservation.

The Treaties of 1855 with these tribes provided that they retain rights to hunt, fish at their usual and accustomed stations, gather roots and berries, and graze livestock on unclaimed lands in their traditional manner. Generally, their goals and concerns were related to the protection and improvement of the natural resources, especially those which the tribes utilize.

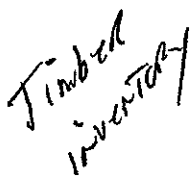
The Confederated Tribes of the Umatilla Indian Reservation provided the three Forests adjacent to their reservation or their ceded lands a document called "Recommendations for Forest Plans " This document identified the Tribes' concerns about treaty resources which could be affected by management of the Forests and recommended practices which they feel should be implemented to protect tribal rights and resources

The Confederated Tribes of the Warm Springs Indian Reservation provided very similar information about their concerns They have a comprehensive plan but it is not specific to the Forests within their ceded lands The Northern Paiute Tribe, which has a reservation north of Burns, Oregon, is one of these confederated tribes. Their concerns are much the same as those provided by the Umatilla Tribes.

2. Other Consultations and Contacts

Owners of Adjacent Land An effort was made to secure addresses of all owners of intermingled and adjacent land through the county tax offices. These landowners were sent a letter inviting their participation in the planning process and bringing them up-to-date. All responses from this group were integrated into the input analysis process for issues, concerns, and opportunities and respondents were added to the mailing list

Timber Industry Various representatives of timber industry groups have met with the Forest planning team throughout the planning effort. The contacts have generally been for the purpose of bringing the representative up-to-date on planning progress and to explain technical details regarding the FORPLAN model or timber data These groups include



Industrial Forestry Association
Northwest Pine Association
Association of Oregon Loggers
Malheur Timber Purchasers

Blue Mountain/Grant County Resource Councils Several presentations have been made to the Grant County Resource Council at their request. These presentations have been for the purpose of apprising the council of planning progress and discussing the FORPLAN model Group members have provided input at the issues, concerns, and opportunities development and roadless area review stages and also during meetings. In addition, the Blue Mountain Resource Council has provided documents to the Forest detailing their concerns

Environmental/Conservationist Groups. Members of various groups have met with or contacted the planning team to discuss planning progress, FORPLAN modeling techniques, and specific unroaded areas Two meetings were held by Grant County Conservationists (GCC) for the purpose of reviewing planning and working on a proposed alternative to be submitted to the Forest Planning team members attended those meetings to explain the process to the group and to answer questions GCC submitted recommendations for a Forest alternative in July 1985 These groups include.

Oregon Natural Resources Council
South Fork Drainage Basin Council
Cascade Holistic Economic Consultants
Citizens for Glacier Monument
Grant County Conservationists

Mining Industry. The American Mining Congress and Atlantic Richfield Company expressed their concerns about mineral accessibility early in the planning process. Atlantic Richfield Company also provided detailed information about the mineral and geothermal resources of the Forest During the review of roadless areas on the Forest in early 1984, these and other companies again expressed concern about mineral accessibility and development restrictions. These contacts include:

American Mining Congress
Atlantic Richfield Company
American Copper and Nickel Co., Inc
ASARCO

Recreational Groups: There has been limited involvement in the Forest planning process by recreational organizations. Habitat and backcountry recreation are specific concerns mentioned by the following groups

Oregon Hunter's Association
American Alpine Club

The following pages indicate how the concerns of some of these publics have been dealt with in the planning process (these concerns are more fully described in correspondence in the planning records) Following the summary of the concern, a number (or numbers) is used to indicate the method of addressing that concern Those numbers and descriptions are listed first.

METHODS FOR ADDRESSING CONCERNS

1 -- Dealt with in standards
2 -- A range of responses provided by the alternatives
3 -- A Management Area designation addresses this
4 -- Not within the scope of the planning process
5 -- Addressed in the text of the Final Environmental Impact Statement.

OREGON STATE FORESTRY

Recommend timber harvest levels of:
40 million cubic feet in 1980
40 million cubic feet in 2000
42 million cubic feet in 2020
47 million cubic feet in 2070 (2)

Concerned about below-cost sales, recommend cost containment (5)

Concerned about timber demand analysis, recommend analysis of private and Wallowa-Whitman NF demand also (5)

Concerned about suitable lands analysis. (2,5)

Interested in subregional harvest levels. Recommend that we look at departure from nondeclining evenflow to offset subregional, especially if the present net value of such an alternative increases (2,5)

Interested in maintaining community stability. (2,5)

Recommend intensive timber management. (2,5)

OREGON DEPARTMENT OF FISH AND WILDLIFE

Goal: Encourage perpetuation of the natural mix of habitat types and plant communities in amounts adequately distributed to maintain at least the current levels of wildlife species. (1,2,3)

Recommend 5 to 15 percent minimum of each major plant community in the forested land base be maintained as old growth (1,2,3)

Recommend 100 percent snag levels in old growth, and 60 percent on the rest of the Forest, with sufficient amount of dead and down material. (1,2,3)

Recommend maintaining or improving water quality and fish and wildlife habitat values in riparian areas Recommend restoration of degraded riparian areas to 80 percent of potential within 10 years (1,2,3)

Recommend maximum protection of cliffs, rimrock, caves, and talus (1)

Maintain, enhance, or restore instream integrity to acceptable levels and water quality to acceptable levels (1,2,3)

Recommend habitat for elk and deer to provide for no less than their management objective herd levels Recommend allocation of forage for big-game based on realistic evaluations of competition as described in Elk of North America (1,2)

Allocate all winter range to an identified winter-range strategy (2)

Protect all bald eagle roost sites (1,3)

Enhance, maintain, or restore anadromous fish habitat to 90 percent of smolt habitat capability index (1,2,3)

Glacier, McClellan Mountain, Aldrich Mountain, Dry Cabin, Dixie, Utley, Pine Creek, Malheur River, and North Fork Malheur River should be managed as Semi-Primitive Non-Motorized. (2,3)

Concerned about high timber harvest level effect on water quality and timing on runoff (5)

CONFEDERATED TRIBES OF THE UMATILLA

Anadromous fisheries are a primary economic and cultural concern and a treaty-protected resource. They have commercial, subsistence, and rearing value. Goal. maintain good quality spawning and rearing habitat (1,2,3)

Recommend providing habitat diversity that encourages perpetuation of naturally occurring mix of climax and seral plant communities in sufficient amounts to maintain current wildlife species and numbers (1,2)

Recommend a sufficient amount of well-distributed old growth (1,2,3)

Maintain 100 percent snag level in old growth and minimum levels or better on the rest of the Forest (1,2,3)

Recommend that habitat provide for at least State management objective herd levels. (2,3)

Recommend stringent control of livestock grazing in riparian areas (1,2,3)

Promote thrifty forests to ward off insects and diseases. Recommend use of uneven-aged management wherever beneficial to tribal interests Do not recommend selling timber above level of demand. (1,2)

OREGON HUNTERS ASSOCIATION

Concerned about allocation of forage between livestock and big game (1,2)

Concerned about forage consumption rates on winter range. (2)

Eliminate overgrazing on mule deer ranges (1)

Close nonvital (secondary and spur) roads to reduce harassment and increase habitat effectiveness. (1,2)

Aim for an optimum cover/forage ratio. (2)

Meet standards for slash treatment to allow for big-game access (1)

ENVIRONMENTAL/CONSERVATION GROUPS

Goal· Emphasize Primitive or Semi-Primitive recreation. (2,3)

Goal. Increase carrying capacity for fish and wildlife (2,3)

Goal. Visually pleasing Forest with clean water, productive soil, and stable or improving vegetative communities (1,2,3)

Goal: Minimize road impacts (1,2)

Goal: Emphasize quality over quantity. (2,3)

Goal: All roadless areas remain roadless. (2,3)

Goal· Manage all winter ranges for big game (2,3)

Goal: Manage summer range forage for big game (2,3)

Protect springs. (1)

Maintain a minimum of 120,000 acres of old growth distributed among all ecoclasses (2)

Goal: Manage all visually sensitive areas and trails for pleasing scenery. Maintain naturally appearing landscapes and scenic overlooks (1,2,3)

Increase aspen acreage. (2,5)

Maintain soil productivity and minimize soil loss (1)

Goal: Protect fish and wildlife habitat and minimize disturbance. Minimize impacts of roads on quality recreation experience. (1,2,3)

Goal. Grow mature ponderosa pine Intensively manage true fir sites which are already roaded. (2) Stress preservation and enhancement of visual resources along highways. (1,2,3)

Analyze a minimum budget alternative. (2,5)

Analyze a full range of roadless area possibilities (2)

TIMBER INDUSTRY

Opposed to wilderness designation of Pine Creek. (2)

Concerned about land suitability analysis (2,5)

Concerned about timber demand analysis (5)

Request we examine an alternative which departs from nondeclining evenflow (2,5)

Concerned about dispersion of old growth (5)

Concerned about possible reduction in timber harvest level (2)

Concerned about community stability (2)

Concerned about protection of resources (1,2,3)

Support RPA timber targets (2,5)

Recommend managing forest land productively and efficiently (2)

Reduce high timber mortality losses. (2,5)

Fully utilize forest growth potential. (2)

Increase income to counties (2)

Meet nation's housing needs at reasonable prices (4)

Maintain or increase the land base devoted to timber production (2,3)

Provide certainty in timber supply (2)

Concerned about effect of minimum management requirements on timber harvest levels. (5)

MINERAL INDUSTRY

Where there is moderate to high potential for deposits of energy or mineral resources, it should be allocated to uses which would minimize restrictions placed on exploration and development of these resources (2)

BLUE MOUNTAIN RESOURCE COUNCIL

Re-evaluate special areas. (2,3,5)

Manage wilderness to avoid excessive use (1,2)

Manage fire, insects, and diseases in wilderness (1,2)

Incorporate fish and wildlife management in all areas (1,2)

Use coordinated resource planning for range management. (1,2)

Maintain a continuing flow of timber. (1,2)

Recommend economic enhancement of communities (1,2,5)

Make better use of wood fiber (1)

Meet State water quality standards. (1,5)

Maintain or improve spring runoff patterns. (5)

Use coordinated resource planning for mineral management (1,2,5)

Increase opportunity for special employment programs. (4)

Manage to reduce the potential and/or severity of fires, and insect and disease outbreaks (1,2,5)

Consider local impacts of public access (1,2,5)

Maintain or enhance soil productivity (1,2)

Have a planned road program. (1,2,5)

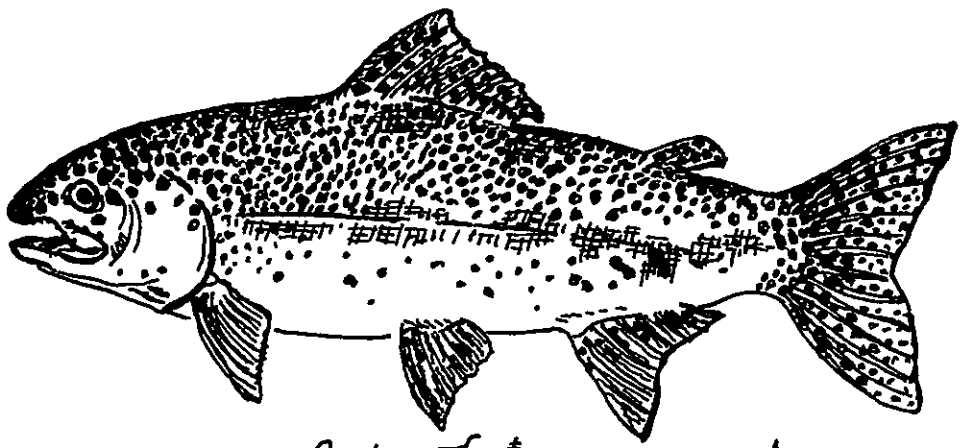
ENVIRONMENTAL PROTECTION AGENCY

Explain how Forest will comply with or exceed best management practices (1,5)

Recommend protecting high quality waters (1,2,3)

Important fish streams should be identified and related to management areas (1,2,3)

Describe plans for degraded streams. (1,2,5)



Rainbow Trout

1990

Appendix B

DESCRIPTION OF THE ANALYSIS PROCESS

APPENDIX B DESCRIPTION OF THE ANALYSIS PROCESS

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APPENDIX B DESCRIPTION OF THE ANALYSIS PROCESS

I. INTRODUCTION

Appendix B describes the analysis process used in developing the Forest Plan. This appendix focuses on the quantitative methods used to perform the analysis and documents how the analysis was done.

As a result of responding to comments received from public and organizations following the release of the Draft Environmental Impact Statement, the following listing is a summary of changes made to the alternatives for this Final Environmental Impact Statement These changes are the result of a concerted Forest effort to respond to significant issues, concerns and opportunities that were received during the Draft Environmental Impact Statement review process.

FORPLAN (FOREST PLANNING) Model Restructured

The Proposed Forest Plan displayed estimated resource outputs and effects on a Forest-wide basis There were no implicit geographic identifiers contained in FORPLAN during this analysis In order to provide more specific basis for management prescription selection and more optimal land assignments, geographic identifiers (seven major watersheds and two range conditions) were incorporated into the FORPLAN model structure Key outputs and activities by the geographic identifiers are now displayed in the Final Plan

In addition to including specific geographic identifiers, a mix of timber harvest treatments were added and errors in harvest dispersion constraints were fixed. The Final Environmental Impact Statement also separately identifies anadromous and nonanadromous streams

Alternatives Added, Deleted and Changed

The following is a list of the alternatives added, deleted or changed since the Draft Environmental Impact Statement, and the reasons therefore

Alternative	Action	Reason
NC	Retained	Decision on Appeal No. 1588
A	Retained	Required by Law
B	Now B-Mod	To respond to the publicly suggested "Preferred Plus Alternative"
C	Now C-Mod	To respond to the publicly suggested "Citizens Multiple Use Alternative"
D	Omitted	Lack of public interest or comment
E	Omitted	Lack of public interest or comment
F	Retained	To provide full spectrum of alternatives.
F-Dep	Omitted	Lack of public interest or comment.
G	Omitted	Lack of public interest or comment
H	Omitted	Lack of public interest or comment.
I	Added	To incorporate the widest possible range of public input, including the State of Oregon comments.

For more information on this subject see section VII A of this appendix.

Habitat Effectiveness Model Used to Estimate Elk Habitat

An analysis process evaluating cover quality, spacing, and open road density has been used to determine elk habitat effectiveness in lieu of cover/forage ratios. Potential elk population numbers have also been re-analyzed for each alternative. Ranking between alternatives related to Habitat Effectiveness has also changed from the Draft to the Final Environmental Impact Statement.

Wildlife and Fisheries Calculation Changes

A new smolt habitat capability index was used for the analysis of the Final Environmental Impact Statement Wildlife and fish user days (WFUDs) are now displayed by alternative, using the new index approach

Fuel Management Estimates Recalculated

An improved method to calculate fuel treatment activities was used for the Final Environmental Impact Statement Consequently, residue utilization goals are more site specific under the Final Environmental Impact Statement

Ten-Year Baseline Period Updated to 1980-1989

The ten-year baseline period for the Forest Plan was updated from 1977-86 average output levels to 1980-89 average output levels (e.g., timber sale levels, range outputs, etc.), as well as accounting for changes in old growth estimates and changes in vegetative conditions, to compare more accurately the change in jobs and timber harvest outputs by alternative. Budgets were also updated to include better estimates of costs, and minor errors in economic tables were corrected.

Energy and Mineral Production Potential Changes

Mineral operating plans were updated by alternative and energy minerals produced are reported in billions of BTUs per year

Timber Management

Based on sampling the seven major watersheds (See Figure B-1), the Forest-wide average of manageable understories is now considered to be 62 percent

Board foot yield tables have been built using cubic foot to board foot conversion ratios based on average diameter harvested Board foot yields are shown for the first decade only.

An error in the FORPLAN model regarding shelterwood harvest constraints was corrected allowing for an increase in ASQ.

In order to account for the time lag that exists between collection of the timber inventory data (1979-80) and the beginning of the planning period (1990), a procedure was developed for use within Forplan. This process simulates the programmed timber harvests over the past ten years (1980-89), thus correcting key attributes (i.e. timber inventory, empirical growth, timber condition classes, etc.) used within the analytical model

Management Indicator Species

The bald eagle, peregrine falcon and chinook salmon have been deleted, and the bull, cutthroat, and rainbow trout have been added to the list of Management Indicator Species

Omnibus Oregon Wild and Scenic Rivers Act of 1988

This legislation resulted in reduction of 2147 acres in the tentatively suitable land base from the Draft Environmental Impact Statement, because of the designation of the Malheur River as a wild river

Change in Riparian Yield Tables

Timber yield tables for these areas were modified to provide longer rotations and more structural material for the stream channels

Snags and Snag Replacements

These were modified to provide a minimum of 40% of potential populations for all alternatives

A. OVERVIEW OF THE PLANNING PROBLEM

The Forest Service is responsible for determining the management of National Forest lands based on public desires and land capabilities In the Forest and Rangeland Renewable Resources Planning Act of 1974 and the National Forest Management Act of 1976 as amended, Congress stated "The management of the Nation's renewable resources is highly complex and the uses, demand for, and supply of the various resources are subject to change over time," and further,

> To serve the National interest, the renewable resource program must be based on a comprehensive assessment of present and anticipated uses, demand for and supply of renewable resources from the Nation's public and private forest and rangelands, through analysis of environmental and economic impacts, coordination of multiple use and sustained yield opportunities as provided in the Multiple-Use Sustained Yield Act of 1960 (74 Stat 215, 16 U S.C 528-531), and public participation in the development of the program

A comprehensive land and resource management plan for each National Forest will be developed and implemented in accordance with National Forest Management Act Each plan will be prepared under procedures of the National Environmental Policy Act of 1969 as a major Federal action

The Malheur National Forest consists of complex natural systems that can be managed for different mixes of resource outputs, land uses, and environmental conditions Different people and groups prefer to see the Forest managed to emphasize different outputs, uses, and conditions Because all the resources, uses, and conditions of a forest are interconnected, managing to emphasize some resources results in changes in others Since there are practical and natural limits to what the Forest can provide, tradeoffs occur when the production of one or more resources is emphasized at the expense of other resources Differences in people's desires concerning management of the Forest's resources are what creates issues Thus, one component of the planning problem is how best to resolve the issues related to management of the Malheur National Forest

The central task in Forest planning is analyzing the alternative ways of managing the National Forest to determine the implications for the environment and for human uses of it. The different emphases on goods, services, uses, and environmental conditions are used to identify the alternative mixtures of management practices which are formulated and analyzed

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 Another component influencing alternatives is the various resource use and development opportunities suggested by either the public or the Forest Service managers The details of the issue development process are in Appendix A.

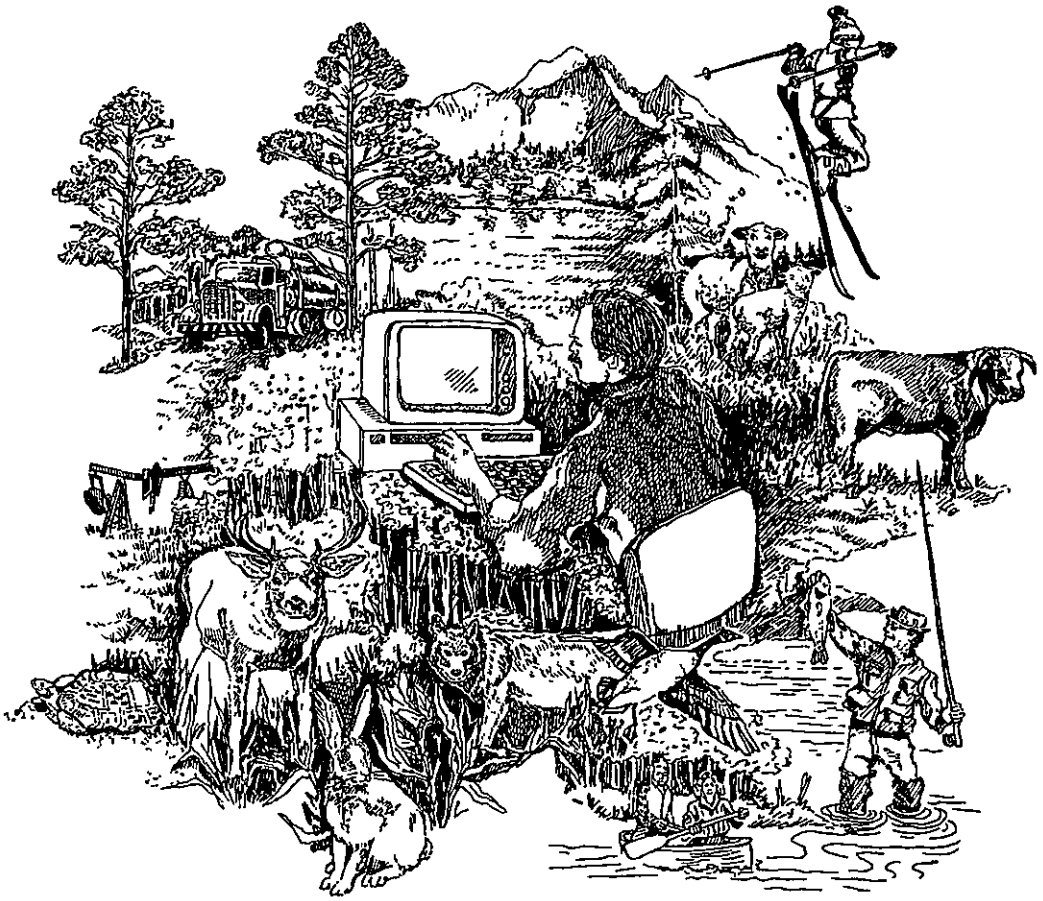
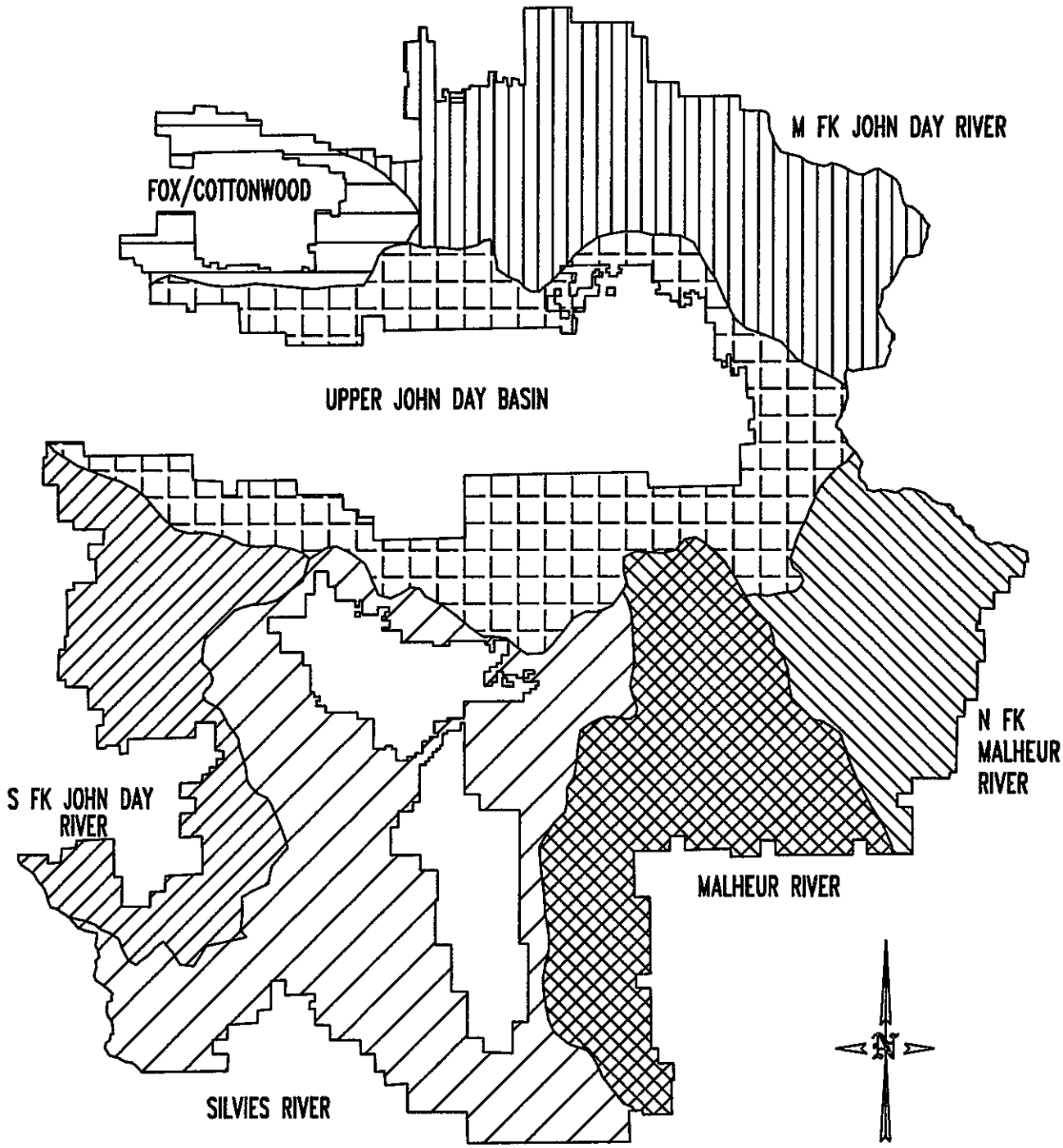


FIGURE B-1

MAJOR WATERSHEDS



Public interest includes divergent viewpoints about the use of market commodities such as timber, grazing, minerals, and nonmarket outputs such as wilderness, unroaded recreation,. scenery, wildlife, old growth, and habitat diversity The Forest's major planning goal is to provide enough information to help decision makers determine which combination of goods, services, and land uses will maximize net public benefit. (This concept is further discussed in Section IV of this Appendix) The National Forest Management Act and the regulations developed under National Forest Management Act (36 CFR 219) provide the analytical framework to address the objective. The requirements of the National Environmental Policy Act and its regulations (40 CFR 1500-1508) must also be applied during the analysis process.

B. OVERVIEW OF THE PLANNING PROCESS

The planning and environmental analysis process brings a new outlook and a new technology to National Forest land management, principally: (1) processes formerly used to make individual resource decisions are now combined to help make integrated resource management decisions, and (2) new mathematical modeling techniques are used to assist in the proposed land use problem, including identifying the most cost-efficient pattern of land management.

The ten-step planning process is discussed in the National Forest Management Act regulations and in Chapter I of the Final Environmental Impact Statement document. Planning steps 1, 2, 7, and 8 are described in Chapters I, II, and in Appendix A of the Final Environmental Impact Statement The execution phase, planning steps 9 and 10, is presented in the Proposed Forest Plan. This appendix describes the analysis phase of the process covering steps 3, 4, 5, and 6 The objectives of these steps are described below

C. INVENTORY DATA AND INFORMATION COLLECTION (PLANNING STEP 3)

Following the issue development process, the Interdisciplinary Team began assessing the data needs of future planning steps The analysis of the management situation, formulation of alternatives, and monitoring require data on resource capabilities, conditions, trends, existing supply and demand, expected outputs, benefits, and costs Existing data was used whenever possible but was supplemented with new data if needed to help resolve sensitive issues or management concerns. During planning step 3, management strategies, standards, resource yield tables, and production coefficients were developed. Section II of this appendix will discuss the inventory data and information collection process in greater detail

D. ANALYSIS OF THE MANAGEMENT SITUATION (PLANNING STEP 4)

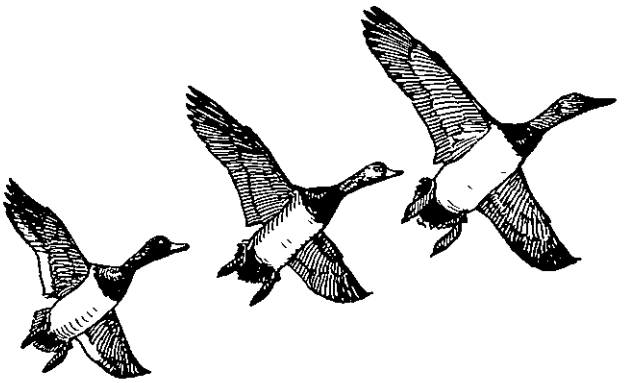
This analysis step examined resource supply and market conditions and determined the abilities of the Forest to resolve the issues A land use allocation model (FORPLAN) was used to address a number of specific requirements, including benchmark analysis Benchmark analysis determines the maximum economic and resource production levels of the Forest in order to define the Forest's "decision space" for formulating alternatives The decision space for the Forest defines the minimum and maximum production levels of the resources. The Interdisciplinary Team used the decision space to develop the alternatives through various combinations of the resource production levels and land allocations The Analysis of the Management Situation document is on file in the Forest Supervisor's Office The summary of this document is Chapter 2 of the Forest Plan

E. FORMULATION OF ALTERNATIVES (PLANNING STEP 5)

The information gathered during the first four planning steps was combined and analyzed to formulate alternative management strategies These alternatives reflect a range of resource management direction Each major public issue and management concern was addressed in one or more alternatives. Alternative emphases for different groups of issues were examined Management prescriptions and practices were combined to represent the most cost-efficient way of attaining the objectives for each alternative. Both priced and nonpriced outputs are considered in formulating the alternatives The process used in formulating the alternatives for the Forest is discussed in Section VII of this Appendix.

F ESTIMATION OF EFFECTS OF ALTERNATIVES (PLANNING STEP 6)

The physical, biological, economic, and social effects of each alternative were estimated and analyzed to determine how each responds to the range of goals and objectives defined to address the issues, concerns, and opportunities. FORPLAN was used to estimate some of the economic and physical output effects, while other methods were used for the remaining effects The analysis determined. (a) direct effects, (b) indirect effects, (c) conflict with other Federal, State, local, and Indian tribe plans, (d) other environmental effects, (e) cumulative effects, (f) socioeconomic effects within the Forest's influence zone, (g) tradeoffs associated with various resource production levels and land management strategies; and (h) mitigating measures for resource protection The effects of the alternatives are discussed in Chapters II and IV of the Final Environmental Impact Statement and in Section VIII of this Appendix



II. INVENTORY DATA AND INFORMATION COLLECTION

A. FOREST DATA BASE

Inventory data were collected for many resources so that issues could be addressed, limitations defined, and capability determined. Some of the data were necessary to develop the Forest planning model and to determine capability and analysis areas.

1. Capability Areas

A capability area is defined as an area of land whose inherent characteristics dictate that the response to, or effects of, management will be relatively the same for all acres within the area. In addition, they are locatable and contiguous.

Capability areas were delineated based on the physical and biological factors described below (Hall, 1973).

a. Ecoclass

- Ponderosa Pine
Timber lands comprising principally ponderosa pine, also including Douglas-fir and white fir.

- Mixed Conifer
Timber lands consisting of Douglas-fir, white fir, western larch, ponderosa pine, western white pine, lodgepole pine, Engelmann spruce.

- Lodgepole Pine
Timber lands comprising principally lodgepole pine, also including Douglas-fir, western larch, ponderosa pine, subalpine fir, white fir, and Engelmann spruce

- Grass Dominant
This is a plant community type that is dominated by bunchgrasses and could have interspersed pine trees and mountain mahogany.

- Sagebrush Dominant
This is a community type that includes all sagebrush, bitterbrush, and mountain mahogany.

- Juniper/Bunchgrass
This community type includes juniper/bunchgrass, juniper/stiff sage scabland, juniper/low sagebrush, and juniper/big sagebrush.

- Moist Meadow
Moist or wet meadows are wet to moist in the spring and are subirrigated or have freely available water within the rooting zone throughout the growing season.

- Dry Meadow
Dry meadows are moist to wet in the spring, but may be moderately to severely dry by fall depending on weather conditions during the year.

- Mesic Tree and Shrub
This is a shrub community type that is dominated either by snowberry (15 to 40 percent cover), ninebark (20 to 60 percent cover), or thinleaf alder (40 to 60 percent cover).

- Fir/Sedge
Located on exposed ridges at or above timberline Dominated by fescue on northerly aspects and sedge on southerly aspects. May have subalpine fir or whitebark pine intermingled

- Rockland
This community is a grouping for all exposed rock formations, knobs, talus slopes, and rocky peaks, 2 acres or larger in size

b. Management Needs Classification

Management needs were based on the 1980 Forest Resource Inventory

- Mature
This type of stand presently will appear to be a mature stand of trees without manageable immature crop tree stocking in the understory.

- Commercial Thin
These stands appear to be even-aged, with very few to no large old trees. Tree size is pole or small saw logs, and stocking at present is excess

- Precommercial Thin
These stands have very few to no trees over 9 inches diameter breast height. There are many more small trees and saplings than necessary to stock the area By removal of these excess small trees, the remaining trees will be able to grow at accelerated rates thus producing a merchantable product sooner than the natural system would

- Two-Storied
The stands in this model category will appear to have a rather sparse overstory in comparison to the understory The overstory must contain enough volume to make commercial entry economical and an understory which may, after this entry, have the characteristics of a stand for which precommercial thinning would be prescribed

- No Treatment
The stands in this model category presently appear to be satisfactorily stocked with healthy trees that do not exceed maturity age for the species they contain

- Needing Reforestation
There are two types of stands which should be reforested in the next 10 years

- Nonstocked
This type of stand will appear to have been logged, burned, site prepared, and planted, or may appear to be a brushfield, but it will still be capable of producing at least 20 cubic feet per acre per year of industrial wood fiber. Presently the stand is less than minimally stocked

To qualify as nonstocked, the stand must, at the present time, have less than 2,000 board feet per acre of merchantable timber with mature and crop tree stocking being less than or equal to 16 percent of the recommended stocking level of seedlings and saplings

- Poorly stocked
Poorly stocked stands must have less than 2,000 board feet per acre of merchantable timber with mature and crop tree stocking at between 16 and 39 percent of recommended stocking level of seedlings and saplings, and the majority of stands predicted to have less than recommended stocking at rotation age.

- Old Growth
An old-growth stand is defined as any stand of trees 10 acres or greater generally containing the following characteristics:

a. Stands contain mature and overmature trees in the overstory and are well into the mature growth stage

b. Stands will usually contain a multilayered canopy and trees of several age classes.

c Standing dead trees and down material are present.

d. Evidence of human activities may be present but do not significantly alter the other characteristics and would be a subordinate factor in a description of such a stand.

- Low Site
Timber lands which are incapable of yielding 20 cubic feet per acre per year of industrial wood fiber

c. Slope

Slope information is derived from Pacific Northwest Region Geometronics and the data is contained in the Forest's Total Resource Inventory Data Base System.

- 35 percent or less
- Greater than 35 percent

d. Roads

Delineations were based on the existing transportation system with differentiation for construction before and after 1982 Unroaded areas and wilderness were also defined

e Range

Delineations were made based on the existing management intensity, as detailed in range allotment management plans.

f Elk Winter Range

A definition of elk winter range was prepared which included evaluation criteria for elevation and snow depth. Using this information, areas of the Forest were proposed as elk winter ranges and were evaluated through cooperative work with the Oregon Department of Fish and Wildlife as well as information from Forest Service personnel who have extensive field experience on the Malheur National Forest. The delineated elk winter ranges were then analyzed to determine how many elk each range could carry, using forage as the driving factor

g. Bald Eagle Winter Roosts

Inventories for bald eagle winter roosts on the Malheur National Forest began in 1979 with U. S. Fish and Wildlife Service personnel reporting bald eagle use on the southern fringe of the Forest Forest Service personnel surveyed and found one additional roost in 1980-1982. In 1982-1984, an interagency study by the Wildlife Cooperative Unit of Oregon State University surveyed the Forest and found additional roosting sites These known roost sites as well as potential roosting habitat are considered in this document For more information, see "Ecology of Bald Eagles Wintering in the Harney Basin, Oregon" by F. Isaacs, on file in the Wildlife Unit in the Malheur National Forest Supervisor's Office

h. Visual Corridors

The viewshed corridors were developed under the guidance of the Forest landscape architect in conjunction with representatives from the four Ranger Districts

A Forest-wide visual resource inventory had been prepared during the late 1970's and early 1980's utilizing the procedure outlined in Agriculture Handbook no. 462, National Forest Landscape Management, vol 2, chapter 1, The Visual Management System.

In 1985 this inventory was reviewed by the Forest landscape architect and Ranger District representatives to see if, after implementing it for several years, corrections or additions needed to be made The conclusion was that the original inventory had overstated the sensitivity of Malheur National Forest visitors to the visual resource.

Based on a re-evaluation of the types of users of the Malheur National Forest and their sensitivity to the visual resource, the inventory was reviewed and revised. Criteria based on the national inventory process as outlined in Agricultural Handbook no 462 was again applied Viewshed corridors were identified that met the national criteria Additional corridors were identified that responded to local concerns and interests based on the best judgment of Forest Service personnel and traffic data gathered by Forest engineering personnel

This revised inventory was used to select viewshed corridors to be managed in all alternatives except the No Action and No Change alternatives. The No Action and No Change alternatives, which are based on present management direction (Forest Unit Plans), have the most viewshed corridors identified. This is because the Forest Unit Plans were developed using the old inventory. The remaining alternatives were developed utilizing the revised inventory.

The viewshed corridors were prioritized according to their importance In all alternatives, those corridors that met the national criteria for being visually sensitive were designated for management as viewshed corridors. Additional viewshed corridors were added based on their priority rating and the theme of the alternative Amenity-oriented alternatives such as Alternative C-Modified have a high number of viewshed corridors identified for management Commodity-oriented alternatives have a low number of viewshed corridors identified for management

The alternatives were formulated by the four District Rangers, the Forest Public Affairs Specialist, and the Forest Recreation Staff Officer The selection of viewshed corridors for each alternative was made by this group, then reviewed by the Forest management team when the alternatives were finalized.

1. Manageable Boundaries for Roadless Areas

These boundaries were developed from the 1979 RARE II Final Environmental Impact Statement, together with the three unit plans, acre data, and maps. The process used is that required for identification of areas which no longer meet RARE II standards (direction book for the 1983 Oregon Wilderness proposal, and the Regional Direction package, November 10, 1983). Maps are on file in the Supervisor's Office Planning Section showing acres which do not meet the criteria. This process was accomplished in the period from January 1983 to December 1985.

During August to December 1985, District Rangers reviewed each area in their respective Districts and made recommendations for manageable boundaries. These are recorded on maps in the planning records. The Management Team finalized these boundaries and they were approved by the Forest Supervisor in February 1986 (Management Team meeting notes, February 19-21, 1986).

In April 1986 a change was made in which the Dixie Butte area was re-inventoried for nonconforming acres The resulting final boundaries were approved by the Forest Supervisor.

In response to public comments, each ranger district assembled an Issue Task Force to review and address specific, substantive comments related to the district's respective roadless area boundaries identified in the Draft Environmental Impact Statement. Evaluation of public comment was accomplished by rating each roadless area's resource attributes in comparison to the available priced and nonpriced outputs. Resulting from this evaluation the task forces recommended to the Management Team specific Management Prescriptions and changes to the manageable boundaries for each area. These changes were either adopted or further modified for inclusion into the Forest Plan (Appendix K).

2. Analysis Areas

One of the first steps in the development of FORPLAN (Forest Planning Model) was to divide the Forest into analysis areas. For this task, the Total Resource Information System 2000 data base was used extensively Analysis areas are a collection of specific land areas (not necessarily contiguous) with relatively homogeneous characteristics in terms of the outputs and effects that are being analyzed within the FORPLAN model. They serve as the basic unit of land in the model for which a range of prescriptions are developed to achieve various multiple-use objectives. Their delineations were intended to capture the significant biological and economic differences in the way the land responds to alternative management strategies The focus of delineating analysis areas was based upon addressing certain issues, concerns, and opportunities identified at the outset of the planning process.

Each analysis area in FORPLAN is defined uniquely by a specific combination of six different level identifiers. A description of and rationale for the analysis areas contained in the FORPLAN model is given in Section III. C of this appendix

3. Production Coefficients

The Interdisciplinary Team developed coefficients for timber, range, sediment, cover quality, roads, water, and costs. Many of the coefficients other than timber were calculated outside the model and using information from some of the reports from the model

4. Suitable Lands

The suitable land classification divides the National Forest land on the Malheur into the following categories water, existing roads, and other nonforested lands; forested lands which are capable but not available for timber harvest, forested lands available and capable, forested lands technologically not suited; and *available, capable, and tentatively suitable forest lands* The suitable lands determination is documented in "Suitable Forested Lands Review," dated August 21, 1984.

The physical review of the Malheur National Forest land base was conducted by both Forest Supervisor's Office and Ranger District personnel. A set of guidelines was first developed, based on National Forest Management Act, Washington, and Regional Office direction, to direct the Forest process and identify those lands most likely to be physically unsuitable for timber production The actual review process used aerial photos, resource maps, the Total Resource Inventory data base, field investigation, and professional judgment. The final outcome of this review can be found in the "Suitable Forested Lands Review" documentation package, December 1983 to October 1984.

The next step in the timber land suitability review was to determine if each individual stand had at least one timber prescription with a positive present net value This was accomplished by using the FORPLAN model, utilizing Objective Function 9, Maximize Present Net Value for Individual Stand with Detail. This analysis generated information that there was at least one prescription with a positive present net value for each timbered category.

Because the number of timber prescriptions proposed did not exceed the total number allowed in FORPLAN, none were deleted because of this step in the analysis. *Timber prescriptions were removed from the model because of certain* physical conditions, i e., no overstory removal option in mature and two-story lodgepole pine, or management consideration; i e , allow only uneven-aged management practices in visual foreground ponderosa pine or mixed conifer stands

The last step in the suitability analysis was done to determine those acres that were not cost-efficient for timber production This was accomplished by the FORPLAN model for each alternative. In general, if the FORPLAN model chose to send acres to minimum level management, it followed this logic First send lodgepole pine >36+ percent slope, then lodgepole pine $\underline{<}35$ percent slope, next mixed conifer >36+ percent slope, then mixed conifer $\underline{<}35$ percent slope, last ponderosa pine >36+ percent slope, then ponderosa pine $\underline{<}35$ percent slope.

5. Developing Allocation and Scheduling Alternatives

The condition classes of existing vegetation were used to schedule management *activities over time for the various benchmarks and alternatives.*

6. Monitoring

Monitoring and evaluation comprise the management control system for the Forest Plan. They will provide the decision maker and the public with information on the progress and results of implementing the Forest Plan.

Monitoring and evaluation entails comparing the end results being achieved to those projected in the Plan. Costs, outputs, and environmental effects, both experienced and projected, will be considered

To do this, a comparison will be made, on a sample basis, of overall progress in implementing the Plan as well as whether the overall relationships on which the Plan is based have changed over time When changes occur, they will be evaluated for their significance, and appropriate amendments or revisions made

The goals for monitoring and evaluating this Forest Plan are to determine.

1. How well the Forest is meeting its planned goals and objectives;

2. If existing and emerging public issues and management concerns are being adequately addressed;

3. How closely the Forest Plan's management standards are being followed;

4. If outputs and services are being provided as predicted;

5. If the effects of implementing the Forest Plan are occurring as predicted, including significant changes in the productivity of the land;

6. If the dollar and manpower costs of implementing the Forest Plan are as predicted;

7. If implementing the Forest Plan is affecting the land, resources, and communities adjacent to or near the Forest;

8 If activities on nearby lands managed by other Federal or other governmental agencies, or under the jurisdiction of local governments, are affecting management of the Forest;

9. If research is needed to support the management of the Forest, beyond that identified in Chapter II of the Forest Plan, and

10. If there is a need to amend or revise the Forest Plan.

Monitoring will test resolution of the same issues and concerns that the Forest Plan was designed to resolve. For each key resource area there are one or more monitoring questions. At specific time intervals, each question will be answered with either a "yes" or "no." If the answer is "yes," then there is reasonable assurance that expected results are being achieved and implementation will continue. If the answer is "no," then the situation will be evaluated and appropriate action taken to correct it Appropriate action will range from correcting performance deficiencies when standards are not being implemented, to modifying the Forest Plan when acceptable effects cannot be achieved within the framework of the Forest Plan

7. Plan Implementation Programs

Implementation of the Malheur National Forest Plan requires moving from an existing management program, with a budget and "targets" for accomplishment, to a new management program with a budget, goals, and objectives that provide a different way of addressing the issues and concerns people have voiced about Forest management. The Forest Plan establishes the direction for the Malheur National Forest for the next 10 to 15 years, when used in conjunction with Forest Service Manuals and Handbooks and the Pacific Northwest Regional Guide

This Forest Plan serves as the single land management plan for the Malheur National Forest Upon implementation, this Plan will supersede all present land management plans for the Malheur National Forest Land management plans superseded are for the John Day, Silvies-Malheur, and South Fork planning units

Subject to existing rights, all other contracts, cooperative agreements, or instruments for occupancy and use of the land will be brought into compliance with the plan generally no later than three years after the plan is enacted or as otherwise specified in the standards.

The management direction provided by this Forest Plan comprises the sideboards 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 (management practices) It provides guidance concerning potential land type and habitat type constraints, including assumptions about the appropriate vegetation management practices for timber sale projects On-the-ground project analysis validates or invalidates the appropriateness of those assumptions

Within this guidance, the projects are developed to most efficiently and effectively accomplish the management goals and objectives All National Environmental Policy Act requirements will be complied with in all projects

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 correctness of the land assignment All of the information included in the project environmental analyses is used in the monitoring process to determine when changes should be made in the Forest Plan

If the environmental analysis for a project shows that (1) the management area prescriptions and standards can be complied with, and (2) little or no environmental effects are expected beyond those identified and documented in the Forest Plan Final Environmental Impact Statement, the analysis will probably result in either an environmental assessment or a categorical exclusion In either case, an analysis file and/or project file will be available for public review In other instances, the District Ranger, Forest Supervisor, or Regional Forester may decide to document the analysis through an environmental impact statement.

B. SOURCES OF DATA

This section is designed to briefly summarize the major data sources used in the analysis This is by no means a comprehensive list However, it does provide a quick overview of the types and variety of information included in the process

1. Data Source Summary

Timber resource information for existing forested types, including stand volumes, average ages, stocking levels, and species composition was taken from the Forest's 1980 Total Resource Inventory Stand type maps were an integral part of the inventory process Initial stand mapping was from 1 12,000 color aerial photos of the Forest. The information from these photos was transferred to 1 15,840 orthophotos. These maps were the basis for the stratification of the Forest into broad areas based upon stand structure and silvicultural treatment

opportunities. These type islands were sampled according to the variation within each type. The composite of this information makes up the Forest Timber Inventory.

Tentative suitability for timber management activities was assessed and lands were identified into the Total Resource Inventory system. This determination was made based on stand maps, ecoclass data, wilderness and research natural area maps, and Forest and district expertise. This assessment is documented in the "Forested land Evaluation, Unsuitable Acres, for the Malheur National Forest"

Managed stand timber yield tables for even-aged silvicultural systems were developed to predict future timber yields based on the management practices applied. The Stand Prognosis Program was the basic yield simulator for the *ponderosa pine, mixed conifer, and lodgepole pine working groups.*

Empirical yield tables for management prescriptions which utilize uneven-aged silvicultural systems were developed by Forest specialists and Stand Prognosis. These tables were based on assumptions of desired stand structure, growth models, and volume equations The development process is documented in the "Managed and Regenerated Yield Tables - Uneven-aged/Multistory" (USDA Forest Service 1986).

Plant communities on the Forest were identified and described in "Plant Communities of the Blue Mountains in Eastern Oregon and Southeastern Washington" (Hall 1973). This guide was used extensively, and was the source of estimates of vegetative growth potential for wood fiber and forage. They also were used as a guide in assessing suitability for natural versus artificial regeneration.

Wildlife habitats were identified for indicator species on the Forest. These were based on habitat requirements, the Forest stand and plant community maps, and specialist knowledge of current or historical use by these species. The Forest's stream inventory classified existing streams as Class I, II, III, and IV, based on Regional standards for stream flow and use characteristics. A Watershed Improvement Needs Inventory (1981-1982) which is updated annually was used for determining watershed conditions.

Forest trail information was obtained from the Forest Trail System Inventory, trail condition surveys, and trail logs. Additional sources include annual trail maintenance plans and the 5-year capital investment program for trails

The second roadless area review and evaluation (RARE II) provided data on *currently unroaded areas*

Riparian plant communities were delineated using a combination of ecosystem mapping, the Soils Resource Inventory, the Stream Classification, and infrared photo interpretation.

Basic recreation data was derived from information collected in the field and stored in the Recreation Information Management System. This data was used to estimate existing recreation use on the Forest and was the basis of the Forest's recreation demand estimates

The "Recreation Opportunity Spectrum (ROS) User's Guide" served as the basis for the recreation capacities on a per acre basis within each recreation opportunity spectrum class (USDA Forest Service 1982). A Recreation Opportunity Spectrum (ROS) Inventory was completed in 1985.

A Visual Resource Inventory was completed in 1982. This document contains information concerning the Forest viewsheds, and areas seen from major Forest travelways and public use areas

Information on Forest mineral materials was obtained from Bureau of Land Management data, project records regarding mineral materials production, and Forest pit development and operation plans.

Information related to the Forest road system was obtained from the Forest transportation and road management program and project records. These records contain information regarding: inventory of roads, transportation system mapping, road management objectives, road closure and obliteration plans, rights-of-way needs, road log and condition surveys, traffic classification and use data, annual and deferred maintenance plans, multiyear capital investment needs, and cooperative maintenance plans with other agencies or private cooperators

Information related to Forest buildings and facilities was obtained from project records, facility inventory data, and multiyear capital investment needs.

Economic benefits and trends were derived on Region 6 Planning Direction Timber values were based on past experienced stumpage prices, adjusted to reflect differences in value by diameter class Other benefit values were taken from the 1985 Resources Planning Act program estimates

Cost data was based on historical records for the starting point values Much of this data was extrapolated and updated to develop costs for current and future cost estimates. A spreadsheet simulation of the ADVENT model was used in the final calculations of present net value and budget estimates for the alternatives.

III. FOREST PLANNING MODEL

A. OVERVIEW

FORPLAN, the Forest Service FORest PLANning model, is the model used in the development and evaluation of benchmarks and alternatives Underlying this land assignment model is an analytical structure and mathematical technique known as linear programming The elements of an assignment problem are included in a set of mathematical relationships (or equations) in the linear programming model. These equations describe the elements of the problem in terms of the overall goal (or objective function) to be achieved, the activities to achieve the goal, and the restrictions (or constraints) placed upon the ways in which the goal can be achieved. In most cases the objective is to maximize economic efficiency as measured by present net value. The activities to achieve the goal are the *Management Prescriptions. The constraints are the Management Requirements or* other restrictions used to address or represent various goals and objectives

FORPLAN is a third-generation configuration of a series of linear programming models developed by the Forest Service to aid in resource management planning Timber Resource Allocation Model and Multiple Use Sustained Yield Calculator, two predecessors, are single-resource models designed to evaluate timber assignment problems. FORPLAN is designed to evaluate problems involving "multiresource" outputs. (For more information refer to "FORPLAN Version 1· An Overview", K Norman Johnson, 1986)

The following are the changes which have been made in analysis methods (principally the FORPLAN model) since the Draft Environmental Impact Statement was published in 1987

Shelterwood dispersion constraints. An error in the specification of these was corrected, resulting in a small increase in the available timber volume

Watershed model. The Draft model used a single geographic area representing the entire forest This has been changed to fourteen areas, representing seven major watersheds, each split into winter range and non-winter range.

Timber inventory update. The timber inventory used in the model was made in 1980. In order to simulate correctly the starting inventory for the plan period, the first ten year period in the model was constrained to produce the known harvest for the 1980-1989 period, distributed approximately according to harvest type and area The results from the second ten year period in FORPLAN were then used to simulate the first decade of the plan, which is the 1990-1999 period

Manageable understories. The method of representing the manageable vs unmanageable understories in two story stands in the model was changed to be more geographically specific and also to reflect more recent estimates of stand health and vigor.

Habitat Effectiveness Index. This approach to modeling elk habitat was adopted after publication of the Draft EIS The FORPLAN model was modified to include cover yield tables, which are used to provide cover outputs over time, and to provide a means by which cover can be a constrained value

Riparian zones. Stream channels (the area of seasonal high-water flows) were removed from the suitable timber land base for each alternative This corrected an earlier model deficiency. In addition, timber yield tables for these areas were modified to provide longer rotations and more structural material for the stream channels

Snags and Snag Replacements. These are now set to provide a minimum of 40% of potential populations The calculation for this is done outside FORPLAN.

Wild and Scenic Rivers. The suitable land base was reduced to reflect the inclusion of areas under the Omnibus Oregon Wild and Scenic Rivers Act of 1988

Uneven-age timber management. Provision for this was added to the revised model and applied to alternatives C-Modified and I

Old growth replacement. Provision was made in the revised model to replace a specified fraction of areas managed for old growth with other areas having similar characteristics This option was used in alternative I only.

Board foot volumes. A more accurate method of calculating board foot volumes was employed, based on variable conversion ratios appropriate to the average diameter

B. ANALYSIS PROCESS AND ANALYTICAL TOOLS

As directed in the Planning Regulations (36 CFR 219.12) "Each alternative shall represent to the extent practicable the most cost-efficient combination of Management Prescriptions examined that can meet the objectives established in the alternative "

The Interdisciplinary Team analyzed economic efficiency at several stages of the planning process in order to be reasonably assured that the alternatives developed and displayed in the Final Environmental Impact Statement complied with the intent of the direction The discussion of the analytical process and tools used will follow the general outline below:

1 Analysis prior to FORPLAN.
2 How FORPLAN was used in the analysis
3 Analysis done in addition to FORPLAN model analysis

1. Analysis Prior to FORPLAN

Once the issues, concerns, and opportunities were identified and planning criteria developed, the Interdisciplinary Team began to formulate management strategies and their associated standards The step was probably one of the most difficult and laborious, and possibly the most important task of the interdisciplinary planning process Management strategies coupled with their respective standards provide specific direction for implementation and serve as a framework for how to use, develop, and protect the Forest's resources in a manner consistent with the goals and objectives of the alternatives

Since the standards provide general rather than site or project-specific direction on how to implement the Forest Plan, it was not possible to calculate a present net value for most of the standards However, economic efficiency was a consideration throughout their development. For example, from a silvicultural standpoint, clearcutting and planting is more desirable in terms of control over species mix than is natural regeneration However, natural regeneration is often more cost effective and successful in various plant communities.

Concurrently with the formulation of Management Areas and the Standards, the Interdisciplinary Team also began to identify the analysis areas to be used in the FORPLAN model. The computerized Forest data base was used extensively to analyze different analysis area combinations which could be used to model and evaluate the production and economic tradeoffs between the recreation, timber, visual, and wildlife resources on the Forest. The objective was to delineate the analysis areas in a way to capture the important variations in the biological, social, and economic characteristics of the land and yet keep the FORPLAN model size to a minimum to maximize operational efficiency The ability to respond to issues, concerns, and opportunities was also a major consideration in the analysis area identification process.

Following the resolution of the analysis area stratification scheme, the process of developing FORPLAN prescriptions was initiated. Developing the prescriptions required the derivation of timber yield tables, other resource yield coefficients, and the economic costs and benefits (see Section IV) associated with each FORPLAN prescription The prescriptions were designed to enable FORPLAN to analyze the *timber, range, and cover outputs associated with alternative land assignments and* multiple-use objectives. Other wildlife, fish, soil, and recreation related outputs and effects were evaluated outside FORPLAN

2. How FORPLAN Was Used in the Analysis

FORPLAN was used to analyze the production and economic tradeoffs between the recreation, timber, visual, range, and wildlife resources on the Forest The model was utilized to analyze the most economically efficient timber related outputs and effects associated with the achievement of the multiple-use objectives of an alternative The prescriptions chosen by the model depended upon the objective function and the set of constraints used to represent a particular benchmark or alternative. The objective functions used were

a. Maximize Present Net Value,
b. Maximize timber production,
c. Maximize Animal Unit Month production, or
d. Maximize wildlife cover.

Each objective function was optimally achieved based on the data present in the model and after satisfying all the specified constraints. Constraints were designed to represent land assignment and scheduling schemes necessary to achieve the objectives of a benchmark or alternative. The constraints attempted to provide assignments and activity schedules which were spatially and temporally feasible. Following is a list of the types of constraints used:

a. Constraints on timber harvest flows, rotation lengths, ending inventories, harvest types, and harvest dispersion;

b. Land assignment constraints for analysis areas and assignment zones,

c. Old-growth constraints including old-growth replacement;

d. Forage assignment constraints,

e. Riparian area constraints;

f. Visual management constraints;

g. Cover constraints (For alternatives only);

h. Watershed constraints (For alternatives only), and

i Mixed conifer to ponderosa pine site conversion constraints (For alternatives C-Modified and I only).

Once the model had arrived at a feasible solution by satisfying all of the constraints, the algorithm would search for the set of prescriptions and timing choices which permitted it to optimize the solution according to the specified objective function

For the alternatives, FORPLAN was used to determine optimal assignments and scheduling of Management Prescriptions for each analysis area within the seven separate major forest watersheds (Refer to Figure B-1) This process allowed for a greater level of geographic specificity in selection of the most cost-efficient Management Prescriptions and land assignments

3. Benchmarks

FORPLAN was used to develop benchmarks for the Analysis of the Management Situation Maximum resource production levels were determined using the objective functions and constraints discussed above. Assignments and activity schedules which maximized net economic returns were calculated. The FORPLAN model was also used to estimate the tradeoffs in costs, outputs, and benefits associated with specific legal and policy requirements such as Management Requirements

Where the benchmark analyses were completed, the Interdisciplinary Team proceeded to develop a range of alternatives to address the issues, concerns, and opportunities (refer to Section VII). Each issue, concern, and opportunity was addressed in the alternatives either through land assignments, harvest scheduling, standards, or policy statements Information from the benchmark analysis was used to determine the "decision space" available to the Interdisciplinary Team for constructing alternatives Alternatives were modeled through the specification of an objective function and a set of constraints necessary to achieve the intent of a particular alternative

4. Timber Inventory Update Analysis

Since the vegetative inventory of standing timber was collected during 1979-1980, timber sales and harvests have been ongoing, thereby altering the components of that standing inventory. In order to address the concern that a time lag exists between when the timber inventory data was originally collected and when it was applied to the beginning of the planning period, a provision was added to the FORPLAN model to simulate harvests that have occurred in the past decade as the first period of the model The second period of the model then becomes the first period of the alternative simulated.

To complete this analysis, harvests from the past decade were simulated for the time period 1980-1989 This was done by inserting the past 10 years of scheduled timber harvests into the appropriate prescriptions within the FORPLAN model structure. As the amount of timber volume sold during this time period is known, these numbers were readily fit into the planning model All periods following the years associated with 1980-1989 time period were allowed freedom of harvest choice, unlike the harvests programmed into the first decade of the planning model The method of estimating the prior harvest is described in the process paper "Calculation of prior harvest fractions for FORPLAN", 3/16/89.

All the alternatives brought forward have been analyzed using this procedure, but the benchmarks have not. The relatively minor effects on benchmark outputs from this procedure would not have a significant effect on the conclusions of the analysis.

5. Manageable Understories

When the FORPLAN model was revised as a result of comments on the Draft Environmental Impact Statement, provision was made to define the manageability of understories in two story stands as a function of watershed, working group, land class, and condition class This replaced a single number definition which applied forest wide New estimates of manageability were made in May 1989, and these reflected changed conditions in the forest due to prior harvests, insect and disease conditions, and potential for future management These are shown in Table B-6, which shows an overall weighted average of 62% compared with 80% used as the *basis for the Draft Environmental Impact Statement. This is also discussed in* Section III.E Development of Timber Options, and in the process paper "Manageable Understories Review", 5/10/89

6. Wild & Scenic Rivers

The management of areas designated under the Omnibus Oregon Wild and Scenic Rivers Act of 1988 can be approximated closely through a visual prescription. Two corridors representing these areas were therefore added to the list of visual corridors used in FORPLAN The details are described in the process paper "Wild and Scenic Corridors in FORPLAN", 12/29/88, (Lindley)

7. Analysis in Addition to FORPLAN

Outputs calculated outside the FORPLAN model are listed below·

1. Developed recreation use
2. Nonwilderness dispersed use
3. Wilderness use
4 Trail construction/reconstruction
5. Developed site reconstruction
6 Visual quality objectives
7. Big-game use
8. Anadromous fish use
9. Anadromous fish commercial harvest
10. Anadromous fish habitat improvement
11. Pileated woodpecker
12 Pine marten
13 Three-toed woodpecker
14 Primary cavity excavators
15 Steelhead escapement
16 *Chinook salmon escapement*
17. Rocky Mountain elk
18 Wildlife habitat improvement
19. Fuelwood
20. Other wood fiber
21 Forest residue
22. Water yield
23. Habitat Effectiveness Index
24. Reduction in timber harvest due to snags and snag replacements

Water yield was initially included in FORPLAN but was removed because it showed no significant variation between alternatives, and because the scheduled output position it occupied was required for another purpose.

Most of the outputs listed above were derived using other outputs from the FORPLAN reports.

Table B-1 lists all outputs and their derivations

TABLE B-1

RESOURCE OUTPUTS AND DERIVATIONS

Resource Output	Unit	How Derived
Developed recreation use	1,000 RVD	See Section III G - Recreation
Nonwilderness dispersed use	1,000 RVD	See Section III G - Recreation
-Semi-Primitive Non-Motorized		
-Semi-Primitive Motorized		
-Roaded Natural		
-Roaded Modified		
Wilderness use	1,000 RVD	See Section III G - Recreation
-Primitive trailed		
-Primitive no trails		
-Semi-Primitive		
Trail construction/reconstruction	Miles	See Section III.G - Recreation
Developed site reconstruction	PAOT	Based on 25-year reconstruction cycle
Visual quality objectives	Acres	Based on "National Forest Landscape
-Preservation		Management,"
-Retention		U.S D A , Vol. 2, Chap. 1.
-Partial retention		
-Modification/Max modification		
Unroaded areas assigned to unroaded Management Prescription	Acres	Selection by management team based on public input.
Big-game use	1,000 WFUD	See Section III G - Wildlife
Smolt Habitat Capability Index (SHCI)	1,000 smolts	See Section III.G - Fish
Anadromous fish use	1,000 WFUD	See Section III.G - Fish
Anadromous fish commercial harvest	1,000 pounds	See Section III.G - Fish
Anadromous fish habitat improvement	1,000 pounds	See Section III G - Fish
Pileated woodpecker	Potential pairs	See Section III G - Wildlife
Pine marten	Potential pairs	See Section III.G - Wildlife
Three-toed woodpecker	Potential pairs	See Section III.G - Wildlife
Primary cavity excavators	Percent of Potential Population	See Section III G - Wildlife
Rocky Mountain elk	1,000 Head	See Section III G - Wildlife
-Potential summer population		
-Potential winter population		
Wildlife habitat improvement	Acres	See Section III.G - Wildlife
Wildlife habitat improvement	Structures	See Section III.G - Wildlife

TABLE B-1 (Continued)
RESOURCE OUTPUTS AND DERIVATIONS

Resource Output	Unit	How Derived
Range-permitted grazing	1,000 AUM	FORPLAN output. See also Section III.G - Range
Timber sale program quantity	MMBF	See Section III.G.2.c
Timber sale program quantity	MMCF	
Allowable Sale Quantity	MMBF	See Section III.G 2.c
Allowable Sale Quantity	MMCF	
Fuelwood (not estimated)	MMCF	Not applicable
Other wood fiber (biomass)	MMCF	See Section III.G - Firewood/Biomass
Forest residue	MMCF	See Section III.G - Firewood/Biomass
Reforestation (planting)	1,000 Acres	See Section III.G.2.d
Timber stand improvement	1,000 Acres	See Section III.G.2.e
Long-term sustained yield	MMCF	FORPLAN output
Timber growth in year 2030	MMCF	FORPLAN output
Water yield	1000 Acre-ft.	See Section III G - Water Yield
Sediment	Index	FORPLAN output
Improved watershed condition	Acres	Professional estimate
Fire management effectiveness index	$/1000 Acres protected	See Section III G - Fire
Arterial and collector road construction and reconstruction	Miles	See Section III.G - Roads
Timber purchaser road -Construction -Reconstruction	Miles	See Section III.G - Roads
Roads suitable for public use -Passenger car -High-clearance vehicle only	Miles	See Section III.G - Roads
Fuel treatment	1,000 Acres	See Section III.G - Fire
Operational costs	Million $	See Section III.G - Economic Effects
Capital investment costs -Allocated -Appropriated	Million $	See Section III.G - Economic Effects
Returns to Government	Million $	See Section III.G - Economic Effects
Changes in jobs	Number	See Section III.G - Economic Effects
Changes in income	Million $	See Section III.G - Economic Effects

TABLE B-1 (Continued)
RESOURCE OUTPUTS AND DERIVATIONS

Resource Output	Unit	How Derived
Payments to Counties	Million $	See Section III.G - Economic Effects
Area available for specific resource uses	Acres	
-Timber harvest		See Section II A 4
-Grazing		All land except wilderness and roads
-Mineral exploration		All acres not withdrawn
Acreage of available timber by harvest prescription	Acres	FORPLAN output
-Clearcut		
-Shelterwood		
-Selection		
Lands tentatively suitable for timber production	Acres	See section II.A.4 - Suitable Lands
Lands suitable for timber production	Acres	Suitability analysis + FORPLAN output
Lands with timber yield reductions	Acres	RO Direction + FORPLAN output

C. ANALYSIS AREAS

The analysis area is the basic unit of land used in the Forest planning model. These areas are generally noncontiguous and homogeneous, scattered pieces of land possessing similar characteristics Forest land areas having similar physical and biological characteristics are expected to respond in a somewhat uniform way to Management Prescriptions.

A brief description of how analysis areas are defined can best be illustrated through an example. At the highest level of aggregation (Level 1), the area is defined with a broad land characteristic, e g , watersheds In the Malheur model, there are 14 Level 1 identifiers, representing 7 watersheds in each of which there are winter range and non-winter range areas. With each succeeding level of detail, new analysis area groupings are created, each a subset of the next higher level of aggregation. These levels define the existing roading level; the timber working group or species composition; the land class (i e., slope and presence or absence of riparian conditions), the existing condition class, and the age Each level contributes to the uniqueness of a response, output, or economic parameter which distinguishes the analysis area. For the bench marks, which were developed using the Draft FORPLAN model, the hierarchy of identifiers was different See the following description and table B-2

One important consideration used by both the management team and the interdisciplinary team was that the FORPLAN model would be oriented more to providing resource information than site-specific configurations due to model size limitations. This is reflected in the selection of identifiers.

A brief description of the analysis areas used in the Malheur National Forest planning model follows The detailed process of generating analysis areas and land allocations for the revised (watershed based) FORPLAN model is described in "Revised analysis areas for FORPLAN" (Lindley, 3/21/90)

1. Level 1

The Level 1 identifier, in the alternatives, represents the seven major watersheds of the Forest, coupled with the identification of winter range. Thus each watershed is represented by two identifiers, one for winter range (terminating with -WR) and one for other lands (terminating with -OT). See Table B-2 for a list of identifiers and Figure B-1 for a map of the major watersheds.

For the benchmarks, the Level 1 identifier categorizes analysis areas based on the level of existing local roading.

a. Roading adequacy level 1 covers those areas where roads were constructed during the 5 years immediately prior to and including Fiscal Year 1982.

b Roading adequacy Level 2 includes areas where no roads were constructed during the 5 years immediately prior to and including Fiscal Year 1982 and which have some type of road system in place.

c. Unroaded areas are larger than one section in size and provide an 800-foot boundary to any existing road.

Roading adequacy levels were developed from transportation and timber sale maps. The information in this identifier provides a method of reflecting roading need and cost differences for timber entries into different roading categories

2. **Level 2**

The Level 2 identifier in the alternatives represents the level of roading. The identifiers are the same as those used for Level 1 in the benchmarks

For the benchmarks, existing range management intensity is used as the Level 2 identifier. In order to portray accurately the cost and yield differences between allotments, it is necessary to know what the existing management intensity is This identifier provides that information We are most concerned with the present level of structural improvements on the allotments. Since "C" and "D" strategies may have the same level of these improvements, they have been aggregated "Other" in Level 2 denotes analysis areas which are not contained within any range allotments

3. **Level 3**

The Level 3 identifier was used for the alternatives to represent the major watersheds as described for Level 1 without the coupling to winter range. This was done mainly for convenience in operating the Forplan model

This level was not used for the benchmarks.

4. **Working Group**

This level identifies the major vegetative groupings on the Forest and corresponds to the working group identifiers from the Forest Timber Inventory Model The Total Resource Inventory data base prepared in 1980 was used as the basis for the working group, since it is consistent with the timber inventory

The working group specifies the species composition of the timber types, thus allowing stumpage price difference between species to be reflected. It also identifies the nonforested lands that occur on the Forest

The working group identifiers for the alternatives and the benchmarks are the same

5. **Land Class**

Slope is the major component of the land class delineated We selected 0-35 percent and greater than 35 percent as the slope breaks for use in FORPLAN. This information was contained in the Total Resource Inventory System. It was also used for making cost determinations as well as for range and sediment yields and timber management consideration

Land class has also been used to identify riparian areas on the Forest. For the alternatives, a single riparian identifier is used, and the differentiation of anadromous and non-anadromous streams is obtained by reference to the watersheds as identified in levels 1 and 3 The Total Resource Inventory system is used as the basis for this identifier Riparian areas management is a key issue on the Forest and, therefore, it was desirable to have these as separate analysis areas

For the benchmarks, two identifiers were used to represent anadromous and non-anadromous streams, since there was no geographic differentiation available from the other identifiers

6. ***Condition Class***

From a range and timber standpoint, it was necessary to have a fair amount of site specificity built into analysis areas Much of this specificity is reflected in condition class identifiers For timber areas, the analysis areas are delineated by the existing condition of the stand. The nonforest areas are separated by the dominant vegetation that is present These delineators were used to differentiate yield and economic information for FORPLAN

Table B-2 lists the identifier codes used both for the alternatives and the benchmarks. The list of Condition Classes for the alternatives was modified from that used in the benchmarks as follows.

a. Old Growth was included in 2 Story, since the two have almost identical characteristics. Old growth is tracked in the analysis area generation part of the model, and used in the assignment of areas to old growth management.

b. Two classes for lodgepole pine were added (Sawtimber, Seeds and Saps). These replaced the seven classes as used for other working groups, thus reducing the size of the model.

Three other attributes reviewed for possible use as analysis area identifiers were visual quality objectives, soils and range allotments. These were reviewed by the Interdisciplinary Team, but were dropped from consideration. Soils information was found to be in an unusable format in the Total Resource Inventory system. Use of range allotments or visual quality objectives expanded the FORPLAN model to an unusable size.

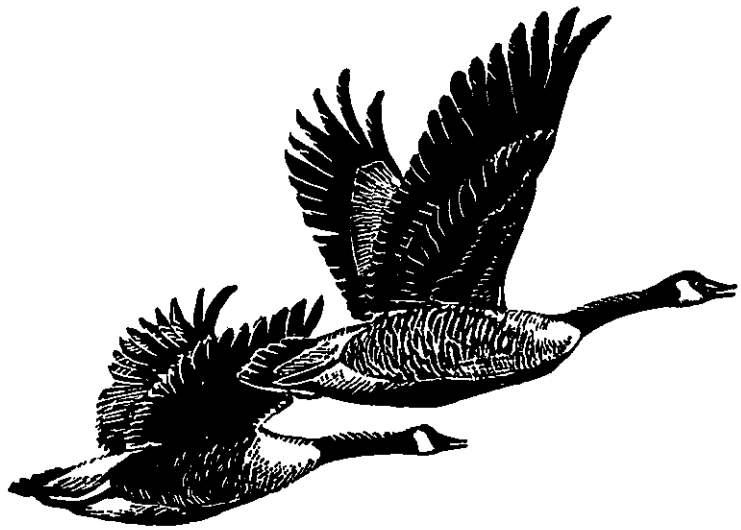


TABLE B-2

ANALYSIS AREA IDENTIFIER CODES (Benchmarks)

Level 1

1. ROADL1 - Roading adequacy level 1
2. ROADL2 - Roading adequacy level 2
3. UNROAD - Unroaded
4. ALROAD - All roading levels
5. WILDNS - Wilderness

Level 2

1. ALOTCD - Range allotment strategy C or D
2. OTHER - All other lands

Level 3

Not used

Working Group

1. P-PINE - ponderosa pine
2. MIXCON - mixed conifer
3. LODGEP - lodgepole pine
4. NONFOR - nonforested
5. ALLWG - all working groups

Land Class

1. 0-35 - Up to 35 percent slope
2. 36+ - Over 35 percent slope
3. RIPAND - Riparian zones - Anadromous
4. RIPNON - Riparian zones - Nonanadromous
5. ALLSLP - All slopes
6. ALLRIP - All riparian zones
7. ALLLC - All land classes

Condition Class

1. MATURE - Mature sawtimber
2. COMTHN - Commercial thin
3. PRETHN - Precommercial thin
4. REFRST - Reforestation
5. 2STORY - Two story
6. NOTRET - No treatment
7. GRASSD - Grass dominant
8. FIRSDG - Fir/sedge
9. MSTMED - Moist meadow
10. DRYMED - Dry meadow
11. RCKLND - Rockland
12. SAGEBD - Sage dominant
13. MESIC - Mesic shrubs and trees
14. JUNBUN - Juniper bunchgrass
15. LOSITE - Unproductive
16. OLDGTH - Old growth
17. ALLCON - All condition classes
18. ALLFOR - All forest classes
19. ALLNON - All non-forest classes

TABLE B-2 (Continued)
ANALYSIS AREA IDENTIFIER CODES (Alternatives)

Level 1

1. FXCTWR - Fox/Cottonwood winter range
2 FXCTOT - Fox/Cottonwood other
3. MFJDWR - Middle Fork John Day winter range
4 MFJDOT - Middle Fork John Day other
5. UPJDWR - Upper John Day winter range
6 UPJDOT - Upper John Day other
7. SFJDWR - South Fork John Day winter range
8. SFJDOT - South Fork John Day other
9. SILVWR - Silvies River winter range
10. SILVOT - Silvies River other
11. MLHRWR - Malheur River winter range
12. MLHROT - Malheur River other
13. NFMHWR - N. Fork Malheur winter range
14. NFMHOT - N. Fork Malheur other

Level 2

1. ROADL1 - Roading adequacy level 1
2 ROADL2 - Roading adequacy level 2
3. UNROAD - Unroaded
4. ALROAD - All roading levels

Level 3

1. FXCT - Fox/Cottonwood
2. MFJD - Middle Fork John Day
3. UPJD - Upper John Day
4. SFJD - South Fork John Day
5 SILV - Silvies River
6 MLHR - Malheur River
7. NFMH - N. Fork Malheur

Working Group

1. P-PINE - ponderosa pine
2. MIXCON mixed conifer
3. LODGEP - lodgepole pine
4. NONFOR - nonforested
5. ALLWG - all working groups

Land Class

1. 0-35 - Up to 35 percent slope
2 36+ - Over 35 percent slope
3. RIPARN - Riparian zones - Anadromous
5. ALLLC - All land classes

Condition Class

1. MATURE - Mature sawtimber
2 COMTHN - Commercial thin
3. PRETHN - Precommercial thin
4. REFRST - Reforestation
5. 2STORY - Two story
6. NOTRET - No treatment
7. GRASSD - Grass dominant
8 FIRSDG - Fir/sedge
9. MSTMED - Moist meadow
10. DRYMED - Dry meadow
11 RCKLND - Rockland
12. SAGEBD - Sage dominant
13. MESIC - Mesic shrubs and trees
14. JUNBUN - Juniper bunchgrass
15 LOSITE - Unproductive
16. - Not used
17. ALLCON - All condition classes
18 ALLFOR - All forest classes
19. ALLNON - All non-forest classes
20. LPPSAW - Lodgepole sawtimber
21. LPPSAS - Lodgepole seeds and saps

D. *IDENTIFICATION* OF PRESCRIPTIONS

1. Overview

The array of potential land treatments applicable to an analysis area are represented in the model by sets of variables known as "Management Prescriptions." Generally, a Management Prescription refers to a set of treatments or practices designed to produce a specific mix of outputs over time. All prescriptions result in multiple production functions, with each combination of analysis areas and prescriptions producing a unique set of outputs and associated benefits and costs. Once aggregated in a Forest-wide model, the most efficient mix of analysis area prescription combinations is selected to meet the stated objectives of an alternative.

The multiple production functions for each prescription are the result of a set of individual resource production functions, represented in FORPLAN as "scheduled outputs " The level of scheduled outputs is determined by the level of intensity of a given prescription and by the inherent potential of a given piece of land to produce those outputs The varying levels of scheduled output coefficients allow *FORPLAN to reflect the tradeoffs associated with alternative Management* Prescriptions A list of the prescriptions used in FORPLAN is shown in Table B-3 The details of the process for generating these prescriptions are described in the process paper "Prescription generator for FORPLAN" (June 1988)

2. Purpose, Criteria, and Assumptions for Prescriptions

The prescriptions can be grouped into general categories by major resource element or application These categories address a variety of objectives and are called Management Areas The derivation of outputs by Management Area from FORPLAN outputs is described in two process papers "Calculation of prescription acres by Management Area from FORPLAN" (Lindley, 1/9/90) and "Period 1 harvest acres and volume by Management Area" (Lindley, 12/11/89)

The purpose of specific prescriptions within each management area is to portray a management activity presently being practiced on the Forest, to respond to a particular issue or group of issues, and to provide a range of management options that could be applied to various land areas

a Management Area 1

(1) Purpose:
This category was developed to provide an option for timber management activity on every acre of land that was identified as being "tentatively suitable" for that use

(2) Criteria and Assumptions
Provide a range of timber management intensities for existing and regenerated stands through the application of commercial and precommercial thinning, final harvest methods, and stand entry time

Provide an option for conventional or aerial logging systems.

Apply even-aged and uneven-aged silvicultural systems.

Recognize and provide for other resource uses compatible with timber production at full yields.

Develop standards and costs using commonly accepted management practices currently in use

b. Management Area 2

(1) Purpose:
This was developed to address the level of grazing management intensity to be applied on riparian and nonriparian lands assigned to range management. The purpose was to provide alternative levels of grazing investments for improvements, betterment, etc., and to see how these levels would affect animal unit month outputs on both riparian and nonriparian grazing lands.

(2) Criteria and Assumptions:
Design grazing intensities to minimize the adverse effects on other resources (i e., fisheries, riparian, wildlife).

Develop standards and costs using commonly accepted management practices currently in use.

c Management Areas 3A and 3B

(1) Purpose·
This was developed to address the issue of protection of anadromous and non-anadromous riparian areas for benefiting resources while still maintaining opportunities for other management (i.e., timber harvests). The purpose was to provide an array of options for riparian area management ranging from no production of controllable outputs to limited production aimed at riparian zone protection

(2) Criteria and Assumptions:
Provide a range of intensities for riparian area management which will include production of controllable outputs (i.e , timber)

Develop standards and costs using commonly accepted management practices currently in use.

d Management Areas 4A&B

(1) Purpose:
This was developed to address the issue of big-game management, primarily elk. The purpose was to provide an array of options ranging from management exclusively for big game through a series of prescriptions that provided for timber production long with various levels of elk production. The wildlife-timber prescriptions were designed to answer the question of how these two resources could be managed jointly on areas important for both.

(2) Criteria and Assumptions:
Objective levels for big-game species to be agreed upon between the Forest Service and Oregon Department of Fish and Wildlife.

Design the prescriptions for use on specific big-game winter range.

Provide for other uses compatible with big-game management objectives.

Develop standards and costs using commonly accepted management practices currently in use.

e Management Area 5

(1) Purpose.
This was developed to address the issue of winter roost habitat for bald eagles The purpose was to confine activities in suitable areas to those which maintain and enhance this habitat

(2) Criteria and Assumptions.
Use uneven-aged timber management to maintain stands or enhance roost habitat.

Comply with the Bald Eagle Recovery Plan

Develop standards and costs using management practices to achieve above objectives.

f. Management Areas 6A, 6B and 6C

(1) Purpose:
This was developed to address the issue of how to manage the Forest's two existing wildernesses and any proposed wildernesses.

(2) Criteria and Assumptions:
The wilderness prescription would be applied to the Wildernesses.

Wilderness prescriptions are applied to roadless areas proposed for wilderness designation.

g. Management Area 7

(1) Purpose
This was developed to address the preservation and protection of areas with outstanding natural scenic views

(2) Criteria and Assumptions.
Commodity production is subordinated to preservation of aesthetic values

Recreation management is generally at the semiprimitive, nonmotorized level.

Develop standards and costs to meet the above objectives

h Management Area 8

(1) Purpose·
This was developed to address the preservation and protection of areas of significant historical, geological, botanical, zoological, paleontological, or other special characteristics.

(2) Criteria and Assumptions·
Commodity production is subordinated to preservation of special interest values

The primary use of these areas is dispersed nonmotorized recreation

Standards and costs are developed to meet the above objectives.

i Management Area 9

(1) Purpose·
This was developed for application to Research Natural Areas. This prescription was designed to provide continued management of the existing Canyon Creek Research Natural Area, and as an option for designating additional areas for the same type of management

(2) Criteria and Assumptions:
Where existing uses are in effect, and no change in management is contemplated, pattern management practices after current approved direction.
Develop standards and costs using commonly accepted management practices currently in use.

j Management Area 10 (1) Purpose:
To provide recreation opportunities for people seeking a high degree of isolation from the sights, sounds, and results of human activity

(2) Criteria and Assumptions:
Commodity production is subordinated to preservation of isolated areas with minimum alteration.

Develop standards and costs to meet the above objectives and accepted management practices

k Management Area 11 (1) Purpose:
To provide motorized recreation opportunities for people seeking a natural-appearing environment with a moderate degree of isolation.

(2) Criteria and Assumptions.
Commodity production is subordinated to preservation of a natural-appearing environment.

Develop standards and costs consistent with the above objectives and accepted management practices

1. Management Area 12 (1) Purpose
To provide recreation opportunities for people seeking developed facilities such as campgrounds, picnic areas, boating sites, etc

(2) Criteria and Assumptions.
Applies to sites classified as development level 3 or higher

No commodity production

Develop standards and costs consistent with above objectives and accepted management practices.

m. Management Area 13 (1) Purpose.
This was developed to address the issue of managing tentatively suitable timber lands for old-growth dependent species of plants and animals. The purpose was to provide for suitable existing and future old-growth habitat while still permitting timber harvesting to occur. The prescriptions were designed to answer the question of what levels of old growth must be managed Forest-wide in order to maintain minimum viable populations of old growth dependent species, as well as provide for ecosystem diversity and other aesthetic values..

(2) Criteria and Assumptions·
Old growth habitat for dependent species will be maintained at varying levels in each alternative, but not less than the minimum. Timber harvesting may occur in other old growth areas.

Develop standards and costs using commonly accepted management practices currently in use

n. Management Area 14

(1) Purpose
The category of visual Management Prescriptions was developed to address the major issue of visual quality objectives pertaining to timber harvest operation The purpose was to provide an array of options for timber harvesting which include visual quality objectives for retention and partial retention These prescriptions were designed to answer the question of how timber harvesting could be modified to maintain scenic quality in sensitive areas

(2) Criteria and Assumptions.
Use the basic concepts and research findings contained in the USDA Forest Service *Handbook (No 426) "Manage for Retention VQO," and appropriate current* silvicultural practices

Design the prescriptions to provide for other resource uses compatible with timber production under retention and partial retention visual quality objectives

Develop standards and costs using commonly accepted management practices currently in use

For modeling purposes in FORPLAN, this Management Area was combined with 22 (Wild and Scenic Rivers). See process paper "Wild and Scenic Corridors in FORPLAN" (Lindley, 12/29/88).

o. Management Area 15

(1) Purpose:
This was developed to address the issue of old growth dependent and cavity nesting wildlife species Some acres under this prescription will also be used by elk as winter range, and some will contain streams supporting fish populations.

(2) Criteria and Assumptions·
Design prescriptions to maintain five stages of forest growth succession

Give special consideration to snag management, water quality, streamside management, and big game cover

Provide for any special habitat requirements

Manage roads to protect key wildlife areas

Develop standards and costs using commonly accepted management practices currently in use.

p. Management Area 16 (1) Purpose

Several prescriptions were developed for application to nonforest lands and lands not suitable for timber production due to low productivity, regeneration problems, or cost inefficiencies for timber management. Included in this category is a minimum level or custodial Management Prescription for lands that are to be managed in their current state, deferring investment in timber production for the Plan period.

(2) Criteria and Assumptions:

Provide for a mix of uses excluding timber management, that are compatible with surrounding land management

q. Management Area 17 (1) Purpose:

This area consists of the National Forest portion of the Byram Gulch Municipal Supply Watershed which provides water for domestic use to the town of Canyon City, Oregon.

(2) Criteria and Assumptions:

Manage to ensure that Oregon water quality standards for community public supply water use are met.

Protect existing beneficial uses of the water by recognizing that commodity production is subordinate to preservation of water quality. Emphasis will be placed on protecting and, where needed, improving the quality and quantity of the water resource in a manner consistent with National, State, and Forest goals.

Develop standards and costs consistent with the above objectives and accepted management practices.

r. Management Area 18 (1) Purpose:

This area consists of the National Forest portion ot the Long Creek Municipal Supply Watershed which provides water to the town of Long Creek, Oregon.

(2) Criteria and Assumptions:

Manage to ensure that Oregon water quality standards for community public supply water use are met.

Protect existing beneficial uses of the water by recognizing that commodity production is subordinate to preservation of water quality. Emphasis will be placed on protecting and, where needed, improving the quality and quantity of the water resource in a manner consistent with National, State, and Forest goals.

Develop standards and costs consistent with the above objectives and accepted management practices.

s. Management Area 19 (1) Purpose:

This was developed to recognize administrative sites such as Ranger Stations and work centers, and other long term special use areas such as the Lake Creek organization camp.

(2) Criteria and Assumptions:
Provides for the maintenance of facility sites necessary for the administration of Malheur National Forest lands.

Develop standards and costs consistent with the above objectives and accepted management practices.

t. Management Area 20 (1) Purpose·
This was developed to include two geographical areas on the Forest that are portions of, and lands adjacent to, former roadless areas. These ares include Dry Cabin and Utley Butte.

(2) Criteria and Assumptions
Manage to provide for high quality wildlife and fish habitat and water quality.

Design the prescriptions to provide for 70 percent of elk habitat effectiveness while allowing for scheduled timber harvest.

Provide opportunities for high quality semiprimitive dispersed recreation.

Develop Standards and costs using commonly accepted management practices currently in use.

u. Management Area 21 (1) Purpose:
This area consists of geographical areas on the Forest that are portions of, and lands adjacent to, former roadless areas These areas include Baldy Mountain, Dixie Butte, Jump-Off Joe, and Nipple Butte

(2) Criteria and Assumptions·
Manage to provide for high quality wildlife and fish habitat and water quality.

Manage elk habitat to provide at least 70 percent of elk habitat effectiveness

Timber harvest will be on a non-scheduled basis and will be used only to meet a wildlife and/or fish habitat objective

Provide opportunities for high quality semiprimitive dispersed recreation

Develop Standards and costs using commonly accepted management practices currently in use.

Details of how this was modeled are described in the process paper "Wildlife Emphasis in FORPLAN", Lindley, 2/22/89.

v Management Area 22 (1) Purpose·
To identify and manage legislatively designated areas under the Omnibus Oregon Wild and Scenic Rivers Act of 1988 Identified areas are segments of the Malheur River and North Fork Malheur River.

(2) Criteria and assumptions:
Manage to maintain the wild and scenic character of the identified river segments in accordance with the above Act.

For modeling purposes in FORPLAN, this Management Area was combined with 14 (Visual). See process paper "Wild and Scenic Corridors in FORPLAN", Lindley, 12/29/88

3. Use of Cost Efficiency in Developing Prescriptions

Cost efficiency was a major consideration in development of the prescriptions; the following process was used to ensure cost-efficient prescriptions Objectives and standards were established for each prescription, by resource element. To meet the objectives of the prescription, costs were estimated under each resource element to meet the standards of the prescription. Costs of producing the outputs that would result from implementing the prescription were developed and compared to the benefit values also produced. Prescriptions were carried forward if they were cost efficient in achieving prescription end products. Two basic assumptions used in developing prescription costs were

a. Costs experienced in implementing past practices were a reasonable basis from which to predict future costs

b. The funding for production of outputs would include only the necessary support funding.

4. List of Prescriptions

Table B-3 shows the prescriptions used in FORPLAN

TABLE B-3
LIST OF FORPLAN PRESCRIPTIONS

Management Emphasis Identifiers 1/	Management Intensity Identifier	Description of Management Intensity	Corresponding Management Area
ALL	MINLVL	Minimum management level	All
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	FHOSWC	Final harvest only, shelterwood, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U,RIPARN	FHOCCC	Final harvest only, clearcut, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	FHSWPC	Final harvest only, shelterwood/ plant, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	CTLSWC	Commercial thin, low stocking level, shelterwood, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	CTLCCC	Commercial thin, low stocking level, clearcut, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	CTLSPC	Commercial thin, low stocking level, shelterwood/plant, range management level "C"	1,4,20
NOT USED	CTLSWD	Commercial thin, low stocking level, shelterwood, range management level "D"	
NOT USED	CTLCCD	Commercial thin, low stocking level, clearcut, range management level "D"	
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	CTHSWC	Commercial thin, high stocking level, shelterwood, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	CTHCCC	Commercial thin, high stocking level, clearcut, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	CTHSPC	Commercial thin, high stocking level, shelterwood/plant, range management level "C"	1,4,20
NOT USED	CTHSWD	Commercial thin, high stocking level, shelterwood, range management level "D"	
NOT USED	CTHCCD	Commercial thin, high stocking level, clearcut, range management level "D"	
OSRTIM,WILDLF	ORLSWC	Overstory removal, low stocking level, shelterwood, range management level "C"	1,4,20

TABLE B-3 (Continued)
LIST OF FORPLAN PRESCRIPTIONS

Management Emphasis Identifiers 1/	Management Intensity Identifier	Description of Management Intensity	Corresponding Management Area
TBRMGT,OSRTIM,WILDLF, CONV-M	ORLCCC	Overstory removal, low stocking level, clearcut, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	ORLSPC	Overstory removal, low stocking level, shelterwood/plant, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	ORLSWD	Overstory removal, low stocking level, shelterwood, range management level "D"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M	ORLCCD	Overstory removal, low stocking level, clearcut, range management level "D"	1,4,20
TBRMGT,OSRTIM	ORHSWC	Overstory removal, high stocking level, shelterwood, range management level "C"	1,4
NOT USED	ORHCCC	Overstory removal, high stocking level, clearcut, range management level "C"	
NOT USED	ORHSPC	Overstory removal, high stocking level, shelterwood/plant, range management level "C"	
TBRMGT,OSRTIM,WILDLF	ORHSWD	Overstory removal, high stocking level, shelterwood, range management level "D"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M	ORHCCD	Overstory removal, high stocking level, clearcut, range management level "D"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	PCTSWC	Precommercial thin, shelterwood, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF	PCTCCC	Precommercial thin, clearcut, range management level "C"	1,4,20
TBRMGT,OSRTIM,WILDLF, CONV-M,CONV-U	PCTSPC	Precommercial thin, shelterwood/plant, range management level "C"	1,4,20
TBRMGT,WILDLF	REGNON	Regenerate nonstocked land	1,4,20
RNGMGT,TBRMGT,WILDLF, CONV-M	LEVELC	Extensive level range management	1,2,4,20
RNGMGT,TBRMGT,WILDLF, CONV-M	LEVELD	Intensive level range management	1,2,4,20
VISUAL	VISUAL	Uneven-aged timber management in visual resource areas	14

TABLE B-3 (Continued)
LIST OF FORPLAN PRESCRIPTIONS

Management Emphasis Identifiers[1/]	Management Intensity Identifier	Description of Management Intensity	Corresponding Management Area
TBRMGT,WILDLF,CONV-M	LOSITE	Timber management on low-site Forested lands	1,4,20
RIPARN	RIPTBR	Resource management in riparian areas	3A,3B
RIPARN	RIPRNG	Resource management in nonforested riparian areas	3A,3B
TBRMGT	CTLSWL	Commercial thin, low stocking level, shelterwood, range management level "C", longer rotations for large trees	1,4
TBRMGT	CTLSPL	Commercial thin, low stocking level, shelterwood/plant, range management level "C", longer rotations for large trees	1,4
TBRMGT,OSRTIM	ORLSWL	Overstory removal, low stocking level, shelterwood, range management level "C", longer rotations for large trees	1,4
TBRMGT,OSRTIM	ORLSPL	Overstory removal, low stocking level, shelterwood/plant, range management level "C", longer rotations for large trees	1,4
OGREP	OGREP	Old growth replacement stands	13
UEATBR	UNEVPP	Uneven-age management in ponderosa pine	1,4
UEATBR	UNEVMC	Uneven-age management in mixed conifer	1,4

[1/] List of Management Emphasis identifiers

Identifier	Description
TBRMGT	Timber management, except as noted below
RNGMGT	Range management
OSRTIM	Overstory removal where understories are manageable
VISUAL	Visual management
RIPARN	Riparian area management
UEATBR	Uneven-age timber management
WILDLF	Wildlife emphasis, scheduled for timber harvest
OGREP	Old growth replacement stands
CONV-M	Mixed conifer stands with manageable understories, converted to pine
CONV-U	Mixed conifer stands with unmanageable understories, converted to pine

Note: This list does not include management emphases which apply to the first period only in order to simulate programmed harvests which occurred before the start of the planning period.

Table B-4 displays a summary of timber, recreation, access, wildlife, range, and protection elements for each prescription by Management Area These include elements which are included in the FORPLAN model and those calculated separately

Acronyms used in the table include

Min Level	=	Minimum management level
FHO	=	Final harvest only
CTL	=	Commercial thin - low stocking level
CTH	=	Commercial thin - high stocking level
ORL	=	Overstory removal - low stocking level
ORH	=	Overstory removal - high stocking level
PCT	=	Precommercial thin
Regnon	=	Regenerate nonstocked land
Lo site	=	Timber management on low-site Forested land
Level C	=	Extensive range management
Level D	=	Intensive range management
Riparn	=	Riparian area resource management
Riprng	=	*Nonforested riparian area resource management*
Mod	=	Modification
Pres	=	Preservation
Ret	=	Retention
PR	=	Partial retention
RM	=	Roaded Modified
RN	=	Roaded Natural
SPNM	=	Semi-Primitive Non-Motorized
SPM	=	Semi-Primitive Motorized
C/C/C/	=	Confine, contain, control
LP	=	Lodgepole pine
RST	=	Restricted

TABLE B-4

PRESCRIPTION STANDARDS

Management Area	FORPLAN Prescription	Recreation			Wildlife	
		Visual Quality Objectives	ROS	Access	Snag Level[1/] (percent)	Elk Habitat Effectiveness Index
Management Area 1						
Minimum Level	Min Level	Mod	RM	High	40 min	0 40 min
Final Harvest Only	FHO	Mod	RM	High	40 min	0.40 min
Commercial Thin Low Stocking Level	CTL	Mod	RM	High	40 min	0 40 min
Commercial Thin High Stocking Level	CTH	Mod	RM	High	40 min	0.40 min
Overstory Removal Low Stocking Level	ORL	Mod	RM	High	40 min	0.40 min
Overstory Removal High Stocking Level	ORH	Mod	RM	High	40 min	0.40 min
Precommercial Thin	PCT	Mod	RM	High	40 min	0.40 min
Regeneration	Regnon	Mod	RM	High	40 min	0 40 min
Low Site Management	Losite	Mod	RM	High	40 min	0 40 min
Uneven-aged Management	UEATBR	Mod	RM	High	40 min	N/A
Management Area 2						
Minimum Level	Min Level	Varies	Varies	High	N/A	0 40-0.50
Level C	Level C	Varies	Varies	High	N/A	0 40-0.50
Level D	Level D	Varies	Varies	High	N/A	0.40-0.50
Management Area 3A&3B						
Minimum Level	Min Level	Varies	Varies	Low	60 min	0 40-0.50
Riparian General	Riparn	Varies	Varies	Low	60 min	0.40-0 50
Riparian Non-Forest	Riprng	Varies	Varies	Low	N/A	0.40-0 50
Management Area 4						
Minimum Level	Min Level	Mod	RM	RST[3/]	40 min	0.50 min
Final Harvest Only	FHO	Mod	RM	RST[3/]	40 min	0.50 min
Commercial Thin Low Stocking Level	CTL	Mod	RM	RST[3/]	40 min	0 50 min
Commercial Thin High Stocking Level	CTH	Mod	RM	RST[3/]	40 min	0.50 min
Overstory Removal Low Stocking Level	ORL	Mod	RM	RST[3/]	40 min	0 50 min
Overstory Removal High Stocking Level	ORH	Mod	RM	RST[3/]	40 min	0.50 min
Precommercial Thin	PCT	Mod	RM	RST[3/]	40 min	0 50 min
Regeneration	Regnon	Mod	RM	RST[3/]	40 min	0.50 min
Low Site Management	Losite	Mod	RM	RST[3/]	40 min	0 50 min
Uneven-aged Management	UEATBR	Mod	RM	RST	40 min	N/A

Footnotes are listed at the end of this table.

Timber							Range	
Scheduled Timber Harvest				Unscheduled Timber Harvest				
Overstory Removal Manage Existing Understory	Commercial Thinnings	Rotation Length (Years)	Size of Created Openings (Acres)	Salvage	Safety	Other Resource Objective	Range Utilization Standards (percent)	Protection
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
No	No	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes		
N/A	N/A	N/A	N/A	N/A	N/A	N/A	0	C/C/C
N/A	N/A	N/A	N/A	N/A	N/A	N/A	0-55	C/C/C
N/A	N/A	N/A	N/A	N/A	N/A	N/A	0-60	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	2/	C/C/C
N/A	N/A	N/A	N/A	N/A	N/A	N/A	2/	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55 5/	C/C/C
No	No	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
No	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
No	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
Yes	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
Yes	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
No	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
No	One	80-100	40 Max	Yes	Yes	Yes	0-55 5/	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55 5/	Control
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55 5/	Control

TABLE B-4 (Continued)
PRESCRIPTION STANDARDS

Management Area	FORPLAN Prescription	Recreation			Wildlife	
		Visual Quality Objectives	ROS	Access	Snag Level[1] (percent)	Elk Habitat Effectiveness Index
Management Area 5	Min Level	Varies	RN	RST[3]	[4]	0.40-0 50
Management Area 6ABC	Min Level	Pres	[9]	Low	[4]	0.40 min
Management Area 7	Min Level	Ret	SPNM & SPM	Low	[4]	0.40 min
Management Area 8	Min Level	Ret-PR	Varies	Mod	[4]	0.40-0.50
Management Area 9	Min Level	Pres	Varies	Low	[4]	0 40-0.50
Management Area 10	Min Level	Ret	SPNM	Low	[4]	0.40-0.50
Management Area 11	Min Level	Ret	SPM	Mod	[4]	0.40-0.50
Management Area 12	Min Level	Ret-PR	RN	High	[4]	0.40-0.50
Management Area 13 (Replacement Stands)	Min Level	Varies	RN	Low	[4]	0.40-0.50
Minimum Level	Min Level	Mod	RM	RST[3]	40 min	0 40-0 50
Final Harvest Only	FHO	Mod	RM	RST[3]	40 min	0.40-0 50
Commercial Thin Low Stocking Level	CTL	Mod	RM	RST[3]	40 min	0.40-0.50
Commercial Thin High Stocking Level	CTH	Mod	RM	RST[3]	40 min	0.40-0.50
Overstory Removal Low Stocking Level	ORL	Mod	RM	RST[3]	40 min	0.40-0.50
Overstory Removal High Stocking Level	ORH	Mod	RM	RST[3]	40 min	0 40-0.50
Precommercial Thin	PCT	Mod	RM	RST[3]	40 min	0 40-0 50
Regeneration	Regnon	Mod	RM	RST[3]	40 min	0 40-0 50
Low Site Management	Losite	Mod	RM	RST[3]	40 min	0.40-0 50
Uneven-aged Management	UEATBR	Mod	RM	RST[3]	40 min	N/A
Management Area 14						
Minimum Level	Min Level	Ret-PR	RN	High	40 min	0 40-0.50
Visuals	Visual	Ret-PR	RN-RM	High	40 min	0 40-0 50

Timber							Range	
Scheduled Timber Harvest		Unscheduled Timber Harvest						
Overstory Removal Manage Existing Understory	Commercial Thinnings	Rotation Length (Years)	Size of Created Openings (Acres)	Salvage	Safety	Resource Objective	Range Utilization Standards (percent)	Protection
N/A	N/A	N/A	N/A	No	Yes	Yes	0-55	Control
N/A	N/A	N/A	N/A	No	No	No	0-55	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	No	Yes	Yes	0	Cont1/Contn
N/A	N/A	N/A	N/A	No	Yes	No	0-55	Control
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	No	Yes	Yes	0	Control
Yes[6/]	1 to 3[6/]	[6/]	2-20	Yes	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	No	Yes	Yes	0-55	C/C/C
No	No	140-180	40 max	No	Yes	Yes	0-55	C/C/C
No	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
No	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
Yes	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
Yes	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
No	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
No	1 to 3	140-180	40 max	No	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	No	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
Yes[6/]	1 to 3[6/]	[6/]	2-20	Yes	Yes	Yes	0-55	C/C/C

TABLE B-4 (Continued)
PRESCRIPTION STANDARDS

Management Area	FORPLAN Prescription	Recreation			Wildlife	
		Visual Quality Objectives	ROS	Access	Snag Level[1/] (percent)	Elk Habitat Effectiveness Index
Management Area 15						
Minimum Level	Min Level	Mod	RM	RST[3/]	40-60	N/A
Final Harvest Only	FHO	Mod	RM	RST[3/]	40-60	N/A
Commercial Thin Low Stocking Level	CTL	Mod	RM	RST[3/]	40-60	N/A
Commercial Thin High Stocking Level	CTH	Mod	RM	RST[3/]	40-60	N/A
Overstory Removal Low Stocking Level	ORL	Mod	RM	RST[3/]	40-60	N/A
Overstory Removal High Stocking Level	ORH	Mod	RM	RST[3/]	40-60	N/A
Precommercial Thin	PCT	Mod	RM	RST[3/]	40-60	N/A
Regeneration	REGNON	Mod	RM	RST[3/]	40-60	N/A
Low Site Management	Lo site	Mod	RM	RST[3/]	40-60	N/A
Uneven-aged Management	UEATBR	Mod	RM	RST[3/]	40-60	N/A
Management Area 16	Min Level	Varies	Varies	Varies	[4/]	0.40-0.50
Management Area 17	Min Level	Mod	RN	Low	40 min	0.40-0.50
Management Area 18						
Minimum Level	Min Level	Mod	RN	High	40 min	0.40 min
Final Harvest Only	FHO	Mod	RN	High	40 min	0.40 min
Commercial Thin Low Stocking Level	CTL	Mod	RN	High	40 min	0.40 min
Commercial Thin High Stocking Level	CTH	Mod	RN	High	40 min	0.40 min
Overstory Removal Low Stocking Level	ORL	Mod	RN	High	40 min	0 40 min
Overstory Removal High Stocking Level	ORH	Mod	RN	High	40 min	0.40 min
Precommercial Thin	PCT	Mod	RN	High	40 min	0.40 min
Regeneration	REGNON	Mod	RN	High	40 min	0.40 min
Low Site Management	Lo site	Mod	RN	High	40 min	0.40 min
Uneven-aged Management	UEATBR	Mod	RN	High	40 min	N/A
Management Area 19	Min Level	Ret-RR	RN	High	60-100	0.40-0.50

Timber							Range	
Scheduled Timber Harvest		Unscheduled Timber Harvest						
Overstory Removal Manage Existing Understory	Commercial Thinnings	Rotation Length (Years)	Size of Created Openings (Acres)	Salvage	Safety	Resource Objective	Range Utilization Standards (percent)	Protection
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
No	No	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes		
N/A	N/A	N/A	N/A	Yes[7/]	Yes[7/]	Yes[7/]	0-55	C/C/C
N/A	N/A	N/A	N/A	No	Yes	No	0-55	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
No	No	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 Max	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes		
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C

TABLE B-4 (Continued)
PRESCRIPTION STANDARDS

Management Area	FORPLAN Prescription	Recreation			Wildlife	
		Visual Quality Objectives	ROS	Access	Snag Level[1] (percent)	Elk Habitat Effectiveness Index
Management Area 20						
Minimum Level	Min Level	Mod	RM-RN	RST[3]	60-100	0.70 min
Final Harvest Only	FHO	Mod	RM-RN	RST[3]	60-100	0.70 min
Commercial Thin Low Stocking Level	CTL	Mod	RM-RN	RST[3]	60-100	0.70 min
Commercial Thin High Stocking Level	CTH	Mod	RM-RN	RST[3]	60-100	0 70 min
Overstory Removal Low Stocking Level	ORL	Mod	RM-RN	RST[3]	60-100	0 70 min
Overstory Removal High Stocking Level	ORH	Mod	RM-RN	RST[3]	60-100	0 70 min
Precommercial Thin	PCT	Mod	RM-RN	RST[3]	60-100	0 70 min
Regeneration	REGNON	Mod	RM-RN	RST[3]	60-100	0.70 min
Low Site Management	Lo site	Mod	RM-RN	RST[3]	60-100	0.70 min
Uneven-aged Management	UEATBR	Mod	RM-RN	RST[3]	60-100	N/A
Management Area 21	Min Level	MOD	RN-RM	High	60-100	0.70 min

1/Calculated outside FORPLAN
2/Varies between 0-70 percent on grass and grasslike, 0-50 percent on shrubs
3/Access may be restricted at times to meet wildlife requirements
4/Snags will be maintained near natural occurring levels
5/In Management Area 4 cattle receive 25 percent of the 55 percent allowable use and big game receives 75 percent.

Timber							Range	
Scheduled Timber Harvest		Unscheduled Timber Harvest						
Overstory Removal Manage Existing Understory	Commercial Thinnings	Rotation Length (Years)	Size of Created Openings (Acres)	Salvage	Safety	Resource Objective	Range Utilization Standards (percent)	Protection
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C
No	No	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
Yes	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	1 to 3	80-100	40 max	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
No	No	Uneven-aged Management	2-5	Yes	Yes	Yes	0-55	C/C/C
N/A	N/A	N/A	N/A	Yes	Yes	Yes	0-55	C/C/C

6/80 Years in lodgepole pine type, uneven-aged management in ponderosa pine and mixed conifer type, standard timber management in the middle ground with some restriction

7/In the forested type only

8/High = unrestricted, moderate = restriction in type of vehicle or mode of travel, low = usually restricted to foot/stock travel.

9/Pristine to Semi-Primitive.

E. DEVELOPMENT OF TIMBER OPTIONS

As discussed in Section III C, analysis areas in suitable forest lands were delineated in part by three working group identifiers (ponderosa pine, mixed conifer, and lodgepole pine) and by seven existing vegetative condition classes (mature, commercial thin, precommercial thin, reforestation, two-story stands, no treatment, and low site).

These analysis area identifiers depicted stands which were classified as suitable and available lands for timber harvesting FORPLAN timber management prescriptions were developed for every combination of management emphasis which called for scheduled harvesting and analysis areas which contained suitable and available forested land. For any one prescription, the model was also offered several timing choices for implementation. Also, for each management emphasis and analysis area combination which involved timber harvesting options, the model could select a prescription which called for no program harvesting. This prescription was used as the final economic suitability test.

The silvicultural prescriptions and their associated yield tables developed for these analysis areas were based on: (1) the 1980 timber inventory data for each strata, (2) management objectives, (3) professional judgment of the Forest Silviculturist, and (4) Stand Prognosis runs

The first step was a meeting of the Forest Silviculturist and timber planners to determine what timber option could be used on each site. (Ref. 1920 letter, Prescription Development, March 26,1982, Letter Notes, April 26,1982). At this meeting it was agreed that even-aged management would be the most appropriate method of management (although later it was agreed to include uneven-age management in viable alternatives) (See discussion on Harvest Cutting Method Selection, Appendix E.) Also, it was deemed unlikely that the Forest would use the clearcutting regeneration option in the ponderosa pine type Clearcutting and shelterwood regeneration options would both be allowed in the mixed conifer type and only the clearcutting regeneration option would occur in the lodgepole pine type.

The next step was actual development of the timber prescription and associated yield tables. During this process while working with the timber data base, it was determined that the timbered stands on the Forest were the same, i.e., they were two-storied in nature and for the most part the existing understory could be managed (Ref. Stand Prognosis runs). It was also determined that in the lodgepole pine type two of the strata (mature and two-story) were almost identical, and they were combined (later the lodgepole condition classes for the alternatives were reduced to two: mature sawtimber, and seedlings and saplings). In addition, due to the mountain pine beetle epidemic the only silvicultural options in susceptible lodgepole pine stands were final harvest or do nothing (minimum level).

In addition, special prescriptions were developed for two specific areas of the Forest: visual and riparian management areas. The objectives in these areas were to provide continuous forest cover (i e., to meet stream-surface shading requirements in timbered riparian areas) and to provide scenic quality and large-diameter trees in the visual zone; both even-aged and uneven-aged timber prescriptions meet the overall objectives of these areas. However, the uneven-aged method, or a modified version, would best meet these objectives in these areas (See Standards for these areas, Forest Plan, Chapter IV, Section F.)

All planting will be done with genetically improved stock. The genetic tree improvement program on the Forest will ensure that genetically-improved stock is maintained in adequate quantities for planting needs The actual configuration of the timber prescription initially available to the FORPLAN model can be found in Table B-7.

There were no special prescriptions developed for elk winter ranges, because the standard timber prescription met the needs of elk on these lands when used in conjunction with cover constraints.

Further analysis of the timber prescriptions showed that some changes were still needed. The high reliance on overstory removals in mature and two-storied stands was not realistic because some stands would have an understory too old to manage, and too much harvest related damage would occur to the understories of others. Estimates of probable occurrence of these situations were made, and that amount of these stands was given only the final harvest or no-treatment options (see 1920 letter, Unmanageable Understories in Two-storied Stands, March 7, 1983). Further refinement was made to the riparian, visual resources, and overstory removal prescriptions over time, but the basic configuration stayed the same. See Table B-7, Summary of Timber Harvest Prescriptions available to FORPLAN, (Final Version). A final revision to the timber harvesting prescriptions was that salvage operations will be allowed in visual resource foreground areas. The estimate of manageable understories has been updated to reflect current conditions (1989).

1. Financial Analysis (Stage II)

A full range of management options were considered for each analysis area, ranging from the low intensities (i.e., natural regeneration and final harvest) to very high levels of management intensities, with different stocking levels and a number of commercial thins varying from one to four in number. National Forest Management Act regulations require that a financial analysis be performed for management prescriptions applied to the lands which are identified as tentatively suitable for timber production (CFR 219.14(b)). To analyze the economic efficiency of the management options available for individual analysis areas, a FORPLAN run with an objective function of "Maximizing Present Net Value for individual stands with detail" was utilized.

Economic efficiency was evaluated for each of the management prescriptions applied to tentatively suitable lands by determining respective present net values. Present net value was calculated by subtracting the direct costs of growing and harvesting timber from the benefits after discounting both to the present at 4 percent interest rate. The PNV includes the benefits and costs of managing the existing stands as well as future stands in the 150-year analysis period. Benefits are the expected cash and in-kind payments from timber sales. Costs are timber sale planning and administration, timber road construction, reforestation, release, precommercial thinning, and sale area betterment for wildlife, fish, soil, water and livestock The analysis only considers the benefits and costs of the timber and does not include values and costs for other resources The assumptions and procedures in FORPLAN (including timber yields and options, management prescriptions, and economic information) are described in this appendix, "Use of Cost Efficiency in Developing Prescriptions", Section III. D. 3.

The present net value of an individual timber stand is determined by many factors which affect the quality of the timber when it is first harvested and the length of time before it can be harvested. First, biological and physical characteristics of the land influence the rate the timber grows, and the size and species of the final stand. Second, management objectives determine the types and timing of management activities which are appropriate to use in the stand. Like the biological and physical factors, the activities influence the rate of growth, the quality of the timber, and when the stand can be harvested.

The biological and physical factors are represented in FORPLAN with different combinations of 3 analysis area identifiers major vegetative groupings, land class delineated by slope, and condition class Management objectives and activities are modeled in FORPLAN with different management prescriptions. The analysis areas and management prescriptions interact so that each analysis area has a multitude of possible economic values which depend upon the schedule of activities associated with the prescription

The different combinations of management areas and scheduling choices modeled in FORPLAN were evaluated to determine which management scenario would have the highest economic value as measured by present net value Economic efficiency was also considered in the development of prescriptions before consideration in FORPLAN for a particular analysis area Those selected for inclusion in FORPLAN were those which represented the goal of the management emphasis in a manner which contributes the greatest to present net value. Table B-5 displays the approximate maximum possible PNV for each working group, land class and condition class.

Analysis of the results indicated that all analysis areas had at least one timber option (i.e., prescription) which resulted in a positive present net value The prescription which maximizes PNV for all stands is the timber prescription performing initial overstory removal and subsequent shelterwood harvesting within mature and two storied ponderosa pine stands relying on natural regeneration. Present net value is maximized within the mixed conifer stands that are initially treated by overstory removal and later regenerated through clearcutting and planting. In most cases, the PNV is highest when the stand is harvested as soon as possible. The present net value begins to decline when the stand is held beyond the point when timber values per acre grow faster than the 4 percent discount rate. Timber values increase not only when the amount of volume per acre is increasing, but also as the trees increase in diameter

As a result of public comment, several changes and/or additions were made to the timber prescriptions (See Table B-7, Summary of Timber Harvest Prescriptions Available to FORPLAN, Version applied to alternatives)

The primary substantive change to the Final Environmental Impact Statement that resulted from public comments was in the amount of forested acres which actually had manageable understories. A review was conducted by ranger district personnel to determine more accurately the percentage of manageable understories related to two-story stands in two working groups and major watersheds (see analysis results in Table B-6). The results of this analysis were then applied to the FORPLAN model based on the respective watersheds This data is for all tentatively suitable acres and is common to all viable alternatives. For details of the process used see the process paper "Manageable Understories Review" (5/10/89).

TABLE B-5

ECONOMICALLY EFFICIENT MANAGEMENT BY WORKING GROUP/MAX PNV (APPROXIMATE DOLLAR VALUES)

Working Group		Lodgepole Pine		Mixed Conifer		Ponderosa Pine	
Condition Class	Land Class (% slope)	Existing Inventory PNV/Acre	Managed Inventory PNV/Acre	Existing Inventory PNV/Acre	Managed Inventory PNV/Acre	Existing Inventory PNV/Acre	Managed Inventory PNV/Acre
2 STORY	0-35%	150	50	1,050	250	1,600	350
	36%+	0	0	400	30	1,150	250
COMTHN	0-35%	200	50	550	250	1,050	350
	36%+	0	0	100	0	650	240
MATURE	0-35	50	0	600	250	1,300	350
	36%+	0	0	150	0	800	250
NOTRET	0-35%	200	40	450	250	650	350
	36%+	0	0	150	0	400	250
OLDGTH	0-35%	150	50	1,050	250	1,600	350
	36%+	0	0	400	0	1,150	250
PRETHN	0-35%	0	50	--	--	250	350
	36%+	--	--	--	--	100	250
REFRST	0-35%	30	50	0	-80	0	350
	36%+	--	--	--	--	--	--
ALLFOR	0-35%	--	--	--	--	1,500	350
(RIPARN)	36%+	250	0	1,050	150	--	--

TABLE B-6

Proportion of Understory Manageable by Timber Type Across Watersheds

Watershed	Proportion of Understory Manageable by Timber Type			
	Ponderosa Pine (Acres)		Mixed Conifer (Acres)	
Silvies River	91%	(100,013)	63%	(126,460)
North Fork Malheur	78%	(16,671)	55%	(45,052)
South Fork John Day	81%	(36,538)	87%	(48,802)
Malheur River	91%	(35,819)	55%	(65,955)
Upper John Day	92%	(18,207)	43%	(84,684)
Middle Fork John Day	92%	(20,306)	21%	(121,630)
Fox/Cottonwood	95%	(4,581)	18%	(14,052)
Totals (weighted by acres)	89%	(232,135)	49%	(506,633)
Overall weighted average		**62% (738,768)**		

Public comments also centered on the minimal amount of uneven-aged management planned for the Forest under the Draft Forest Plan. In response to these comments, a prescription was developed to produce ponderosa pine timber volume based on uneven-aged silvicultural management methods (See 2110 letter, Managed and Regenerated Yield Tables - Uneven-aged/Multistory, 6/9/88). The developed uneven-aged silvicultural prescriptions were applied to specific management areas.

Other relevant comments focused on the need to consider commercial thinning prescriptions, which was felt to be necessary for stand improvement, during the early decades of the Forest Plan This prompted a review by timber management personnel of the Prognosis data for commercial thins and no-treatment stands. The review indicated that these stands were structured such that few large diameter overstory trees were present along with many smaller diameter trees in the understory. The harvest of these stands would actually result in a commercial thin, along with the removal of the few larger diameter overstory trees.

Consequently, these type of harvest entries are now being considered as commercial thins, rather than what was formerly termed as overstory removal This change relates to both commercial thins and no-treatment model components within existing stands of ponderosa pine and mixed conifer. In addition, resulting from the time period which has elapsed from the last inventory to present (ten years), these activities were allowed to occur one decade sooner (See Table B-7, Summary of Timber Harvest Prescriptions Available to FORPLAN, Version applied to alternatives)

The last significant change to the prescriptions was to adjust the entry period from three to five decades in the ponderosa pine and mixed conifer two-storied stands (0501 and 0502 model components). This change allowed for a longer period of time for these stands to be entered for harvest.

TABLE B-7

SUMMARY OF TIMBER HARVEST PRESCRIPTIONS IN FORPLAN (Benchmark Version)

PONDEROSA PINE	MIXED CONIFER	LODGEPOLE PINE
0101 FH only	0201 FH only	0103 (None)
0201 FH only CT-FH CT-CT-FH CT-CT-CT-FH	0202 FH only CT-FH CT-CT-FH CT-CT-CT-FH	0203 FH only CT-FH CT-CT-FH CT-CT-CT-FH
0301 FH only PCT-CT-FH	0302 None	0303 PCT-FH PCT-CT-FH
0401 FH only PCT-FH PCT-CT-FH	0402 FH only PCT-FH PCT-CT-FH	0403 FH only PCT-FH PCT-CT-FH
0501 FH only OSR-FM OSR-CT-FH OSR-CT-CT-FH	0502 FH only OSR-FH OSR-CT-FH OSR-CT-CT-FH OSR-CT-CT-CT-FH	0503 FH only
0601 FH only CT-FH CT-CT-FH CT-CT-CT-FH	0602 FH only CT-FH CT-CT-FH CT-CT-CT-FH	0603 FH only CT-CT-CT-CT-FH CT-CT-CT-FH CT-CT-FH CT-FH
Common to all of the above: 1 In all stands, FH is a SW 2 All OSR include concurrent PCT 3 Stands must have OSR take place within three decades of first entry If this does not happen, then stands will be scheduled for a FH 4 Planting with genetically improved stock will take place under SW 36+ slopes. There is a natural regeneration only option for SW on all slopes--on 36+ slopes, a two-decade regeneration period is used for natural regeneration	Common to all of the above 1 In all stands FH are SW or CC 2 All OSR include concurrent PCT. 3 Stands must have OSR take place within three decades of first entry If this does not happen then stands will be scheduled for a FH 4. All planting will be with genetically improved stock, planting will take place under SW on slopes 36+ There is also a natural regeneration only option for SW on all slopes--on 36+ slopes a three decade regeneration period is used for natural regeneration.	Common to all of the above 1 In all stands FH is a CC. 2 All OSR include concurrent PCT. 3 Stand must have a OSR take place within two decades of first entry. If this does not happen, then stands will be scheduled for a FH. 4 Nonstocked lands will be planted with genetically improved stock. In all other cases, natural regeneration will be relied on

FH = Final Harvest; SW = Shelterwood, OSR = Overstory Removal, PCT = Precommercial Thin; CT = Commercial Thin, CC = Clearcut; Riparian = All timber prescriptions will be the same as above; Visuals = Ponderosa pine - Uneven-aged management, entry every three decades, no salvage between entries; Mixed Conifer - Uneven-aged management, entry every two decades, no salvage between entries, Lodgepole pine - Same as above (timber).

TABLE B-7 (Continued)

SUMMARY OF TIMBER HARVEST PRESCRIPTIONS AVAILABLE TO FORPLAN (Version applied to alternatives)

PONDEROSA PINE		MIXED CONIFER		LODGEPOLE PINE	
0101 FH only	*	0201 FH only	*	0103 (same as 0503)	
OSR-FH		SE-SE-....			
OSR-CT-FH					
SE-SE- ...					
0201 FH only		0202 FH only		0203 (Same as 0503)	
CT-FH		CT-FH			
CT-CT-FH		CT-CT-FH			
CT-CT-CT-FH		CT-CT-CT-FH			
SE-SE-. ..		SE-SE-.....			
0301 PCT-FH		0302 None		0303 PCT-FH	
0401 FH only		0402 FH only		0403 (same as 0303)	
PCT-FH		PCT-FH			
PCT-CT-FH		PCT-CT-FH			
0501 FH only		0502 FH only		0503 FH only	•
OSR-FH	*	OSR-CT-FH	*	CT-FH	
OSR-CT-FH	*	OSR-CT-CT-FH	•	CT-CT-FH	
OSR-CT-CT-FH	•	OSR-CT-CT-CT-FH	•	CT-CT-CT-FH	
SE-SE- ...	•	SE-SE-.. ..	*		
0601 FH only		0602 FH only		0603 (Same as 0303)	
CT-FH		CT-FH			
CT-CT-FH		CT-CT-FH			
CT-CT-CT-FH		CT-CT-CT-FH			
SE-SE-. ..		SE-SE-.....			

1. In all stands, FH is SW.	1 In all stands, FH are SW or CC	1. In all stands FH is a CC.
2. 60 Percent of all OSR have a PCT at the time of OSR.	2. 60 Percent of all OSR have a PCT at the time of OSR.	2 60 Percent of all OSR have a PCT at the time of OSR.
3. Stands must have OSR take place within five decades of first entry. If this does not happen, then stands will be scheduled for a FH	3. Stands must have OSR take place within five decades of first entry. If this does not happen, then stands will be scheduled for a FH	3 Stands must have OSR take place within three decades of first entry. If this does not happen, then stands will be scheduled for a FH.
4. All planting will be accomplished with genetically improved stock. There is a SW with interplanting option, available for slopes ≥ 36 percent, as well as a SW natural regeneration only option There can be up to a two-decade total regeneration period.	4. All planting will be accomplished with genetically improved stock. There is a SW with interplanting option, available for slopes ≥ 36 percent, as well as a SW natural regeneration only option There can be up to a two-decade total regeneration period.	
5 Selection harvest will be available in all model components, and will emphasize ponderosa pine.	5 Selection harvest will be available in all model components, and will emphasize ponderosa pine	

The following page has an explanation of the acronyms and symbols used in Table B-7.

TABLE B-7 (Continued)
SUMMARY OF TIMBER HARVEST PRESCRIPTIONS AVAILABLE TO FORPLAN (Version applied to alternatives)

Additional prescriptions

Riparian	All timber prescriptions will be available as above, plus uneven-aged management, as in visual resources (Lodgepole pine - Uneven-aged management entry every four decades)
Visual Resource	Ponderosa pine - Uneven-aged management, entry every three decades. Mixed Conifer - Uneven-aged management, entry every two decades Lodgepole pine - Same as above (timber).
Low site	Uneven-aged management, entry every four decades

Acronyms and symbols

FH = Final Harvest, SW = Shelterwood; OSR = Overstory Removal, PCT = Precommercial Thin; CT = Commercial Thin; CC = Clearcut, SE = Selection (uneven-age), <35% only
* = Prescriptions used for updating for harvests in the 1980-89 period

F. DEVELOPMENT OF YIELD COEFFICIENTS

1. Timber

Timber yield coefficients were developed from a Forest timber inventory completed in 1980 The inventory data were processed in a computer model called Stand Prognosis for Managed and Regenerated Yield Tables and, at the Regional Office for the existing situation, Empirical Yield Tables These models predict yields over time for each timber strata, based on existing volume, age, growth rates, and specific management activities Other yield tables were also developed using the above data and applying professional knowledge or accepted statistical methodology to get desired results again for Managed and Regenerated Yield Tables (1920 letter, August 13, 1982 Processing Criteria - Empirical and Managed Yield Tables; 1920 letter, August 15, 1982, Malheur National Forest Timber Management Yield Tables; 1920 letter, June 4, 1985, Managed Yield Tables, Uneven-aged Management - Visuals, 1920 letter, September 28, 1984, Timber Yield Tables <20 ft^3/ac/yr (low site).) All of these coefficients were adjusted to give net values for timber production (1920 letter, May 28, 1982, Adjustment to Yield Tables), with the exception of low-site and empirical yield tables which were net values to start with. Further adjustments were also made to fit these yield coefficients into the FORPLAN computer model (Notes, Error in FORPLAN "Free-Form" Timber Yield Tables used for Overstory Removals (OSR), December 11, 1985) These tables were adjusted to the year 1987, on the assumption that that year would be the mid-point of the first decade of the plan.

Resulting from public comments prompting changes to the Final Environmental Impact Statement, new yield tables were developed for uneven-aged management (2410 letter, June 9, 1988, Managed and Regenerated Yield Tables - Uneven-aged/multistory) These tables were then used in FORPLAN analysis for application in the general forest management areas.

In the course of revising the FORPLAN model to represent seven watersheds, some timber yield tables were changed in such a way as to reduce the size of the model without changing the total timber output. In essence, it is assumed that instead of the affected acres being harvested every fourth decade on a rotating basis, each acre is harvested every decade but produces only one fourth of the volume This results in the harvest acres being overstated in FORPLAN reports, and corrections are necessary outside FORPLAN to account for this Six tables are formulated in this way, affecting low site, uneven-aged riparian, and uneven-aged visuals. For further information see "Modeling Riparian Zone Harvests with FORPLAN" (Peterson, August 1988)

Another result of the FORPLAN model revision is that the inventory is updated to 1990 conditions (see Section III B.4) Therefore, the yields in the first decade are those applicable to the year 1997 for the Alternatives. For the Benchmarks, the corresponding year remains 1987.

2. Range

Range outputs were calculated in FORPLAN with some manual adjustments outside the model. Four levels of range management intensity were defined: A, B, C, and D These are commonly referred to as range strategies or levels, and represent increasingly intense management levels.

A- No grazing
B- Minimum level management
C- Management with subdivided pastures
D- Nonstructural treatments (seed, burn, etc.)

FORPLAN used strategies C and D only, and adjustments for A were calculated manually. Level B was not used.

For each combination of land class, condition class, and range strategy, estimates were made of the total herbage output in pounds per acre and the livestock utilization efficiency These were based on the literature and the professional judgment of range specialists. From these were calculated the potential livestock animal unit month capability values and coefficients. Details of the methods used are given in the process paper "Range Prescriptions and Yield Tables" (Quinn, 1982). The principal data source used was "Plant Communities of the Blue Mountains in Eastern Oregon and Southeastern Washington" (Hall, 1973) This data is based on good range conditions, and adjustments were made for other conditions (fair, poor, very poor) as described in a meeting documentation note "AUM data and results from No Action run - Assumptions for determining livestock AUM yields for all FORPLAN data sets" (January 13, 1986). See also process papers "Validation of collapsing the Range IDs in the FORPLAN model" (March 1988), and "Changes to AUM basis" (2/19/86)

In riparian areas, it was assumed that utilization would be at a level of 45 percent in all alternatives except the No Action, where 70 percent was assumed consistent with recent past practice. The FORPLAN yield tables were based on 55 percent utilization in riparian areas, and subsequent adjustments to 45 percent were made outside FORPLAN. See process paper "AUM output calculations from FORPLAN results in Paradox" (Lindley, 2/2/90)

3. Roads

Analysis of transportation within FORPLAN is limited to reconstruction and construction of local roads. For analysis purposes the Forest has been divided into four distinct levels based upon the adequacy of the existing transportation system. The roading levels are defined as follows:

Level I - Areas in which roads were constructed in the period from Fiscal Year 1978 through FY 1982.

Level II- Areas in which the road system was constructed prior to Fiscal Year 1978.

Unroaded- Areas larger than one section in size that are more than 800 feet from any existing road

All road- Areas other than timbered areas in which roads will be constructed to access timber. This includes areas such as low-site or range land.

The acres assigned to each level are listed below:

Level I	191,642
Level II	351,360
Unroaded	88,236
All road	233,574
Total	864,813

Road activities within the FORPLAN model are dependent upon timber harvest activities selected by the model. The following categories are used

- First final harvest entry
  This applies to the first entry of a two-stage shelterwood harvest (regeneration cut), and to clearcuts

- Later final harvest entry
  This applies to the second entry of a two-stage shelterwood harvest (overwood removal cut)

- First commercial entry.
  This applies to the first commercial entry in a manageable stand. This entry would either be a commercial thin, selection harvest, overstory removal, or a combination of commercial thin and overstory removal

- Later commercial entry
  This applies to later, nonregeneration entries into a manageable stand.

Analysis of actual timber sale areas has shown that, on average, a road density of about 3 5 miles per section is needed for timber harvest activities Some areas will have more miles per section due to previous logging methods that differ from the methods used today. It is anticipated that these roads will close naturally over time, however, some roads will be closed administratively. Reconstruction miles are based upon historical data and vary depending upon the harvest method.

Yield coefficients used for modeling purposes are displayed in Table B-8, which follows Units are miles of local road per section

TABLE B-8
ROADING YIELD COEFFICIENTS
(Miles of Local Road Per Section)

Final Harvests (No Thins) Entry	Construction	Reconstruction
Level I		
First final harvest entry	0 24	1.46
Later final harvest entry		1.10
Level II		
First final harvest entry	1.22	1.83
Later final harvest entry		0 98
Unroaded		
First final harvest entry	3.05	0.61
Later final harvest entry		1 83
Commercial Thins Followed by Harvest		
Level I		
First commercial entry	0 24	1.46
Later commercial entry		1.10
First final harvest entry		0.98
Later final harvest entry		0.85
Level II		
First commercial entry	1.22	1.83
Later commercial entry		0.98
First final harvest entry		0.92
Later final harvest entry		0.85
Unroaded		
First commercial entry	3.05	0.61
Later commercial entry		1.83
First final harvest entry		1.40
Later final harvest entry		0 85
All Road		
First commercial entry	1 98	1.83
Later commercial entry		1.04

Note· Yields for regenerated stands are the same as existing prescriptions.

The costs for road construction and reconstruction used in the model are based upon the actual costs incurred in Fiscal Year 1984 and Fiscal Year 1985 Costs from earlier years were not used due to the change in road standards in Fiscal Year 1983 The Fiscal Year 1984 and Fiscal Year 1985 costs were converted to Fiscal Year 1982 dollars The costs used for road construction and reconstruction are displayed in Section IV, Table B-11 The costs incurred by timber purchasers for road maintenance and commodity haul are accounted for in the total logging costs

4. Sediment

Sediment yield tables were developed for selected analysis area identifiers and different levels of management emphasis and intensity levels Examples of the analysis area identifiers used are roading adequacy levels 1 and 2, unroaded, all roading levels, ponderosa pine, mixed conifer, lodgepole pine and two land classes (0-35% slope and 36%+ slopes) Examples of management emphasis and intensities are minimum level management, final harvest only, and commercial thin.

The yield tables were generated from (1) the Modified Universal Soil Loss Equation (MUSLE), (2) known sediment yields from Bear Creek on the Ochoco National Forest, (3) sediment yields published on the John Day Basin Study, and (4) professional judgment Professional judgment based on experience on the Malheur National Forest was used to validate the sediment rates computed from Modified Universal Soil Loss Equation and other data

The Modified Universal Soil Loss Equation is a model which considers the major factors affecting sedimentation Those factors include a rainfall/snowmelt erosion energy factor (R), a soil erodibility coefficient (K), a length of slope factor (L), a slope steepness factor (S), a ground cover factor (Vm), and a sediment delivery coefficient (Dc) Estimates of each component were made to simulate the condition of the Malheur National Forest

It is important to note that the sediment index figures are not absolute estimates of erosion or sedimentation. They can only be used to compare alternatives on a relative scale For example, if Alternative B-Modified produces 855 tons/acre in the first decade and Alternative I produces 807 tons/acre, the only valid conclusion is that Alternative B-Modified has the potential to produce approximately 6 percent more sediment than Alternative I.

5. Water Yield

Average total annual water yield tables for FORPLAN runs were generated by analyzing different vegetative ecotypes (ponderosa pine, mixed conifer, low-site ponderosa pine/mixed conifer, grass dominated, fir/sedge and mesic shrub, moist/dry meadow, and juniper/sage), slopes (greater than or less than 35 percent), whether areas were roaded or unroaded, and type of harvest (commercial thinning, minimum level management, clearcut, shelterwoods, and final harvest) occurring on those lands available for commercial harvest activities

The water yields calculated by this procedure for the benchmark runs for the Analysis of the Management Situation showed no significant differences between runs. The water outputs for the alternative cases for the Draft Environmental Impact Statement were based on the benchmarks, since the output position in FORPLAN occupied by water was required for another purpose.

6. Cover Yields

Scheduled output tables for cover were built into the FORPLAN Model based on working group and condition class from the 1980 timber inventory, and were derived from the Stand Prognosis Cover Extension Program. Cover outputs vary in response to timber stand manipulation, growth occurring in both manipulated and undisturbed stands, and time. Detailed information is documented in "Modeling Thermal Cover on The Malheur National Forest (May 1988) and "Process for modeling Habitat Effectiveness Index in forest wide applications on the Malheur National Forest" (Peterson, May 1989) Four classes of cover are defined (ranging from satisfactory to low marginal) and may be combined into composites which are convenient for evaluation and for the definition of constraints. For each cover class or composite represented in FORPLAN, a scheduled output is assigned, with it's own set of yield tables. The yield coefficients (usually 0 or 1), when multiplied by the acres applied to, give the acres of cover class or composite, which are used to measure outputs or to set constraints on The most useful combinations are satisfactory cover (COVER1), satisfactory plus the best marginal cover (COVER1 + COVER2), and total cover (COVER1 + COVER2 + COVER3 + COVER4).

It is necessary to "overmodel" the cover constraints, especially for satisfactory cover, which means that the constraints in FORPLAN must be set higher than the minimum standards in order to produce consistently the desired value on the ground. The reasons for this are explained in "Modeling Elk cover and minimum volume constraints" (Peterson, 2/6/90). Other modifications to yield coefficients to assure model feasibility are described in "Negative Cover Yield Coefficients" (Lindley, 10/17/89)

G. ANALYSIS DONE OUTSIDE FORPLAN

The analysis process outside FORPLAN consisted of some analysis completely independent of the FORPLAN model and some analysis processes that were dependent upon FORPLAN outputs

1. Analysis Independent of FORPLAN

Analysis processes that were conducted independently (i.e , not modeled in FORPLAN) include the following

a. Recreation

Areas of the Forest were assigned to different recreation classes using the classifications and procedures given in the Recreation Opportunity Spectrum Users Guide. Only four classes (Primitive, Sem'-Primitive Non-Motorized, Semi-Primitive Motorized, and Roaded Natural) of the six in the Recreation Opportunity Spectrum Users Guide were applicable, plus the additional classification of Roaded Modified.

Recreation capacity was calculated using the approach described in the Recreation Opportunity Spectrum Users Guide The procedures are documented in "Dispersed Recreation Capacity Calculations" (E. Cole, September 27, 1982)

b. Wildlife

Wildlife habitat capability in terms of numbers of animals and/or acres of habitat was calculated outside FORPLAN

Resulting from public and other agency response to the elk modeling approach used in the Draft EIS and inconsistency with other Forests in the Blue Mountains, changes have been made related to elk modeling for inclusion with the Final Environmental Impact Statement For the Draft Environmental Impact Statement, the Forest had developed an elk numbers model based on forage availability in response to creation of transitory forage by timber harvest activities. For inclusion with the FEIS, a Habitat Effectiveness Model for elk was developed using the latest

information and research for winter elk habitat, which is applicable for both winter and summer range.

The previous model, which used a cover/forage ratio, assumed that size and spacing standards for cover and forage would be met. However, it was observed that in practice, cover size and spacing standards were not being met, and determining elk habitat solely on forage conditions was not acceptable Though forage supplies the basic need for energy, cover areas free from disturbance which help the animals conserve energy had to be considered This lead to the development of the Elk Habitat Effectiveness Model by Thomas et al. (1988), developed for the Blue Mountains which is now regarded as the most acceptable process by which the results of habitat manipulation can be assessed on the Forest

The Elk Habitat Effectiveness Model is based on the preference of elk for certain types of habitat This model consists of three variables for summer range and an additional one for winter range. Each variable is itself an index of the relative habitat effectiveness for elk One factor considered is the size and spacing of cover, another is cover quality expressed in terms of height and canopy closure, the third is an index relating potential habitat effectiveness to open road density, and the fourth (which is used on winter range only) rates the quality and quantity of forage The actual application of the model on the Forest assumes forage is a constant factor, and is not considered as a variable.

The Elk Habitat Effectiveness Model is a biologically based model that tells us how effective an area will be in supporting elk The model was designed to measure effectiveness on a scale of 0 to 1, with 1 representing the highest potential effectiveness and 0 representing the least desirable situation for elk. It is intended to be only a relative measure of effectiveness, and does not consider many factors that would influence the actual number of elk found on an area. These additional factors include the effects of hunting, predators, disease, yearly changes in weather and forage production, competition with other animals, and the rate at which elk populations can change from one level to another

To make the results of the model easier to interpret, the effectiveness index was translated into a number of animals that could be supported on an area. This was done by estimating the density of animals that could be supported on an area if the habitat were maintained at optimum effectiveness It was then assumed that a habitat effectiveness value of 0 89 translated to this highest possible density of elk, and the lower values would translate to proportionally lower densities. The numbers shown in the document are these numbers of elk that could be supported on the area The numbers are not projections of actual elk populations As noted above, many additional factors would have to be considered in order to project actual elk populations. It is especially important to note that the current elk numbers on an area may not be the direct result of factors that are measured in the habitat effectiveness model. The current population in an area could be limited by the availability of winter range on private land, by hunting pressure, or by any of the other factors discussed above In this case, habitat effectiveness might decline, but have not real influence on the number of elk that occupy the area. Or, habitat effectiveness might increase but still have no influence on the number of elk. Because the numbers shown in tables and graphs only represent habitat effectiveness, it is important to read the full text in order to understand the effect of forest management on the elk populations

Capability for old growth/mature timber indicator species was based on the amount of old growth in dedicated old growth units as well as old growth in roadless areas and wilderness. For more information on how territories were calculated, see the Forest Planning Document "Territory Calculation for Pine Marten and Pileated Woodpecker "

Capability for primary cavity excavators (woodpeckers) was based on estimated snag levels. For example, a 20-percent level of primary cavity excavators means that enough snags will be managed to carry 20 percent of the potential cavity-nesting population

Diversity of animal communities was based on the relative acreages of forest successional stages For more information see Forest Planning Papers "The Diversity Index (H'max)· Its Derivation," and "How to Do Wildlife Data."

Capability for three-toed woodpeckers was based on the estimated acreage of lodgepole pine and subalpine fir. For more information see Forest Planning Paper "Calculating Pairs of Three-toed Woodpeckers."

The ability of the Forest to produce Wildlife and Fish User Days was based on the assumption that the number of big-game hunters using the Forest would increase or decrease in proportion to the number of big game available to hunt. For more information, see the Forest Planning Document "Process Paper· Calculating *Potential Wildlife and Fish User Days on the Malheur National Forest.*"

Wildlife habitat improvements were estimated from past and future projects which manipulate vegetation or install structures to improve fish and wildlife feeding or breeding habitat. For more information, see the Forest Planning Document "Cost Data for Forest Planning."

c. Fish

The existing supply of resident fish angling opportunities exceeds demand. Management requirements will maintain resident fish populations at or above current levels. Forest-wide, demand will probably not exceed supply within the planning period. Therefore, resident fish outputs were not calculated for each alternative.

The process for estimating anadromous fish outputs was revised between the Draft and the Final Environmental Impact Statement In the Draft Environmental Impact Statement, including the Benchmark analyses, estimates were based on actual spawning ground counts of steelhead and Chinook in the John Day River and tributaries. In order to respond to Regional direction, to respond to other agency and organization comments on the draft, and to provide for more consistency between Forests, estimates for the Final Environmental Impact Statement were based on U.S v Oregon coefficients for rearing capacity. As a result, the outputs displayed here for commercial harvest and WFUDs, which are the values with assigned economic values from RPA, are not directly comparable to what was displayed in the Draft Environmental Impact Statement These numbers still reflect the economic value of the anadromous fish habitat on the Forest. They do not reflect the fact that spawning occurs at a higher density on the Forest than in downstream areas. Forest streams are providing spawning for fish that rear downstream from the Forest boundary Another factor that is not accounted for in these calculations is the effect of expected improvement in water quality in many alternatives, on the habitat quality of downstream areas.

One other result of this change in process is that the estimated output numbers from the Benchmark analyses are no longer directly comparable to the numbers for the alternatives For example, with the assumptions used for the Benchmark Max PNV with MRs, and for the No Action alternative (Alternative A), anadromous fish outputs should be a little higher for Alternative A than for the Benchmark run With the change in process, the estimated numbers are somewhat smaller. Benchmarks have not been recalculated to make these numbers comparable

Anadromous fish (spring chinook salmon and summer steelhead trout) habitat capability was calculated outside FORPLAN Changes from the existing condition were calculated for each alternative, based on expected changes in riparian vegetation condition, and on the level of investment for structural watershed and fish habitat improvement The process paper (Gritz, 1988) is included in the Forest planning documents The following is a summary of that document.

Coefficients used to estimate current habitat capability are from U.S v Oregon Catch to escapement ratios and WFUDs (Wildlife and Fish User Days) per fish were agreed to in 1984 for the Blue Mountain Forests Commercial to sport harvest ratios are from Meyer, 1982 Indian harvest is included with commercial harvest Values for commercial and sport harvest are RPA assigned values (used in economic analysis, but not here)

The estimated Forest totals for current habitat capability, expressed as Smolt Habitat Capability Index (SHCI) are 30,740 chinook and 115,700 steelhead.

To express this estimated output in numbers suitable for economic analysis using RPA assigned values, it is necessary to convert them to pounds of commercial harvest and WFUDs This is done with the coefficients from the references noted above. The starting point numbers are 17,568 WFUDs and 23,733 lbs of commercial harvest

Changes over time for each alternative are based on estimated changes in riparian condition and channel morphology, due to changes in livestock management and timber harvest prescriptions in riparian areas, and on the amount of structural watershed and fish habitat improvement work to be done It was estimated that habitat capability within the area treated with structural improvements will increase by about 50 percent (Stuber, 1985). Estimating changes in habitat capability due to expected changes in riparian condition was much more involved

Literature references for increased salmon production due to changes in riparian condition and channel morphology, in response to removing livestock grazing from riparian areas in degraded condition are varied and range up to tenfold increases. This improvement in the shade and bank stability due to more abundant and diverse riparian vegetation, and the increased diversity of instream morphology which usually follows, is referred to as geomorphic recovery. A 200 percent increase in habitat capability (Hall, J D and C.O Baker, 1982, Platts, W S , 1981) prorated over the recovery period was used for this analysis. Approximately 25 percent of the anadromous stream miles were considered to be in a degraded condition Much of this is due to water temperature problems associated with a lack of shade from riparian vegetation The rate of recovery was estimated based on the various livestock management strategies in the alternatives. In Alternative I, the timber management prescription is also modified so that it will provide a long term improvement in riparian condition Geomorphic recovery is a long term process, taking at least a few decades and often much longer to

achieve Thus, anadromous fish outputs continue to increase throughout the planning period

Lesser increases in habitat capability can also be achieved by improving riparian condition in those areas that are currently only moderately affected by previous management activities. There are relatively few anadromous riparian areas which have not been affected in some way by man's activities. Increases in habitat capability due to riparian recovery and structural treatment are considered to be additive.

d. Fire

To determine the number of acres that would receive fuel treatment under each alternative, a survey was made on each District to determine the average percent of acres that would normally be treated under each type of cutting prescription used on the Forest The results are given below:

Shelterwoods	85 percent
Overstory removal	80 percent
Selective cuts	60 percent
Clearcuts	100 percent
Precommercial thinning	80 percent

This percentage rate was then applied to the timber harvest acres developed for each alternative

2. Analysis Dependent Upon FORPLAN

Several analysis processes were conducted that were dependent upon FORPLAN output. These processes varied in their dependency on the FORPLAN model; descriptions of the processes follow

a. Biomass

Biomass coefficients were based on timber model components, the "Photo Series for Quantifying Natural Forest Residues in Common Vegetation Types" (1980), "Photo Series for Quantifying Forest Residues" (1979), and fuel inventory data from Forest fuel inventories (See 1920 letter, October 5, 1982 Process Criteria - Development of Biomass Potential) These values were further adjusted for biomass material already sold, from Forest cut-and-sold report (see 1920 letter,February 4, 1985, Additional Timber Volume to be calculated outside the FORPLAN model, Nonchargeable Volume) and the material needed to meet wildlife's down/woody debris requirements, supplied by the Forest Wildlife Section

b. Firewood

Not estimated. This value is considered part of the available biomass totals. Firewood projections are made by using actual sell volumes generated for use in the Forest cut-and-sold report base period, for a 30-month period, June 1983 to December 1985.

c. Allowable Sale Quantity and Timber Sale *Program Quantity*

The Allowable Sale Quantity was obtained by subtracting allowances for snags and material used for fish habitat improvement from the FORPLAN harvest output. The Timber Sale Program Quantity was generated by using the Allowable Sale Quantity and adding other saleable timber products (1920 letter, February 4, 1985, Additional Timber Volume to Be Calculated Outside of FORPLAN). This extra volume takes into consideration cull logs, miscellaneous products, and mortality salvage not captured at the time of a scheduled silvicultural entry.

d Reforestation

Reforestation acres were equal to the regeneration timber harvest acres plus nonstocked acres reforested by decade, as scheduled by FORPLAN.

e. Timber Stand Improvement

Timber stand improvement acres are equal to the acres found in FORPLAN under Precommercial Thins and Precommercial Thins under Overstory Removals Timber prescriptions selected by the FORPLAN model determined the timber stand improvements scheduled This varied by working group.

f. Species Mix

For determination of the species mix, the ponderosa pine volume was taken from the FORPLAN output The mixed conifer and lodgepole pine volumes were determined using the species mix papers dated March 4, 1985 and May 19, 1986 for these two groups Using this information, the base percentage was calculated in a spreadsheet program and then applied to the remaining volume to determine the actual mixed conifer and lodgepole pine volumes for the alternative considered. Between the Draft and Final Environmental Impact Statement, a new method for determining ponderosa pine harvest volumes was used by applying a revised yield table against the previous FORPLAN solution.

g Water Yield

Average total annual water yield tables for FORPLAN runs were generated by analyzing different vegetative ecotypes (ponderosa pine, mixed conifer, low-site ponderosa pine/mixed conifer, grass dominated, fir/sedge and mesic shrub, moist/dry meadow, and juniper/sage), slopes (greater than or less than 35 percent), whether areas were roaded or unroaded, and type of harvest (commercial thinning, minimum level management, clearcut, shelterwoods, and final harvest) occurring on those lands available for commercial harvest activities.

The water yields calculated by this procedure for the benchmark runs for the Analysis of the Management Situation showed no significant differences between runs The water outputs for the alternative cases for the Draft Environmental Impact Statement were based on the benchmarks, since the output position in FORPLAN occupied by water was required for another purpose.

h Roads

The FORPLAN model is designed to represent the relationship between acres harvested and miles of local road constructed in inadequately roaded areas as a linear function That is, as 1 acre is harvested, approximately 0 0055 miles of local road is constructed (3 5 miles of road per 640 acres) However, this linear relationship does not apply to actual cases because statistical analysis of historical data for unroaded areas shows that over 95 percent of the transportation network has been constructed when 40 percent of the area has been entered Roads built early in the development of an unroaded area create new access to more acres per mile than roads built later. An additional and more recent consideration is the desire to avoid fragmentation of roadless areas due to future harvest operations, which will require new strategies for road placement to be developed. Also, the FORPLAN output does not account for the fact that some roads will have to be rebuilt (i e. relocated) because they are in riparian areas, or on steep slopes which need to be protected, so that their use would not comply with current standards. Taking all these factors into account, it is estimated that the first decade construction mileage should be increased by a factor of 2.1, and the later decades left at their FORPLAN output values These figures will be reviewed and adjusted as site specific timber sales are developed.

Construction and reconstruction of arterial and collector roads are not represented in FORPLAN, and estimates for these are based on historical data and predictions of future needs These indicate that no additional construction will be necessary, and 62 miles per year of reconstruction should be planned for each alternative.

i Range

Range outputs were calculated in FORPLAN with some manual adjustments outside the model. Four levels of range management intensity were defined A, B, C, and D These are commonly referred to as range strategies or levels, and represent increasingly intense management levels

A- No grazing
B- Minimum level management
C- Management with subdivided pastures
D- Nonstructural treatments (seed, burn, etc)

FORPLAN used strategies C and D only, and adjustments for A were calculated manually. Level B was not used.

For the adjustments outside FORPLAN, the acres subject to A strategy were developed from allotment maps taking account of riparian ares in unsatisfactory condition These acres were then removed from the FORPLAN output and the animal unit months were reduced using the model coefficients. Table B-9 shows an example of the process. For elk winter range the animal unit months were assumed to be split 75/25 between livestock and elk in the appropriate areas

j. Economic Effects

A spreadsheet simulating the ADVENT computer system was used to integrate the FORPLAN outputs with the resource analyses completed outside FORPLAN, resulting in a complete economic efficiency analysis of each alternative (the economic efficiency analysis process is detailed in Section IV of this appendix) The spreadsheet was used to obtain present net value, discounted costs and benefits by major resource group, and budget requirements for all alternatives. Also derived from the spreadsheet were the returns to the U.S. Treasury and expected payments to local governments. For details see "PNV for FEIS" (Krause, 2/20/90)

An analysis to determine changes in employment and income (within Grant and Harney Counties) was completed using IMPLAN, a Forest Service developed input-output model For this Forest, the FORPLAN outputs of each alternative, specifically the timber harvest and permitted grazing levels, were inserted into the IMPLAN model. These two outputs are the key elements in this region's economy, providing a major portion of the employment base. Refer to Section V (Economic Impact Model) of this appendix for a complete discussion of the IMPLAN model; the Forest planning records contain the supporting documentation.

k. Yield Tables

Resulting from changes incorporated into the Final Environmental Impact Statement, an updated method to determine ponderosa pine volume produced by harvest type for each decade has been used. This method utilizes an approach whereby ponderosa pine yield tables are applied against the FORPLAN solution. This method does not apply to the benchmarks.

l Cover Production

Scheduled output tables have been built to compute cover production by alternative for the FORPLAN alternative runs Outputs include both total acres of cover produced and acres of cover of different quality levels (satisfactory, marginal and non-cover) These outputs have been used to compute the Habitat Effectiveness Indices for the alternatives This method does not apply to the benchmarks

m Board Foot Volumes	Calculation of board foot outputs are now based on yield tables applied against the FORPLAN model solution and are based on diameter-defined board foot to cubic foot volume conversion ratios. This method does not apply to the benchmarks.
n Watershed Outputs	FORPLAN outputs indicate the major watershed where the activity is scheduled to occur. This does not apply to the benchmarks.
o. Snags	Since the timber yield tables did not account for snags and snag replacements, the calculations for these were done outside FORPLAN. Details of the process are given in "Calculating Snags and Snag Replacements for the FEIS alternatives" (Peterson, 3/14/90).

TABLE B-9

ADJUSTMENT OF FORPLAN RUNS BY ANIMAL UNIT MONTHS AND ACRES [1/]

		DECADE 1		DECADE 2	
		Acres	AUMs	Acres	AUMs
ALTERNATIVE A					
FORPLAN RUN		1,351,275	131,358	1,351,275	135,152
70 percent Use (Cattle)					
ADJUSTMENT (Outside FORPLAN)			None		None
ADJUSTED TOTAL BY MGMT. LEVEL					
(Unsat Rips)	A	0	0	0	0
	B	0	0	0	0
	C	1,345,275	130,109	1,345,275	133,811
Tbr. Seeding	D	6,000	1,249	6,000	1,341
TOTAL [2/]		1,351,275	131,358	1,351,275	135,152
ALTERNATIVE B-MODIFIED					
FORPLAN RUN		1,351,275	120,443	1,351,275	122,883
45 percent Use (Cattle)					
ADJUSTMENT (Outside FORPLAN)					
Unsatis riparian			-847		-424
ADJUSTED TOTAL BY MGMT LEVEL					
(Unsat. Rips.)	A	2,000	0	2,000	0
	B	0	0	0	0
	C	1,343,275	118,347	1,343,275	121,118
Tbr. Seeding	D	6,000	1,249	6,000	1,341
TOTAL		1,351,275	119,596	1,351,275	122,459
ALTERNATIVE C-MODIFIED					
FORPLAN RUN		1,351,275	106,675	1,351,275	104,662
45 percent Use (Cattle)					
ADJUSTMENT (Outside FORPLAN)					
Unsatis riparian			-27,941		-14,435
Winter range			-2,892		-2,892
ADJUSTED TOTAL BY MGMT LEVEL					
(Unsat Rips)	A	375,000	0	375,000	0
	B	0	0	0	0
	C	915,460	75,542	915,460	87,335
(Winter Rge.)	C (75% game, 25% cattle)	60,815	0	60,815	0
	D	0	0	0	0
TOTAL		1,351,275	75,842	1,351,275	87,335

1/The No Change Alternative is not included in this table because no FORPLAN runs were made for this alternative.

2/No adjustment in AUMS or acres because forage seeding was assumed to be included in the model for the No Action (A) Alternative.

DECADE 3		DECADE 4		DECADE 5	
Acres	AUMs	Acres	AUMs	Acres	AUMs
1,345,275	130,239	1,345,275	130,953	1,351,275	130,953
	None		None		None
0	0	0	0	0	0
0	0	0	0	0	0
1,345,275	128,971	1,345,275	129,703	1,345,275	129,728
6,000	1,268	6,000	1,250	6,000	1,225
1,351,275	**130,239**	**1,351,275**	**130,953**	**1,351,275**	**130,953**
1,351,275	122,423	1,351,275	118,704	1,351,275	118,704
	0		0		0
0	0	0	0	0	0
0	0	0	0	0	0
1,345,275	121,155	1,345,275	117,454	1,345,275	117,479
6,000	1,268	6,000	1,250	6,000	1,225
1,351,275	**122,423**	**1,351,275**	**118,704**	**1,351,275**	**118,704**
1,351,275	99,640	1,351,275	106,615	1,351,275	106,615
	0		0		0
	-2,892		-2,892		-2,892
0	0	0	0	0	0
0	0	0	0	0	0
1,290,460	98,222	1,290,460	105,321	1,290,460	105,321
60,815	0	60,815	0	60,815	0
0	0	0	0	0	0
1,351,275	**98,222**	**1,351,275**	**105,321**	**1,351,275**	**105,321**

TABLE B-9 (continued)

ADJUSTMENT OF FORPLAN RUNS BY ANIMAL UNIT MONTHS AND ACRES

		DECADE 1		DECADE 2	
		Acres	AUMs	Acres	AUMs
ALTERNATIVE F					
FORPLAN RUN		1,351,275	119,413	1,351,275	122,870
45 percent USE (Cattle)					
ADJUSTMENT (Outside FORPLAN)					
Unsatis. riparian			-2,236		-3,353
ADJUSTED TOTALS BY MGMT. LEVEL					
(Unsat. Rips.)	A	30,000	0	45,000	0
	B	0	0	0	0
	C	1,315,275	115,928	1,300,275	118,176
	D	6,000	1,249	6,000	1,341
TOTAL		1,351,275	117,177	1,351,275	119,517
ALTERNATIVE I					
FORPLAN RUN		1,351,275	114,950	1,351,275	115,475
45 percent Use (Cattle)					
ADJUSTMENT (Outside FORPLAN)					
Unsatis. riparian			-2,236		-3,353
ADJUSTED TOTALS BY MGMT. LEVEL					
(Unsat. Rips.)	A	30,000	0	45,000	0
	B	0	0	0	0
	C	1,315,275	111,465	1,300,275	110,781
	D	6,000	1,249	6,000	1,341
TOTAL		1,351,275	112,714	1,351,275	112,122

DECADE 3		DECADE 4		DECADE 5	
Acres	AUMs	Acres	AUMs	Acres	AUMs
1,351,275	118,185	1,351,275	117,970	1,351,275	117,986
	-1,117		0		0
15,000	0	0	0	0	0
0	0	0	0	0	0
1,330,275	115,800	1,345,275	116,720	1,345,275	116,761
6,000	1,268	6,000	1,250	6,000	1,225
1,351,275	**117,068**	**1,351,275**	**117,970**	**1,351,275**	**117,968**
1,351,275	114,652	1,351,275	115,979	1,351,275	115,979
	-1,117		0		0
15,000	0	0	0	0	0
0	0	0	0	0	0
1,330,275	112,267	1,345,275	114,729	1,345,275	114,754
6,000	1,268	6,000	1,250	6,000	1,225
1,351,275	**113,535**	**1,351,275**	**115,979**	**1,351,275**	**115,979**

IV. ECONOMIC EFFICIENCY ANALYSIS

This section explains the concepts and defines the costs and benefits involved in economic efficiency analysis, how the values were derived, and how they were used in the Forest planning process. Economic efficiency analysis is required by the National Forest Management Act Regulations (36 CFR 219) and played an important role in the development and evaluation of Forest planning benchmarks and alternatives Specifically, the Regulations (36 CFR 219.12(f)) state that.

> "The primary goal in formulating alternatives, besides complying with NEPA procedures, is to provide an adequate basis for identifying the alternative that comes nearest to maximizing net public benefits."

Additionally, 36 CFR 219.12(F)(8) states·

> "Each alternative shall represent to the extent practicable the most cost efficient combination of management prescriptions examined that can meet the objectives established in the alternative."

A. DESCRIPTION OF CONCEPTS

Before explaining the specifics of how economic efficiency analysis was used in the development of the Malheur National Forest Final Environmental Impact Statement and Forest Plan, a few concepts and terms related to efficiency analysis in general need to be explained

1. Priced Outputs

Priced outputs are goods or services which can be exchanged in the market place. The quantitative values are determined by actual market transactions or by estimation methods that produce prices commensurate with those determined by market transactions. Timber, forage, and minerals are examples of commodities which are bought and sold in the market. Their values are determined through the interaction of buyers and sellers based on the supply and demand conditions in the market at the time of the transaction. Recreation Visitor Days, on the other hand, are not normally exchanged by market transactions. Their market values are estimated by using some market transaction data in combination with various theoretical techniques. Conceptually, these assigned values should be consistent and comparable to those values which were actually derived by market transactions (Rosenthal et al 1985). Therefore, both assigned and market values for priced outputs are appropriate to use for calculating quantitative measures of efficiency such as present net value.

2. Nonpriced Outputs

Nonpriced outputs are outputs which have no available market transaction evidence and no reasonable basis for estimating a dollar value commensurate with the market values associated with the priced outputs. This situation requires that subjective noncash values be attributed to the production of the outputs The values are qualitatively rather than quantitatively described They may be either positive or negative. What may be considered to be a benefit to some may represent a cost to others. Examples of nonpriced outputs include the maintenance or enhancement of threatened and endangered species, natural and scientific areas, historical and anthropological sites, visual quality, and clean air. The outputs are also referred to as nonpriced indicators of responses to issues, concerns, and opportunities for the benchmarks and alternatives

3. Discounting

Financial analyses of alternative investment options usually involves cash flows over different periods of time in the future Inherently, there is a time value associated with money; a dollar today is worth more than a dollar 10 years from now. Discounting is a process for adjusting the dollar values of costs and benefits which occur at different periods in the future to dollar values for a common time period so they may be compared Usually the common time period is the present, then the discounted cash flow is referred to as the present value

4. Present Net Value

Present net value is the difference between the discounted value (benefits) of all outputs to which monetary values or established prices are assigned and the total discounted costs of managing the planning area. The maximization of present net value was the criterion used to help ensure each alternative was the most economically efficient combination of outputs and activities needed to meet the objectives established for the alternative Present net value calculations consider only the benefits for which market prices exist or can be assigned. On the Malheur National Forest, the priced benefits included timber, recreation, wildlife, fisheries and water quality, and range The benefits were compared against all Forest Service fixed and variable costs associated with managing the planning area, regardless of whether the costs were incurred for the production of either priced or nonpriced outputs, or as overhead expenses for general maintenance of the organization. Therefore, present net value is an estimate of the current market value of the priced forest resources after all costs of producing both priced and nonpriced outputs and meeting other multiple-use objectives have been considered.

5. Opportunity Costs

Opportunity costs are defined as the value of a resource's foregone net benefit in its most economically efficient alternative use (Forest Service Manual 1970.5). In relation to the economic analysis performed for Forest planning, it represents the decrease in maximized present net value of an alternative when some alternative level of resource outputs is forced into solution Therefore, opportunity costs measure the change in present net value for priced resource outputs, and can be used to measure the relative value traded off in order to produce the nonpriced benefits included in net public benefits In the opposite sense, increasing the priced (market, timber, etc) outputs through a series of higher levels, will also show the physical tradeoffs imposed on non-market outputs.

6. Net Public Benefits

The maximization of net public benefits is a goal of the Forest planning process Net public benefits are the overall value to the nation of all outputs and positive effects (benefits) less all the associated Forest Service inputs and negative effects (costs) whether or not they can be quantitatively valued Net public benefits cannot be expressed as a numeric quantity because they include qualitatively valued nonpriced outputs.

Conceptually, net public benefits are the sum of the present net value of priced outputs plus the full value of all nonpriced outputs. The full value of nonpriced benefits is used because the costs associated with their production is accounted for in the calculation of present net value Marginal values of nonpriced outputs should be identified when management inputs are increased in order to provide the outputs at levels above current standards or legal requirements. In such cases, it is important to depict the physical, biological, and social dimensions of the nonpriced outputs, as well as who will be affected by changes in their production Account should also be taken of any changes occurring among the other nonpriced outputs as a result of providing a particular nonpriced output

In assessing the net public benefits of a particular alternative, nonpriced indicators should be evaluated to determine if their value to society exceeds the opportunity cost of their production.

7. Welfare Distribution Effects and Impacts

Another level of effects which are a concern of National Forest policy and management are the welfare distribution effects influenced by the mix and level of outputs produced by the National Forest. These effects can be either positive or negative. The impacts can also be local, regional, or national in scope. Some distributive effects such as changes in consumer prices or taxpayer costs have national level impacts. Others, such as induced jobs and income or payments in lieu of taxes are more local or regional in nature. The effects are more related to questions of equity (i e., who pays and who benefits) rather than efficiency and are not assessed in the context of the efficiency criteria associated with the present net value and net public benefit concepts.

However, the positive and negative distributive effects need to be assessed in conjunction with the net public benefit measures since equity objectives often influence efficiency objectives and vice versa The distributive effects will be discussed in more detail in Section V

B. PARAMETERS AND ASSUMPTIONS USED FOR ECONOMIC EFFICIENCY ANALYSIS

In order to calculate the present net value for each alternative, several assumptions were made regarding discount rates, demand curves, real dollar adjustments, and real price and cost trends. This section will summarize the decisions and the resulting parameters A more detailed discussion can be found in various process records in the Supervisor's Office.

1. Discount Rates Used

Discounting requires the use of a discount rate which represents the cost or time value of money in determining the present value of future costs and benefits One discount rate was used to calculate the Present Net Value for each benchmark and alternative. A real discount rate was used, meaning it was adjusted to exclude the effects of inflation (real dollar adjustments will be discussed more below).

For evaluations of long-term investments and operations in land and resource management in the 1986-1995 planning period, a 4 percent real discount rate was used as directed by the Washington Office. The 4 percent rate approximates the "real" return on corporate long-range investments above the rate of inflation (Row et al., 1981). The 4 percent rate was used to solve FORPLAN and calculate the Present Net Value for each benchmark and alternative An analysis of the sensitivity of the alternatives to the discount rate was performed by using a discount rate of 7-1/8 percent All costs and benefits were discounted from the midpoint of the decade in which they were incurred.

2. Demand Curves and Real Price Trends

As specified by the Washington Office (1920 letter to the Regional Forester, February 3, 1981 "Downward Sloping Demand Curves,") and FSM 1971 65, horizontal demand curves for timber and nontimber resources were used to analyze the benchmarks and alternatives for the Draft Environmental Impact Statement Many factors can influence the demand for stumpage from any one Forest (Adams et al., 1985). Some of the factors include trends in (1) interest rates, (2) the species and products mix of forest products consumption, (3) use of wood for energy, (4) forest products exports, (5) the cost of wood in Canada, (6) the rate of technical improvements in wood and fiber processing, and (7) the harvest levels of other National Forests and private timber owners

All of the factors contain some degree of uncertainty regarding their future disposition and effect Neither the empirical nor the theoretical bases have been well enough developed to derive reasonable estimates of the demand functions for the resources offered at the Forest level. For purposes of the analysis conducted here, the assumption was made that the amount of total timber offered would not affect the prices paid. In other words, the timber demand curve for the range of output levels analyzed during the development of alternatives is best depicted by a horizontal demand function.

As a surrogate for resource demand curves, real price trends were developed and used to represent the rate at which resource values will change over time as a result of anticipated supply and demand interactions in the market place. As specified by the Regional Office (1920 letter to Forest Supervisors, September 25, 1984 "Timber Price Trends, Values, and Costs"), a 1 percent per year real price trend for stumpage was used for FORPLAN harvest scheduling analyses These were applied for the first 50 years, and then a 0 percent price trend was assumed for the remaining 100 years of the harvest scheduling planning horizon. These imply that nominal stumpage prices (i.e., those which include the effects of inflation) will increase during the next 50 years at a rate 1 percent greater than the rate of inflation, and equal to the rate of inflation thereafter.

Since price trends are reflections of expected futures, there is an inherent uncertainty involved with making such projections In recognition of the uncertainty, a sensitivity analysis was performed by using alternative stumpage *price trends of 0, 2, and 3 percent. The results of the runs indicate that,* generally, higher price trends make silvicultural investments economically more attractive

A 0 percent real price trend for all other resources were used during the development of the benchmarks and the alternatives In other words, their future nominal values will change at rates equal to inflation.

3. Real Cost Trends

A 0 percent real cost trends were used for all future costs used in the development of the benchmarks and alternatives That is, the costs of labor, fuels, materials, and all other factors of production involved with managing the Forest are assumed to change at a rate equal to the rate of inflation

4. Real Dollar Adjustments

Future prices and costs can be expressed in both nominal and real terms. The projection of nominal values includes the effects of inflation on the values For example, assume future prices for commodity "XYZ" are projected to increase annually by 8 percent Also assume the rate of inflation is anticipated to be 5 percent. In real terms, the prices are increasing by only 3 percent per year above and beyond the rate of inflation (whereas the nominal value change would be 8 percent) Real value changes are the result of the interactions of supply and demand forces in the market place and do not include the effects of inflation

All future values and costs used in the Forest planning process were expressed in real 1982 dollars, consistent with the 1985 Resource Planning Act program The Gross National Product implicit price deflator index was used to convert both historical and future nominal prices and costs to the common base (Forest Service Manual 1971 32b)

C. COSTS USED FOR ECONOMIC EFFICIENCY ANALYSIS

This section describes the costs used to perform economic efficiency analysis for each of the benchmarks and alternatives considered during the development of the Draft and Final Environmental Impact Statements. All Forest Service costs were included for purposes of estimating budgets and calculating Present Net Values for each alternative. In the Draft Environmental Impact Statement, the costs were identified by their Management Information Handbook codes as described in Forest Service Handbook 1309.11. The Management Information Handbook activity descriptions and their associated codes were useful for identifying how different costs would be treated during the planning process All costs were categorized as either fixed or variable and as either a capital investment or an operational or maintenance cost. If a cost was identified as a variable cost, a decision was made as to whether it would be analyzed in FORPLAN.

All variable costs not included in FORPLAN and all fixed costs were analyzed using the a spreadsheet simulating the ADVENT system. This system was also used in the accounting of capital investments and operation and maintenance costs Costs were determined by examining: (1) ADVENT Resource Planning Act budget planning files, and (2) historical records and contracts. Professional judgment was also an important factors in making assumptions regarding what bearing historical costs had on anticipated future costs All costs were developed and reviewed by the Forest Economist, the Forest Management Team, and the appropriate staff personnel. In the following discussion, the cost breakdowns and how they were incorporated into the efficiency analyses for each alternative are discussed.

Since publication of the Draft Environmental Impact Statement and the Proposed Forest Plan (1987), fixed and variable costs used for economic efficiency analysis have been updated. The updating of costs resulted in higher costs for some activities from what was displayed in the Draft Environmental Impact Statement for all alternatives and benchmarks As a result, Present Net Value has changed for all alternatives, and several of the benchmarks However, the relationships among the alternatives have not changed as a result of the cost updates.

1. Fixed Costs Considered

A cost was classified as "fixed" if the cost:

a. Was not expected to vary significantly over the range of alternatives considered;

b. Could not be tied to specific activities within any of the prescriptions;

c. Represented a very small and insignificant amount of the Forest budget; or

d. Was not related to the production of outputs and effects which were relevant to addressing the Forest planning issues.

Fixed costs were a component of the budget estimates and Present Net Value calculations for each alternative

Table B-10 summarizes Malheur National Forest budget costs considered in the economic efficiency analysis and calculation of alternative budgets. In this table, the fixed costs are those displayed as "varying insignificantly " Some costs may vary between the alternatives; however, the costs did not vary over time and had no influence on the assignment and scheduling for any given alternative The cost estimates were derived using professional judgment and experience based on the goals and objectives of each alternative, and the estimates were included in the spreadsheet to calculate an appropriate Present Net Value for each alternative.

2. Variable Costs Considered

All other costs used in the economic efficiency analysis were classified as "variable " These costs are identified in Table B-10 as "varying significantly." The costs were tied to the implementation of activities within a FORPLAN prescription or to scheduled activities outside FORPLAN, and were expressed as costs per acre or costs per unit of output (i e., dollars per thousand cubic feet, etc)

In general, FORPLAN contained all of the variable costs associated with implementing timber and range management activities, and most local road construction and reconstruction costs incurred to access roadless areas or upgrade existing roads The model also contained some nonfederal logging costs The nonfederal costs were included in FORPLAN's Present Net Value calculations, but did not influence the Forest Service budget estimates Table B-11 depicts the Forest's variable costs included in FORPLAN or in the spreadsheet which contributed to the calculation of Present Net Value for each alternative.

Table B-11 lists the FORPLAN activity codes for which costs were developed and entered into FORPLAN The costs were usually expressed in terms of dollars per acre or dollars per thousand cubic feet Logging costs were deducted from timber benefit values and were not diameter specific For each FORPLAN cost category, an average cost or a range of costs were entered into the model based on the management prescriptions and the characteristics of the analysis areas to which the costs applied The table presents some broad FORPLAN cost categories, the units for which the costs were based, and the costs included in the model.

3. Capital Investments and Operation and Maintenance Costs

All costs were categorized as either capital investment expenditures or operation and maintenance costs using the professional judgment of Forest personnel. In general, capital investments are one-time expenditures of funds for specific projects (e.g , road construction, recreation construction, timber stand improvement, or range improvements) while operation and maintenance costs are either continuous or periodically recurring (e g., administrative costs of keeping offices open, periodic maintenance of Forest improvements, etc).

TABLE B-10

COSTS CONSIDERED IN ECONOMIC EFFICIENCY ANALYSIS

Cost Item	Inside FORPLAN	Outside FORPLAN	Significant Variation	Insignificant Variation	Capital Investment	Operations and Maintenance
Recreation Planning		X	X		X	
Recreation Inventory		X		X	X	
Cultural Resource Evaluation & Assessments		X		X		X
Cultural Resource Protection & Enhancement		X		X		X
Facility and Site Reconstruction		X	X		X	
Facility and Site Construction		X		X	X	
Facility and Site Management		X	X			X
Recreation Use Administration		X	X			X
Trail Reconstruction		X	X		X	
Trail Construction		X	X		X	
Trail System Maintenance and Operation		X	X			X
Wilderness Planning		X	X		X	
Wilderness Inventory		X		X	X	
Wilderness Use Administration		X		X		X
Wildlife and Fish Surveys, Planning, etc.		X		X		X
Nonstructural Habitat Improvement		X	X		X	
Structural Habitat Improvement		X	X		X	
Structural Habitat Maintenance		X	X			X
Range Planning		X		X		X
Range Inventory		X		X		X
Range Nonstructural Improvements	X		X		X	
Range Nonstructural Improvement Maintenance		X	X			X
Range Structural Improvements	X		X		X	
Range Structural Improvement Maintenance		X	X			X
Range Administration and Management	X	X	X			X
Timber Planning and Inventory		X		X		X
Silvicultural Examination and Prescription	X		X			X
Reforestation	X		X		X	
Timber Stand Improvement	X		X		X	
Timber Sale Preparation	X		X			X
Timber Harvest Administration	X		X			X
Genetic Forest Tree Improvement Program		X		X	X	
Water, Soil, and Air Inventories		X		X	X	
Water, Soil, and Air Planning		X		X		X
Watershed and Soil Improvements	X		X		X	
Watershed, Soil, and Air Administration		X		X		X
Resource Inventory Reports		X		X	X	
Water Rights Management		X		X		X
Resource Improvement Maintenance		X	X			X
Monitoring		X		X		X
General Technical Inventory & Evaluation		X		X	X	
Site-Specific Technical Investigations		X		X	X	
Processing of Site-Specific Development Proposals		X		X		X
Administration of Operations		X		X		X
Contests, Hearings, and Appeals		X		X		X

TABLE B-10 (continued)
COSTS CONSIDERED IN ECONOMIC EFFICIENCY ANALYSIS

Cost Item	Inside FORPLAN	Outside FORPLAN	Significant Variation	Insignificant Variation	Capital Investment	Operations and Maintenance
Reserved and Outstanding Rights		X		X		X
Youth Conservation Corps		X		X		X
Senior Employment Program		X		X		X
Special Use Management, Licenses and Permits		X		X		X
Withdrawals, Modifications, and Revocations		X		X		X
Property Boundary Locations		X		X		X
Property Boundary and Corner Maintenance		X		X		X
Other Land Title Claims Management and Encroachment			X		X	X
Landownership Planning		X		X		X
Land Exchange, Equalization, Acquisition		X		X	X	
Land Transfers		X		X		X
Right-of-Way Acquisition		X		X		X
Right-of-Way Cost-Share Agreements		X		X		X
Forest Level Planning		X		X		X
Transportation System Planning and Inventory	X		X	X		
Preconstruction Roads, Bridges and Culverts		X	X		X	
Construction Engineering Roads, Bridges and		X	X		X	
Road Construction		X		X	X	
Road Reconstruction		X		X	X	
Road Maintenance Levels 1,2,3,4, and 5		X		X		X
FA&O Construction/Reconstruction		X		X	X	
FA&O Facility Maintenance		X		X		X
Dam Administration		X		X		X
Timber Purchaser Road Construction/ Reconstruction	X	X	X		X	
Fire Management Planning/Analysis and Prevention		X		X		X
Fire Detection		X		X		X
Primary Initial Attack Forces		X		X		X
Secondary Attack Forces		X		X		X
Initial Attack Fire Suppression Action		X		X		X
Treatment of Natural Fuels		X		X	X	
Aerial Platform		X		X		X
Law Enforcement		X		X		X
Law Enforcement (Cooperative)		X		X		X
Line Management		X		X		X
Program Support		X		X		X
Common Services		X		X		X
**Resource Coordination[1/]		X	X			X

1/Resource coordination included in various resource programs (e g. recreation, wildlife, etc.) needed to produce the annual programmed timber harvest in an environmentally acceptable manner

TABLE B-11
VARIABLE COSTS USED WITHIN THE FORPLAN MODEL

FORPLAN General Cost Category	Units	Cost Range
Reforestation (Planting)	$/acre	176-267
Site Preparation	$/acre	90
Precommercial Thinning	$/acre	45-89
Timber Sale Preparation and Administration	$/MCF	37
Logging	$/MCF	572-826
Local Road Construction/Reconstruction		
Construction	$/mile	16,600
Reconstruction	$/mile	14,000
Unroaded areas	$/mile	16,000-21,000
Range Improvement and Maintenance	$/AUM	30-16.67

D. BENEFITS CONSIDERED FOR ECONOMIC EFFICIENCY ANALYSIS

This section describes both the priced and nonpriced benefits which were incorporated in the economic efficiency analyses for each benchmark and alternative considered during the development of the Final Environmental Impact Statement. Resource outputs to which dollar values were assigned constitute the priced benefits included in the Present Net Value calculations Like all of the costs included in the analyses, benefits incurred during the planning horizon were incorporated in the Present Net Value calculations. The economic efficiency analysis for each alternative also considered nonpriced benefits. Nonpriced benefits are outputs for which there is no available market transaction evidence and no reasonable basis for estimating a dollar value commensurate with the market values associated with the priced outputs A subjective qualitative value must be attributed to their production Conceptually, addition of the nonpriced benefits to Present Net Value is used to derive the net public benefits associated with each alternative. Both priced and nonpriced outputs and their associated values will be summarized below. More-detailed documentation of the specific values and the process used to develop them can be found in the Supervisor's Office.

1. Priced Benefits Considered

Priced benefits fall into one of two categories: market and nonmarket (assigned). Market values constitute the unit price of an output normally exchanged in a market after at least one stage of production, and are expressed in terms of what people are willing to pay as evidenced by market transactions Nonmarket values constitute the unit price of a nonmarket output not normally exchanged in a market at any stage before consumption, and thus must be computed from other economic information (Forest Service Manual 1970 5). They are valued in terms of what reasonable people would be willing to pay (above participation costs) rather than go without the output In either case, the values are theoretically commensurate and appropriate for inclusion in Present net value calculations.

The resources for which values were estimated on the Malheur National Forest consisted of timber, range, anadromous fish, watershed condition, and developed/dispersed and fish-and-wildlife-oriented recreation. Timber and range were the only resources to which market prices were assigned in FORPLAN; commercial anadromous fish market prices were used in the spreadsheet. Nonmarket prices were used in the spreadsheet for all other resources. The process for deriving each of the values will be briefly explained in the following sections.

a Timber Resource Benefit Values

On the Malheur National Forest, the process for calculating timber resource benefit values was based on average mill values and logging costs supplied by the Regional Office in the April 27, 1984, direction package. The average mill value by species was adjusted by the Forest average logging cost (adjusted upwards for timber on slopes greater than 35 percent) to express the timber benefit values at time of harvest (i.e. stumpage) and reflect the increased logging costs required for steeper slopes.

All calculations were performed in terms of constant 1982 dollars. Also, since most of the source data was expressed in terms of dollars per thousand board feet, it was necessary to convert these to dollars per thousand cubic feet in the process. The species-specific values were further refined by 4-inch diameter classes based on stumpage valuation and price per diameter relationships developed by the Pacific Northwest Forest and Range Experiment Station. The stumpage values for individual species were used to generate working group stumpage values; essentially, the predominant species in the stand (i.e. greater than 50 percent) dictates the stumpage value used in FORPLAN. However, for the mixed conifer working group benefit values, the species mix was assumed to be 50 percent white fir/50 percent Douglas-fir

Table B-12 displays the characteristics which cause changes in the timber benefit values of existing and regenerated stands. The entire process that was followed in developing timber benefit values is explained in detail in the Forest planning records, on file in the Supervisor's Office.

b. Range Resource Benefit Values

The range outputs represent the amounts of forage permitted to be grazed and is measured in units of animal unit months. Animal unit month values were calculated as the value of the marginal product of an animal unit month in the production of a marketable animal. The Forest Service entered into a cooperative agreement with the USDA Economic Research Service to develop livestock enterprise budgets for each National Forest (Gee, 1981). The Ranch Budget Approach was used for the analysis. Because Forest animal unit months are not actually priced in a free competitive market, the calculated price is an estimate of market value First, returns from all ranch products were determined; then, all costs of production were subtracted. The remaining returns plus the cost of operations on National Forest lands became the residual value of the Animal Unit Month The residual value of an animal unit month to ranch livestock production is comparable to conversion surplus timber values Based on the information provided in the RPA 1985 Program analysis for the Draft Environmental Impact Statement, and a Regional Office letter (2340, September 30, 1983), the animal unit month value for the Malheur National Forest in 1982 dollars is $14 02

TABLE B-12
CHARACTERISTICS AFFECTING STUMPAGE VALUE DIFFERENTIALS

Existing Stands

Slope - Two Categories (0 to 35 percent) (greater than 35 percent)

Commercial/Precommercial Thin Opportunity

Regeneration Harvest Opportunity

Overwood Removal Opportunity

Working Group Assigned (i e., Species Mix)

Site Productivity Class (i.e., low site)

Regenerated Stands

Slope - Two Categories (0 to 35 percent) (greater than 35 percent)

Working Group Assigned (i e , Species Mix)

Site Productivity Class (i e., low site)

c. Anadromous Fish and Watershed Condition

The value used for anadromous fish (commercial harvest) was among those stipulated in the Regional Office direction package of April 27, 1984. Although anadromous fish use does not occur within the Forest boundary, the Forest does provide significant habitat for the fisheries resource Thus, the values for both sport fishing and commercial harvesting were used. The values for watershed condition, specifically the values for maintained water quality and improved water quality, were also contained in the Regional Office direction package referenced above.

d Wildlife and Recreation Benefit Values

The non wildlife-related recreation and wilderness outputs represent the amount of use consumed on the Forest and are measured in terms of recreation visitor days. The wildlife- and fish-related recreation use is measured in terms of wildlife and fish user days. Values used for the priced outputs were derived directly from the 1985 Resource Planning Act Program assessment. The following discussion is a summary of the write-up found in Appendix F of the 1985 Resource Planning Act Final Environmental Impact Statement.

The development of recreation, wilderness, and wildlife values for the 1985 Resource Planning Act Program analysis consisted of two steps: (1) development of recreation and wildlife benefit values by activity per recreation visitor day or wildlife and fish user day; and (2) adjustment of values to reflect standard and less-than-standard levels of management The Malheur National Forest used only values from the standard level.

The Resource Evaluation Group at the Rocky Mountain Forest and Range Experiment Station conducted an extensive literature search to develop the 1985 activity values for recreation. Benefit values for recreation, wilderness, and wildlife activities were developed from recent travel cost models and contingent valuation research (Loomis, 1982) Forest Service and academic specialists reviewed research and activity values and adjusted the initial values to achieve methodological consistency to apply them to regional conditions. The recreation visitor day values by recreation activity generated by the study can be found in Table F.4 of the 1985 Resource Planning Act Final Environmental Impact Statement.

For program evaluation purposes, the values were subsequently adjusted downward because:

- The travel-cost method represents a total willingness-to-pay. Other resource values in the Resource Planning Act evaluation represent market price or value of the marginal product. Consequently, the willingness-to-pay values were adjusted in an effort to make recreation values more compatible with values used for other resource outputs.

- The travel-cost method estimates values on a site-by-site basis. The method does not address the question of whether regionally or nationally a given quantity of recreation visitor days will, in fact, be consumed if the price were changed

- Travel-cost studies are typically done at higher-quality sites, do not take into account substitutes to individual sites, and do not accurately measure trip length, consequently, values from the studies may be on the high side when applied to average situations on a region-wide basis

In response to the first concerns, values were adjusted based on the relationship between the proportion of recreation provided by the Forest Service and estimates of an average nationwide demand elasticity for outdoor recreation Nationally, roughly a 5 percent increase in price will result in a 1 percent decrease in quantity demanded (Lewis, 1977) In 1982 the Forest Service provided 7-1/2 percent of all outdoor recreation Consequently, there will be a 5 percent decrease in price for each percent of the 7-1/2 percent Forest Service market share or a total decrease of 37 5 percent for clearing the market Therefore, the initial willingness-to-pay values were reduced 37 5 percent for use in comparing resource allocation choices

The final values used were assigned to the most significant recreation uses occurring on the Forest. These values, along with the anadromous fish and watershed values, are displayed in Table B-13 The recreation values are expressed in terms of the Recreation Opportunity Spectrum activity categories in accordance with the way they were developed and tracked during the process of analyzing alternatives.

TABLE B-13
1985 RESOURCE PLANNING ACT BENEFIT VALUES (1982 dollars)

Anadromous Fish and Watershed Values	Units	Value
Anadromous Fish Commercial Harvest	$/MLBS	1,050.00
Improved Water Quality	$/Acre-Foot	1.40
Maintained Water Quality	$/Acre-Foot	.20
Recreation Values		
Wilderness - Primitive Use	$/RVD	17 50
Wilderness - Semi-Primitive Non-Motorized	$/RVD	17 50
Primitive Use	$/RVD	11 25
Semi-Primitive Non-Motorized	$/RVD	13.25
Semi-Primitive Motorized	$/RVD	12.13
Roaded Natural	$/RVD	9.38
Rural	$/RVD	7.56
Urban	$/RVD	3.85
Big-game Hunting	$/WFUD	30 00
Resident Fishing	$/WFUD	15.00
Anadromous Sport Fishing	$/WFUD	33.00

2. Nonpriced Outputs Considered

The calculation of Present Net Value enables the comparison of alternatives with regard to their output levels for priced resources and their efficiency in producing them. However, other factors also influence the decision making process. In some cases, the importance of nonpriced benefits, for which it is impossible to assign monetary values, can outweigh the advantages of producing higher levels of priced outputs. The importance of the need to consider these subjectively valued benefits in Forest management decision making is addressed in the National Forest Management Act Regulations which charge the Forest Service with identifying the alternative which comes nearest to maximizing net public benefits (36 CFR 219.12(F)).

Net public benefits represent the overall value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs), whether or not the costs and benefits can be quantitatively valued. (36 CFR 219.3). Net public benefits include both priced and nonpriced resource outputs, less all costs associated with managing the area. As stated earlier, all priced outputs and all costs associated with managing the Forest are included in the calculation of Present Net Value The net subjective values of the nonpriced outputs must be added in order to arrive at the overall net public benefit of an alternative. Some of the most important nonpriced benefits addressed during the Malheur National Forest planning process include the following (1) Local Economic Stability (2) Visual Quality in Major Corridors (3) Old growth Timber (for wildlife habitat) (4) Roadless Areas (5) Elk Winter Range (6) Riparian Areas and Water Quality

The outputs and effects listed above are influenced to a large degree by decisions regarding management of the Forest. Several issues and concerns identified at the outset of the planning process focused on outputs and effects considered as nonpriced outputs. It is impossible to measure their value in dollar terms comparable to market values The values must be subjectively determined.

The provision for many of the nonpriced benefits is achieved by applying constraints to the production of priced outputs (e g , timber harvesting constraints in FORPLAN) The constraints usually result in a decrease in the Present Net Value of the priced outputs to which the constraints were applied. Subjective judgments are then necessary to assess whether benefits of producing the nonpriced outputs exceed the opportunity costs associated with producing fewer priced outputs If after analyzing a series of constraint levels, a Present Net Value tradeoff induced by the provision of a particular level of constraint for a nonpriced output is judged acceptable, then a positive contribution to net public benefits has resulted and the alternative is more efficient.

The nonpriced outputs considered during the development and evaluation of alternatives are discussed below. While the quantitative dollar values of each cannot be determined, nonpriced outputs can generally be evaluated by examining such quantitative indicators as acres of appropriate allocations, resource inventories, or timber production related activities and outputs

a. Local Economic Stability

The residents of Grant and Harney counties are especially dependent upon the Malheur National Forest. The Forest is both directly and indirectly responsible for thousands of area jobs, millions of dollars of personal income, and sizeable contributions to local government through the 25 percent payments to counties which support local road and school programs The Forest's importance to the local communities is based primarily on its timber program which provides most of the timber processed locally The range program is also important to local community stability, as many permittees are dependent upon Forest-produced forage. Recreation opportunities are widespread on the Forest, and activities such as big-game hunting attract people, which augments the local retail trade

b Visual Quality in Major Corridors

While the value of visual quality in major travel corridors is not directly included in the Present Net Value calculations, its value is indirectly represented through the consideration of recreation as a priced benefit. The provision of positive visual experiences is assumed to have a direct relationship to the quantity and quality of recreation on the Forest. A large number of people benefit from the visually appealing scenery. Two principal highways and several high-standard Forest roads pass through the Forest and people who drive on these roads pass through some high-quality scenic areas People who live in or around the Forest enjoy the scenic qualities associated with the forested mountain environment Experiences are not counted as recreation visitor days, because the benefits the people receive are not measurable in dollar terms.

Each alternative varies in emphasis on meeting inventoried visual quality objectives by proposing different corridor assignments. Emphases can be measured in terms of acres of retention and partial retention visual quality objectives which are being met through the implementation of an alternative.

c. Old growth

During the past decade, there has been a growing interest in old growth, apparently brought about by an awareness that unaltered old-growth stands are diminishing both in size and in number. One reason frequently given for retaining old-growth timber is to meet wildlife needs, but the desire apparently goes beyond this. On the Malheur National Forest, there is no wildlife species that has been identified as requiring only old-growth timber conditions, although some species require conditions that are best represented in old-growth stands. People also want old growth for the recreational enjoyment it provides, and for aesthetic and other qualities such as the size and age of its trees. Those opposed to the retention of old-growth conditions cite their concern for the loss of wood production and often prefer that land be converted to rapidly growing timber stands These conflicting desires are the basis of the old-growth issue

d Roadless Areas

On the Malheur National Forest, 18 roadless areas were inventoried in RARE II; Appendix C fully details these areas and the treatment of these areas by alternative. In general, as remaining roadless areas are roaded and developed for other uses, there are fewer opportunities for semiprimitive and primitive recreation experiences Furthermore, 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. To the extent that retaining roadless areas in undeveloped conditions does not overly restrict the efficient production of priced outputs, both the recreation diversity and the future options which they offer are considered a nonpriced benefit

e. Elk Winter Range

The Malheur National Forest provides habitat for a significant local elk population which is currently increasing. Although elk production from the Forest is valued (priced as wildlife and fish user days for big-game hunting) indirectly as a recreational activity, there are nonpriced benefits associated with the provision of elk winter range. The Oregon Department of Fish and Wildlife and owners of adjacent private land (which elk use heavily in harsh winters) view the provision of elk winter range by the Forest as highly beneficial. The provision of winter range by the Forest through vegetative manipulation can result in healthier elk populations and less impact on adjacent land.

f Riparian Areas/ Water Quality

The Malheur National Forest has provided forage for many grazing permittee operations for many years. As a result, some riparian areas have been degraded by livestock use and are in need of rehabilitation Clean water is another commodity of Forest management that cannot be priced directly. Instead, an indicator of water quality, namely sediment yield, is used to reflect changes in the types and magnitude of Forest activities In the analysis, sediment production of the alternatives is evaluated in relative terms against the Minimum Level Benchmark. The Minimum Level Benchmark sediment yield reflects the background geologic sediment production level for the Malheur National Forest

V. SOCIAL AND ECONOMIC IMPACT ANALYSIS

A. INTRODUCTION

Many small communities and people in eastern Oregon are dependent upon the Malheur National Forest for their economic, recreational, and social way-of-life. Population levels, economic well-being, lifestyles, attitudes, beliefs, values, and social organization are all related to Forest activities to a certain extent In fact, many of the issues, concerns, and opportunities which the planning process must address reflect the importance of the Forest to both local and regional publics Economic and social consequences resulting from the implementation of land management planning decisions are considered during the evaluation of alternatives

Economic impact analysis is a means by which relevant Forest management decisions are evaluated with regards to their impacts on employment, personal income, and local government revenues within an area defined as the "Forest influence zone." Social analysis, in turn, evaluates the polarizing or cohesive effects arising in different community types within the Forest influence zone in response to land management planning decisions This section provides an overview and description of the economic and social impact analysis performed during the evaluation of alternatives

B. OVERVIEW - FOREST INFLUENCE ZONE

The Forest zone of influence was established early in the planning process (1981). As detailed in the Draft Environmental Impact Statement (1986), Grant and Harney Counties were considered as the Forest zone of influence Some respondents to the Draft Environmental Impact Statement suggested that the Forest zone of influence should be expanded to include adjacent counties (e g Baker, Umatilla, Wallowa, etc) After reconsidering the criteria which were used in determining the zone of influence, such as the historical timber sale purchase patterns, Grant and Harney Counties remain the primary zone of influence of the Malheur National Forest, therefore, the Forest zone of influence will not be changed in this Final Environmental Impact Statement In future planning cycles, the Forest zone of influence will be re-evaluated and revised, if necessary, to reflect any changes in long term socioeconomic patterns

The zone of influence of the Malheur National Forest is an area of magnificent scenery, remote small communities, and a rural western lifestyle found in few parts of the country today Grant and northern Harney counties are located in the Blue Mountains of Eastern Oregon and cover an area of over 6,500 square miles They are over 5 hours by car from Portland, Oregon, and 3 hours from Boise, Idaho, the two nearest metropolitan areas

The population of the area under consideration is about 15,000 The largest towns are Burns, John Day, Hines, and Prairie City with 1980 populations of 3,579, 2,012, 1,632, and 1,106 respectively Other communities in the area are hamlets of several hundred or fewer people, and these are separated from each other by rather large distances The nearest interstate highway, the nearest railroad passenger service, and the nearest airport with scheduled air service are over an hour away. The nearest scheduled bus service is located in Burns and Baker, each about an hour from John Day

Over 60 percent of Grant County's population lives in the John Day Valley, within a 15-mile radius of John Day. This is the area in which the major lumber mills are located and is considered the trade center for the county Similarly, over 60 percent of Harney County's population resides within a 10-mile radius surrounding the county's largest community, Burns

Population growth has been generally slow but steady. Severe fluctuations have occurred in the past. These fluctuations often parallel the health and viability of the national timber market Population projections for the area indicate a future growth rate averaging less than 2 percent per year.

The economy is heavily resource-based with logging and ranching as the principal industries Federal, State, and local government also are major employers in the area. More than half of the area under consideration is publicly owned and the majority of that is National Forest. Thus, the Malheur National Forest resource use and assignment decisions can have a major effect on the economic well-being of the area.

1. Communities and Lifestyles

There are 11 incorporated communities within the zone of influence in Grant and Harney counties. The largest of these are Burns (population 3,579) and John Day (population 2,012)

Institutions and establishments normally associated with small, western, intermountain ranching and logging communities are in evidence Most of the towns have a post office, cafe, bar, grocery store, service station, farm implement dealership, elementary school, and several churches Many have several of the above establishments.

Each town's post office, grocery store, cafe, or bar (or a combination of the above) serves as more than a dispensary of mail, food, and drink, but also as a social center and meeting place for some of the citizens in the area.

Several of the larger communities have, in addition to the already-mentioned establishments, such specialized institutions as police stations, government offices, high schools, libraries, museums, nursing homes, professional offices, motels, and a variety of other business establishments. However, since the largest town has only about 3,000 people, there are few urban amenities.

Community structure in most of the towns in the county, especially the smaller ones, is generally cohesive, traditional, conservative, family-oriented, and based on primary groups Usually each community is small enough that most residents know each other Informal social control is strong, and law enforcement is minimal and needed infrequently. Community life often approximates that of a folk culture, with face-to-face contacts and personal interaction the dominant way of conducting personal and business transactions. Different occupational and socioeconomic groups exist and their members interact with each other, especially in the larger communities

The number of people belonging to racial and cultural minorities in the two counties is small. The major exception to the predominantly Caucasian population is the tribe of Harney Valley Northern Paiute Indians living on a reservation north of and in the community of Burns. These people are descendants of Native Americans who have lived in the region for centuries and who traditionally hunted, gathered food, created tools, and lived in much of the Forest area While fewer of the local Paiutes continue these practices than they did in the past, such activities are symbolic of their heritage and are of considerable importance to them.

Other tribes located along the Columbia River and in Central Oregon (Middle Oregon, Walla Walla, Umatilla, and Cayuse tribes) also traveled through and used portions of the Forest. Their interests in the Forest remain similar to those described for the Paiute Tribe.

Since the mid-1850's there have been various treaties, executive orders, statutes, court decisions, and commission adjudications which grant certain rights and privileges to American Indian citizens These rights include such things as hunting, fishing, and gathering roots and berries Certain sites on the Forest are also important for spiritual and religious reasons Since much of the cultural and religious practices are related to sites known only to certain individuals, site disturbance is of concern to these groups.

The American Indian Religious Freedom Act ensures that the right to practice traditional religions and gain access to religious sites will not be infringed upon It does not convey exclusive use nor does it grant free use of Forest products. Protection of these rights and management of the Forest remain in a delicate balance and are of concern to Forest managers and the various tribes.

As members of local communities and residents of the area, these people also share many of the same interests in, concerns about, and ties to the Forest as other local residents

2. Attitudes, Beliefs, and Values

The people of the area retain many of the social values which characterized the early American West These values include an affinity to the outdoors, independence, and freedom from control and regulation. These deep-rooted values were forged during an era of abundance and unrestricted use of natural resources. These values and the economic history of the area have a strong bearing on local attitudes towards the use and assignment of the public lands and natural resources.

At times, the Forest Service may be seen as a relative newcomer to the area, interfering with past practices, promoting change, and brandishing the power of the Federal Government At other times, the National Forests are seen as great assets to the area

Many newcomers to the area share many of the values held by native residents. This is reinforced by the employment opportunities that are generally limited to occupations in the agricultural and timber industries Newcomers with professional occupations, and others not moving to the area for employment in these industries, value the small town, rural lifestyles and values present here.

Others, "nontraditional immigrants," generally reject the commodity-production oriented philosophy toward the use of the Forest's resources held by the local majority. They tend to value these resources primarily for what they provide in nonconsumptive attributes, rather than in terms of consumptive goods.

As the local majority and power structure, the native residents tend to stress the concept that Forest activities should be primarily influenced by the needs and desires of the local majority. The opposing view holds that the management of the Forest should be more responsive to national needs and values. These views tend to reflect the means of influence with which each group is familiar and successful.

Local disagreements about practices and resource management stemming from deeply held beliefs and values will continue in the future How disruptive those disagreements will be will depend on the advocates' ability to find a common ground for agreement, compromise, and mutual understanding.

All points of view are represented by local residents and there is more commonality than is often perceived It is just as wrong to place all resident natives or members of specific occupational groups on the extreme production/commodity end of the scale as it is to place all "nontraditional immigrants" on the extreme preservationist end of the land-use scale.

In general, the local communities--while adjusting to change--are cohesive, sharing a common consciousness of hard work, independence, control over one's life, and an intimate relationship with the outdoors.

3. Economic Setting

The principal private-sector industries in Grant and Harney counties are timber, livestock, and retail trade These three sectors account for approximately 50 percent of total area employment The other major sector of the economy is government (local, State, and Federal) accounting for 35 percent of the area's employment

4. Timber Industry

The lumber and wood-products sector is a major contributor to the economic well-being of the area, providing about 15 to 20 percent of total area employment. Many local businesses derive a large portion of their sales from timber-industry employees and their families.

The timber industry is subject to severe fluctuations in the timber market. Events during the 1980's serve to illustrate the local economic hardships which can occur as a result of depressed timber markets, excess inventories, and high interest rates In the early part of the decade, unemployment rates in Grant and Harney counties were high primarily due to the depressed timber market, at times reaching 20%. More recent unemployment rates have ranged from 5.3 percent (Harney county average for June, 1988) to 18 percent (Grant County average for March, 1988), and unemployment rates have continued to drop for the last two years, due to the strong timber market.

A major factor affecting stability of the lumber and wood-products work force in Grant County is the abundance of ponderosa pine on the Forest. Pine lumber is not closely tied to the housing market and does not have to compete with the dimension-type lumber imported from Canada. The supply of ponderosa pine from the Forest is important to the continued economic viability of many local mills.

Information pertaining to local mill capacities and historical cut-and-sold volumes is presented in the Timber Demand section of Chapter II of the Forest Plan, Summary of the Analysis of the Management Situation

5. Livestock Industry

Livestock grazing on the Forest is a long-established use. Area ranches provide a steady, year-round demand for many of the basic goods and services offered by local businesses.

Nationally during the past 10 years, a steady trend toward fewer ranches and lower agricultural employment, in conjunction with increasing herd sizes on the remaining ranches, has occurred However, in Grant and Harney counties, approximately one-half of all ranches are less than 200 head of cattle in size The small operations prevalent in the Forest zone of influence are more susceptible to downward trends in the livestock industry. Consequently, some smaller operations are being purchased by larger, more efficient operations

At the present time, the livestock-producing sector accounts for approximately 15 percent of total area employment and 10 percent of total wage and salary income.

The agricultural industry, primarily ranching, has a stabilizing influence on local communities The effects of the ranching sector on the local economies may be found more in terms of social stability and local leadership than in terms of significant economic benefits

6. Retail Trade

The retail trade sector provides year-round employment equal to that in lumber and wood products (15 percent) To some extent, it is broader based than normally found elsewhere. None of the communities is large enough to support a large discount chain, so many independent merchants are required to provide goods and services Total sales and profits in this sector are highly dependent on the other sectors of the local economy

7. Government

The largest segment of the area's economy is government (local, State, and Federal), accounting for about 35 percent of area employment and income. At the present time, future levels of Federal government expenditures and employment are highly unpredictable, with reductions in both being a distinct possibility. Declines in the government sector could have a significant impact on the area's economy

The Forest plays an important role in terms of the fiscal health of Grant County. Malheur National Forest 25 Percent Fund payments account for 35 to 40 percent of Grant County's total budget

Malheur National Forest payments to Harney County are much less significant, comprising approximately 5 percent of that county's total budget

8. External Influences

While activities on the Forest do not directly impact the daily lives of people beyond the Forest's zone of influence, they are important to them for various reasons There are three activity-oriented groups in particular which are likely to be impacted by management decisions These activity groups are firewood gatherers, big-game hunters, and recreationists

Certainly, these activity groups also include local residents; however, they represent the main types of activities on the Forest engaged in by people from other areas. Nonlocal firewood gatherers come principally from the Vale/Ontario (Oregon) and Nampa/Caldwell/Boise (Idaho) population centers, approximately 180 miles distant. Nonlocal hunters tend to come to the Forest from the Willamette Valley (Oregon). This is particularly true of mule deer hunters.

Recreationists can be divided into three groups: dispersed Non-Motorized recreationists, dispersed Motorized recreationists, and wilderness advocates. Motorized recreationists tend to be local residents. The other two categories include almost half local residents and about half other Oregon residents, with only a few visiting from southeast Washington and California and even fewer from other states.

C. Economic Impact Analysis

Input-output analysis was used to help evaluate the employment and income impacts within the regional economy of Grant and Harney counties associated with the proposed output and activity levels for each of the land management planning alternatives. The impacts were estimated for the first decade based on timber and range outputs for each alternative. The quantitative employment and personal income impacts were qualitatively augmented with an assessment of the social consequences which could accompany implementation of each alternative.

The IMPLAN model (Alward et al., 1983) was used to perform the economic impact analysis for the Draft and Final Environmental Impact Statements. IMPLAN is an input-output model software program available for microcomputers. The IMPLAN model will not be discussed in detail here. For more information on IMPLAN, the reader is referred to the Micro IMPLAN Software Manual (March 1989).

Economic input-output (I-O) analysis is based upon the interdependence of the production and consumption sectors of the economy for the area being studied. Industries must purchase inputs from other industries, as well as from 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 Input-Output accounts can be thought of as a "picture" of an impact area's economic structure at one point in time. The structure is represented as a mathematical transactions matrix of buyers and sellers in the economy For the analysis conducted for the Malheur, the data from calendar year 1982 was most representative of the existing situation.

The proposed output levels associated with each alternative are represented as changes in the current levels of final demand for the outputs in the IMPLAN model. The resulting production requirements needed to satisfy the changes in final demand and the flow of industrial inputs and outputs can then be traced by the Input-Output accounts to determine impacts on the different industries composing the regional economy. Through mathematical matrix manipulations, the estimated direct, indirect, and induced impacts can be evaluated. The impacts concerning most people in the local economy are changes in employment and personal income.

Also of interest are changes in the amount of payments to counties in lieu of taxes resulting from implementation of an alternative The IMPLAN Input-Output model was not used to analyze changes in county payments The process used will be discussed after the following brief review of the data and information used to construct and calibrate the Forest Input-Output model

1. IMPLAN Data Base

The IMPLAN model has a data base consisting of (1) a national-level technology matrix, and (2) a file of estimated activity levels for total gross output, six final demand components, three final payment indicators, and employment estimates for 466 industrial/business sectors (Alward et al., 1985) The national level technology matrix is based on a 1972 Department of Commerce Input-Output model converted to an "industry by industry" basis and updated to 1982. Unreported data were estimated using an economic growth modeling procedure (Stone et al., 1962).

2. National Data Reduction to Impact Area

The county-level information is based on a 1982 data set constructed by Engineering Economics Associates of Berkeley, California Utilizing the national technology matrix and control totals for the two counties, a data reduction method was employed to develop the input-output table for the economic *impact area The method used exploits the property of "openness" displayed by* smaller regional economies when compared to the national economy (Richardson, 1972) Smaller regional economies exhibit much greater tendencies to import and export goods and services than the national economy; therefore, they are more "open" than the national economy Assuming 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 for data reduction was adopted (Schaffer et al , 1969)

Comparisons indicated the Forest's IMPLAN model did a reasonably good job of reflecting the "picture" of the county economy as it was in 1982. The local economy has changed since then, but employment and income predictions based on the 1982 Input-Output model still can give a reliable comparison. For example, shifts in unit productivity within the timber industry have occurred through technological advances and more efficient operations. In the woods products industry this has lead to approximately a 30 to 40 percent lower requirement in workforce for the same level of production Other employment sectors are also undergoing similar adjustments, but to a lesser extent Given these changes, the range of employment and income effects attributable to the various alternatives based on the provision of timber and range outputs can still be considered valid, but should be used only for comparative purposes.

3. Final Demand Expenditures

For each alternative, the Input-Output model was used to translate proposed changes in timber and range output levels from recent average levels of production into changes in employment and personal income for the Grant and Harney region as a whole.

An intermediate step in the process was to equate changes in the respective resource outputs to changes in final demand expenditures by sector. Final demand expenditures are different from the values used in the Present Net Value efficiency analysis. The Present Net Value efficiency analysis examines only the market value of the raw material leaving the Forest. For timber outputs, market values are the stumpage values. Final demand expenditures represent dollars spent by the ultimate consumer at the point of final consumption The point of final consumption is the sector from which the ultimate consumer purchases a product or the sector beyond which the output is exported from the region For example, the point of final consumption for an output of timber might be in the new construction sector because the timber is used in construction of a house which a consumer may purchase However, if the timber is exported following processing at the sawmill, the point of final consumption is the sawmills sector.

By identifying the final consumption point, transactions of all industries involved in processing the output are considered For more detail regarding how final demand expenditures are calculated, refer to the Micro IMPLAN Software Manual (March 1989)

For purposes of assessing the potential economic impacts which may result from the implementation of an alternative, output levels for timber and range were tracked. The outputs were selected because they reflect the primary differences in the resource production levels between the alternatives, and they also have the most significance to the local economy

4. Returns to the Local Government and U.S. Treasury

Predicted returns to the U S Treasury and local governments were calculated for each alternative. The returns illustrate the potential impacts of Forest management decisions on both the Federal government receipts collected as a result of revenue-producing programs on the Forest and the resultant change in revenues passed on 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 Forest Service Manual 6531 12b "Annual Collections Statement," of the National Forest Fund Cash returns to the U S Treasury from the Malheur National Forest are generated by timber, recreation, range, mineral and energy leases, and special-use receipts. Returns to local governments are calculated as 25 percent of the returns to the U S. Treasury funds. The funds are paid to the State of Oregon and then disbursed to local county governments based on the percentage of Forest acres located within each county Returns to local counties are often referred to as payments in lieu of property taxes, since the U S. Government as a landowner does not pay local property taxes.

The projections of the revenues for each alternative were based on their respective proposed output and activity levels for the programs The stumpage receipts, which account for over 99 percent of total returns to the government, are based on FORPLAN harvest scheduling solutions for each alternative

D. FINDINGS FROM THE ECONOMIC IMPACT ANALYSIS

Chapters II and IV of the Final Environmental Impact Statement present details of the anticipated socioeconomic impacts associated with implementation of each alternative. Table II-5 displays the estimated relative impacts associated with each alternative for the first decade with regards to jobs, personal income, total returns to the U S Treasury, and payments to counties in lieu of taxes. In this section, a brief narrative of the findings is presented.

In reviewing these results it should be remembered that they represent only the effects of changes in the timber and range outputs Thus employment and other economic outputs cannot be compared directly with statistics from other sources.

The modeling of economic impacts was based on proposed changes in resource output levels between the respective alternatives and the output levels upon which the current economy is based Output levels in two resource areas, timber and range, were used to determine the relative impacts on employment and personal incomes within Grant and Harney counties' regional economy Table B-14 displays recent average output levels for each resource and total jobs and income response coefficients that would result from an output change of one unit for each resource.

Since publication of the Draft Environmental Impact Statement and Proposed Forest Plan (1987), recent output levels for timber harvests have changed In the economic impact analysis for this Final Environmental Impact Statement and Plan, the 10-year period has been updated from 1977-86 to 1980-89 As a result, higher average output levels for the ten year period (1980-89) than presented in the Draft Environmental Impact Statement result in changes in employment projections for all alternatives

TABLE B-14

EMPLOYMENT AND INCOME RESPONSE COEFFICIENTS BY RESOURCE

Resource Name	Output Units	Current Output Levels 1/	Employment Response No of Jobs	Income Response $MM
Timber	MMBF	219	7 6	0 251
Range	MAUMS	117	0.5	0 008

1/Average outputs during the 10-year period of 1980-89

In general, alternatives which emphasize commodity outputs tend to produce the most jobs, income, returns to the U S Treasury, and payments to local governments Timber receipts are the greatest source of returns to the U.S Treasury and payments to local governments. The relative economic impacts estimated for each alternative will not be discussed here; see Chapters II and IV of the Final Environmental Impact Statement for specific estimates.

E. SOCIAL IMPACT ANALYSIS

Social impact analysis has been identified in laws governing Forest management as a required component of National Forest planning and decision making The National Environmental Policy Act of 1969 and the National Forest Management Act of 1976 both require managers to display and consider the social effects of alternative actions before choosing a course of action

These two laws and others, such as the Multiple-Use Sustained Yield Act of 1960, have formalized a policy of maximizing net public benefit, in other words, providing the "greatest good for the greatest number in the long run " To achieve this, *proposed actions and output levels are considered at national, regional, and* Forest levels in terms of cost efficiency, environmental effects, and economic and social impacts

More than the legal requirements compel land managers to assess the social impacts of their decisions. The National Forest is not an island isolated from the larger social and political world. Increasingly, a manager's decisions must stand up to a barrage of challenge from members of this social and political environment Forest users are increasingly demanding a voice in the decision making process This is appropriate because the outcomes of these decisions affect the quality of their lives.

Each of these individuals has a personal stake in the Forest based on the lifestyle choices of that individual. That stake, or interest, reflects the attitudes, beliefs, values, and expectations a person has about the Forest and its management. These deeply held feelings affect an individual's sense of personal freedom, self-sufficiency, and sense of control about the future

People will spend considerable time and energy defending what they like to do in the way they like to do it. When their preferences are threatened by another segment of the community, or another segment seems to benefit by their loss, groups within a community oppose each other and become polarized Social well-being in the community is undercut as resources are used in opposition rather than cohesion.

In addition, an alternative that threatens individual freedom of choice and undercuts social well-being has little chance of being implemented, no matter how scientifically sound or economically desirable the alternative may be. It is a prudent manager, then, who attempts to assess the social impacts of the alternatives under consideration and uses that assessment as one variable in the decision making process.

1. Social Effects

Essentially, the process of estimating social effects consisted of delineating and categorizing different Forest user or activity/interest groups. Current directives require decision makers to select appropriate variables to consider the effects of each alternative on four categories· (1) jobs/lifestyle; (2) attitudes, beliefs, and values; (3) social organization; and (4) population (Forest Service Manual 1973 3). The input-output model, IMPLAN, described previously was used to determine changes in variables (1) jobs/lifestyle and (4) population.

Category (2)--attitudes, beliefs, and values--includes the feelings, preferences, and expectations people have for the Forest. A measurable and appropriate variable for this category is "opportunities foregone." A foregone opportunity means that implementation of a particular alternative will cancel future opportunities to engage in activities that are incompatible with that alternative Category (3), social organization, is concerned with social institutions and community cohesion Community cohesion is described as the degree of unity and cooperation within a community in achieving its goals and the regard and respect people hold for their community and each other Conversely, it is the degree of polarization among various groups within a community. Management alternatives that polarize groups undercut social well-being. A measurable and appropriate variable for this category is the degree of "community cohesion "

2. Methods and Procedures

The methodology used for social impact assessment required a panel of judges to review a set of issues and determine how a set of local activity/interest groups would feel about these issues. This was done for the issues in general as a philosophical base for each group, and then for the alternatives to compare to the established base.

The panel consisted of five members selected from among Malheur National Forest employees in the Forest's zone of influence An attempt was made to represent all local community areas and an array of ideologies, rural and town residents, and length of residence. As much as possible, members were selected who actually are members of the selected activity/interest groups (e.g , local government, environmental interest, etc.)

The activity/interest groups analyzed included· firewood gathering, ranching, local government, timber harvest and related activities, business and retail, Non-Motorized dispersed recreationists, wilderness advocates, motorized hunters, and people who engage in Native American cultural activities.

The panel members narrowed the planning issues, concerns, and opportunities down to the six most important issues. This was done because more than six issues would be too cumbersome to analyze successfully. The issues analyzed were timber harvest and intensive management, protection of riparian areas, production of salmon and steelhead, optimal big-game habitat, road construction and density, and protection of old-growth habitat.

The panelists then reviewed the issues and estimated the current position (pro, con, or neutral) that specific activity/interest groups would take on each issue. These responses were tabulated and the results provided a base estimate of the amount of community cohesion existing in the Forest's zone of influence.

The alternatives were then reviewed and the position that each activity/interest group would take on each alternative was estimated. These responses were compared to the base estimate of community cohesion and the degree of change was noted for each alternative. In other words, the results of this analysis indicated whether an alternative was likely to increase or decrease polarization in the Forest's zone of influence

The second phase of the analysis determined the distribution of effects of the alternatives Three factors were used to estimate these effects: scope, intensity, and duration

Scope is an estimation of the loss of future opportunities to engage in an activity. (For instance, by roading some currently unroaded areas, wilderness advocates lose 25 percent of their opportunity for future wilderness designation.)

Intensity indicates how much the loss will be felt by the group. (As wilderness experiences are more readily available elsewhere in northeast Oregon, the intensity of loss decreases)

Duration indicates the difficulty of recovering the loss if it were desired to do so (If an area is roaded and logged, it would take over 100 years to come close to providing a wilderness environment again given today's technology and budget history.)

Identification of opportunities foregone provides a supplement to the community cohesion analysis by explaining further why the groups take a stand on a certain issue or alternative. The method of estimating these variables was identical to the community cohesion analysis The result was a relative ranking among the alternatives and information about distribution of the impacts

3. Social Impacts Summary

Social impacts are defined within the context of individual choice. The variables most directly tied to economic impacts of the alternatives (jobs and population) reflect the individual's lifestyle through choice of employment and decision to live in the area. The context of choice in the Forest's zone of influence is further measured by community cohesion and opportunities foregone. The alternative which has the least negative impact on economic variables, results in an increase or the least decrease in community cohesion, and has the fewest opportunities foregone is the alternative which best resolves the social aspect of the social and economic planning topic

VI. ANALYSIS PRIOR TO DEVELOPMENT OF ALTERNATIVES

A. INTRODUCTION

The primary analysis prior to development of alternatives was the "Analysis of the Management Situation." This step examines the ability of the Forest to supply goods and services in response to society's demands. The primary purpose of this analysis is to provide a basis for formulating a broad range of reasonable alternatives. This is accomplished by defining the "decision space" within which the Forest can operate to address issues, concerns, and opportunities. This planning step is documented in a planning document titled "Analysis of the Management Situation and Proposed Alternatives " Most of the relevant information is also found in this appendix

A series of benchmarks was developed in accordance with Regional direction (November 10, 1983) FORPLAN was the major analytical tool used in this process. A few benchmarks were estimated outside FORPLAN

B. DEVELOPMENT OF MANAGEMENT REQUIREMENTS

The Pacific Northwest Region developed direction to assure that the Management Requirements of the National Forest Management Act (36 CFR 219.27) were applied consistently across all Forests within the Region. This direction (1920 letter from Jeff Sirmon, February 9, 1983, on "Regional Guidelines for Incorporating Minimum Management Requirements in Forest Planning") is on file in the Regional Office in Portland and the Supervisor's Office in John Day.

Application of the standards is sufficient to achieve most Management Requirements without impacting the levels of goods and services provided by the Forest. Some Management Requirements for timber, soil, water, and wildlife required special modeling constraints, however.

The size of created openings is generally limited to 40 acres in size with logical cutting units left in between (36 CFR 219 27 (d)) Additionally, shelterwood and overstory removals are limited to 80 acres in size to address watershed, wildlife diversity, and visual management concerns It was necessary to model this Management Requirement in FORPLAN because linear programming solutions tend to assign entire decision variables (in this case, analysis area/management prescription/timing choice options) rather than split them This results in entire analysis areas, which often include contiguous blocks of much more than 40 to 80 acres, being harvested in one decade. Those constraints were also considered helpful in meeting soil and water Management Requirements (36 CFR 219.27 (f)) The dispersion factors used in FORPLAN were based on the professional judgment of the Interdisciplinary Team and were tested by spatial disaggregation (mapping) to ensure their feasibility These constraints were implemented by limiting the fraction of a watershed - management emphasis combination which could be harvested in a given decade.

Special attention must be given to land and vegetation near water (36 CFR 219 27 (e)) A management prescription, Management Area 3, was developed for areas comprising surrounding the riparian zone This prescription applies to a variable width area based on slope, soil hazard, and vegetation type. The portion of each analysis area that would be included in the riparian protection zone was estimated based on stream classes. These acres were assigned to Management Area 3 in each FORPLAN run that met Management Requirements.

For the purpose of developing wildlife Management Requirements, the Forest has been assigned to the "Blue Mountain Zone." In this zone, the Forest has responsibility to maintain minimum habitat needs for the pileated woodpecker, three-toed woodpecker, pine marten, and primary cavity excavators. Each Forest had to consider the need for Management Requirements in riparian zones.

The following strategies for meeting Management Requirements of the above-named species

1. Riparian Zone· The indicator species for anadromous fish streams is steelhead, and for non-anadromous streams are bull trout, cutthroat trout, and rainbow/redband trout. The Forest did not model Management Requirements for these species because the management prescription for riparian zones to meet state water quality standards meets minimum habitat needs.

2. Primary Cavity Excavators: The Management Requirement for these species is to maintain a 20 percent population level. The current standard used on the Forest is designed to maintain a 40 percent population level on timber and range emphasis areas, and 60 percent in wildlife emphasis areas These are to be provided in land areas no larger than normal harvest unit size. (See Regional Office letter dated Sept. 9, 1988, "Wildlife Tree Management Standards for Forest Plans", file reference 1920/2600)

3. The three indicator species that represent old-growth habitat on the Forest are three-toed woodpecker, pileated woodpecker and pine marten Old-growth mapping started in 1982 The first step in modeling Management Requirements for the old-growth species was to identify old-growth stands on the Forest. Then a base map was developed using a grid to connect these known old-growth units to ensure adequate dispersion of old-growth units for pileated woodpecker and pine marten. The maximum distance between units was 6 miles and the minimum was 4 miles for pileated woodpeckers. Pine marten units were dispersed at 2.5-mile distances. Suitable and capable old-growth units were delineated using the grid methods.

   Next, the mapped sites were used as a starting point to determine if distance requirements were met. Additional old-growth units were delineated within the 4- to 6-mile radius if necessary to meet distance requirements. Each old-growth unit was connected to at least three other units where possible. Pine marten and pileated woodpecker units were combined where possible to form one old-growth unit. Old-growth units were modified by the Ranger Districts to best fit on-the-ground conditions.

   The resulting old-growth Management Requirement map was shared with neighboring Forests to ensure continuity in distribution patterns. In 1986, the grid requirement was dropped The Forest could identify a 300-acre old-growth unit within a 10,000- to 12,000-acre area This allowed the Forest to delineate suitable habitat instead of capable habitat where possible.

C. BENCHMARK ANALYSIS

1. Purpose of Benchmark Analysis

In the analysis process, resource supply potentials were determined by establishing the maximum production potential through FORPLAN computer analysis called benchmarks. Economic benchmarks were also developed as a point of reference to measure the costs and effects of applying Forest Service regulations and policies. These benchmarks serve as references from which to evaluate the costs and effects of various land management objectives

The benchmark analysis enabled the Forest to.

- Estimate the schedule of management activities, resource outputs, effects, discounted benefits and costs, Present Net Value, and acreages of prescription assignments needed to achieve the purpose of the benchmarks;

- Define resource production levels associated with maximizing single resource outputs,

- Analyze the implications of land management laws and policies, including Management Requirements of 36 CFR 219.27,

  Analyze the potential to resolve issues and concerns,

- Analyze the current and expected future level of goods and services if current management is continued,

- Analyze the need to change management direction;

- Define the range within which alternatives could be formulated

After public comments were received on the Draft Environmental Impact Statement, the FORPLAN model was reconstructed as described in Section III The alternatives *were re-run but the benchmarks were not Only technical and legislative changes* would have affected the benchmark results, and it is estimated that the timber outputs (ASQ) would be approximately 3-4% less because of these. This difference is not considered significant with respect to the comparison between benchmarks, so that they remain suitable for this purpose

The following sections describe the benchmarks which were developed to define the production potentials and economic relationships of Forest resources

2. Benchmark 1 Maximum Timber

a Description

This benchmark estimates the maximum biological potential timber volume that can be produced on the Forest on a sustained yield basis, subject to rotation age restrictions and nondeclining yield

b Purpose

The purpose of developing this benchmark is to determine the maximum level of timber volume which could be produced subject to the harvest flow constraints stated above.

c. FORPLAN Objective Function

Initially, timber production is maximized in the first decade The first decade volume is then "locked in," and the case is re-run to maximize timber production over the 150-year horizon The volume figures for the first and fifteenth decades are then "locked in" and the case is re-run again to maximize Present Net Value to select the most efficient set of practices which maximize timber production

d. Assumptions and Constraints

Timber harvest is scheduled only on lands classified as "suitable" through the suitability analysis.

Management requirements are not constraints

Nondeclining flow at or below long-run sustained yield capacity.

Rotations based on 95 percent of culmination of mean annual increment.

Ending inventory constraint applied

All constraints are applicable throughout the planning horizon (150 years).

e. Timber

This benchmark run produced a long-term sustained yield capacity of 68 8 million cubic feet per year with a first decade harvest volume of 59 2 million cubic feet per year (326.6 million board feet per year) This includes approximately 4.3 million cubic feet per year (13 0 million board feet per year) of mortality salvage and nonchargeable timber volume. This total volume will exceed the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" in all five decades See Table B-15 for volume of timber harvest by decade

The species mix for the first decade is approximately 60 percent ponderosa pine and 40 percent mixed conifer species. This gradually shifts to 76 percent mixed conifer species and 24 percent ponderosa pine by Decade 5. See Figure B-2 for the harvest methods used to achieve these volumes by decades. In addition, there is an average forest residue potential of 47.1 million cubic feet per year produced over the planning period (See Figure B-3.)

To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high levels of precommercial thinning in the first three decades with a significant decrease in the last two decades A significant increase in reforestation (planting) acres occurs in the last two decades of the planning period. See Figures B-4 and B-5 for precommercial thinning and planting acres

FIGURE B-2
HARVEST METHODS

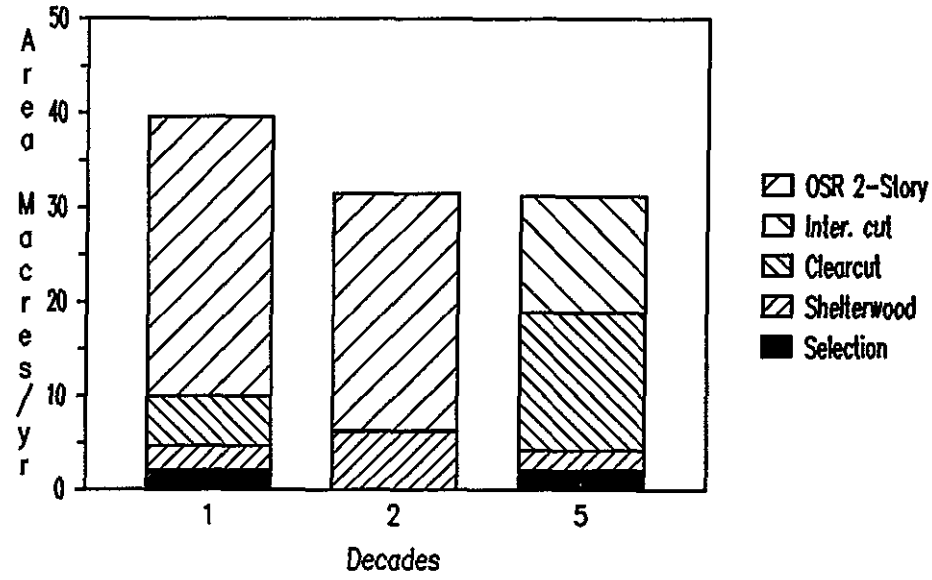


FIGURE B-3
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

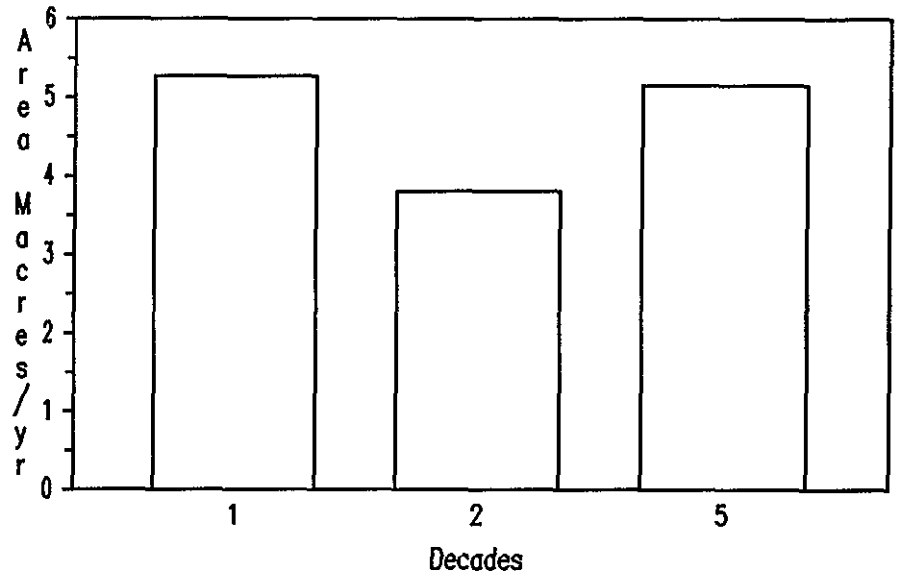


FIGURE B-4
PRECOMMERCIAL THINNING

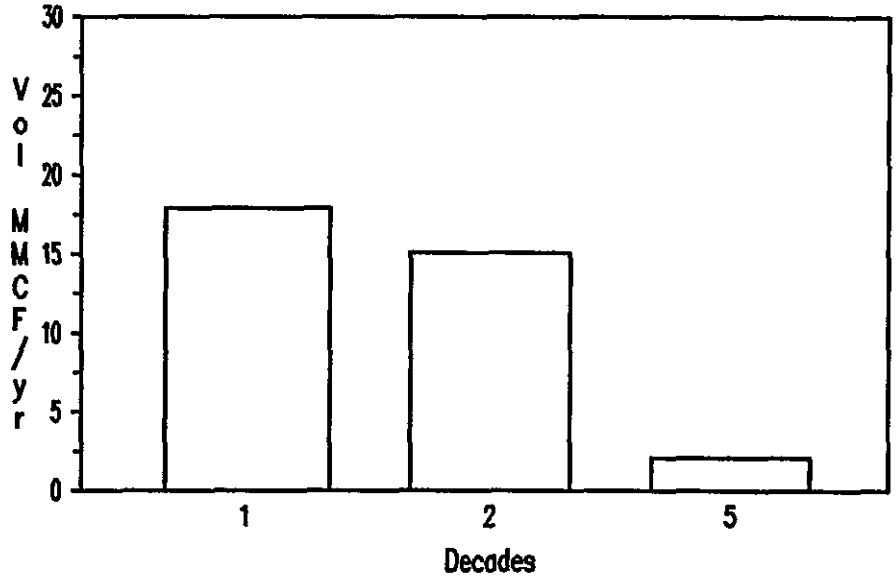
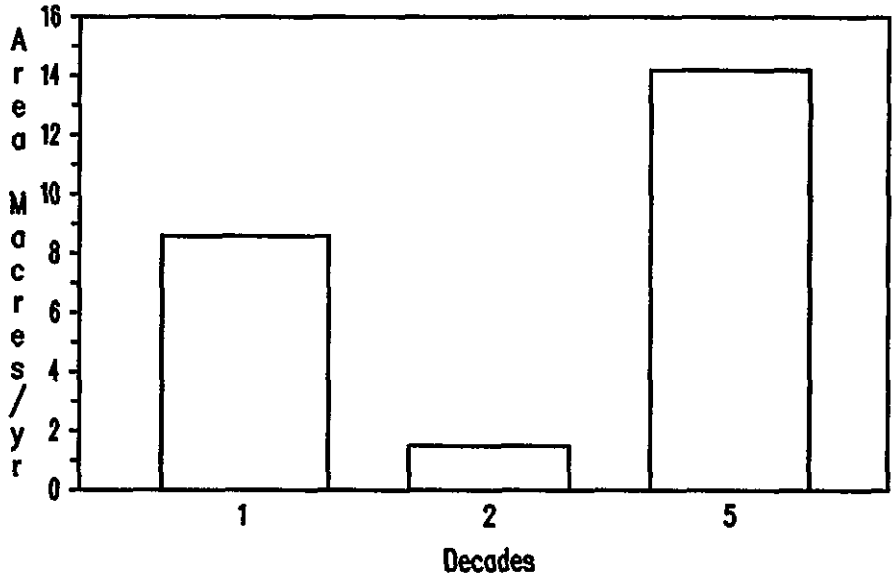


FIGURE B-5
REFORESTATION (PLANTING)



f. Range Management — On Forested land an increase in animal unit months occurs in Decade 2 then remains level through Decade 5 On nonforested lands, the animal unit months remain level through Decade 2 and the level then decreases slightly through Decade 5. The overall trend is an increase in Decade 2 followed by a slight decrease. (See Figure B-6.)

g Wildlife — Big-game habitat shows a steady increase toward optimum cover/forage ratios through the fifth decade (Figure B-8). Habitat Effectiveness Indices were not calculated for this analysis Estimated elk numbers (per forage capability) on both summer and winter ranges decrease sharply in Decade 2 Estimated elk numbers on summer range recover slowly, but those on winter range remain constant (Figure B-7). Elk numbers were estimated by forage availability and a discount for less-than-optimum cover conditions only No other factors such as hunting, predation, roading, weather, etc , were used to estimate the hypothetical population capacity of this benchmark.

h Old Growth — Old-growth stands will not exist outside the wildernesses

i. *Fisheries* — *Since harvestable (merchantable) timber in riparian areas is liquidated in the* first decade with regeneration harvest prescriptions, water quality standards for temperature would not be met in many streams. This high level of timber harvest activity near streams, plus the increased rate of road construction, would also increase the probability that water quality standards for turbidity would not be met This would have a substantial adverse effect on fish habitat quality.

Liquidation of the merchantable timber in riparian areas also removes the long-term supply of large woody material to the stream. This results in a loss of pool habitat which is an additional adverse effect on fish habitat.

After the initial harvest and site preparation, there would be little need for operating equipment near the streams until commercial thinning entries begin. Thus, there should be a general recovery of riparian condition through most of the following five decades This should moderate the adverse effects on fish habitat in decades 3 through 5

Livestock grazing on the Forest increases substantially from the current situation However, the animal unit months produced in riparian areas are reduced from the current situation Assuming the large investment to achieve this redistribution of livestock, fish habitat would not be adversely affected A stable trend could be expected as it relates to livestock management With 100 percent control of livestock and maximum administration, an upward trend would be possible.

The decrease in fisheries production potential shown in Table B-15 and Figure B-9 is only an estimate More detail concerning application of best management *practice investment levels for mitigation, and other Forest activities would be* needed to verify this estimate Within the general description of this benchmark, it would be possible to build a scenario where the Forest contribution to the downstream and ocean anadromous fisheries would be negligible.

j Water — See summary analysis, Section VI C.10 d

FIGURE B-6
LIVESTOCK

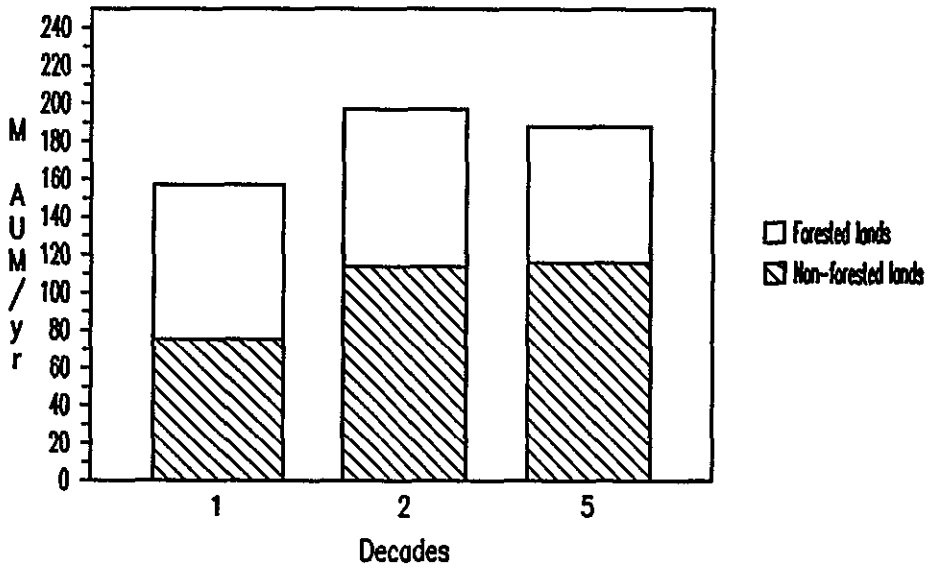


FIGURE B-7
ESTIMATED ELK NUMBERS (per forage availability)

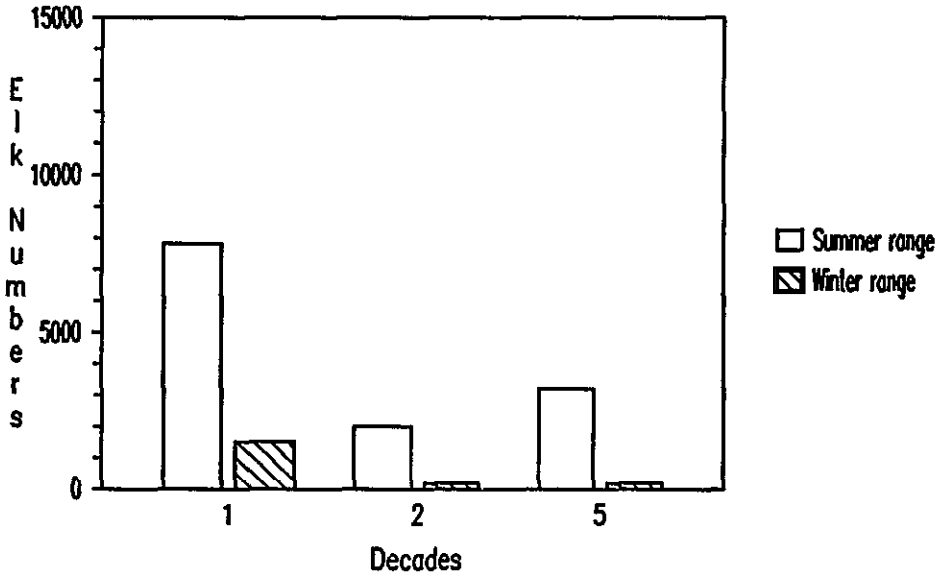
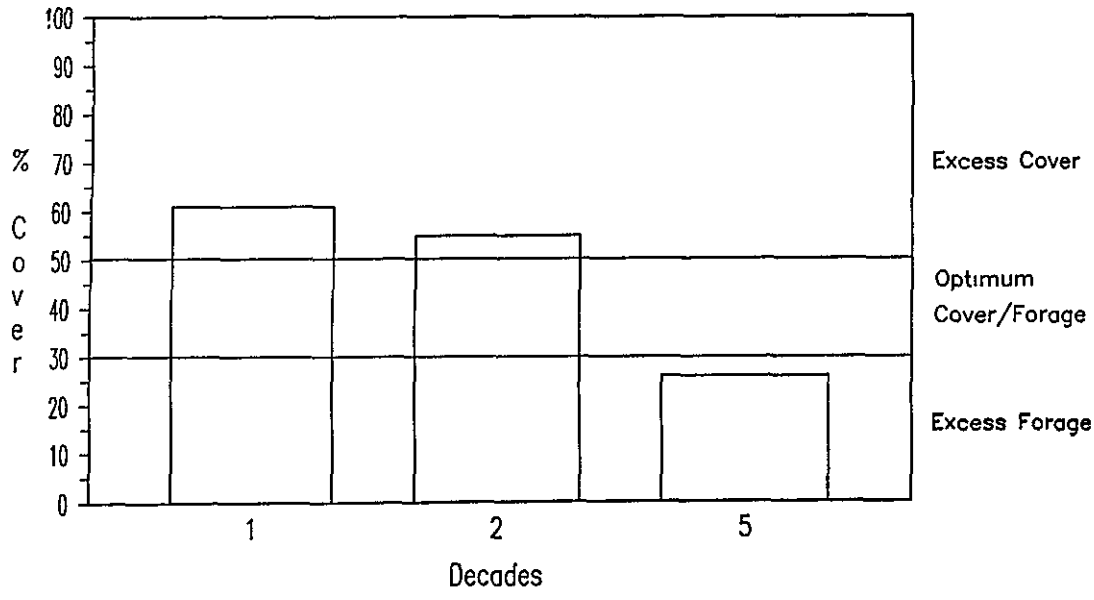
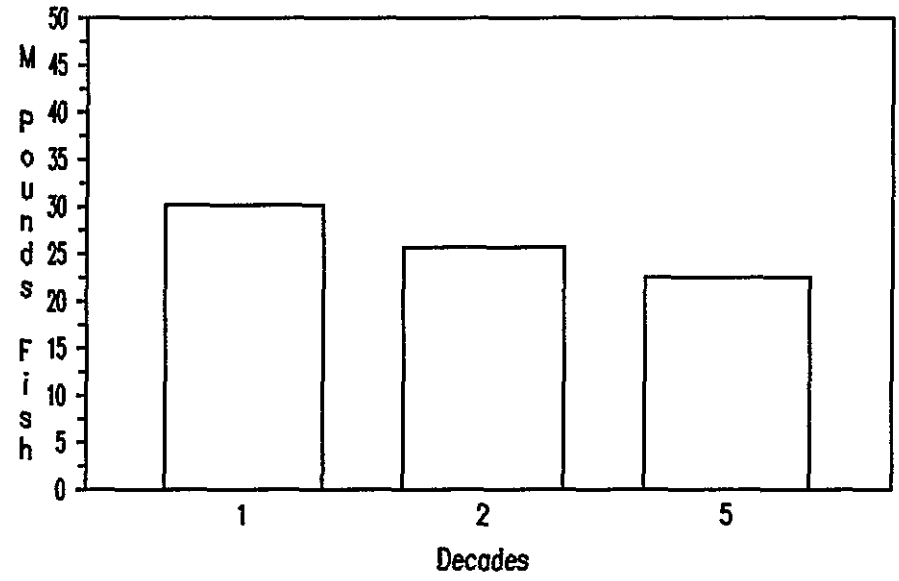


FIGURE B-8
BIG-GAME HABITAT CAPABILITY



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

FIGURE B-9
ANADROMOUS FISH PRODUCTION POTENTIAL



k. Recreation

Developed Recreation: Developed recreation opportunities would not be provided.

Dispersed Recreation: Unroaded dispersed recreation opportunities outside wilderness would be eliminated in the first decade. This benchmark would eventually provide only roaded modified and wilderness recreation opportunities.

Visual Resource: No provisions for visual resource management would be made. By the second decade the only natural-appearing landscapes remaining would be those in wilderness.

Cultural Resource: Cultural resources will be inventoried prior to the implementation of potentially impacting management activities. The number of acres managed for cultural resource values is primarily influenced by the acres of timber to be harvested annually. New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located. Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined.

l. Transportation

Arterial and collector road construction and reconstruction will remain constant over time. The reason for this is the even dispersion of harvest and recreational activities over the Forest. The indications from the projected outputs of the benchmarks is that this dispersion will continue. This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program. Since local roads are usually used by only high-clearance vehicles, they fall into maintenance level 2 which will change over time.

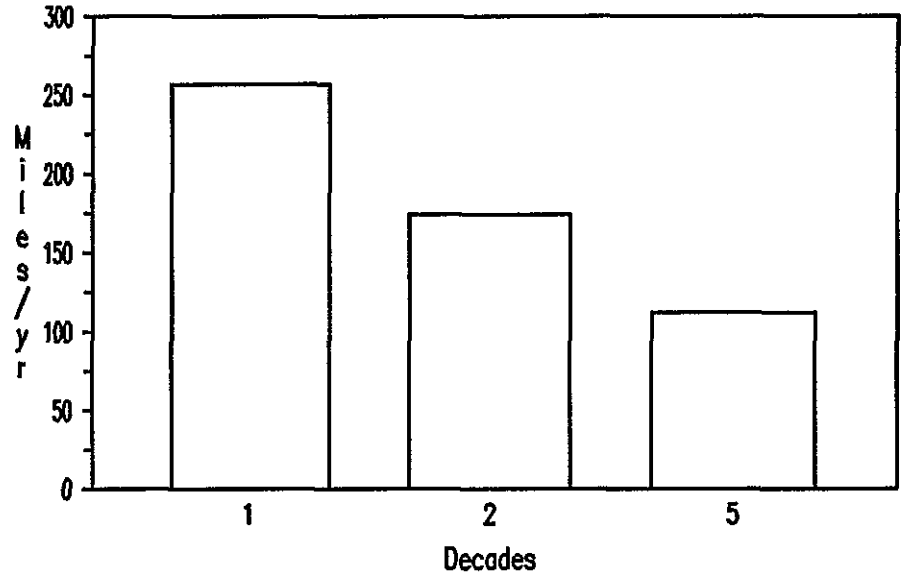
The local road system construction and reconstruction program varies over time. This is shown in Figure B-10. This graph shows a decrease in road construction and reconstruction miles after the first decade.

m. Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative. Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected. Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected.

Method of Measurement: Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection Dollars to Emergency Firefighting costs and resource loss values. Program effectiveness is computed by averaging the annual cost over a decade.

PIGURE B-10
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION



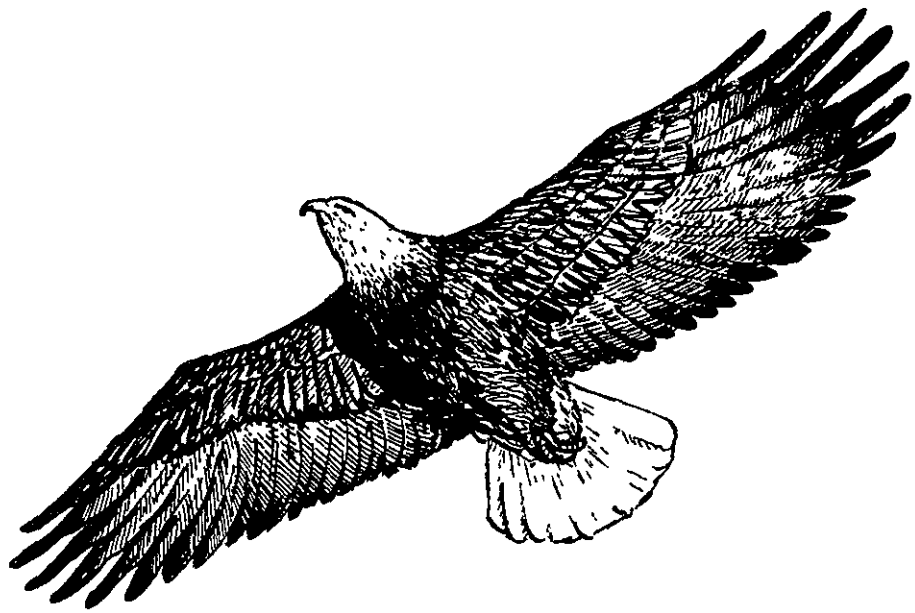


TABLE B-15

BENCHMARK BM1 - MAXIMUM TIMBER

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	0	0	0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	157.3	157.3	157.3
Roaded Natural	M RVDs	1949.0	976.1	0
Roaded Modified	M RVDs	1542.0	2633 0	3294.4
Wilderness	M RVDs	61 8	61 8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	7800	2000	3200
Anadromous Fish	M Pounds	30.2	25.7	22 5
Big-Game Use[1/]	M WFUDs	72 7	47.3	52.6
Fish Use[1/]	M WFUDs	22.3	19.0	16.6
RANGE				
Livestock Use	M AUMs	157 3	197 3	188 2
TIMBER				
LTSYC	MM Cu Ft	---------- 68 8 in Decade 15 --------		
Programmed Sale	MM Bd Ft	326.6	N/A	N/A
Offered[2/]	MM Cu Ft	59.2	59 4	60.1
Other wood fiber and				
Personal firewood	MM Cu Ft	5 27	3 81	5 15
Volume by species				
Ponderosa Pine	MM Cu Ft	32.8	23 1	12.9
Mixed Conifer	MM Cu Ft	21.9	30.4	41.5
Lodgepole Pine	MM Cu Ft	0 2	1 3	0 4
Harvest Method				
Overstory removal/				
Two-story stand	M Acres	29.6	25.2	0
Intermediate cut	M Acres	0	0	12.3
Clearcut	M Acres	5 3	0 1	14 7
Shelterwood cut	M Acres	2 6	6 2	2.1
Selective cut	M Acres	2.1	0	2 1
Precommercial thin	M Acres	17.9	15.1	2.1
Reforestation (Plant)	M Acres	8.6	1.5	14.2
WATER QUALITY				
Sediment	Index	1490	1127	1442
Water Yield	M Acre feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1344	1344	1344
Fuel Treatment	M Acres	32.3	25.3	27.5
FACILITIES				
Passenger Car	Miles	1472	1472	1472
High Clearance Vehicle	Miles	6183	6919	7478
Construction and	Miles	257	174	112
Reconstruction				

1/Included in recreation visitor days in recreation

2/Including 4.3 million cubic feet per year salvage.

3. Benchmark 3
Maximum Present Net Value (PNV) (Assigned Values)

a Description

This benchmark estimates the maximum Present Net Value that might be attained on the Forest when those outputs which have either an established market value or an assigned monetary value are emphasized Timber outputs are subject to rotation age, nondeclining yield, and long-term sustained yield capacity restrictions.

b Purpose

The purpose of developing this benchmark is to determine the level of resource outputs which would maximize Present Net Value It provides the means for *comparison of this Present Net Value and associated output levels with those of* other benchmarks and alternatives

c. FORPLAN Objective Function

Maximize Present Net Value for 15 decades

d. Assumptions and Constraints

Timber harvest is scheduled only on lands classified as "suitable" through the suitability analysis.

Management requirements are not constraints

Nondeclining evenflow at or below long-term sustained yield capacity.

Rotations based on 95 percent of culmination of mean annual increment

Ending inventory constraint applied

All constraints are applicable throughout the planning horizon (150 years).

Only the benefits and variable costs associated with the timber and livestock animal unit month outputs are considered

e. Present Net Value

This benchmark established the maximum Present Net Value that could be generated from the Forest.

f. Timber

This benchmark run produced a long-term sustained yield capacity of 64.4 million cubic feet per year with a first decade harvest volume of 57.5 million cubic feet per year (317 5 million board feet per year) This includes approximately 4 3 million cubic feet per year of mortality salvage and nonchargeable timber volume. *This total volume will exceed the volume production goals for the Malheur National* Forest called for in the "Forestry Program for Oregon" in all five decades. See Table B-15 for volume of timber harvest by decade

The species mix for the first decade is 73 percent ponderosa pine and 27 percent mixed conifer species. By the fourth decade it nearly reverses as the species mix becomes 29 percent ponderosa pine and 71 percent mixed conifer. In the fifth decade it recovers to 54 percent ponderosa pine and 46 percent mixed conifer. See Figure B-11 for the harvest methods used to achieve these volumes by decades. In addition, there is an average forest residue potential of 44.8 million cubic feet per year over the planning period (See Figure B-12.)

FIGURE B-11
HARVEST METHODS

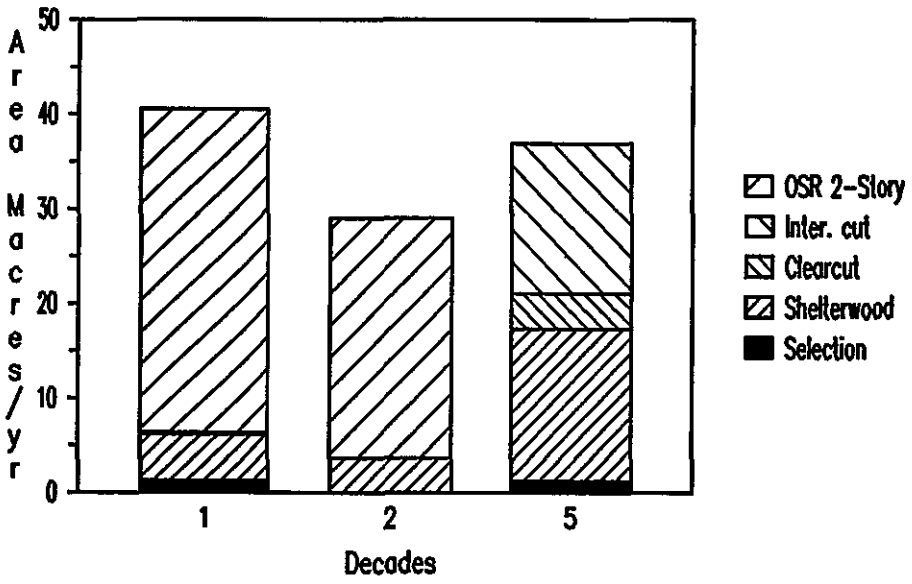


FIGURE B-12
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

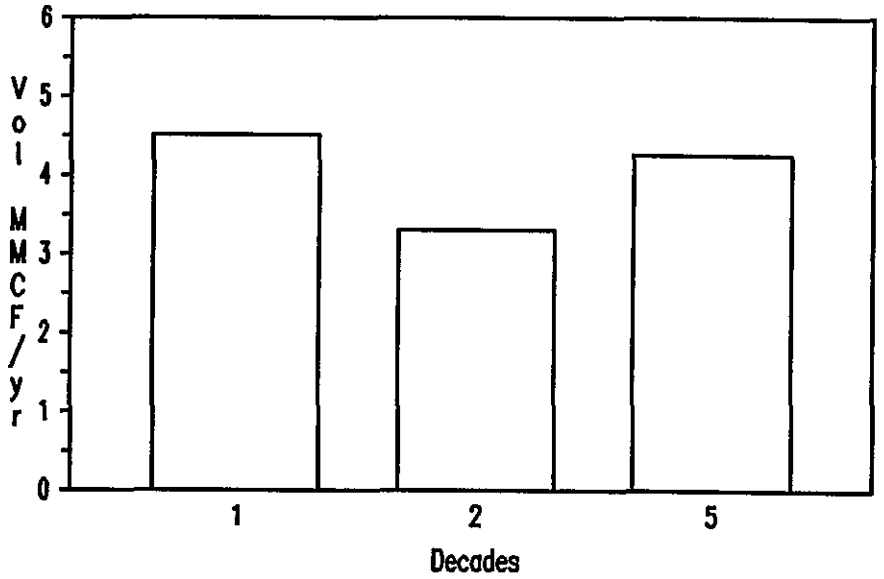


FIGURE B-13
PRECOMMERCIAL THINNING

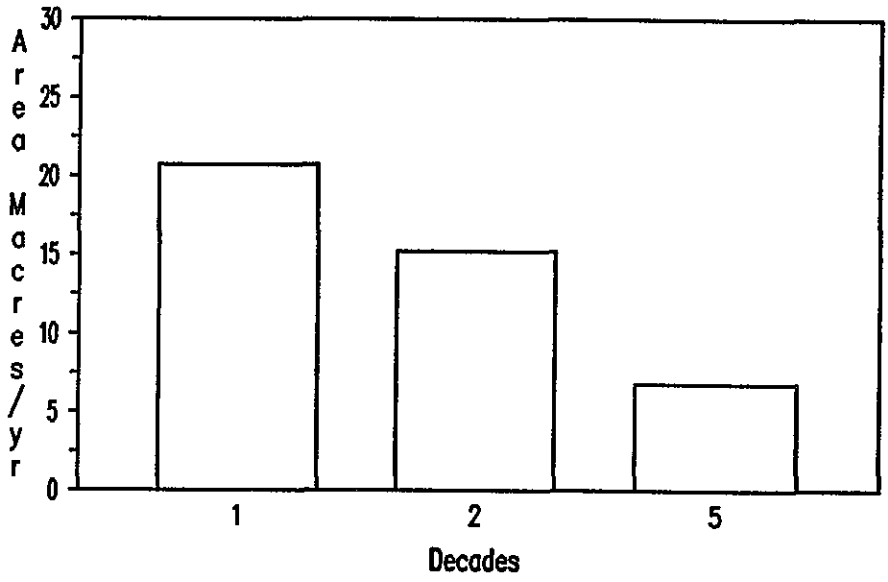
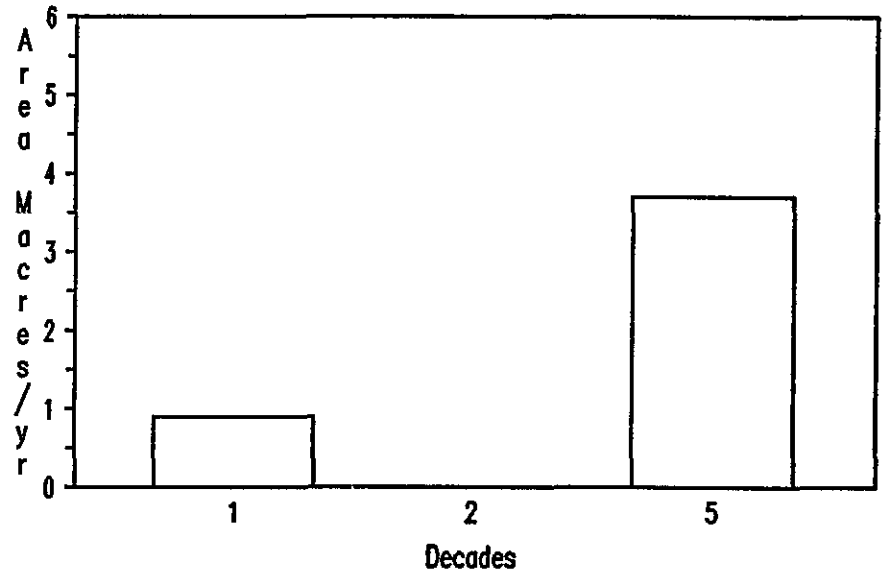


FIGURE B-14
REFORESTATION (PLANTING)



To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high levels of precommercial thinning in the early decades with decreasing levels later. A significant increase in reforestation (planting) acres occurs toward the end of the planning period. See Figures B-13 and B-14 for precommercial thinning and planting acres.

g Range

On Forested land the animal unit months show very little change over the planning period. An expected increase in animal unit months due to stocking level control appears to be offset by a shift of animal unit months from two-storied stands to nonforested range for economic reasons. On nonforested land a large increase in animal unit months occurs in Decade 2 This is attributed to increased forage created by large investments in structural and nonstructural range improvements which occur primarily on nonforested lands (See Figure B-15.)

h. Wildlife

Big-game habitat shows a steady improvement in cover/forage ratios through the fourth decade By the fifth decade, there is an excess of forage and cover *becomes limiting* *(See Figure B-17)*

Estimated elk numbers (per forage capability) on both summer and winter ranges decrease sharply in Decade 2 Estimated elk numbers on summer range recover slowly, but those on winter range remain constant (Figure B-16). Elk numbers were estimated by forage availability and a discount for less than optimum cover conditions only. No other factors such as hunting, predation, roading, weather, or Habitat Effectiveness Indices, were used to estimate the hypothetical population capacity of this benchmark

i. Old Growth

Old-growth habitat will not exist outside the wildernesses.

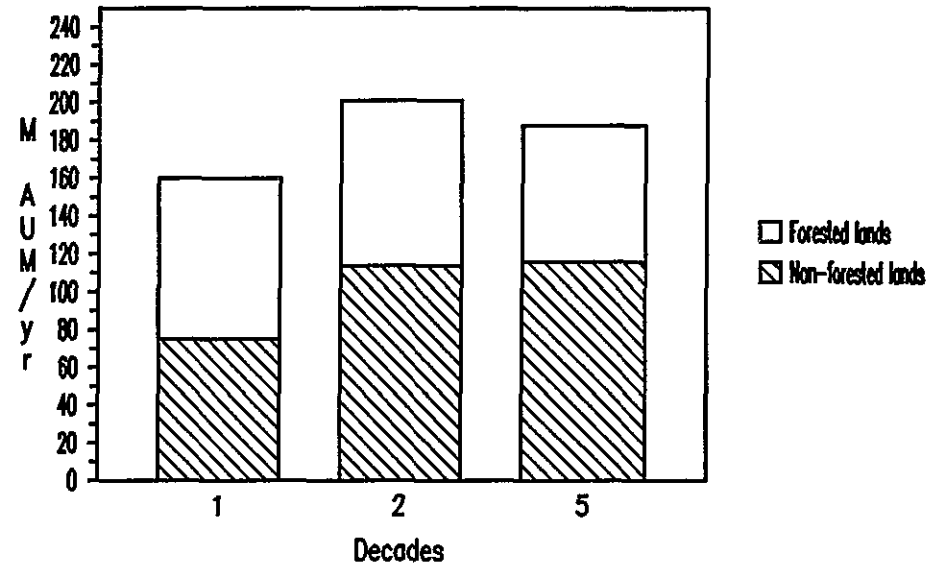
j. Fisheries

Since harvestable (merchantable) timber in riparian areas is liquidated by the third decade with regeneration harvest prescriptions, water quality standards for temperature would not be met in many streams This high level of timber harvest activity near streams, plus the increased rate of road construction, would also increase the probability that water quality standards for turbidity would not be met. This would have a substantial adverse effect on fish habitat quality. Liquidation of the merchantable timber in riparian areas also removes the long-term supply of large woody material to the stream. This results in a loss of pool habitat which is an additional adverse effect on fish habitat.

After the initial harvest and site preparation there would be little need for operating equipment near the streams until commercial thinning entries begin Thus, there should be a general recovery of riparian condition in the fourth and fifth decades. This should moderate the adverse effects on fish habitat in these decades.

Livestock grazing on the Forest increases substantially from the current situation. However, the animal unit months produced in riparian areas is reduced from the current situation. Assuming the large investment to achieve this redistribution of livestock, fish habitat would not be adversely affected. A stable trend could be expected as it relates to livestock management. With 100 percent control of the livestock and maximum administration, an upward trend would be possible.

FIGURE B-15
LIVESTOCK



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

FIGURE B-16
ESTIMATED ELK NUMBERS (per forage availability)

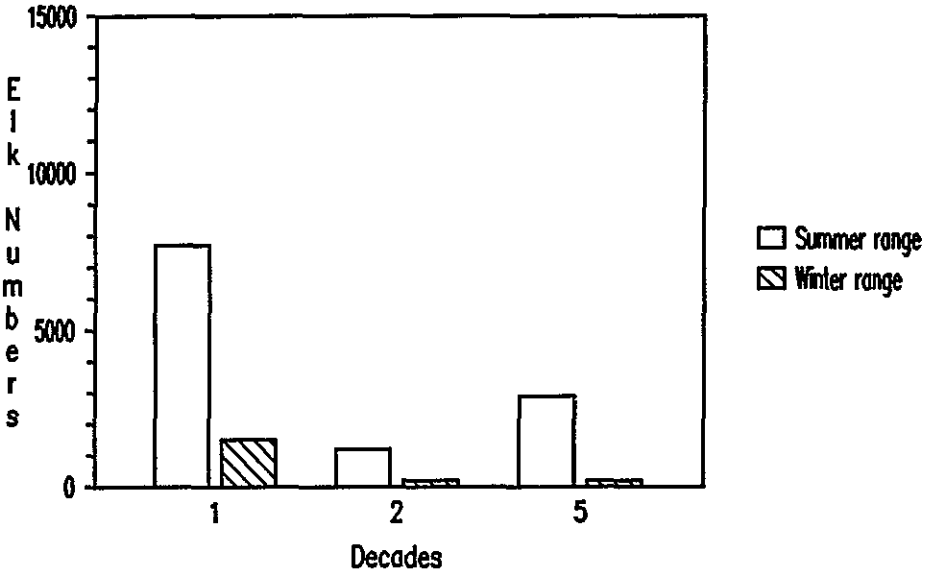


FIGURE B-17
BIG-GAME HABITAT CAPABILITY

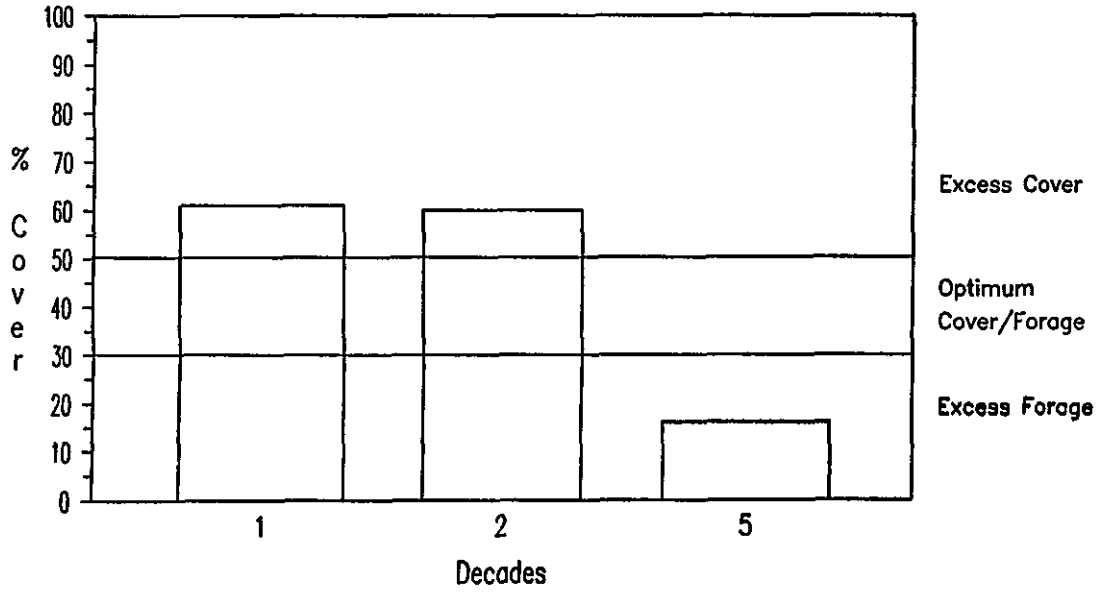
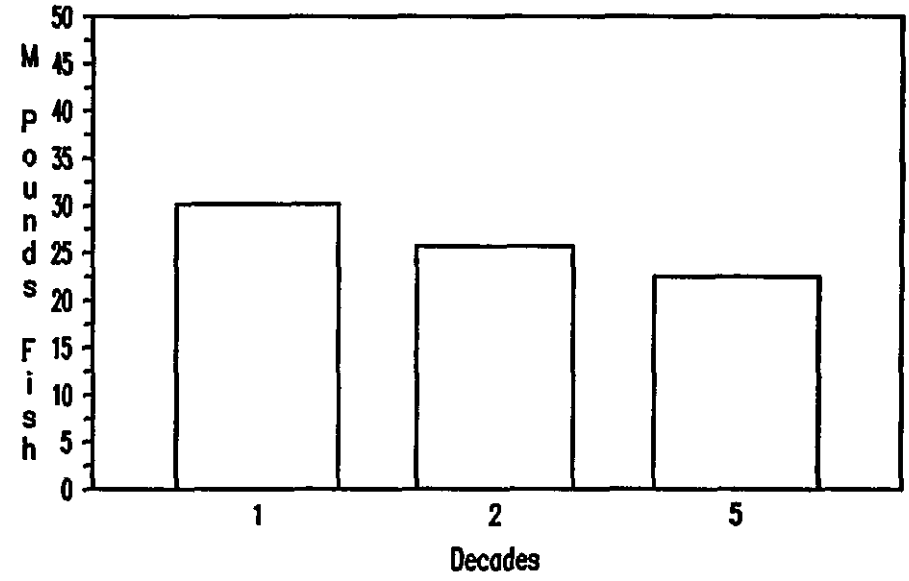


FIGURE B-18
ANADROMOUS FISH PRODUCTION POTENTIAL



The decrease in fisheries production potential shown in Table B-16 and Figure B-18 is only an estimate. More detail concerning application of Best Management Practices investment levels for mitigation, and other Forest activities would be needed to verify this estimate. Within the general description of this benchmark, it would be possible to build a scenario where the Forest contribution to the downstream and ocean anadromous fisheries would be negligible.

k Water

See summary analysis, Section VI C 10 d.

1. Recreation

Developed Recreation: Developed recreation opportunities would not be provided.

Dispersed Recreation: Unroaded dispersed recreation opportunities outside wilderness would be eliminated by the second decade. This benchmark would eventually provide only roaded modified and wilderness recreation opportunities.

Visual Resource: No provisions for visual resource management would be made By the second decade the only natural-appearing landscapes remaining would be those in wilderness

Cultural Resource Cultural resources will be inventoried prior to the implementation of potentially impacting management activities. The number of acres managed for cultural resource values is primarily influenced by the acres of timber to be harvested annually. New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined

m Transportation

Arterial and collector construction and reconstruction will remain constant over time. The reason for this is the dispersion of harvest and recreational activities across the Forest This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program Since local roads are usually used by only high-clearance vehicles, they fall into the maintenance level 2 which will change over time.

The local road system construction and reconstruction program varies over time This is shown in Figure B-19 This graph shows a decrease in road construction and reconstruction miles after the first decade

n Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative. Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected.

Method of Measurement Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection Dollars to Emergency Firefighting Costs and resource loss values Program Effectiveness is computed by averaging the annual cost over a decade.

TABLE B-16

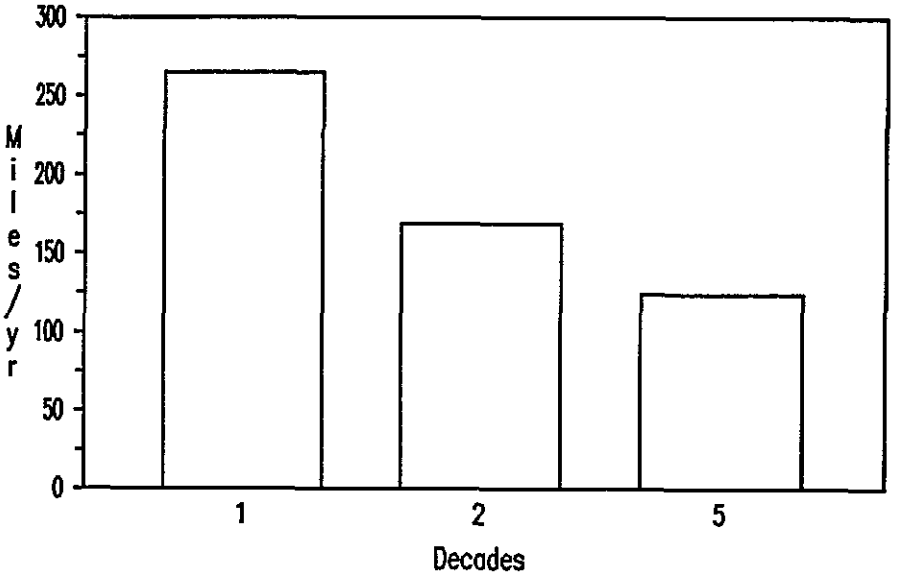
BENCHMARK BM3 - MAXIMUM PNV

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	0	0	0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	157 3	157.3	157.3
Roaded Natural	M RVDs	1949	976.1	0
Roaded Modified	M RVDs	1542	2633	3294 4
Wilderness	M RVDs	61.8	61.8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	7700	1200	2900
Anadromous Fish	M Pounds	30 2	25.7	22.5
Big-Game Use[1/]	M WFUDs	72 1	38.1	46.0
Fish Use[1/]	M WFUDs	22 3	19.0	16.6
RANGE				
Livestock Use	M AUMs	159.5	200 7	188.0
TIMBER				
LTSYC	MM Cu Ft	--------- 64.4 in Decade 15--------		
Programmed Sale	MM Bd Ft	317 5	N/A	N/A
Offered[2/]	MM Cu Ft	57 5	57.6	58 1
Other wood fiber and				
Personal firewood	MM Cu Ft	4 51	3.30	4.26
Volume by species				
Ponderosa Pine	MM Cu Ft	38.7	24 6	28.7
Mixed Conifer	MM Cu Ft	14 4	28.6	24 6
Lodgepole Pine	MM Cu Ft	0 1	0	0
Harvest Method				
Overstory Removal				
Two-story stand	M Acres	34 2	25.3	0
Intermediate cut	M Acres	0	0	15 8
Clearcut	M Acres	0 2	0	3.8
Shelterwood cut	M Acres	4.9	3 7	16.1
Selective cut	M Acres	1 2	0	1 2
Precommercial thin	M Acres	20 7	15 2	6.8
Reforestation (Plant)	M Acres	0 9	0	3 7
WATER QUALITY				
Sediment	Index	1368	1113	1394
Water Yield	M Acre Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1344	1344	1344
Fuel Treatment	M Acres	32 4	23.4	30 8
FACILITIES				
Passenger Car	Miles	1472	1472	1472
High-Clearance Vehicle	Miles	6172	6894	7426
Construction and	Miles	265	169	124
Reconstruction				

1/Included in recreation visitor days in recreation.

2/Including 4.3 million cubic feet per year salvage.

FIGURE B-19
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION



4 Benchmark 7
Maximum Present Net Value (PNV) with Management Requirements (Assigned Values)

a Description — This benchmark is identical to Benchmark 11, except that assigned values are used instead of market values to price the outputs The same FORPLAN run was used for both cases and all physical outputs are identical. The tables and graphs for Benchmark 11 also apply to this benchmark

b Present Net Value — The Present Net Value reduction (FORPLAN Present Net Value rather than ADVENT) attributable to the imposition of the set of constraints (when compared to Benchmark 3) is $76 4 million

5. Benchmark 11
Maximum Present Net Value (PNV) with Management Requirements (Market Values)

a. Description — This benchmark estimates the Present Net Value that might be obtained on the Forest as a function of the benefits and variable costs associated with timber, livestock, and anadromous fish outputs, subject to rotation-age restrictions, nondeclining yield, and Management Requirements

b Purpose — The purpose of this benchmark is to show the opportunity costs of the Management Requirements in terms of Present Net Value and output levels

c FORPLAN Objective Function — *Maximize Present Net Value for 15 decades*

d Assumptions and Constraints

Timber harvest is scheduled only on lands classified as "suitable" through the suitability analysis.

Management Requirements are constraints.

Nondeclining flow at or below long-term sustained yield capacity.

Rotations based on 95 percent of culmination of mean annual increment.

Ending inventory constraint applied

Only resource outputs which have an established market value are considered as benefits for Present Net Value calculations.

Selection harvest only in riparian areas (except lodgepole pine) in order to meet water quality (temperature) standards and other riparian area resource needs

Old-growth acres (44,860) necessary to maintain viable wildlife populations removed from land base available for timber harvest.

Harvest dispersion constraints:

Less than or equal to 25 percent per decade of mixed conifer and ponderosa pine in riparian areas;

Less than or equal to 10 percent per decade of lodgepole pine in riparian areas;

Less than or equal to 38 percent per decade on all other available lands for shelterwood final harvests;

Less than or equal to 25 percent per decade on all other available lands for clearcut final harvests.

All constraints are applicable throughout the planning horizon (150 years).

e. Timber

This benchmark run produced a long-term sustained yield of 61.7 million cubic feet per year with a first decade harvest volume of 51.7 million cubic feet per year (284 8 million board feet per year). This includes approximately 4.0 million cubic feet per year (11.9 million board feet per year) due to mortality salvage and nonchargeable timber volume This total volume will exceed the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" in all five decades See Table B-17 for volume of timber harvest by decade.

The species mix for the first decade is approximately 55 percent ponderosa pine and 43 percent mixed conifer. This gradually shifts to 70 percent mixed conifer species and 30 ponderosa pine in the fifth decade. See Figure B-20 for the harvest methods used to achieve these volumes by decades. In addition, there is an average forest residue potential of 32.1 million cubic feet per year produced over the planning period (see Figure B-21)

To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high initial levels of precommercial thinning, gradually decreasing towards the fifth decade. A significant increase in reforestation (planting) acres occurs over the planning period. See Figures B-22 and B-23 for precommercial thinning and planting acres

f Range Management

On Forested land, animal unit months remain approximately constant. On nonforested lands animal unit months increase in the second decade and then remain constant in decades 3 through 5. (See Figure B-24.)

The assumed increase in forage productivity is based upon installation of structural and nonstructural range improvements, which will occur on both commercial forest and nonforest lands, as well as stocking level control from timber management activities.

FIGURE B-20
HARVEST METHODS

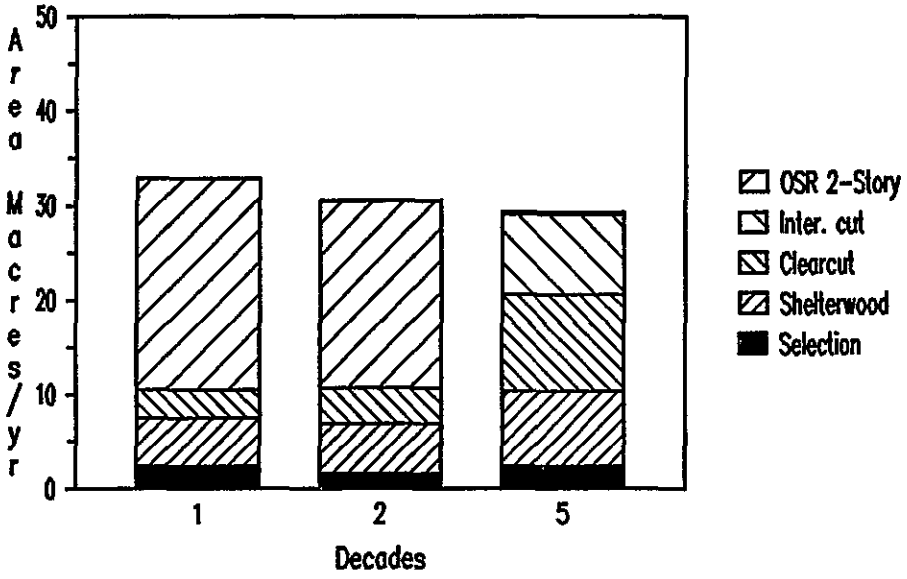


FIGURE B-21
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

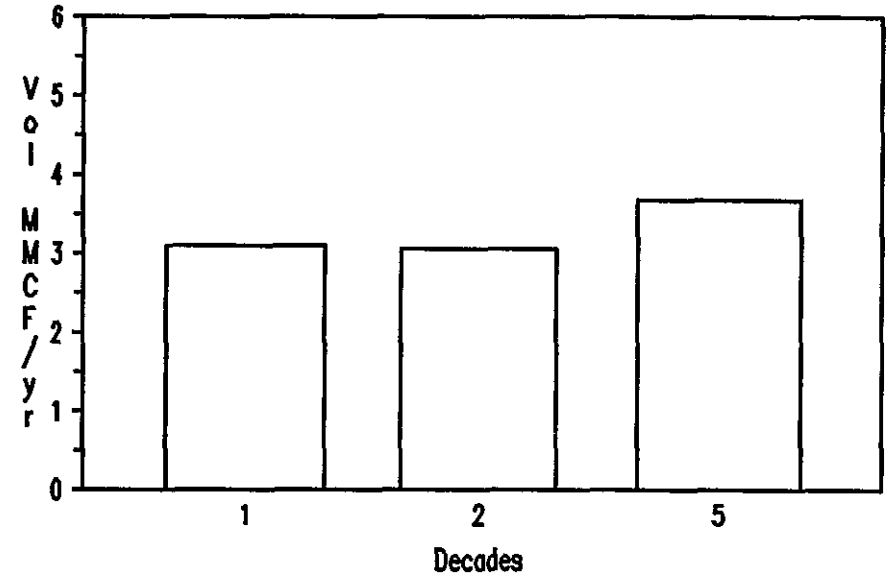


FIGURE B-22
PRECOMMERCIAL THINNING

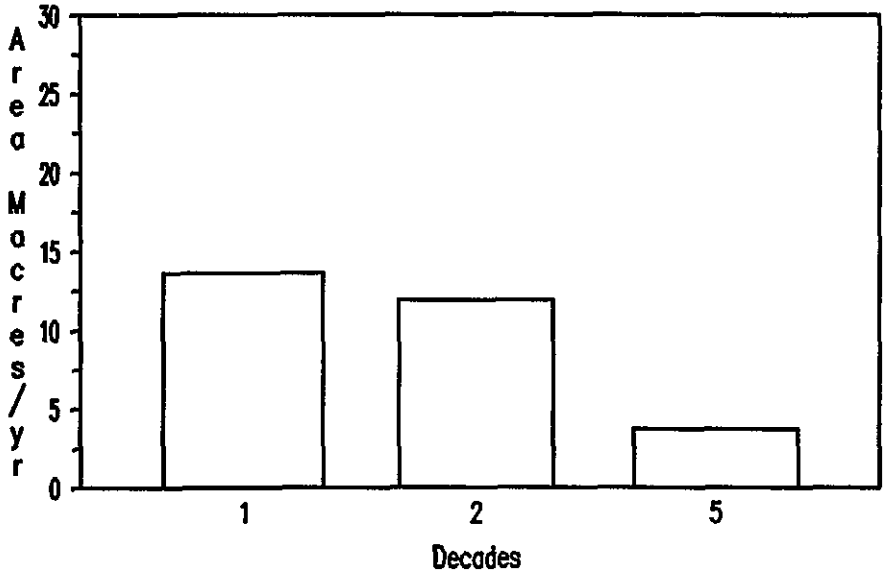


FIGURE B-23
REFORESTATION (PLANTING)

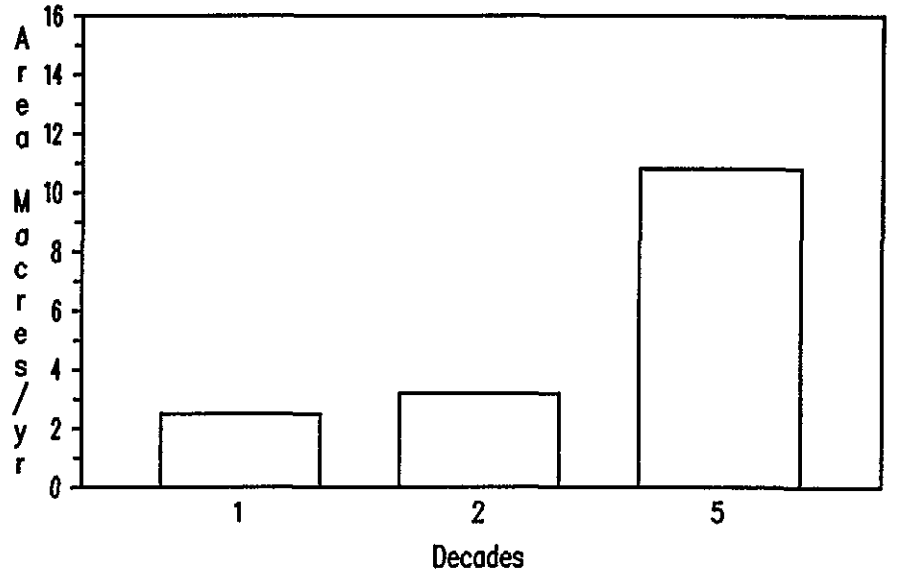
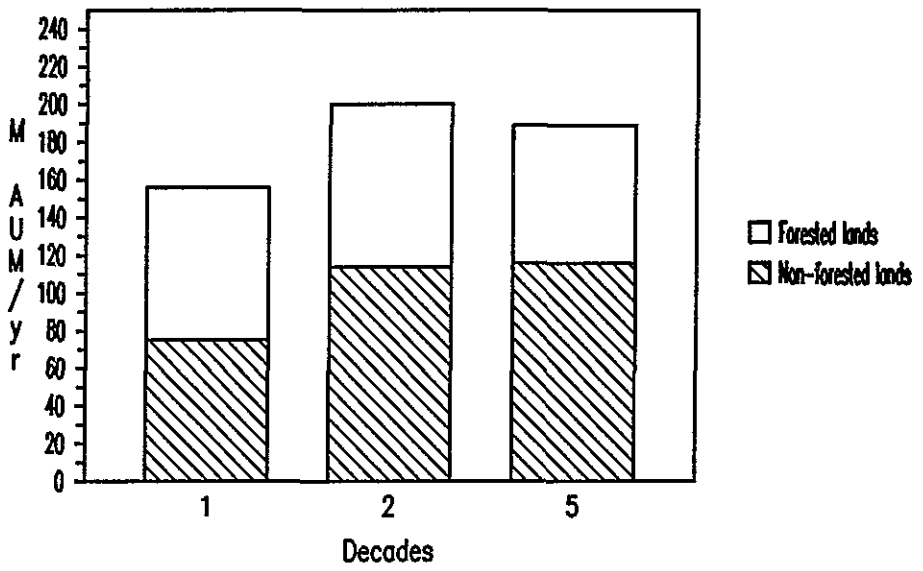


FIGURE B-24
LIVESTOCK



g. Wildlife

Big-game habitat shows a steady increase toward optimum cover/forage ratios through the fifth decade (Figure B-26).

Estimated elk numbers (per forage capability) on both winter and summer ranges decrease through the second decade then remain approximately constant (Figure B-25). Elk numbers were estimated by forage availability and a discount for less than optimum cover conditions only No other factors such as hunting, predation, roading, weather, or Habitat Effectiveness Indices, were used to estimate the hypothetical population capacity of this benchmark.

h. Old Growth

Old-growth habitat will be maintained at a level necessary to maintain viable wildlife populations (44,860 acres)

i. Fisheries

This benchmark run has constraints which are intended to meet Management Requirements. In terms of water quality and fish habitat, the constraints which are most important are those which specify selection harvest in riparian areas and cause the harvest to be more evenly distributed over time Within the limits of our ability to predict changes on such a broad scale, it appears that this run is at least close to providing for shading requirements On-the-ground implementation of this prescription could probably make the necessary adjustments to meet shade requirements from the perspective of timber harvest. The natural contribution of large woody material to the streams would continue to decline over time.

FIGURE B-25
ESTIMATED ELK NUMBERS (per forage availability)

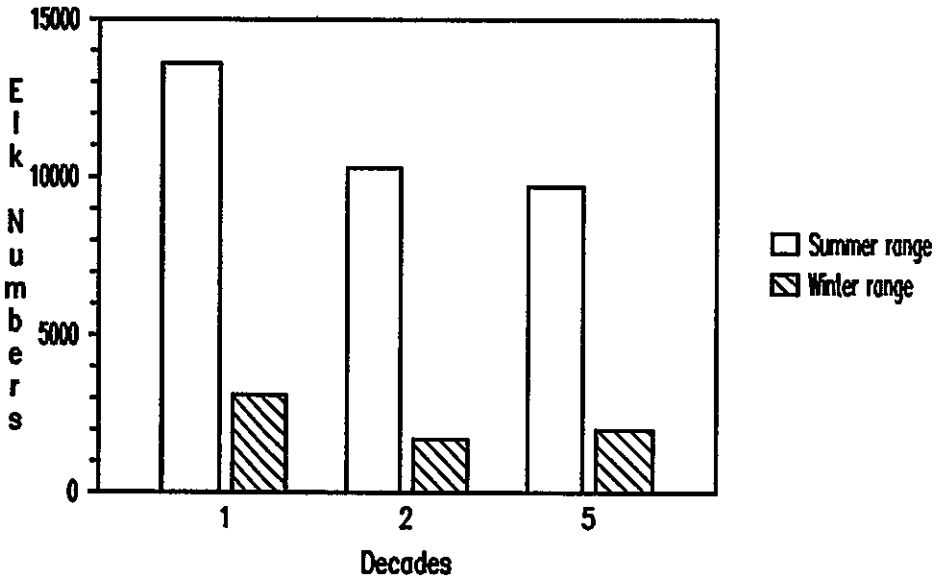
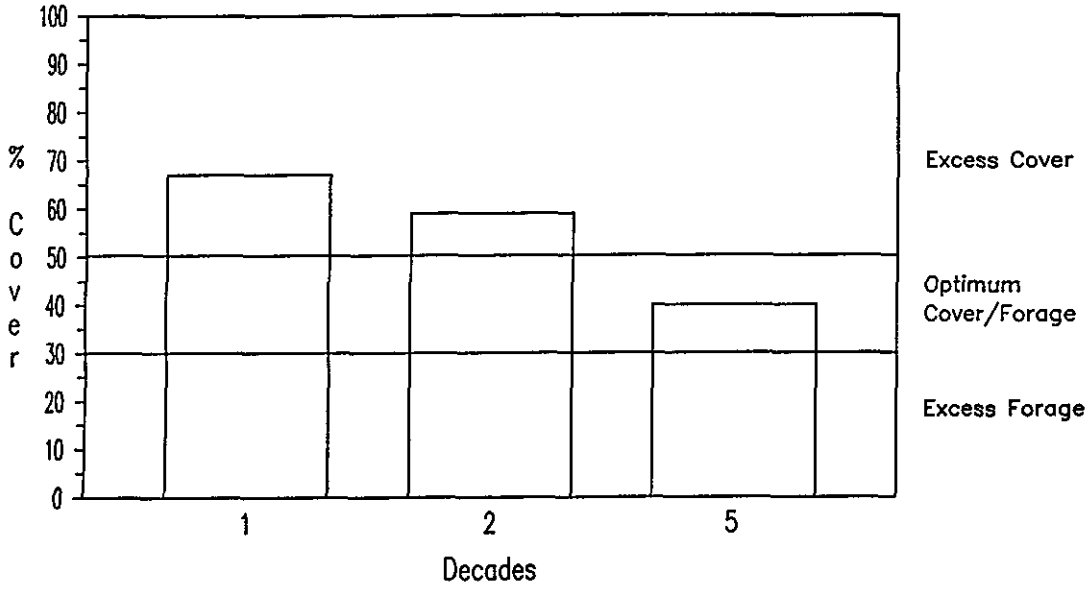


FIGURE B-26
BIG-GAME HABITAT CAPABILITY



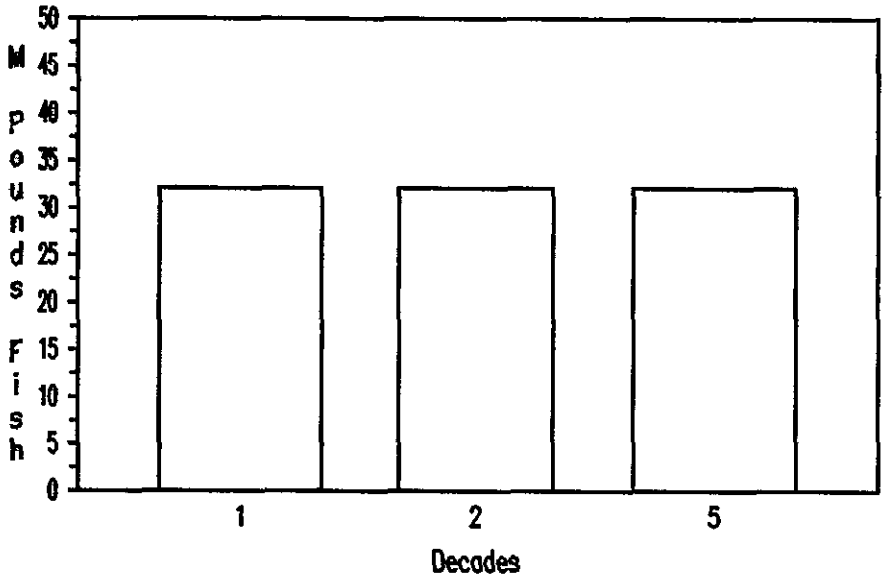
Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

Road construction and reconstruction increase only slightly over the current situation We assume that best management practices for timber harvest activities, including roading, will meet State water quality standards for sediment and turbidity.

Livestock grazing on the Forest increases substantially from the current situation. However, the animal unit months produced in riparian areas is reduced from the current situation Assuming the large investment to achieve this redistribution of livestock, fish habitat would not be adversely affected A stable trend could be expected as it relates to livestock management. With 100 percent control of the livestock and maximum administration, an upward trend would be possible.

Investments in habitat improvements, including bank stabilization and riparian improvements, are assumed to continue at relatively low levels, being accomplished primarily through the K-V program. The net result should be a stable fish habitat condition over time, with improvement due to mitigation offsetting impacts due to increased commodity production (See Figure B-27)

FIGURE B-27
ANADROMOUS FISH PRODUCTION POTENTIAL



j. Water — See summary analysis, Section VI.C.10.d.

k Recreation — Developed Recreation. Developed recreation opportunities would not be provided.

Dispersed Recreation· Semiprimitive recreation opportunities outside wilderness would be eliminated by the first decade This benchmark would provide only roaded modified and wilderness semiprimitive nonmotorized opportunities.

Visual Resource: No provisions for visual resource management would be made. By the end of the first decade, the only natural-appearing landscapes remaining would be those in wilderness.

Cultural Resource. Cultural resources will be inventoried prior to the implementation of potentially impacting management activities The number of acres managed for cultural resource values is primarily influenced by the acres of timber to be harvested annually. New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined.

l. Transportation — Arterial and collector road construction and reconstruction will remain constant over time. The reason for this is the dispersion of harvest and recreational activities across the Forest. This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program. Since local roads are usually used by only high-clearance vehicles, they fall into maintenance level 2 which will change over time.

The local road system construction and reconstruction program varies over time. This is shown in Figure B-28. This graph shows a decrease in road construction and reconstruction miles after the first decade

m. Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative. Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost efficient alternative was selected. Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected.

Method of Measurement: Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection dollars to Emergency Firefighting costs and resource loss values. Program Effectiveness is computed by averaging the annual cost over a decade.

FIGURE B-28
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION

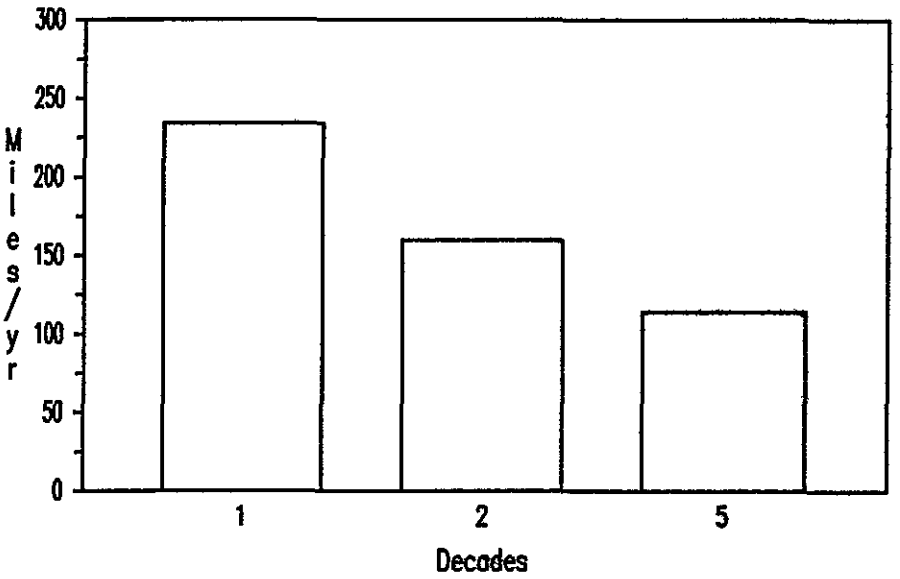


TABLE B-17

BENCHMARK BM11 MAXIMUM PNV WITH MRs

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	0	0	0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	157.3	157.3	157.3
Roaded Natural	M RVDs	1949	976.1	163.1
Roaded Modified	M RVDs	1542	2633	3183
Wilderness	M RVDs	61.8	61.8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	13,600	10,300	9,700
Anadromous Fish	M Pounds	32.1	32.1	32.1
Big-Game Use 1/	M WFUDs	105 6	70.4	109.2
Fish Use 1/	M WFUDs	23.7	23 7	23.7
RANGE				
Livestock Use	M AUMs	156.0	199.9	188 9
TIMBER				
LTSYC	MM Cu Ft	--------- 61.7 in Decade 13 ---------		
Programmed Sale	MM Bd Ft	284.8	N/A	N/A
Offered 2/	MM Cu Ft	51.7	52.0	52 3
Other wood fiber and				
Personal firewood	MM Cu Ft	3.10	3.06	3 68
Volume by species				
Ponderosa Pine	MM Cu Ft	26.1	23.2	14.5
Mixed Conifer	MM Cu Ft	20.7	23.7	33.1
Lodgepole Pine	MM Cu Ft	0.8	0 9	0.1
Harvest Method				
Overstory Removal				
Two-story stand	M Acres	22 3	19.8	0.2
Intermediate cut	M Acres	0	0	8.5
Clearcut	M Acres	3.0	3.8	10.3
Shelterwood cut	M Acres	5.1	5.3	7.9
Selective cut	M Acres	2.4	1.6	2.4
Precommercial thin	M Acres	13.6	11.9	3.7
Reforestation (Plant)	M Acres	2.5	3.2	10.8
WATER QUALITY				
Sediment	Index	1333	1168	1446
Water Yield	M Acre Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	26.6	24.9	25.5
FACILITIES				
Passenger Car	Miles	1,472	1,472	1,472
High-Clearance Vehicle	Miles	6,103	6,735	7,196
Construction and	Miles	234	160	114
Reconstruction				

1/Included in recreation visitor days in recreation.

2/Including 4 0 million cubic feet per year salvage.

6. Maximum Animal Unit Months Benchmark

a Description — This benchmark estimates the maximum capability of the Forest to provide commercial livestock grazing subject to rotation-age restrictions, nondeclining yield, and Management Requirements.

b Purpose — The purpose of this benchmark is to estimate the maximum level of livestock animal unit months which the Forest could provide

c FORPLAN Objective Function — Maximize animal unit months for 15 decades.

d Assumptions and Constraints — Timber harvest is scheduled only on lands classified as "suitable" through the suitability analysis.

Management Requirements are constraints.

Nondeclining evenflow at or below long-term sustained yield capacity.

Rotations based on 95 percent of culmination of mean annual increment

Ending inventory constraint applied

Only the benefits and variable costs associated with the timber and livestock outputs are considered

Selection harvest only in riparian areas (except lodgepole pine) in order to meet water quality (temperature) standards and other riparian area resource needs.

Old-growth acres (44,860) necessary to maintain viable wildlife populations were removed from land base available for timber harvest

Harvest dispersion constraints

(1) Less than or equal to 25 percent per decade of mixed conifer and ponderosa pine in riparian areas;

(2) Less than or equal to 10 percent per decade of lodgepole pine in riparian areas,

(3) Less than or equal to 38 percent per decade on all other available lands for shelterwood final harvests,

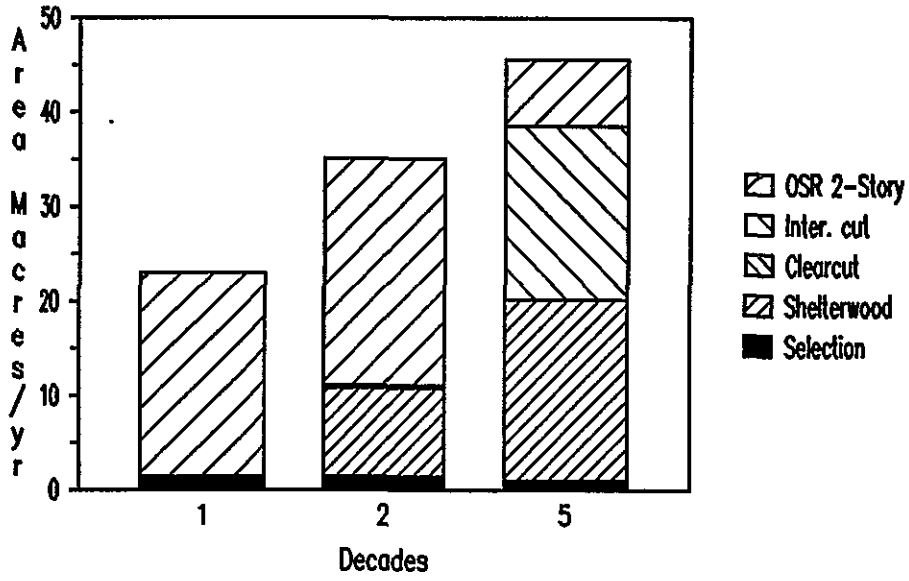
(4) Less than or equal to 25 percent per decade on all other available lands for clearcut final harvests.

All constraints are applicable throughout the planning horizon (150 years)

e. Timber

This benchmark run produced a long-term sustained yield capacity 52.4 million of cubic feet per year with a first decade harvest volume of 46.9 million cubic feet per year (254.8 million board feet per year) This includes approximately 4 3 million cubic feet per year (13.0 million board feet per year) due to mortality salvage and nonchargeable timber volume This total volume will exceed the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" for all five decades See Table B-18 for volume of timber harvest by decade. The species mix for the first three decades is approximately 60 percent ponderosa pine and 40 percent mixed conifer species. The last two decades will produce a species mix of 70 percent mixed conifer species and 30 percent ponderosa pine. See Figure B-29 for the harvest methods used to achieve these volumes by decades. In addition, there is an average forest residue potential of 46.3 million cubic feet per year produced over the planning period (See Figure B-30.)

FIGURE B-29
HARVEST METHODS



To achieve the projected harvest volumes, there will be an increase in precommercial thinning acres over the 50-year period General trends indicate increasing levels of precommercial thinning through the fifth decade Reforestation (planting) occurs only in the first decade. See Figures B-31 and B-32 for precommercial thinning and planting acres.

f. Range Management

Range livestock forage availability on commercial forest land rises slowly through the five-decade period On nonforested land, it increases to high levels in Decade 2 and then remains constant See Figure B-33 for increase in animal unit months by decade.

The increases are achieved through capture of forage production as a result of timber harvest activity, stocking level control, and installation of structural and nonstructural range improvements

FIGURE B-30
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

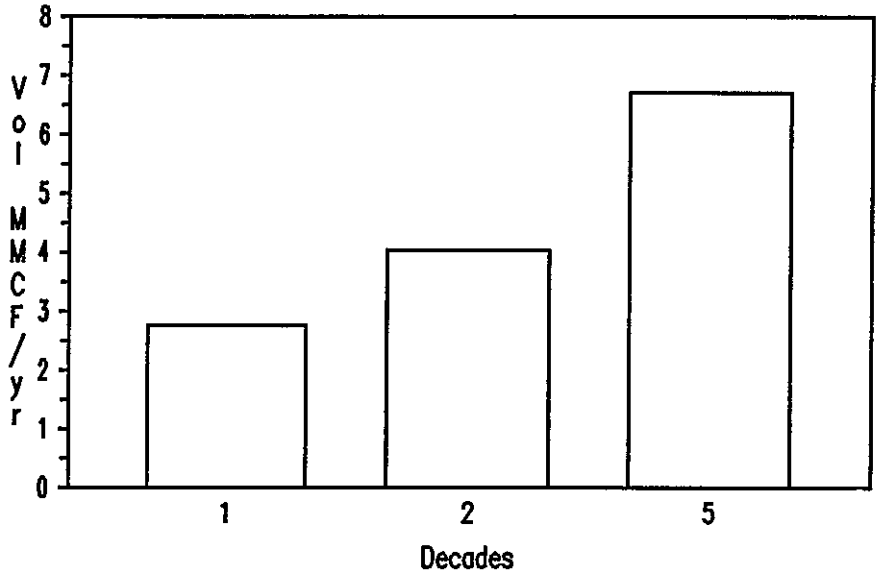
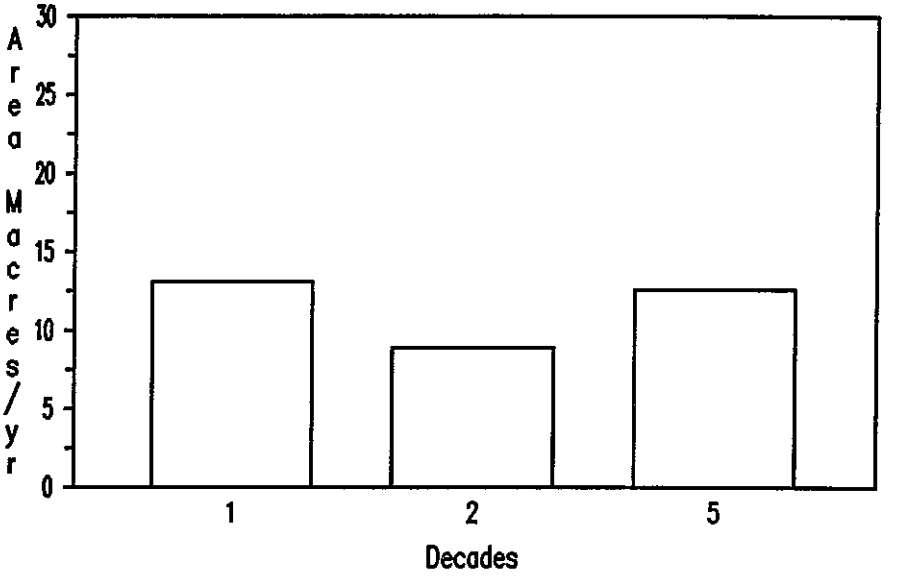


FIGURE B-31
PRECOMMERCIAL THINNING



g Wildlife

Big-game habitat capability steadily moves toward optimum through the fourth decade, but by the fifth decade habitat capability begins to move away from optimum (Figure B-35) as cover falls below the optimum range.

Estimated elk numbers (per forage availability) on both winter and summer ranges decrease in the second decade and remain at this level at the fifth decade (Figure B-34) Elk numbers were estimated by forage availability and a discount for less than optimum cover conditions only. No other factor such as hunting, predation, roading, weather, or Habitat Effectiveness Indices, were used to estimate the hypothetical population capacity of this benchmark

FIGURE B-32
REFORESTATION (PLANTING)

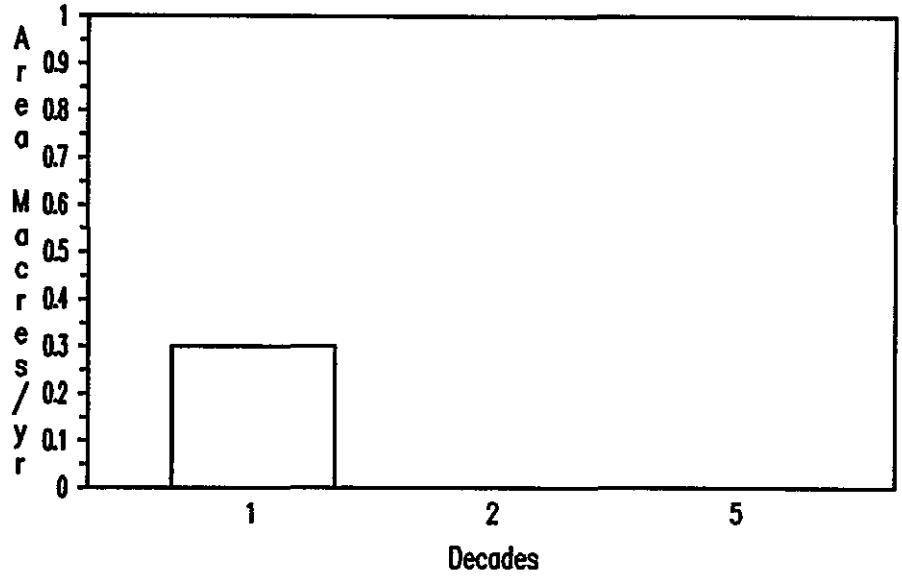


FIGURE B-33
LIVESTOCK

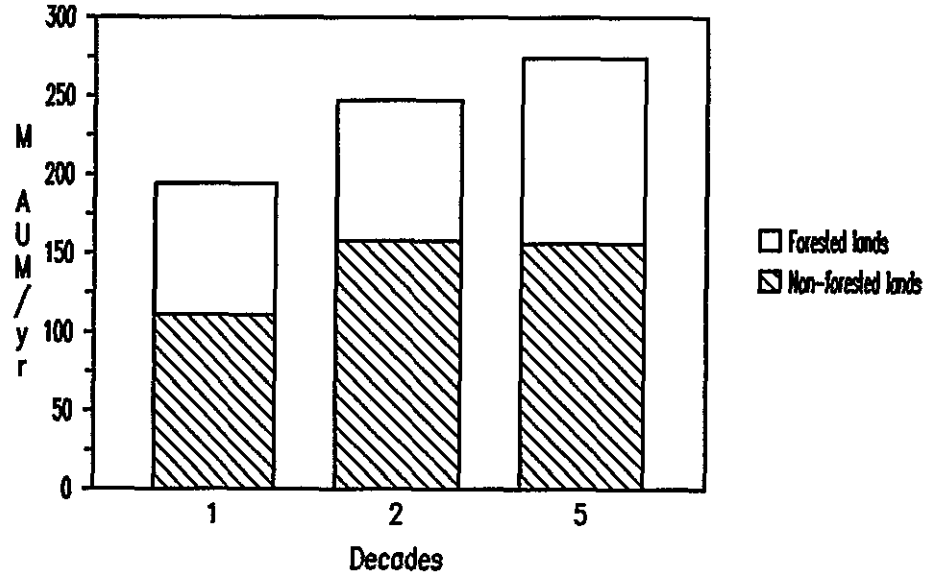


FIGURE B-34
ESTIMATED ELK NUMBERS (per forage availability)

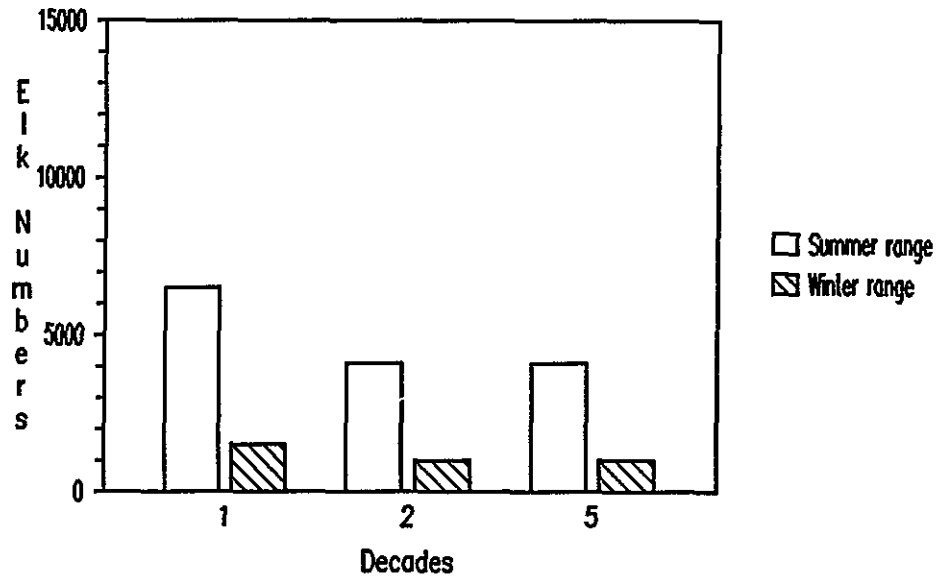
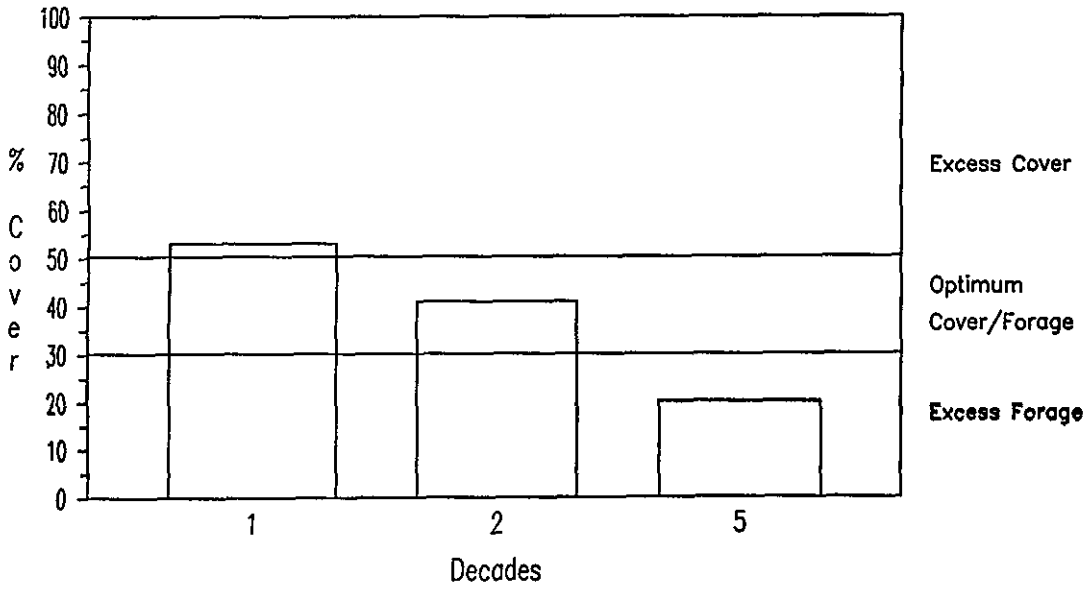


FIGURE B-35
BIG-GAME HABITAT CAPABILITY



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

h Old Growth

Old growth acres will fall steadily through the fifth decade to the Management Requirement level of 44,860 acres

i. Fisheries

This benchmark is constrained to meet Management Requirements. In terms of water quality and fish habitat, the constraints which are most important are those which specify selection harvest in riparian areas and cause the harvest to be more or less evenly distributed over time. These constraints are primarily aimed at temperature regulation

Within the limits of our ability to predict changes on such a broad scale, it appears that this run is at least close to providing for shading requirements. On-the-ground implementation of this prescription could probably make the necessary adjustments to meet shade requirements from the perspective of timber management. Timber harvest in riparian areas would nearly double from the current situation. The emphasis on analysis and coordination of project planning would be even greater under this management scenario than currently.

Road construction and reconstruction decrease a little from the current situation. We are assuming that best management practices for timber harvest activities, including roading, will meet State water quality standards for sediment and turbidity

The number of Animal Unit Months from this benchmark more than doubles by the third decade. This output is achieved by assuming a larger cost for redistributing livestock out of riparian areas and by intensively managing nonriparian areas to maximize livestock production. Thus, although the total animal unit month output for the Forest more than doubles from the current situation, livestock use in riparian areas remains constant at the current level. We can assume that riparian vegetation condition would be maintained at the current condition. Investment in habitat improvements, including bank stabilization and riparian planting, are assumed to continue at a relatively low level, being accomplished primarily through the K-V program. The net result should be a stable fish habitat condition over time, with improvements due to investments which offset the impacts of higher output production.

External funding for fish habitat improvement projects (such as the Bonneville Power Administration anadromous fish program) could continue to the extent that such investments are consistent with other ongoing management Actual fish habitat condition could improve in proportion to the amount of external funding, with the upper limit of this potential improvement somewhat less than the potential improvement under the current situation

j Water

See summary analysis, Section VI C 10 d.

k Recreation

Developed Recreation. Developed recreation opportunities would be provided through the maintenance of existing facilities Demand for developed recreation *would be met through the fifth decade*

Dispersed Recreation. 100 percent of semiprimitive recreation opportunities outside wilderness would be eliminated by the end of the first decade.

Visual Resources The existing viewshed corridors on the Forest will have a heavily altered appearance with some exceptions where riparian or old-growth areas lie adjacent to sensitive roads In these cases the landscape may look moderately altered The Forest in general will have a heavily altered appearance

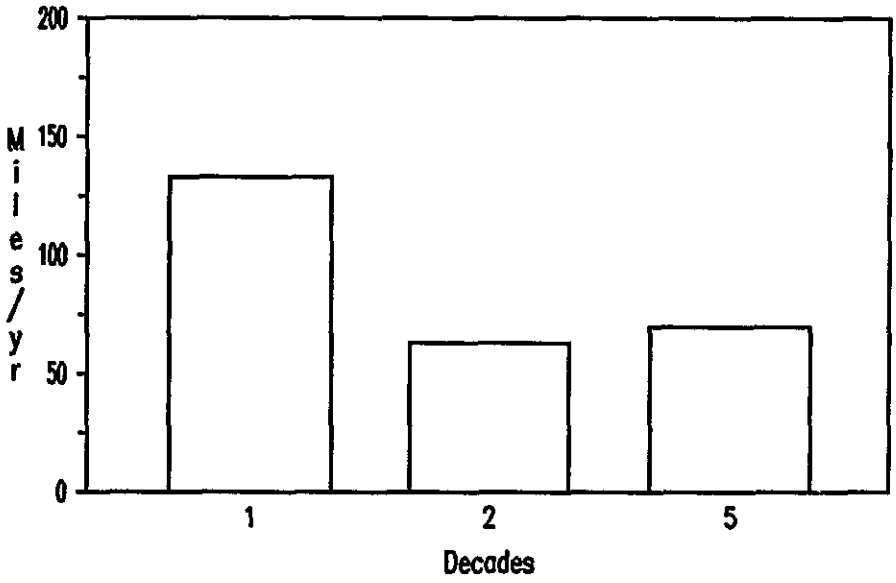
Cultural Resource Cultural resources will be inventoried prior to the implementation of potentially impacting management activities. The number of acres managed for cultural resource values is primarily influenced by the acres of timber to be harvested annually New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located. Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined

l Transportation

Arterial and collector construction and reconstruction will remain constant over time The reason for this is the dispersion of harvest and recreational activities across the Forest This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program Since local roads are usually used by only high-clearance vehicles, they fall into the maintenance level 2 which will change over time

The local road system construction and reconstruction program also varies over *time This is shown in Figure B-36 This graph shows a decrease in road* construction miles after the first decade followed by a fairly constant program.

FIGURE B-36
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION



m. Fire Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative. Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected. Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected.

Method of Measurement. Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection dollars to Emergency Firefighting costs and resource loss values. Program Effectiveness is computed by averaging the annual cost over a decade.

TABLE B-18

BENCHMARK MAX AUMs

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	0	0	0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	0	0	0
Roaded Natural	M RVDs	1,949	976.1	0
Roaded Modified	M RVDs	1,542	2,633	3,294
Wilderness	M RVDs	61 8	61 8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	6,500	4,100	4,100
Anadromous Fish	M Pounds	N/A	N/A	N/A
Big-Game Use[1/]	M WFUDs	66 2	55.3	55.2
Fish Use[1/]	M WFUDs	N/A	N/A	N/A
RANGE				
Livestock Use	M AUMs	194 3	246 9	273 9
TIMBER				
LTSYC	MM Cu Ft	---------- 52 4 in Decade 14 ----------		
Programmed Sale	MM Bd Ft	254 8	N/A	N/A
Offered[2/]	MM Cu Ft	46 9	46.9	46.9
Other wood fiber and				
Personal firewood	MM Cu Ft	2.76	4.05	6.71
Volume by species				
Ponderosa Pine	MM Cu Ft	25 2	26.2	12 6
Mixed Conifer	MM Cu Ft	16 9	15.8	29.7
Lodgepole Pine	MM Cu Ft	0.2	0	0
Harvest Method				
Overstory Removal				
Two-story stand	M Acres	21.6	24.0	7 1
Intermediate cut	M Acres	0	0	18.3
Clearcut	M Acres	0 2	0.3	0
Shelterwood cut	M Acres	0 2	9 4	19.2
Selective cut	M Acres	1 0	1.4	1 0
Precommercial thin	M Acres	13.1	8 9	12 6
Reforestation (Plant)	M Acres	0 3	0	0
WATER QUALITY				
Sediment	Index	N/A	N/A	N/A
Water Yield	M Acre Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	28 7	35 5	47 3
FACILITIES				
Passenger Car	Miles	1,472	1,472	1,472
High-Clearance Vehicle	Miles	5,371	5,301	5,291
Constr & Reconstr.	Miles	133	63	70

1/Included in recreation visitor days recreation.

2/Including 4.3 million cubic feet per year salvage.

7. Maximum Big-Game Benchmark

a. Description

This benchmark is formulated to optimize the cover/forage ratio for big game on both summer and winter ranges and to sustain optimum habitat conditions. In developing the assortment of benchmarks for FORPLAN analysis, certain assumptions were used to estimate outputs and tradeoffs. The maximum big-game benchmark was developed under the concept that optimum big-game habitat conditions, and specifically cover to forage ratios, could be estimated outside of the FORPLAN model structure.

Public response to the Draft Environmental Impact Statement have indicated that the Habitat Effectiveness Index model would be more appropriate for use in determining habitat conditions for big-game. Consequently, the changes made between Draft and Final Environmental Impact Statements for estimating big-game habitat conditions have made direct comparisons between benchmarks and alternatives difficult.

b Purpose

The purpose of this benchmark is to show the opportunity costs of maintaining optimum big-game cover and other Management Requirements in terms of Present Net Value and output levels.

c FORPLAN Objective Function

Maximize Present Net Value for 15 decades.

d. Assumptions and Constraints

No timber harvest in mature and commercial-thin ponderosa pine stands for the first three decades. Harvest in the two-story ponderosa pine limited to high stocking level prescriptions and final harvest stands only. At least 60 percent of all working groups must be 60+ years old from decades 4 through 15

Timber harvest is scheduled only on lands classified as "suitable" through the suitability analysis.

Management Requirements are constraints

Nondeclining evenflow at or below long-term sustained yield capacity

Rotations based on 95 percent of culmination of mean annual increment.

Ending inventory constraint applied

Only the benefits and variable costs associated with the timber and livestock outputs are considered.

Selection harvest only in riparian areas (except lodgepole pine) in order to meet water quality (temperature) standards and other riparian area resource needs.

Old-growth acres (44,860) necessary to maintain viable wildlife populations removed from land base available for timber harvest.

Harvest dispersion constraints:

(1) Less than or equal to 25 percent per decade of mixed conifer and ponderosa pine in riparian areas;

(2) Less than or equal to 10 percent per decade of lodgepole pine in riparian areas;

(3) Less than or equal to 38 percent per decade on all other available lands for shelterwood final harvests;

(4) Less than or equal to 25 percent per decade on all other available lands for clearcut final harvests

All constraints (unless otherwise specified) are applicable throughout the planning horizon (150 years).

e. Present Net Value

The Present Net Value reduction (FORPLAN) due to imposition of the set of constraints (when compared to Benchmark 3) is $181.4 million.

f Timber

This benchmark run produced a long-term sustained yield capacity of 52 6 million cubic feet per year with a first decade harvest volume of 50.3 million cubic feet per year (275.1 million board feet per year) There is an additional volume of approximately 4 7 million cubic feet per year (14 1 million board feet per year) because of mortality salvage and nonchargeable timber volume This total volume substantially exceeds the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" in all five decades See Table B-19 for volume of timber harvest by decade

The species mix for the first three decades is approximately 60 percent ponderosa pine and 40 percent mixed conifer Decades four and five will produce a species mix of 70 percent mixed conifer species and 30 percent ponderosa pine. See Figure B-37 for the harvest methods used to achieve these volumes by decades. In addition, there is an average forest residue potential of 38 0 million cubic feet per year produced over the planning period. (See Figure B-38)

To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high levels of precommercial thinning in the first three decades with decreasing levels in decades four and five A significant increase in reforestation (planting) acres occurs in the last two decades of the planning period See Figures B-39 and B-40 for precommercial thinning and planting acres.

g. Range Management

On forested and nonforested land, a major decrease in livestock animal unit months occurs. On forested land, a decrease of 90 percent occurs in the first decade The levels then remain constant through decades 2 through 5 (See Figure B-41)

In Decade 1 on nonforested land, a decrease of 90 percent occurs The levels then increase slightly in the second decade and then remain constant through the fifth decade.

FIGURE B-37
HARVEST METHODS

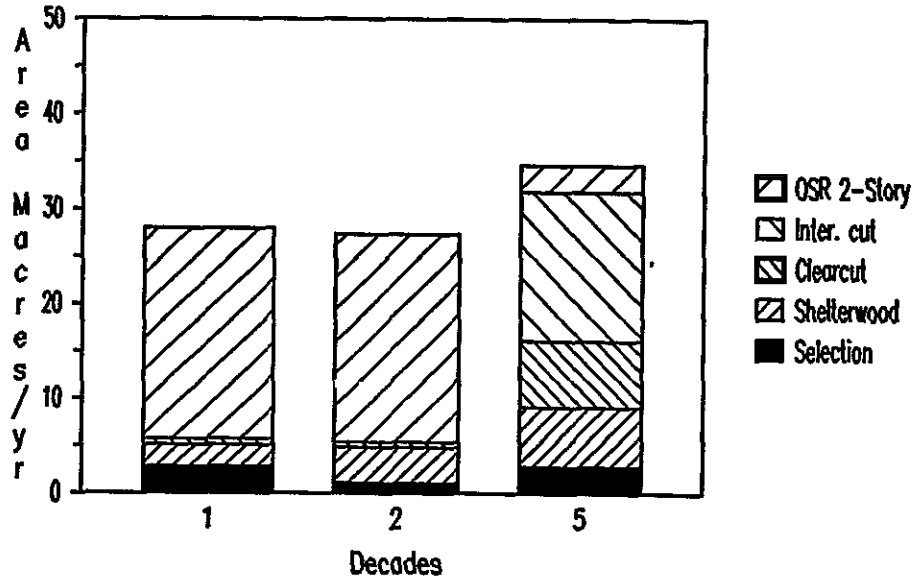


FIGURE B-38
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

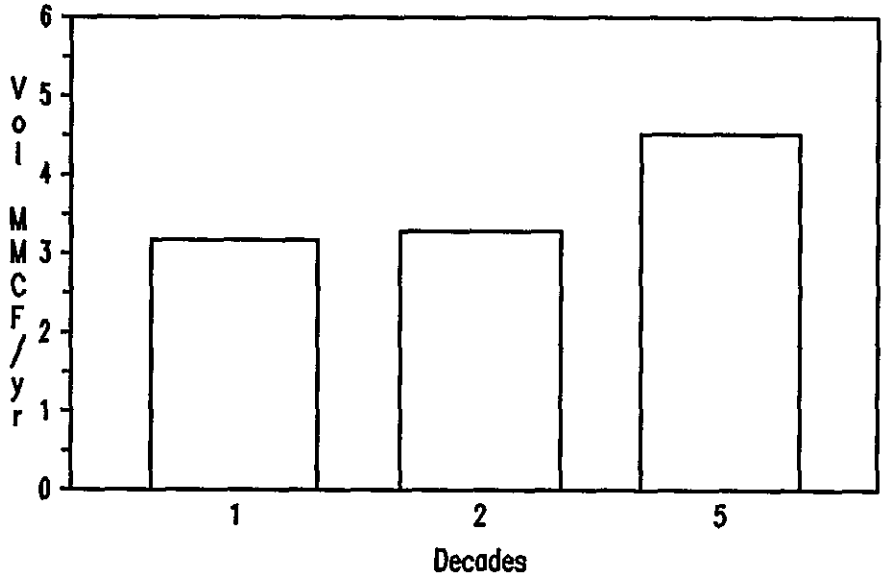


FIGURE B-39
PRECOMMERCIAL THINNING

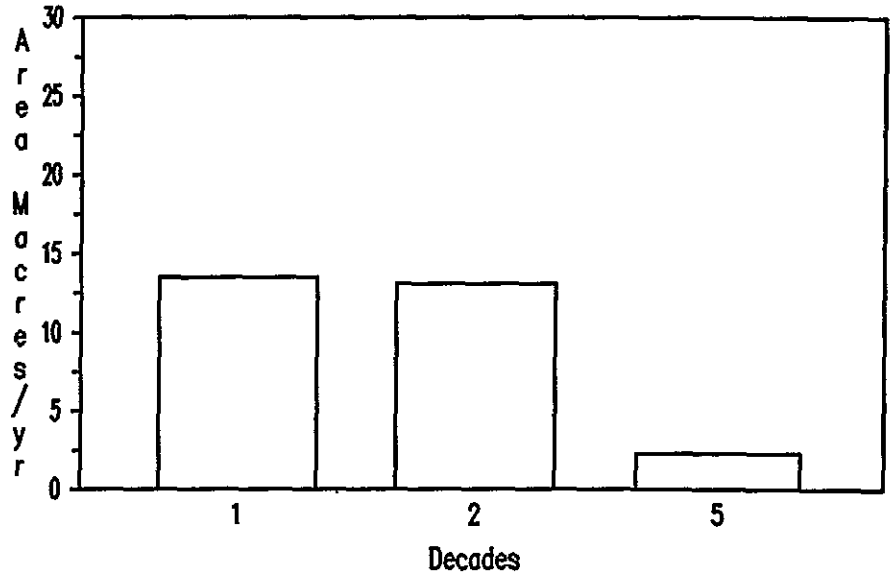


FIGURE B-40
REFORESTATION (PLANTING)

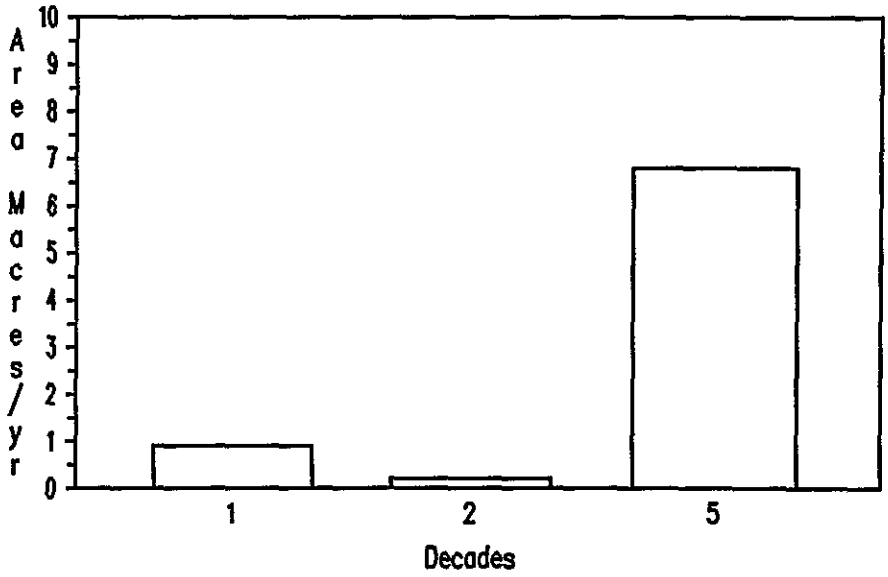
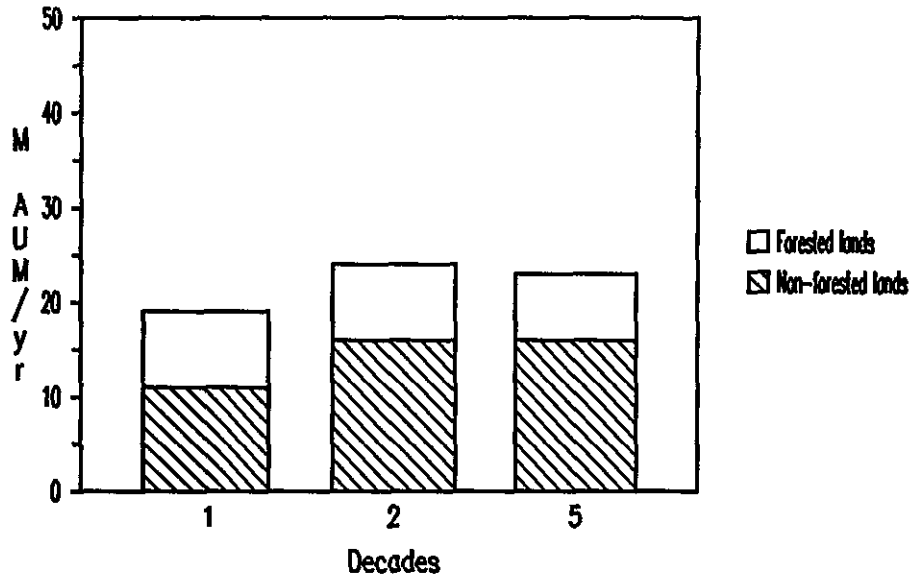


FIGURE B-41
LIVESTOCK



h. Wildlife

Big-game habitat shows a net increase toward optimum cover/forage ratios by the fifth decade, with the greatest improvement occurring between decades four and five (Figure B-43).

Estimated elk numbers (per forage capability) on both winter and summer ranges initially decline then increase slightly in later decades (Figure B-42) Elk numbers were estimated by forage availability and a discount for less than optimum cover conditions only. No other factors such as hunting, predation, roading, weather, etc., were used to estimate the hypothetical population capacity of this benchmark.

i Old Growth

Old growth acres will fall steadily through the fifth decade to the Management Requirement level of 44,860 acres.

j. Fisheries

This run has constraints on it which are intended to meet Management Requirements. In terms of water quality and fish habitat, the constraints which are most important are those which specify selection harvest in riparian areas and cause the harvest to be more or less evenly distributed over time. These constraints are primarily aimed at temperature regulation. The natural contribution of large organic debris to the streams would continue to decline over time.

Within the limits of our ability to predict changes on such a broad scale, it appears that this run is at least close to providing for shading requirements. On-the-ground implementation of this prescription could probably make the necessary adjustments to meet shade requirements from the perspective of timber management Timber harvest in riparian areas would nearly double that of the current situation The emphasis on analysis and coordination of project planning would be even greater under this management scenario than currently Best Management Practices for timber harvest activities, including roading, will meet State water quality standards for sediment and turbidity

The number of animal unit months produced by this benchmark is much lower than current levels because the forage produced is assigned to big game The expected fisheries output for the benchmark is the same as that for Benchmark 11, Maximum Present Net Value Because it is not practicable to redistribute big-game use away from riparian areas, however, impacts to riparian vegetation could be great It could be necessary to increase streamside and instream work to maintain fishery habitat conditions at current levels

External funding for fish habitat improvement projects (such as the Bonneville Power Administration anadromous fish program) could continue to the extent that such investments were consistent with other ongoing management. Actual fish habitat condition could improve in proportion to the amount of external funding, with the upper limit of potential improvement slightly less than the maximum potential of the current situation

k Water

See summary analysis, Section VI C 10 d.

FIGURE B-42
ESTIMATED ELK NUMBERS (per forage availability)

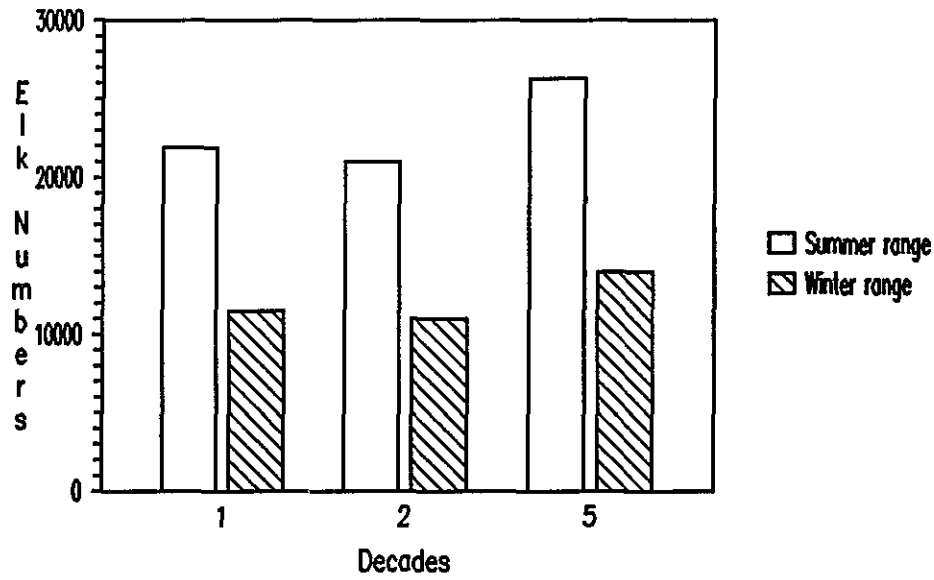
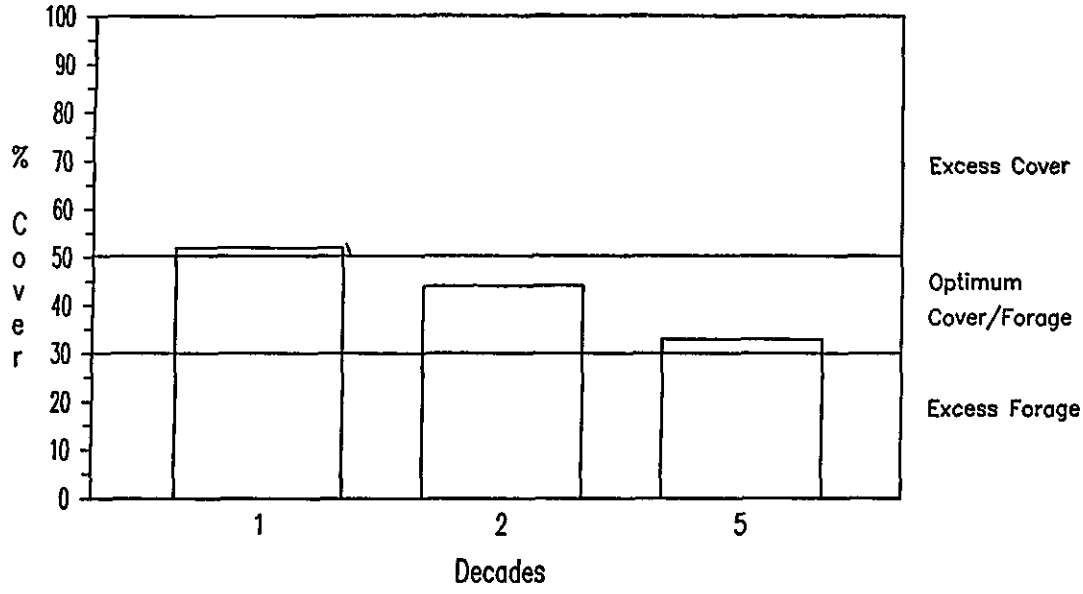


FIGURE B-43
BIG-GAME HABITAT CAPABILITY



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

1. Recreation

Developed Recreation: Developed recreation opportunities would be provided through the maintenance of existing facilities. Demand for developed recreation would be met through the fifth decade.

Dispersed Recreation: Semiprimitive recreation opportunities outside wilderness would be eliminated by the first decade. This benchmark would provide only roaded modified and wilderness semiprimitive nonmotorized opportunities.

Visual Resource: No provisions for visual resource management would be made By the end of the first decade the only natural-appearing landscapes remaining would be those in wilderness.

Cultural Resource: Cultural resources will be inventoried prior to the implementation of potentially impacting management activities The number of acres managed for cultural resource values is primarily influenced by the acres of timber to be harvested annually New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined.

m. Transportation

Arterial and collector road construction and reconstruction will remain constant over time. The reason for this is the dispersion of harvest and recreational activities across the Forest This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program. Since local roads are usually used by only high-clearance vehicles, they fall into the maintenance level 2 which will change over time.

The local road system construction and reconstruction program also varies over time. This is shown in Figure B-44 This graph shows only a small variation over the planning period.

n. Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected. Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected

Method of Measurement: Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection dollars to Emergency Firefighting costs and resource loss values. Program Effectiveness is computed by averaging the annual cost over a decade.

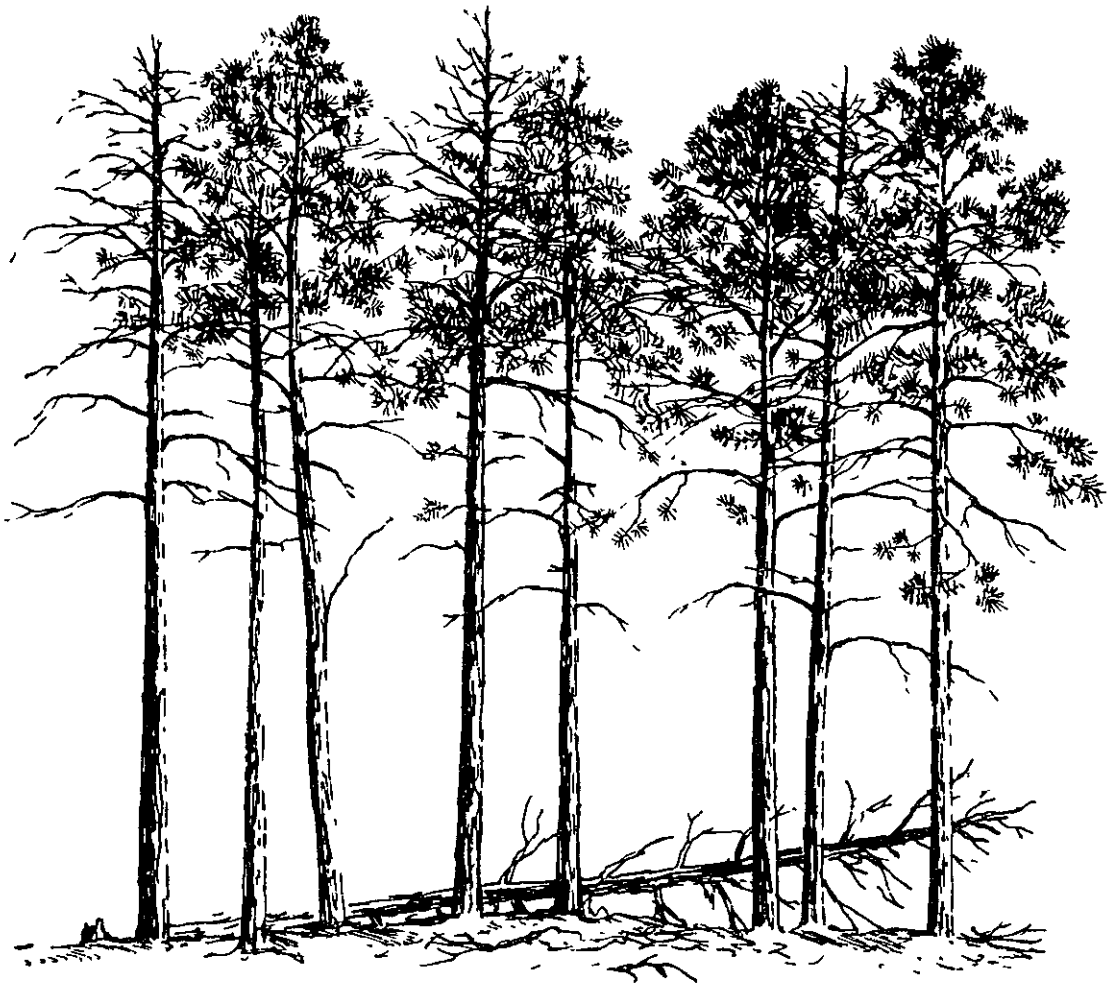


TABLE B-19

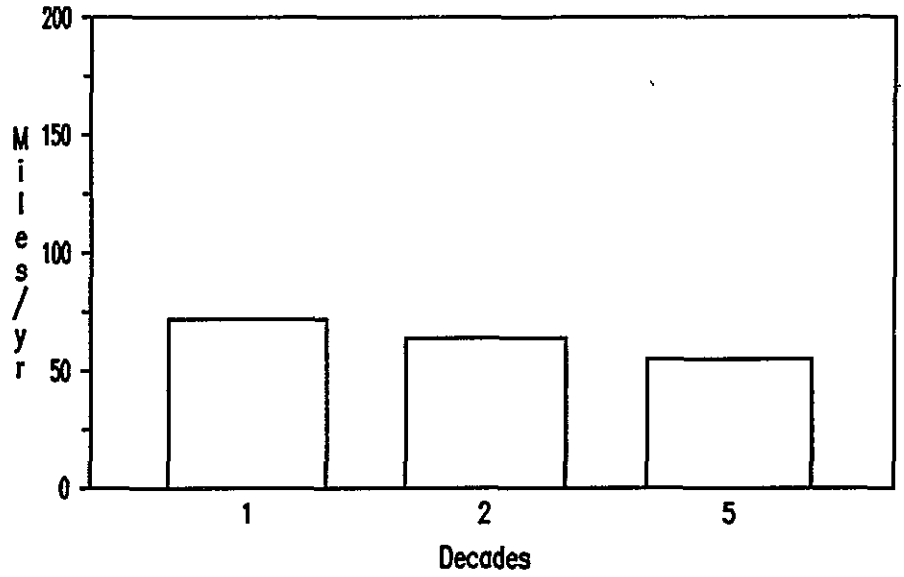
BENCHMARK MAX BIG GAME WITH MRs

OUTPUT/EFFECT Output/Effect	Unit of Measure/yr.	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	132.1	138.0	138.0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	0	0	0
Roaded Natural	M RVDs	1,949	976.1	0
Roaded Modified	M RVDs	1,542	2,633	3,294.4
Wilderness	M RVDs	61.8	61.8	61 8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	21,900	21,000	26,300
Anadromous Fish	M Pounds	32.1	32.1	32.1
Big-Game Use[1/]	M WFUDs	168.3	162.4	194 7
Fish Use[1/]	M WFUDs	23.7	23 7	23 7
RANGE				
Livestock Use	M AUMs	18.6	23 7	23 1
TIMBER				
LTSYC	MM Cu Ft	---------- 52.6 in Decade 15 ----------		
Programmed Sale	MM Bd Ft	275.1	N/A	N/A
Offered[2/]	MM Cu Ft	50.3	50.3	50 3
Other wood fiber and				
Personal firewood	MM Cu Ft	3.17	3.29	4.52
Volume by species				
Ponderosa Pine	MM Cu Ft	28 6	27.6	13 5
Mixed Conifer	MM Cu Ft	16 6	17.5	31 8
Lodgepole Pine	MM Cu Ft	0 4	0.5	0.3
Harvest Method				
Overstory Removal/				
Two-story stand	M Acres	22.2	21 9	2 8
Intermediate cut	M Acres	0	0	15.7
Clearcut	M Acres	0 6	0.6	7.0
Shelterwood cut	M Acres	2.3	3 8	6 3
Selective cut	M Acres	2 8	1.0	2.8
Precommercial thin	M Acres	13 5	13.1	2.3
Reforestation (Plant)	M Acres	0 9	0.2	6.8
WATER QUALITY				
Sediment	Index	N/A	N/A	N/A
Water Yield	M Acre Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	32 5	32.9	30.7
FACILITIES				
Passenger Car	Miles	1,472	1,472	1,472
High-Clearance Vehicle	Miles	2,771	2,771	2,771
Construction				
and Reconstruction	Miles	72	64	55

1/Included in recreation visitor days in recreation.

2/Includes 4.7 million cubic feet per year salvage

FIGURE B-44
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION



8. Maximum Anadromous Fish Benchmark

a Description — This benchmark estimates the maximum anadromous fish production that could be attained on the Forest, subject to Management Requirements and continued management of other resources

b. Purpose — The purpose of this benchmark is to estimate the maximum level of anadromous fish that the Forest could provide

c. FORPLAN Objective Function — This benchmark is developed outside the FORPLAN model.

d Assumptions and Constraints — It is assumed the Izee Falls passage project on the South Fork of the John Day River will be completed by 1990. Therefore, there will be a total of 280 miles of anadromous fish habitat on the Forest.

In addition to the standard riparian area constraints on timber management, two trees per acre each 40 years (minimum 20 inches diameter at breast height) in riparian anadromous areas are dedicated to fisheries. These are to provide additional large organic debris for instream structure to improve pool/riffle ratios. They may be left to fall naturally into the stream or be physically placed there to meet fisheries management objectives.

Instream and streamside enhancement projects (including planting shrubs and/or trees as needed, bank stabilization, occasionally raising the water table, and instream structural habitat improvement work) would occur on an estimated 250 miles of stream. Cost estimates for this work range from $10,000 to $40,000 per mile, averaging $25,000 per mile. After an average structural life of about 40 years, about 40 percent of these structures would need to be replaced. Improved riparian vegetative condition and channel morphology should offset the need for the other 60 percent of the structures. It is estimated to take two decades to complete the initial structural and vegetative improvement work Maintenance costs are estimated at 2 percent of installation cost per year.

To fully accomplish the objective of this benchmark, it would also be necessary to relocate and/or extensively mitigate an estimated 20 miles of roads in riparian areas, at an estimated cost of $20,000 per mile.

All constraints (unless otherwise specified) are applicable throughout the planning horizon (150 years).

e Timber

This benchmark run produced a long-term sustained yield capacity of 61.7 million cubic feet per year with a first decade harvest volume of 51.7 million cubic feet per year (284.8 million board feet per/year) This includes approximately 4 0 million cubic feet per year (11 9 million board feet per year) due to mortality salvage and nonchargeable timber volume. This total volume exceeds the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" in all five decades See Table B-20 for volume of timber harvest by decade.

The species mix for the first three decades is approximately 55 percent ponderosa pine and 43 percent mixed conifer species. This gradually shifts to 70 percent mixed conifer species and 30 percent ponderosa pine in the fifth decade See Figure B-45 for the harvest methods used to achieve these volumes by decade. In addition, there is an average forest residue potential of 32.1 million cubic feet per year produced over the planning period. (See Figure B-46)

FIGURE B-45
HARVEST METHODS

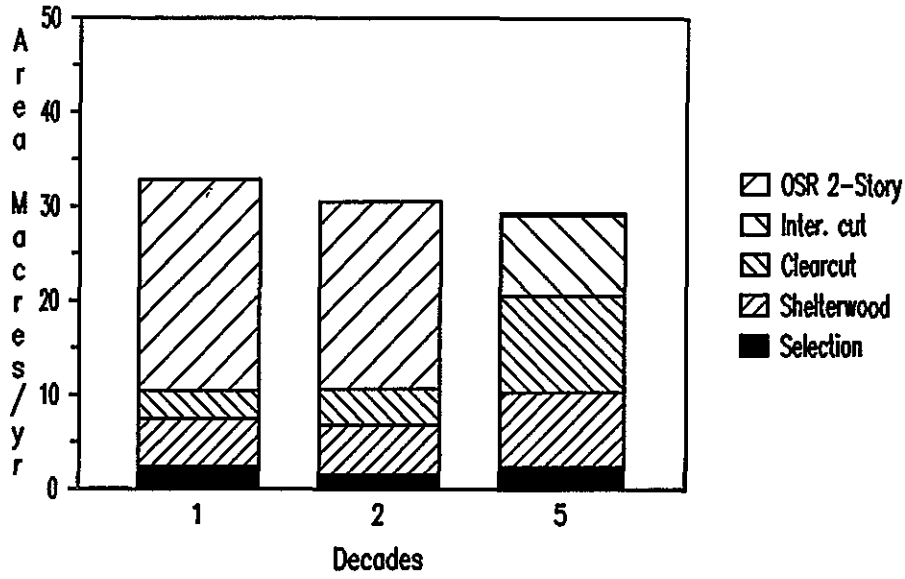
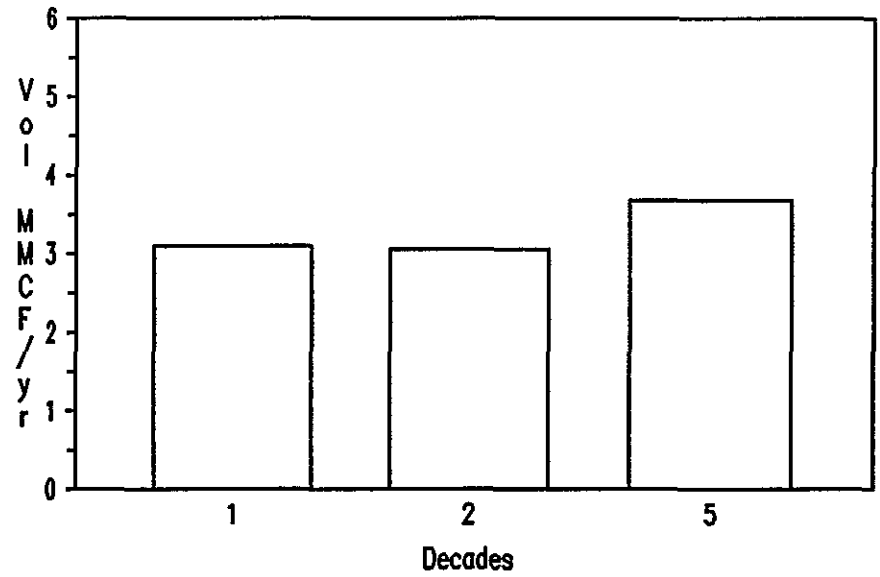


FIGURE B-46
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD



To achieve the projected harvest volumes, there will be an increase in precommercial thinning and planting acres over the 50-year period. General trends indicate high levels of precommercial thinning in the first three decades with decreasing levels in the last two decades. Reforestation (planting) occurs only in the later decades of the planning period See Figures B-47 and B-48 for precommercial thinning and planting acres.

FIGURE B-47
PRECOMMERCIAL THINNING

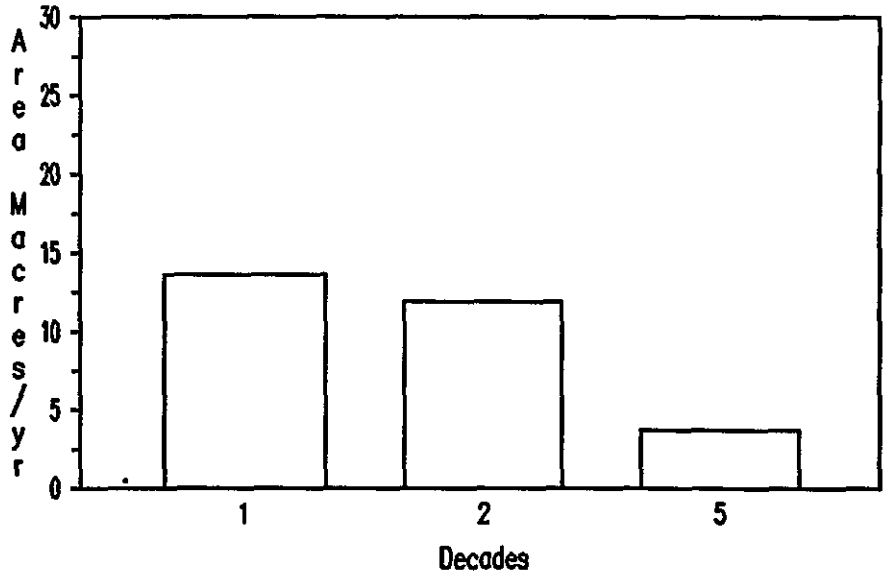
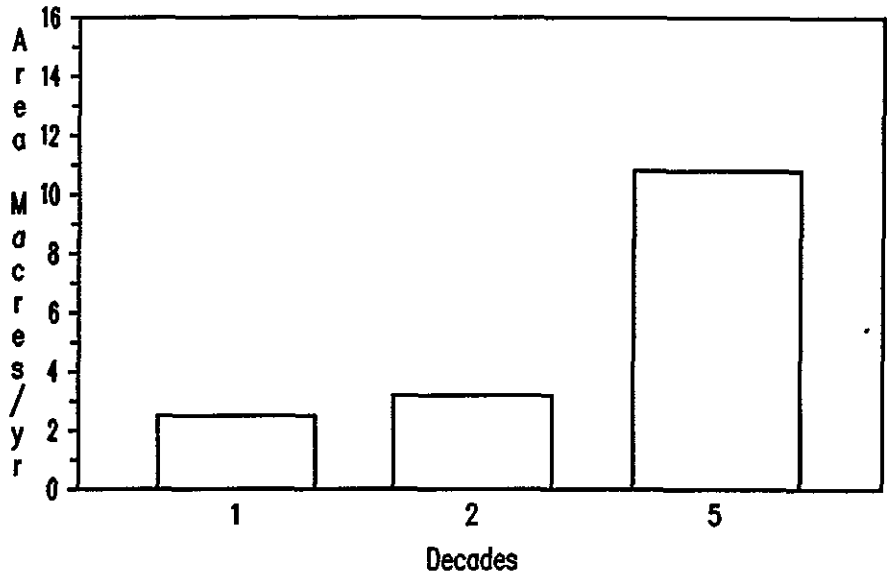


FIGURE B-48
REFORESTATION (PLANTING)

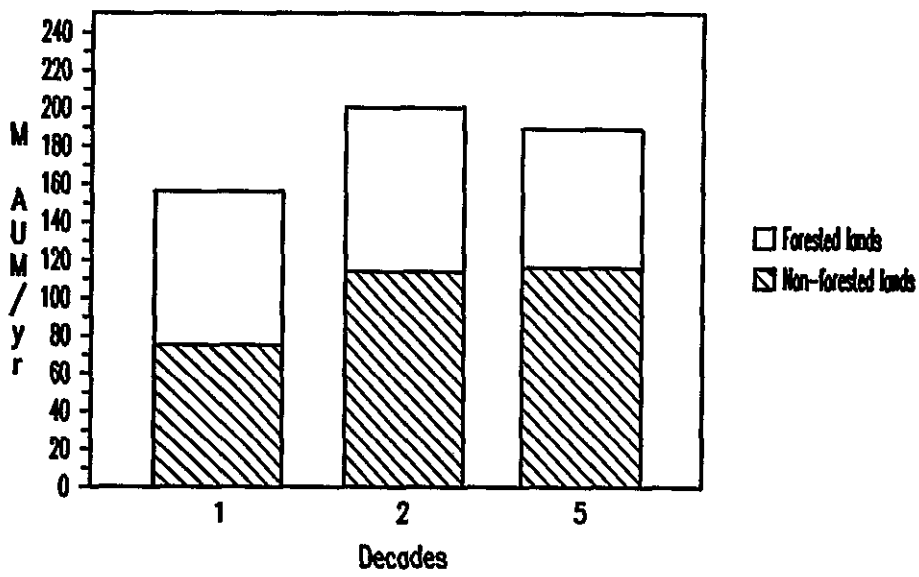


f. Range Management

Livestock would be removed from most riparian anadromous areas for one decade. In about 50 percent of the areas, this would continue for a second decade. After stream banks are stabilized and woody riparian vegetation well established, livestock use may be resumed under Riparian Management Area No. 3 Periodic short-term livestock exclusion may also be needed in the future.

Fencing for livestock control and developing water sources outside the riparian area, and/or providing water gaps for livestock, is estimated to cost $2 2 *million This will occur on an estimated 300 miles of stream. Maintenance costs* are estimated at $220,000 per year This will maintain current animal unit months by redistributing the animals outside the riparian areas (See Figure B-49)

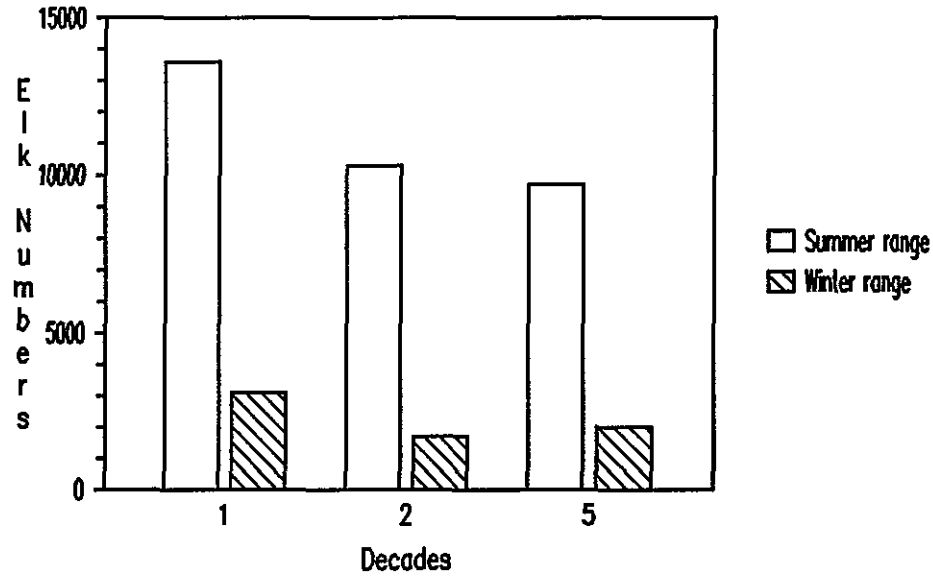
FIGURE B-49
LIVESTOCK



Habitat diversity shows a slight increase in the first decade. Diversity decreases through the third decade and then increases again through the fifth decade.

Estimated elk numbers (per forage capability) on both winter and summer ranges decrease in the second decade then remain approximately constant. See Figure B-50. Elk numbers were estimated based on forage availability and a discount for less than optimum cover conditions only. No other factors such as hunting, predation, roading, weather, or Habitat Effectiveness Indices, were used to estimate the hypothetical population capacity of this benchmark.

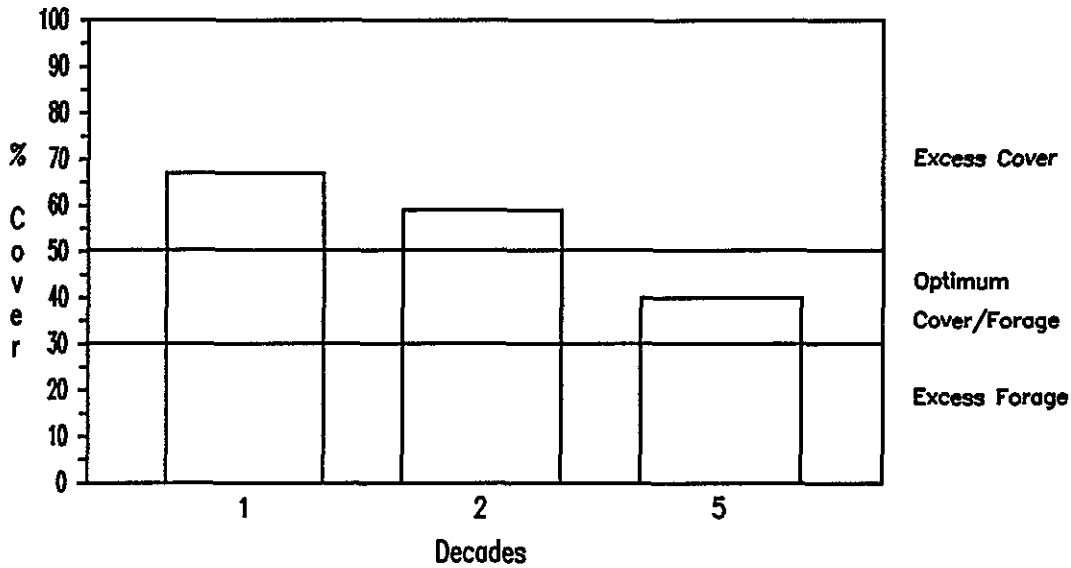
FIGURE B-50
ESTIMATED ELK NUMBERS (per forage availability)



g. Wildlife

Big-game habitat shows a steady increase toward optimum cover/forage ratios through the fifth decade (Figure B-51)

FIGURE B-51
BIG-GAME HABITAT CAPABILITY



Cover in the above figure refers to an undefined combination of satisfactory and marginal cover categories

h. Old Growth

Old growth will be maintained at the Management Requirement level of 44,860 acres

i. Fisheries

Anadromous fish production would more than double in the first two decades then continue to increase at a slower rate through the fifth decade. This would result in an increase of about 33,600 wildlife and fish user days and 45,500 pounds of commercial harvest to the downstream fisheries This is about 90 percent of the 1980 Resource Planning Act target.

j. Water

See summary analysis, Section VI.C.10.d.

k. Recreation

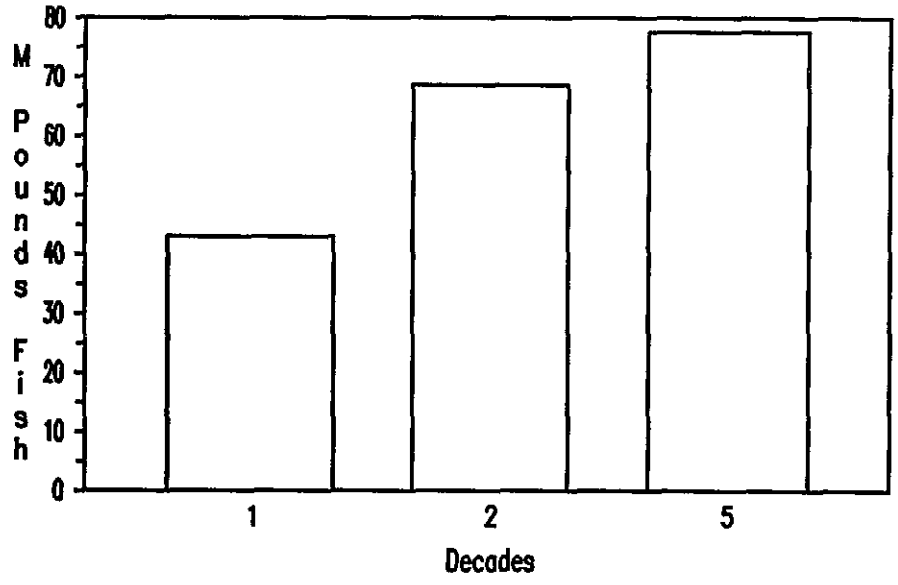
Developed Recreation: Developed recreation opportunities would be provided through the maintenance of existing facilities. Demand for developed recreation would be met through the fifth decade

Dispersed Recreation. Unroaded dispersed recreation opportunities outside wilderness would be eliminated by the first decade. This benchmark would provide only roaded modified and wilderness semiprimitive nonmotorized opportunities.

Visual Resource: No provisions for visual resource management would be made. By the end of the first decade, the only natural-appearing landscapes remaining would be those in wilderness.

Cultural Resources. Cultural resources will be inventoried prior to the implementation of potentially impacting management activities. The number of acres managed for cultural resource values equals the acres of timber to be harvested annually New acres will accumulate until all lands suitable for timber production have been surveyed and cultural resources located. Thereafter, new cultural resource management acres will continue to accrue as other Forest acres are examined, but at a slower rate and not as a significant correspondence with any specific resource output

FIGURE B-52
ANADROMOUS FISH PRODUCTION POTENTIAL



l Transportation

Arterial and collector road construction and reconstruction will remain constant over time The reason for this is the dispersion of harvest and recreational activities across the Forest. This assumption of a constant program also applies to maintenance levels 1, 3, 4, and 5 of the road maintenance program Since local roads are usually used by only high-clearance vehicles they fall into the maintenance level 2 which will change over time.

The effect of this benchmark is to require movement of local roads away from streamsides and out of creek bottoms, probably at a more rapid rate and with a greater monitoring effort to ensure that it occurs. This would increase costs because of relocation requirements Approximately 20 miles of road would need to be relocated or mitigated at a cost of $20,000 per mile. (See Figure B-53)

m Protection

The cost of protection (dollars per million acres protected) will not vary by benchmark or alternative Eighteen protection alternatives were run through the Fire Management Analysis process and the most cost-efficient alternative was selected Differences in benchmarks or alternatives will probably have no measurable effect on the Fire Management Effectiveness level selected

Method of Measurement Fire Management Effectiveness is measured by adding appropriated Forest Fire Protection dollars to Emergency Firefighting costs and resource loss values Program Effectiveness is computed by averaging the annual cost over a decade.

FIGURE B-53
LOCAL ROAD CONSTRUCTION/RECONSTRUCTION

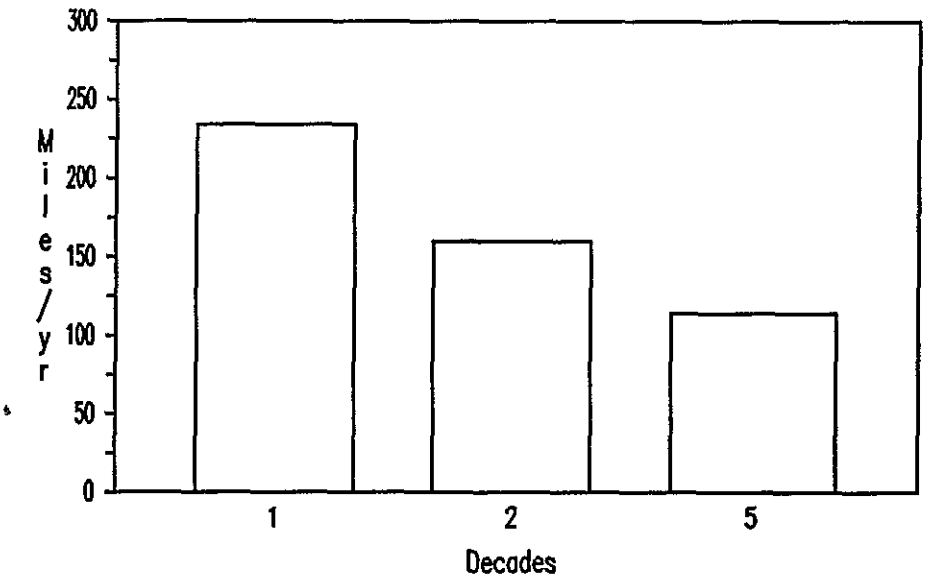


TABLE B-20

BENCHMARK MAX FISH WITH MANAGEMENT REQUIREMENTS

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	132 1	138.0	138 0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	0	0	0
Roaded Natural	M RVDs	1,949	976.1	163.1
Roaded Modified	M RVDs	1,542	2,633	3,294 4
Wilderness	M RVDs	61.8	61.8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	13,600	10,300	9,700
Anadromous Fish	M Pounds	43.0	68.6	77.6
Big-Game Use[1/]	M WFUDs	105.6	70 4	109.2
Fish Use[1/]	M WFUDs	31 8	50.6	57 3
RANGE				
Livestock Use	M AUMs	156.0	199.9	188.9
TIMBER				
LTSYC	MM Cu Ft	---------- 61.7 in Decade 15 ----------		
Programmed Sale	MM Bd Ft	284 8	N/A	N/A
Offered[2/]	MM Cu Ft	51.7	52.0	52.3
Other wood fiber and				
Personal firewood	MM Cu Ft	3.10	3.06	3 68
Volume by species				
Ponderosa Pine	MM Cu Ft	26.1	23.2	14.5
Mixed Conifer	MM Cu Ft	20.7	23.7	33.1
Lodgepole Pine	MM Cu Ft	0.8	0.9	0.1
Harvest Method				
Overstory Removal/				
Two-story stand	M Acres	22.3	19.8	0.2
Intermediate cut	M Acres	0	0	8 5
Clearcut	M Acres	3.0	3.8	10.3
Shelterwood cut	M Acres	5.1	5 3	7 9
Selective cut	M Acres	2.4	1.6	2.4
Precommercial thin	M Acres	13.6	11.9	3.7
Reforestation (Plant)	M Acres	2.5	3.2	10.8
WATER QUALITY				
Sediment	Index	1,333	1,168	1,446
Water Yield	M Acre Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	26 6	24 9	25.5
FACILITIES				
Passenger Car	Miles	1,472	1,472	1,472
High Clearance Vehicle	Miles	6,103	6,735	7,196
Construction and				
Reconstruction	Miles	234	160	114

1/Included in recreation visitor days in recreation.

2/ Including 4.0 million cubic feet per/year salvage

9. Minimum Level Benchmark

a Description	This benchmark specifies the minimum level of management which would be necessary to maintain the unit as part of the National Forest System. This includes the minimum costs and outputs associated with this level of management (See Table B-21)
b. Purpose	The purpose of developing this benchmark is to determine the probable costs of managing the Forest at the lowest level of management intensity allowed by law All budget expenditures would be necessary to provide minimum environmental constraints and protection of the life, health, and safety of users
c. FORPLAN Objective Function	This benchmark was developed outside the FORPLAN model
d. Assumptions and Constraints	Only those activities would occur which are essential to provide minimum environmental protection and to protect the life, health, and safety of users of the Forest. All constraints are applicable throughout the planning horizon (150 years).
e Timber	Timber harvest would cease There would be personal use of fuelwood, fence posts, rails, etc. The reduction in this amount over the planning period is due to the reduced amount of roads available for access to the Forest.
f. Range	There are no permitted commercial livestock using the Forest. Forage would be used by wild horses, wildlife, and incidental recreational livestock. The area used by wild horses would increase as the number of animals increased. The potential for damage to the wild horse territory would increase as the horse herd grew Resource damage and competition between wild horses and elk would occur on the winter range of the original territory.
g Wildlife	Big-game habitat capability would decrease over time as the forested canopy closes, creating an overabundance of cover Yet, we project that elk numbers will remain at the present levels through the fifth decade. Habitat diversity would decrease over the five decades, approaching a natural forest condition
h. Old Growth	Old-growth habitat would increase as stands mature into the old-growth characteristics
i Fisheries	Fish habitat would improve over time to a near-natural condition The decrease in management activities such as logging, roading, and livestock grazing would reduce sedimentation and improve streamside vegetation. There would also be an improvement in water temperature. Habitat condition would attain 90 percent of the natural potential by the fifth decade
j. Water	Water quality would generally improve over the planning period.
k. Recreation	Developed Recreation: There would be no developed sites maintained for use.

Dispersed Recreation. Roaded modified settings would convert to Roaded Natural settings by the third decade. Semiprimitive settings and wilderness would remain in their current conditions

Visual resource: The Forest would return to a natural-appearing landscape by the third decade.

Cultural Resources· Cultural resource inventories and mitigating measures would be needed for ground-disturbing activities conducted by permittees for activities such as mining, electronic site development, etc.

l Transportation — Total road miles would decrease as roads closed naturally Maintenance would be confined to main access routes and that needed to correct situations which would cause resource damage such as sedimentation in streams

m. Protection — Fire protection index would be higher due to the reduced protection force. There would be a reduced expenditure on a per-acre basis but a higher loss expense from fires due to an increase in natural fuels.

Law enforcement would be primarily confined to preventing theft of Government property

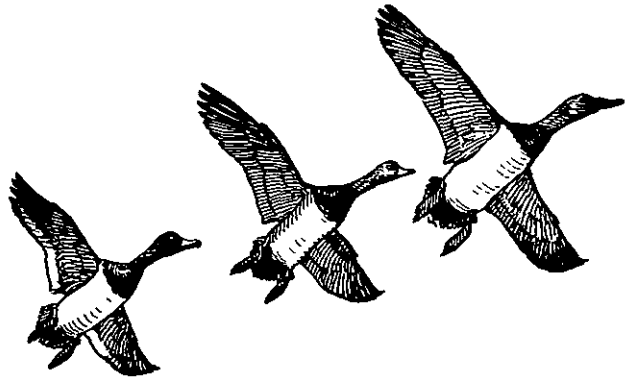


TABLE B-21

BENCHMARK MINIMUM LEVEL

Output/Effect	Unit of Measure/yr	1st Decade	2nd Decade	5th Decade
RECREATION				
Developed Use	M RVDs	0	0	0
Dispersed Use				
Semi-Primitive				
Non-Motorized	M RVDs	0	0	0
Semi-Primitive				
Motorized	M RVDs	157 3	157 3	157.3
Roaded Natural	M RVDs	3,357	3,791	4,226
Roaded Modified	M RVDs	588.7	294.8	0
Wilderness	M RVDs	61.8	61 8	61.8
WILDLIFE AND FISH				
Elk (Summer)	Numbers	10,100	10,100	10,100
Anadromous Fish	M Pounds	40 9	61.6	70.6
Big-Game Use[1/]	M WFUDs	49.1	49.1	49.1
Fish Use[1/]	M WFUDs	30 2	45.5	52.1
RANGE				
Livestock Use	M AUMs	0	0	0
TIMBER				
LTSYC	MM Cu Ft	No Timber Harvest		
Programmed Sale	MM Bd Ft	No Timber Harvest		
Offered	MM Cu Ft	No Timber Harvest		
Other wood fiber and				
Personal firewood	MM Cu Ft	2 9	1 4	0 7
Volume by species				
Ponderosa Pine	MM Cu Ft	---------- None ----------		
Mixed Conifer	MM Cu Ft	---------- None ----------		
Lodgepole Pine	MM Cu Ft	---------- None ----------		
Harvest Method				
Overstory Removal/				
Two-story stand	M Acres	---------- None ----------		
Intermediate cut	M Acres	---------- None ----------		
Clearcut	M Acres	---------- None ----------		
Shelterwood cut	M Acres	---------- None ----------		
Selective cut	M Acres	---------- None ----------		
Precommercial thin	M Acres	---------- None ----------		
Reforestation (Plant)	M Acres	---------- None ----------		
WATER QUALITY				
Sediment	Index	215	215	215
Water Yield	M Acre-Feet	620	620	620
FIRE				
Fire Effective Index	$/M Acres	1,344	1,344	1,344
Fuel Treatment	M Acres	0	0	0
FACILITIES				
Passenger Car	Miles	0	0	0
High-Clearance Vehicle	Miles	7,100	7,100	7,100
Construction and				
Reconstruction	Miles	0	0	0

1/Included in recreation visitor days in recreation

10. Summary

As stated before, the results of the benchmark analysis are based on the FORPLAN model used for the Draft Environmental Impact Statement, and are not updated for changes included in the Final Environmental Impact Statement. This does not affect the comparability of the benchmarks with each other

a Timber

The highest long-term sustained yield capacity produced in the benchmark runs was 68 8 million cubic feet in Benchmark 1, and (with the exception of the Minimum Level Benchmark) the lowest 52 4 million cubic feet per year in the Maximum animal unit months benchmark run (See Figure B-54.)

All of the benchmark runs, except the minimum level benchmark, produce a first-decade harvest volume that is greater than the allowable sale quantity of Alternative A No Action. This value varies from 59 2 million cubic feet per year (326.6 million board feet per year) as a high to 46.9 million cubic feet per year (254.8 million board feet per year) as a low, after adjusting for mortality salvage and other nonchargeable volume All of the benchmarks exceed the volume production goals for the Malheur National Forest called for in the "Forestry Program for Oregon" (Figure B-55)

The potential to produce other wood fiber in the first decade is high in all benchmarks. This value ranges from 47 1 million cubic feet per year (Benchmark 1) to 32.1 million cubic feet per year (Benchmark 11) This value varied due to selection of different harvest methods in all runs. (See Figure B-56, Other wood fiber and personal use firewood)

All of the benchmark runs produce a species mix of approximately 60 to 70 percent ponderosa pine and 30 to 40 percent other species in the first decade. After the third decade, mixed conifer species become the predominant harvest category in most cases, about 65 to 75 percent of total harvest volume.

The majority of the harvested volume, by harvest method, comes from first-entry two-story stands in all benchmark runs, except the Maximum animal unit months benchmark (66 percent other harvest methods in the second and third decades), and Current Direction run (75 percent regeneration harvest first three decades) for the first three decades (See individual benchmark tables for a summary of harvest methods by decades.) The harvest volume in the fourth and fifth decades is supplied by regeneration and intermediate cuts. The majority of the harvest acres is regeneration cuts with clearcutting as the primary harvest cutting method in all benchmarks except Maximum Animal Unit Months and Current Direction.

Precommercial thinning acres are high in the first three decades for all benchmarks except in the Maximum Animal Unit Months benchmark (8,900 acres per year in the second decade) The range for precommercial thinning is from 13,600 acres per year for a low to 20,700 acres per year for a high This acreage drops to almost 0 by the fifth decade in some benchmarks but the average is 5,000 acres/year. The large number of acres of precommercial thinnings in the first three decades can be attributed to the number of acres harvested by overstory removal cuts. (See Figure B-57.)

For the first three decades, reforestation (planting) acres are low in all benchmark runs except the maximum timber The fourth and fifth decades require planting at an average rate of 7,800 acres per year The general trend of low reforestation acres in the first three decades can be attributed to the number of acres harvested by overstory removals In the latter decades, a large number of

clearcuts and other regeneration cuts chosen by the model cause an increase in planting acres (See Figure B-58)

FIGURE B-54
LONG-TERM SUSTAINED YIELD CAPACITY

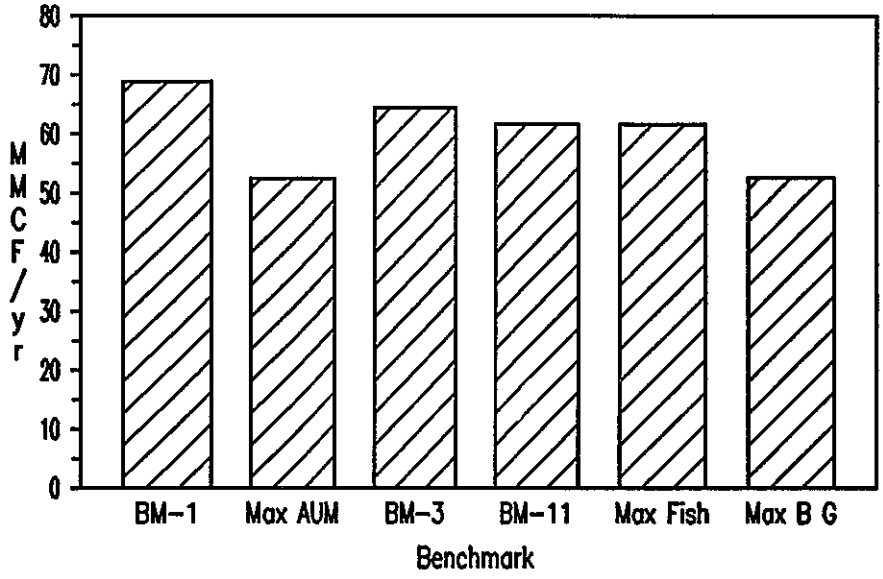


FIGURE B-55
PROGRAMMED SALES OFFERED

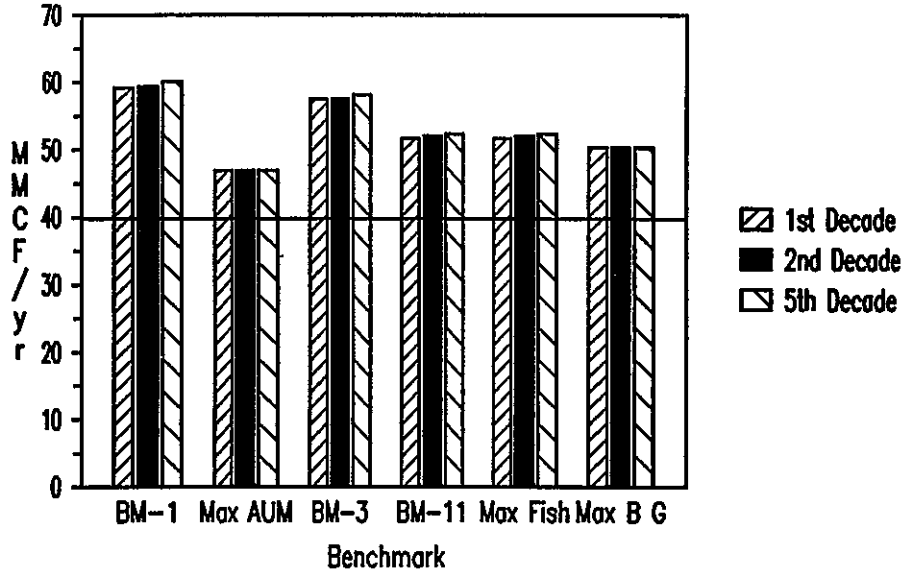


FIGURE B-56
OTHER WOOD FIBER AND PERSONAL USE FIREWOOD

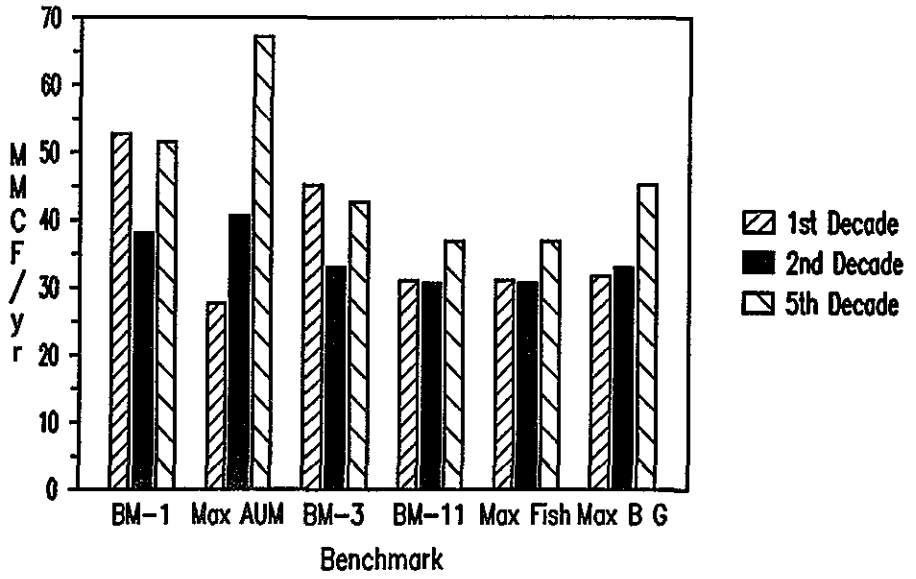


FIGURE B-57
PRECOMMERCIAL THINNING

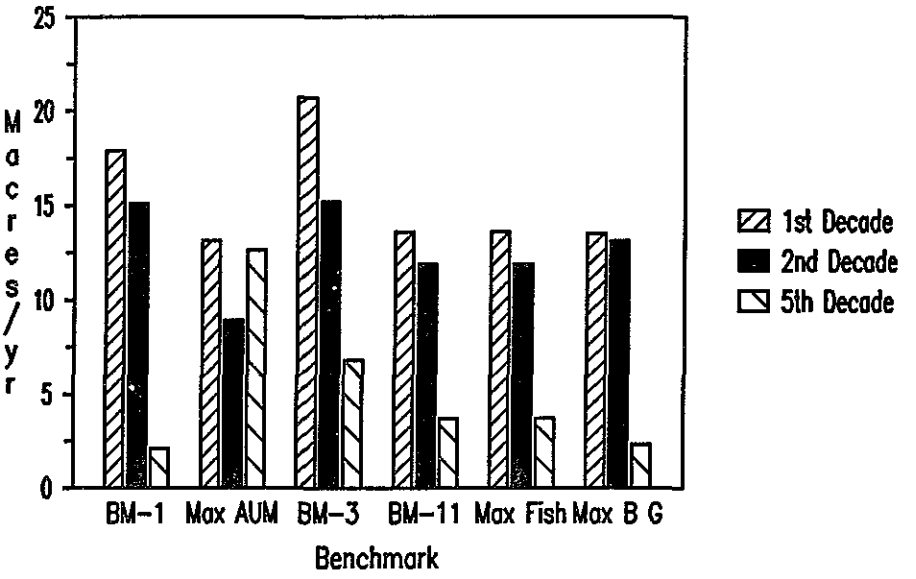
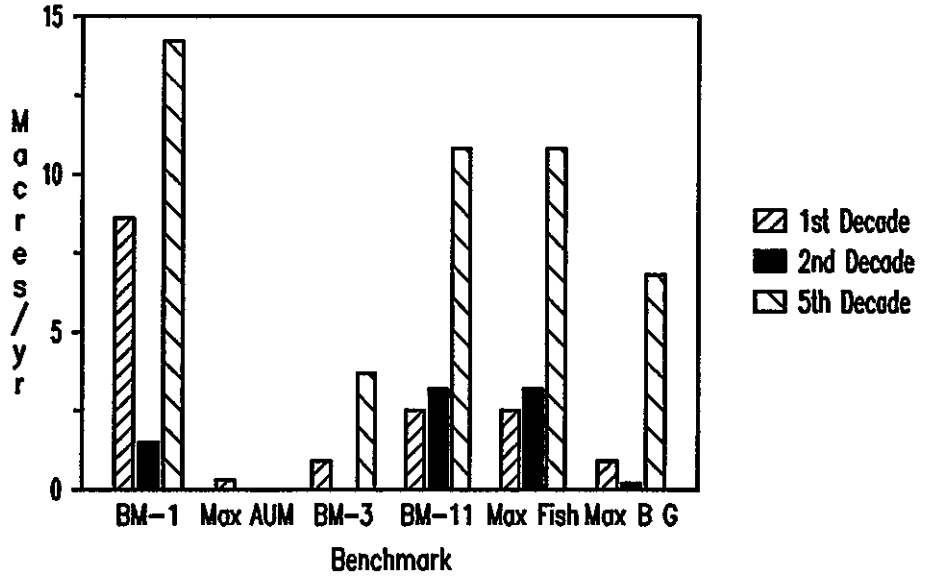


FIGURE B-58
REFORESTATION (PLANTING)



Generally, the benchmarks indicate that a higher level of timber outputs, both normal products and forest residue material, can be produced than is presently occurring. To accomplish a higher level of timber outputs, management activities will have to change over time to best utilize the biological potential of the land. This will require a much higher investment, both in dollars and personnel. However, to reach these higher output levels, there may be greater negative impacts on other forest resources.

Effects of Management Requirements - A comparison of the Max Present Net Value Benchmark (with all Management Requirements) to the Max Present Net Value Benchmark (without Management Requirements) shows the total effect of all Management Requirements taken together reduces Present Net Value by 14 percent, long-term sustained yield capacity by 4 percent, and first decade allowable sale quantity by 11 percent. Further analysis shows the effect of each Management Requirement individually when compared to the Max PNV (without Management Requirements) Benchmark. The following constraint analysis in Table B-22 was developed for the Draft Environmental Impact Statement published in 1987. Since then costs have been updated and the Present Net Value of some benchmarks has changed. Although Present Net Value may have changed for some benchmarks, the constraint analysis is still valid.

The harvest dispersion Management Requirement establishes a maximum amount of acres that can be regenerated in any decade This Management Requirement limits openings created by clearcutting to 40 acres or less with logical cutting units surrounding, shelterwood and overstory removals are limited to 80 acres or less to address watershed, wildlife diversity, and visual management concerns. This Management Requirement results in a substantial reduction in Present Net Value (9 percent); first decade allowable sale quantity is down about 5 percent. Present Net Value reductions are primarily due to timber harvests foregone in valuable, mature timber in the first decade, and the implementation of more costly timber management practices over time. However, long-term sustained yield capacity is higher because of the mix of timber management practices

The mature old-growth Management Requirement results in the dedication of acres of suitable timberland for wildlife habitat for old-growth-dependent wildlife Indicator species considered are pileated woodpecker and pine marten This Management Requirement results in a 3-percent decrease in Present Net Value and a 5-percent decrease in first decade allowable sale quantity The reduction in long-term sustained yield capacity is due to reduction in suitable timber land because of old-growth dedication.

The riparian Management Requirement was designed to protect riparian zones on the Forest Present Net Value and first decade allowable sale quantity tradeoffs are small (Present Net Value - less than 3-percent, allowable sale quantity - 1 percent) This Management Requirement has smaller tradeoffs because it is identified with specific areas of the Forest, the harvest dispersion and old-growth Management Requirements have Forest-wide effects.

The Management Requirements for the Forest were designed to protect specific qualities of the Forest Consequently, there is very little overlap in effect on Present Net Value and allowable sale quantity between Management Requirements, and the Management Requirements are mostly additive Slight overlap between the riparian Management Requirement and the harvest dispersion Management Requirement accounts for the difference in total effect

TABLE B-22

SUMMARY OF MANAGEMENT REQUIREMENTS (MRs) CONSTRAINT ANALYSIS

Benchmark/MR	Present Net Value		Long-Term Sustained Yield Capacity		First Decade Allowable Sale Quantity	
	MM$ 1/	Change 2/	MMCF	Change 3/	MMCF	Change 3/
Max PNV (without MRs)	638 6		593 9		532 6	
Harvest Dispersion	583.4	-55 2	616.2	+22 3	508.1	-24 5
Old Growth	617.7	-20 9	586.5	- 7.4	506.5	-26.1
Riparian	624 1	-14 5	594 6	+ 0 7	526 4	- 6.2
Max PNV (with all MRs)	549.7	- 88.9	572.3	-21.6	477.2	-55.4

1/Discount rate equals 4 percent Present net value calculated in 1982 dollars

2/Change from the Max Present Net Value (without Management Requirements) Benchmark. Also can be interpreted as opportunity costs of the Management Requirements

3/Change from the Max Present Net Value (without Management Requirements) Benchmark.

Effects of Timber Policy Constraints - Analyzing Benchmark 7 (Max PNV with assigned values and Management Requirements), the policy of nondeclining flow results in a reduction in Present Net Value of about 1 percent when compared to a FORPLAN run utilizing sequential lower and upper harvest scheduling (20 percent variation limit per decade) First decade allowable sale quantity is reduced by 7 percent, and allowable sale quantity fluctuates throughout the planning horizon. (See Table B-23). Volume harvests tend to be higher in the early decades (1 through 5) as high-valued existing stands are liquidated, decline in the middle decades as supplies of merchantable material decline, and surge higher in the later decades (10 through 15) as regenerated stands mature and are harvested. The policy of nondeclining flow results in biological gains (exhibited by an increase in long-term sustained yield capacity).

The policy of establishing rotation age on culmination of mean annual increment results in a Present Net Value reduction of less than 1 percent, and a first decade Allowable Sale Quantity reduction of about 2 percent when compared to rotations based on minimum utilization standards (using Benchmark 7) This policy assures that timber is harvested at or beyond its maximum mean annual growth rate, as required by NFMA (36 CFR 219.16) This policy also results in biological gains, as exhibited by an increase in long-term sustained yield capacity.

Culmination of mean annual increment and 95 percent thereof was determined for each individual timber model component and management scenario. Growth potentials were based on Plant Communities of the Blue Mountains in Eastern Oregon and Southeastern Washington (Hall, 1973) and research work done (Barrett, 1979).; Cochran, 1979; Dahms, 1975) in individual timber working groups Actual timber yield tables were built using Stage's stand prognosis model, through linear regression, or through professional judgment

Once each timber yield table was developed, adjustments were made to account for mortality salvage and a reduction for defect, nonplantable sites, etc. Mean annual increments were then calculated for each stand and their individual culmination points identified Rotation age for each stand, both managed and unmanaged, was based on culmination of mean annual increment (or 95 percent thereof) of the managed stand.

It was also determined that all timber model component stands except precommercial thins and nonstocked stands were at or part culmination of mean annual increment and could be regenerated at once Those stands that were not at culmination of mean annual increment were not allowed to have regeneration harvests until they reached 95 percent of culmination of mean annual increment

TABLE B-23
SUMMARY OF TIMBER POLICY CONSTRAINTS, OPPORTUNITY COSTS, AND OUTPUT EFFECTS 1/

Constraint	Present Net Value MM$	First Decade Allowable Sale Quantity MMCF	Long-term Sustained Yield Capacity MMCF
Individual Constraint			
Nondeclining Flow	-7 2	-35 9	+69 0
Culmination of mean annual increment	-2 8	-11 6	+74.1
Combined Constraints	-7 6	-36 3	+69 1

1/Compared to Max Present Net Value (with assigned values and MRs) Benchmark.

Summary of Prescription Assignments - The following table summarizes the acres of suitable timberland by prescription for the various benchmarks

TABLE B-24
SUMMARY OF AVAILABLE TIMBER HARVEST PRESCRIPTIONS BY BENCHMARK (Acres)

Harvest Prescription	Min Level	BM 1	BM 3	BM 7 & 11	Max AUM	Max Big Game	Max Fish
Clearcut	0	651,009	693,131	457,312	172,044	287,936	457,312
Shelterwood	0	372,493	329,205	472,580	707,503	617,151	472,580
Selection	0	21,358	19,218	66,193	46,976	67,178	66,193

b. Range

All benchmarks project a substantial increase in cattle animal unit months from one through five decades, with the exception of the Maximum Big Game and Minimum Level cases

Benchmark 1 (Maximum Timber) is significantly above the current permitted level and increases to approximately 190,000 animal unit months in decade 5

Benchmark Maximum Animal Unit Months displays the highest projected increase in animal unit months. Expected increases of cattle animal unit months begin at 194,000 animal unit months in Decade 1 and increase to 273,000 animal unit months in the fifth decade.

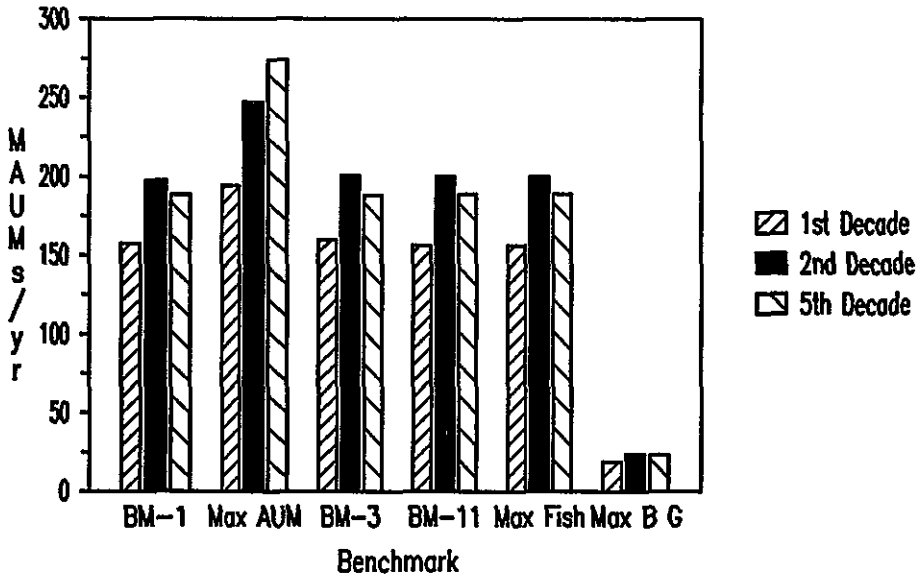
Benchmark Minimum Level provides for no permitted commercial cattle grazing.

Generally, the large projected increases in cattle animal unit months will result in grazing all suitable areas well above the amount currently permitted (See Figure B-59) Proper distribution of cattle will require high investments in stock water, fences, and intensive livestock and range management by permittees and the Forest

c. Wildlife

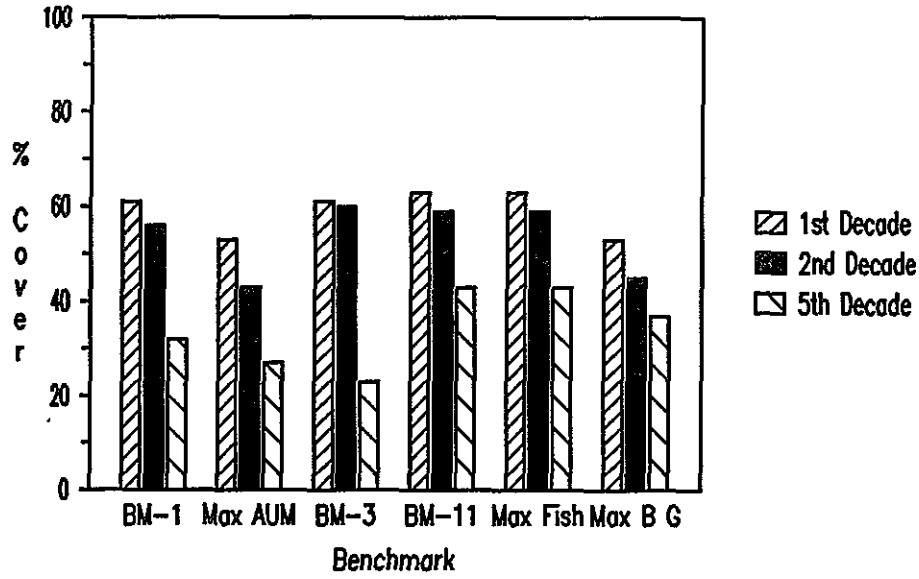
The Forest is responsible for managing big-game habitat to maintain the percentage of elk that would utilize Forest winter and summer habitat according to Oregon Department of Fish and Wildlife herd management objectives. At the present time, Oregon Department of Fish and Wildlife estimates at least 2,865 elk are wintering on the Forest. This number meets the Oregon Department of Fish and Wildlife herd-level objective for wintering elk on the Forest. Elk populations have increased in the past 8 years and wintering elk numbers will probably increase as total elk numbers on the Forest increase.

FIGURE B-59
LIVESTOCK



Elk thermal cover standards (which state that 10 percent of elk winter range will remain in thermal cover) are met in all the benchmarks during the five-decade analysis. (This differs from, and should not be confused with, the analysis method used for the alternatives, which is based on satisfactory and marginal cover applied to individual watersheds). Since no timber harvest occurs in the Minimum Level benchmark, it will be excluded in the following discussion

FIGURE B-60
BIG-GAME HABITAT CAPABILITY



Big-game cover capability increases towards optimum in all benchmarks and all show optimum big-game cover conditions for at least two of the five decades Two benchmarks show cover decreasing below 30 percent The Max Animal Unit Month benchmark produces a 28/72 cover/forage ratio in the fourth decade and 24/76 cover/forage ratio in the fifth decade However, 10 percent of the winter range would still carry thermal cover in these benchmarks. The best big-game cover condition is produced in the Maximum Big Game Benchmark (See Figure B-60)

Livestock management does not affect cover; however, cattle grazing can impact the amount of forage available for big-game use. Forage left unused by livestock on flat ground and the majority of forage found on steep ground (greater than 35 percent slope) would be available for big-game use

Habitat diversity displays the relative degree of abundance of forest successional stages. A diversity index is a number that indicates the relative degree of diversity in habitat on the Forest for each decade. A high degree of diversity reflects a healthy, stable forest community capable of supporting many wildlife species. The Max AUM Benchmark displayed a high diversity index, thus indicating *a good mixture of forest successional stages.*

Old-growth acres remain constant through all benchmarks (with the exception of Benchmarks 1 and 3). Approximately 44,860 acres of old growth were selected to meet dispersion and habitat requirements for a minimum viable population of old-growth dependent species. Additional old growth is available in the wilderness, in the Pine Creek Further Planning Area, and in the Vinegar Hill-Indian Rock Scenic Area

The amount of bald eagle winter roost habitat (both potential and active) remains constant at 4,400 acres and potential peregrine falcon eyrie sites remain constant at four sites through all benchmarks (except Benchmarks 1 and 3)

d. Water

Water yield remains constant in all decades for all benchmarks

Sediment is a function of road construction and logging, no ties to range animal unit months or practices were attempted. Livestock grazing could have a substantial affect on sediment yield With the exception of the Maximum Anadromous Fish, Maximum PNV, and Minimum Level benchmarks, sediment tends to peak in the third decade which is due to the model building most roads in that decade Sediment yield figures were adjusted to reflect building roads into the majority of unroaded areas in the first decade However, the third decade peak persists, presumably due to road construction elsewhere

e. Fisheries

The benchmark analysis makes evident the following· (1) Anadromous fish production cannot be maintained at current levels without implementation of management practices designed to meet State water quality goals for temperature and turbidity; and (2) increases in anadromous fish production can be achieved by significant expenditures in riparian area improvements and/or by a significant reduction in riparian area management activities

D. RESULTS OF THE BENCHMARK ANALYSIS

As detailed in the previous section (Section C, Benchmark Analysis) in the text and summaries of outputs, the benchmarks produce varying environmental effects and resource output levels The modeling constraints for each benchmark have been previously discussed, the following section presents the results of the benchmark analysis. Most of the results are presented in an incremental fashion; i.e., differences in benchmarks are displayed in successive fashion. The analysis which follows is largely concerned with the following benchmarks: Minimum Level Management, Maximize Timber without Management Requirements (MRs) - Benchmark 1; Maximize PNV without MRs with Assigned Values - Benchmark 3; Maximize PNV with MRs with Assigned Values - Benchmark 7, and Maximize PNV with MRs with Market Values - Benchmark 11. The analysis completed for other benchmarks (Max AUM, Max Anadromous Fish, and Max Big Game), whose primary purpose was to generate upper production limits for specific resource outputs, was detailed in Section VI.C, Benchmark Analysis. The Current Situation benchmark is identical to the No Action Alternative which is discussed in Section VIII of this Appendix; consequently, the Current Situation Benchmark is not discussed in detail here

As stated before, the results of the benchmark analysis are based on the FORPLAN model used for the Draft Environmental Impact Statement, and have not been updated for changes included in the Final Environmental Impact Statement. This does not affect the comparability of the benchmarks with each other.

1. Economic Comparisons

Table B-25 displays major economic results of Benchmarks 1, 3, 7, 11, and Minimum Level The Present Net Value calculations for the benchmarks range from a high of $557 5 million for Benchmark 3 to a low of $67 9 million for the Minimum Level Benchmark. These economic comparisons have been updated from the Draft Environmental Impact Statement to reflect the revised Forest cost package. The largest changes in total discounted costs and benefits are related to management of the timber resource Correspondingly, benefits from range management will fluctuate as the timber output changes. Timber and forage production are part of the joint production structure of the forest ecosystem Forage production from the transitory range following a timber harvest will change as the number of acres cut and, therefore, the total volume harvested changes.

TABLE B-25
ECONOMIC COMPARISONS (Millions of 1982 Dollars)

Benchmark (ranked in order of decreasing PNV)	Present Net Value $MM	Present Net Value Change	Opportunity Cost	Benefits Discounted $MM	Benefits Discounted Change	Discounted Costs $MM	Discounted Costs Change	First Decade Payments to Counties $MM	First Decade Payments to Counties Change
BM-3	557 5		0	862 0		304.5		10.4	
		-30 5			- 3.1		+27 4		-0.9
BM-1	527.0		30 5	858.9		331 9		9 5	
		-54.4			-84.6		-30 2		-2 5
BM-7	472.6		84 9	774 3		301.7		7.0	
		-106.5			-106.5		0		0
BM-11	366 1		191 4	667 8		301 7		7 0	
		-298 2			-564 8		-266.6		-7.0
BM-Min	67 9		489 6	103 0		35 1		0	

TABLE B-25 (continued)
ECONOMIC COMPARISONS (Millions of 1982 Dollars)

Benchmark (ranked in order of decreasing PNV)	Decade 1 Gross Receipts	Gross Receipts Change	Net Receipts	Net Receipts Change	Noncash Benefits	Noncash Benefits Change
BM-3	41 8		25 4		4 3	
		-3 8		-6 0		+2.1
BM-1	38 0		19 4		6.4	
		-10 1		-5 5		-0 1
BM-7	27 9		13 9		6.3	
		0		0		-6.3
BM-11	27 9		13.9		0	
		-27 9		-13.9		+2.2
BM-Min	0		0		2 2	

BM-1 Max. Timber
Max. PNV/MRs (assigned values)
BM-Min Minimum level benchmark
BM-3 Max PNV BM-7
BM-11 Max. PNV/MRs (market values)

Tables B-26 and B-27 display the benchmarks ranked by increasing discounted costs and decreasing discounted benefits Also displayed in these tables are the costs or contributions to the totals by individual resource group. These tables are useful for evaluating the major sources of costs and benefits among the benchmarks.

TABLE B-26
COST COMPARISONS BY RESOURCE GROUP (MILLIONS OF 1982 DOLLARS)

Benchmark (ranked in order in increasing discounted costs)	Discounted Costs by Resource Group							
	Total Discounted Costs	Timber	Change	Wildlife	Change	Range	Change	Other Resource	Change
BM-Min	35.1	.2		0		.3		34 6	
			+166.8		0		+35.8		+58.1
BM-11	301.7	167.0		5.9		36.1		92 7	
			0		0		0		0
BM-7	301.7	167.0		5 9		36.1		92 7	
			+2 1		0		0		+0 7
BM-3	304.5	169.1		5.9		36 1		93.4	
			+20.3		0		0		+7.1
BM-1	331.9	189.4		5.9		36 1		100.5	

TABLE B-27
BENEFIT COMPARISONS BY RESOURCE GROUP (MILLIONS OF 1982 DOLLARS)

Benchmark (ranked in order of decreasing discounted benefits)	Discounted Benefits by Resource Group							
	Total Discounted Benefits	Timber	Change	Wildlife	Change	Range	Change	Other Resource	Change
BM-3	862.0	708.3		76.6		55 8		21.3	
			-7.2		+5.0		-0.7		-0.2
BM-1	858.9	701.1		81 6		55.1		21.1	
			-88.7		0		-0.2		+4 3
BM-7	774 3	612.4		81.6		54 9		25 4	
			0		-80.8		-0.3		-25 4
BM-11	667 8	612.4		0.8		54 6		0	
			-611.7		+75 8		-54.2		+25.3
BM-Min	103.0	0 7		76.6		0 4		25 3	

6/Primarily road construction, reconstruction, and maintenance related to timber management. Category includes general administration, fire protection, wilderness, lands, minerals, soil and water, and special use management

BM-1 Max. Timber BM-3 Max. PNV BM-7
Max. PNV/MRs (assigned values) BM-11 Max. PNV/MRs (market values)
BM-Min Minimum level benchmark

2. Physical Comparisons

A comparison of the physical outputs of the range of benchmarks is presented in Table B-28. The differences in the outputs of the benchmarks vary widely because of the characteristics of the benchmarks For example, the Minimum Level Benchmark projects physical outputs/effects on one extreme of the spectrum of possible Forest management strategies. Similarly, the Maximum Present Net Value without Management Requirements and Assigned Values Benchmark (BM-3) projects physical outputs/effects on the other extreme of the Forest management strategy spectrum Every benchmark has a different emphasis, which results in different mixes of goods and services Table B-28 displays the prominent physical outputs of the benchmarks

TABLE B-28
COMPARISON OF PHYSICAL CHARACTERISTICS OF THE BENCHMARKS

Benchmark (Ranked in order of decreasing PNV	First Decade Average Annual Timber Harvest		Long-Term Sustained Yield Capacity		Suitable Timber Lands	
	MMBF	Change	MMCF	Change	1,000 Acres	Change
BM-3	317 5		64 4		1,041.6	
		+ 9 1		+ 4 4		+3 3
BM-1	326 6		68 8		1,044 9	
		- 41 8		- 7 1		- 48.8
BM-7	284.8		61 7		996.1	
		0		0		0
BM-11	284 8		61 7		996.1	
		-284 8		N/A		+ 48 8
BM-Min	0		N/A		1,044.9	

TABLE B-28 (continued)
COMPARISON OF PHYSICAL CHARACTERISTICS OF THE BENCHMARKS

Benchmark (Ranked in order of decreasing PNV	Permitted Range Use		First Decade Changes in Employment		Unroaded Areas Retained	
	1,000 AUM	Change	Jobs	Change	1,000 Acres	Change
BM-3	159		+ 830		0	
		- 2		+ 77		0
BM-1	157		+ 907		0	
		- 1		-353		0
BM-7	156		+ 554		0	
		0		0		0
BM-11	156		+ 554		0	
		-156		-2,506		+180 9
BM-Min	0		-1,952		180 9	

BM-1 Max. Timber BM-3 Max PNV BM-7
Max PNV/MRs (assigned values) BM-11 Max PNV/MRs (market values)
BM-Min Minimum level benchmark

TABLE B-28 (continued)

COMPARISON OF PHYSICAL CHARACTERISTICS OF THE BENCHMARKS

Benchmark (Ranked in order of decreasing PNV	Decade 1 Big-Game Use 1,000 WFUDs	Change	Decade 1 Anadromous Fish Use 1,000 WFUDs	Change	Decade 5 Old Growth Retained 1,000 Acres	Change
BM-3	72.1		22 3		0	
		+ 0 6		0		0
BM-1	72 7		22.3		0	
		+32 9		+1 4		+44 8
BM-7	105.6		23 7		44.8	
		0		0		0
BM-11	105.6		23 7		44 8	
		-56 5		+6 5		N/A
BM-Min	49.1		30.2		N/A	

BM-1 Max Timber BM-3 Max. PNV BM-7
Max PNV/MRs (assigned values) BM-11 Max PNV/MRs (market values)
BM-Min Minimum level benchmark

3. **Summary**

The following discussion details the tradeoffs occurring within individual benchmarks (e.g., in Benchmark 3, there are tradeoffs of physical outputs such as retained unroaded area acres or retained old-growth acres for higher timber harvests, which translates into higher Present Net Value). Also detailed are the differences between benchmarks. As an example, the differences between Benchmarks 3 and 7 are primarily the imposition of Management Requirements, which results in more acceptable resource management but some losses of economic efficiency (i.e., Present Net Value)

a. Benchmark 3

Benchmark 3 has the highest Present Net Value of all benchmarks, a logical result of the constraint set imposed on this benchmark and the corresponding objective function This benchmark determined the Maximum Present Net Value that could be generated by Forest management activities without Management Requirements Timber policy constraints were utilized, however (i e , nondeclining flow, ending inventory requirements, and rotations based on 95 percent of culmination of mean annual increment) This benchmark has a lower timber harvest level than Benchmark 1 (Max Timber BM) but a higher net present value The reason for this difference is that the Max Timber Benchmark (BM 1) maintains timber harvest levels which incur higher discounted costs, and harvests smaller, lower-valued material (although total harvests are higher) For the Malheur National Forest, timber harvest and permitted grazing levels are the major resource elements generating Present Net Value

The maximization of Present Net Value with minimal consideration of nonpriced resources or outputs results in physical tradeoffs The tradeoffs result in near-maximal levels of priced commodity outputs (i.e , timber harvest and permitted grazing levels) at the expense of nonpriced resources. Examples of nonpriced resource tradeoffs under this benchmark include no acres of unroaded areas retained under unroaded management prescriptions, no acres of old growth retained intentionally, and less wildlife benefits than under Benchmarks 1 and 7 Range outputs are maximized (in comparison to Benchmarks 1, 7, 11, and Minimum Level Management, the Max animal unit month benchmark generates the absolute grazing capacity maximum). Benchmark 1 does not have Management Requirements to maintain State water quality standards As a result, anadromous fish production would decrease from the current level. Actual implementation (although not a possibility) would result in intensive and extensive timber management activities, a substantially lowered visual quality on the Forest, and reductions below acceptable levels in wildlife habitat for management indicator species

b. Benchmark 1

This benchmark generates less Present Net Value than Benchmark 3 but more than any of the other benchmarks. The objective of this benchmark is to establish the maximum amount of timber that can be harvested on a sustained yield basis on the Malheur National Forest. The Present Net Value loss ($30 million), when compared to Benchmark 3, is due to investments forced for timber production maximization that result in economic efficiency losses Of the benchmarks discussed here, Benchmark 1 incurs more discounted costs than any other, primarily timber-growing investments

The maximum outputs of timber harvests would support more employment opportunities than any other benchmark Similarly, the long-term sustained yield capacity of this benchmark is the highest of all benchmarks Suitable timber land acreage is higher than any other benchmark; correspondingly, there would be little opportunity to retain old-growth habitat or unroaded areas in their current condition Permitted grazing use would be high, reflecting the compatibility of timber harvesting and grazing on transitional range Resource damage may occur in some areas (e g., soil, water, wildlife) because of the intensity of timber management practiced throughout the Forest. Benchmark 3 does not have Management Requirements to maintain State Water Quality Standards As a result, anadromous fish production would decrease from the current level

c. Benchmark 7

Benchmark 7 is an important benchmark from a comparative standpoint This benchmark is used as the upper bound of economic efficiency for comparison to the alternatives considered in detail. Benchmark 7 provides a management strategy base for the generation of some alternatives, particularly the commodity-oriented *alternatives This benchmark also establishes the costs associated with* Management Requirements The adjustment for Management Requirements under this benchmark results in a substantial Present Net Value drop ($84 9 million), when compared to Present Net Value generated under Benchmark 3. These Management Requirements result in resource protection for wildlife, fish, soil, and water as required by NFMA regulations defined in 36 CFR And finally, this benchmark displays the value of resource outputs with assigned values ($106 5 million), this amount is the difference between Benchmark 7 and Benchmark 11 (Benchmark 11 is the Max PNV with MRs and Market Values Benchmark).

This benchmark results in a 13 percent reduction in timber harvest when compared to the Max Timber Benchmark (BM 1) When compared to the Max Present Net Value Benchmark (BM 3), the timber harvest reduction due to the implementation of Management Requirements is about 10 percent The drop in commodity outputs, namely timber harvest, results in less employment opportunities than under Benchmarks 1 and 3. Long-term sustained yield capacity and the acres of suitable timber land under this benchmark are correspondingly lower when compared to Benchmarks 1 and 3. Because of the implementation of Management Requirements, there are increases in wildlife habitat diversity as more acreage is dedicated to old growth. This benchmark does not dedicate any acres to unroaded area prescriptions; however, some old growth is retained to ensure compliance with the Management Requirements. Among the Management Requirements provided for in Benchmark 7 are those necessary to meet State water quality standards. One of the results of this is that anadromous fish production would be maintained at or near the current level.

d Benchmark 11

This benchmark is similar to Benchmark 7 with the exception that resource outputs *that do not have market values are not valued (i.e , do not contribute to Present* Net Value) This benchmark establishes the maximum Present Net Value that can be generated from Forest management activities when only resource outputs with market values are considered. Examples of resource outputs not valued under this benchmark include wildlife and fish user days, recreation visitor days, and wild horse grazing on the Forest. Gross receipts and payments to counties are the same as Benchmark 7 because the production of priced commodity outputs is the same.

The physical characteristics of this benchmark are similar to those of Benchmark 7. The similarities are due to the fact that Benchmarks 7 and 11 have essentially the same management strategy and corresponding resource outputs, the major difference is the identification of the Present Net Value of resource outputs without market values.

e Minimum Level Management

This benchmark establishes the minimum funding level required for the Forest and the associated tradeoffs that would be required if this benchmark were in effect The costs of this benchmark are the lowest of all benchmarks and alternatives; annual Forest expenditures would be $1 4 million which is 12.6 percent of the average Forest budget in recent years (1983-85). The opportunity cost if the Forest were managed at this level is very high, $481.1 million. The high opportunity costs are primarily due to foregone timber harvests and permitted grazing prohibition The employment impacts on the Forest zone of influence would result in large decreases.

VII. FORMULATION OF ALTERNATIVES

A. OVERVIEW

Each Forest Plan alternative is a unique combination of land assignments, Management Prescriptions, and activity schedules As a result, each alternative would generate a different mix of goods, services, and environmental effects According to National Forest Management Act (36 CFR 219 12f), alternatives must

- Be distributed within the minimum and maximum resource potentials to reflect to the extent practicable the full range of major commodity and environmental resource uses and values that would be produced from the Forest;

- Reflect a range of resource outputs and expenditure levels;

- Be formulated to facilitate analysis of opportunity costs, and of resource use and environmental tradeoffs among alternatives, and between alternatives and benchmarks;

- Be formulated to facilitate evaluation of effects on present net value, benefits, and costs of achieving various outputs and nonpriced benefits;

- Provide different ways to address and respond to major public issues, management concerns, and resource opportunities identified during the planning process,

- Be formulated to require changes in existing laws and policies, to implement if reasonable and necessary, to address major public issues, management concerns, or resource opportunities,

- Respond to and incorporate the Resource Planning Act Program tentative resource objectives for the Forest in at least one alternative,

- Reflect the current level of goods and services provided by the Forest, and the highest level of goods and services that would be provided in the future if current management direction continues in at least one alternative (the "no action" alternative pursuant to National Environmental Policy Act;

- Represent, to the extent practicable, the most cost-efficient combination of Management Prescriptions examined that can meet the objectives established in each alternative;

- State the conditions and uses that will result from long-term application of the alternative,

- State what goods and services will be produced, including timing and flow of outputs and associated costs and benefits,

- State resource management standards; and

- State the purposes of the proposed management direction.

Formulation of Alternatives, planning step five, followed the Analysis of the Management Situation Benchmarks from this analysis defined the range within which alternatives were developed In addition, seven alternatives were required.

No Change Alternative: The No Change alternative, Alternative NC, was developed in response to decisions made regarding appeal number 1588, brought by the Northwest Forest Resources Council on May 19, 1986 The appeal questioned the *decision by the Regional Forester to "require inclusion of minimum management* requirements in the No Action 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 the Forest Plan Draft Environmental Impact Statements. In response to this, a No Change Alternative was developed which represented the existing 1979 Timber Resource Management Plan Existing direction in applicable unit plans was also utilized when those plans did not contradict the direction of the Timber Resource Plan.

No Action (Current Direction); This is the alternative of "no action" required by the Council of Environmental Quality regulations (40 CFR 1502.14) This alternative would continue the management of the Forest as defined by existing direction in approved management plans. It assumes continuation of existing policies and standards; current budget levels updated for changing costs over time; and, to the extent possible, production of current levels and mixes of resource outputs

Alternative A is the No Action alternative in this Final Environmental Impact Statement

Emphasis on the Current Resource Planning Act Program· This alternative will determine how the current (1980) Resource Planning Act program distributed to the Forest through the Regional Guide could best be implemented.

Alternative B was the current Resource Planning Act program alternative in the Draft Environmental Impact Statement This has not been carried forward, but is approximated by alternative B-Modified

Emphasis on Market Opportunities· This alternative has an emphasis on outputs that have an established market price (timber, livestock forage, commercial fish, developed recreation opportunities, and minerals) Management for other resources will be at economically and environmentally feasible levels consistent with the emphasis on market-oriented outputs

Alternative B was also the alternative in the Draft Environmental Impact Statement which emphasized market opportunities, as well as meeting RPA requirements This has been modified to reflect input from the timber industry and attributes of the *Preferred-Plus alternative It has been brought forward to the Final* Environmental Impact Statement as alternative B-Modified

Emphasis on Nonmarket Opportunities· This alternative has emphasis on 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.

Alternative C was the alternative in the Draft Environmental Impact Statement which emphasized nonmarket opportunities. This has been modified to reflect concerns of the environmental community and attributes of the Citizens Multiple Use Alternative, and has been brought forward to the Final Environmental Impact Statement as alternative C-Modified.

Emphasis on Dispersed Unroaded Recreation and Intensified Management· This alternative designates a large portion of the roadless areas on the Forest as dispersed unroaded recreation while increasing commodity production on those areas already roaded Its purpose is to balance the economic effects of not beginning commodity production in roadless areas It also attempts to reduce potential cumulative effects of management activities on National Forest and adjacent forest lands.

Alternative G was the alternative which best emphasized dispersed unroaded recreation and intensified management in the Draft Environmental Impact Statement It has been dropped in the Final Environmental Impact Statement due to lack of broad public support and close similarity with other alternatives

Departure Alternative One alternative in the Draft Environmental Impact Statement was the "departure" alternative. It had the same land assignment and resource Management Prescriptions as the alternative that it was based upon. However, the timber harvest schedule had been modified from the base sale schedule which resulted in nondeclining flow of timber, never exceeding the long-term sustained yield capacity of the Forest In most cases, management under a departure alternative results in higher volumes of timber harvested in the near future and lower volumes of timber available in the intermediate future The ability of the Forest to produce timber in the long run is no less than that of the alternative upon which the departure was based

The departure alternative (F-Dep) was not considered in detail in the Final Environmental Impact Statement because of lack of public comments pertaining to this alternative, and it was not needed in the Final Environmental Impact Statement to display the complete range of alternative management strategies The process used to derive alternatives is outlined below as a series of steps. Some of these took place concurrently

- Major public issues, management concerns, and opportunities were identified through public and internal meetings and Forest Plan Reports See Appendix A for additional detail

- A comprehensive multiresource data base was formed based on the identified issues and concerns and stored in a computer system.

- A set of Management Prescriptions was prepared to represent a variety of possible ways and intensities to manage the Forest in response to the issues, concerns, and opportunities

- Analysis areas which represent 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

- A determination of the appropriate Management Prescriptions to be considered for each analysis area was made.

- The costs of applying Management Prescriptions to analysis areas, and the outputs and resource values which would result, were estimated

- Demand for various outputs was estimated

- A FORPLAN model was developed for the Forest, incorporating the information developed in the preceding steps A detailed description of the FORPLAN model is found in Section III of this Appendix.

- During the Analysis of the Management Situation, supply potentials were determined using the FORPLAN computer model and other techniques. Various assumptions, constraints, and objectives were used to establish benchmarks for supply potentials of each resource. A benchmark was established for maximum present net value. Existing resource supply and projected demand were compared. Opportunities to resolve issues and management concerns were explored by comparing existing and projected demand to potential production levels. These potentials, when compared to the No Action, indicate opportunities and/or need for change.

- Alternative goals and objectives were established to provide a broad range of options for future management of the Forest and to provide a broad range of responses to the Forest's planning problems.

- Eight alternative land assignments (Alternatives A, B, C, D, E, F, G, and H) were mapped to meet the goals and objectives established above. The land assignments for these were modeled in FORPLAN. Additional objectives were modeled as constraints. FORPLAN computer runs were made on these alternatives using an objective function of maximization of present net value over the 15-decade modeling horizon. This objective function was used for all alternatives to assure that the most cost-efficient solution possible was achieved, given the other goals and objectives of the alternatives.

Two other alternatives, the No Change Alternative and the F-Departure Alternative, were also generated using different formulation processes

- Alternative F-Dep was developed in the Draft Environmental Impact Statement as a departure based on Alternative F, the preferred alternative A number of departures from the base sale schedule developed for Alternative F were examined. As finally configured, Alternative F-Dep had the same land assignments as Alternative F but intensified harvest in those stands which have experienced severe defoliation due to spruce budworm infestations and other damaging agents. Alternative F-Dep was not considered in the Final EIS.

- The No Change Alternative was developed in response to decisions made regarding appeal number 1588, brought by the Northwest Forest Resource Council on May 19, 1986. The appeal centered on direction by Regional Forester James F. Torrence to "require inclusion of Minimum Management Requirements in the No Action 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 Environmental Impact Statements. In response to this, a No Change Alternative was developed which represented the existing 1979 Timber Resource Management Plan Existing direction in applicable unit plans was also utilized when those plans did not contradict the direction of the Timber Resource Plan.

Alternatives A, B-Modified, C-Modified, F, and NC have been brought forward and are described in detail in Chapter II of the Final Environmental Impact Statement. Alternative I was developed in response to public comments on the Draft Environmental Impact Statement. The intent of this alternative is to balance land assignment between amenity values and commodity-production emphasis

based on public sentiment. These land assignments were modeled in FORPLAN, and any additional objectives were modeled as constraints similar to other alternatives

Table B-29 below summarizes the disposition of alternatives.

TABLE B-29.
DISPOSITION OF FULLY-DEVELOPED ALTERNATIVES CONSIDERED IN FINAL EIS

	Alternatives													
Treatment in EIS	A	B	B Mod 1/	C	C Mod 2/	D	E	F	F Dep	G	H	I Pre 3/	NC	Current Directn Bnchmk4/
Alternative listed in Draft EIS	X	X		X		X	X	X	X	X	X		X	X
Alternative listed in Final EIS	X		X		X			X				X	X	X
DEIS Alternatives eliminated in FEIS		X		X		X	X		X	X	X			
New Alternatives brought into FEIS			X		X							X		

1/ Alternative B-Modified represents a change in Alternative B (RPA) related to proposals by timber industry representatives following release of the draft EIS Alternative B-Mod is a new commodity-oriented alternative

2/ Alternative C-Modified represents changes made to Alternative C, in response to comments from environmental community representatives following release of the draft EIS. Alternative C-Mod is a new amenity-oriented alternative

3/ Preferred Alternative I.

4/ Current Direction Benchmark with incorporation of National Forest Management Act (NFMA) requirements, which is Alternative A in this FEIS

B. CONSTRAINTS COMMON TO ALL ALTERNATIVES

Some constraints and prescriptions were common or constant in all the alternatives. These were necessary to meet planning requirements, existing laws or policies, or the objectives of prescriptions These are discussed below. Prescriptions which varied by alternative are discussed in the alternative descriptions.

1. Administrative Designation

Constraint. Some areas on the Forest will not vary by alternative These include two Congressionally designated wildernesses, one established and three proposed research natural areas (except Alternative NC, which proposes no additional research natural areas, and Alternative I which proposes four)

Purpose To perpetuate and protect the values and resources for which these areas were established

Rationale: *The management of these areas was (or will be) established and we did* not have the authority to consider a wide range of choices or prescriptions.

Tradeoff: Impacts of this assumption were not analyzed because it was beyond the scope of this planning process. Present net value and commodity production would decrease. The amounts are unquantified, however.

2. Suitability

Constraint: Timber harvest can be scheduled only on lands classified as tentatively suitable for timber harvest through the Stage I suitability analysis. See Table III-3 in Chapter III of this Final Environmental Impact Statement for acreages (except Alternative NC, which uses the land classification in the 1979 Timber Resource Management Plan).

Purpose: To meet the timber resource land suitability requirements of National Forest Management Act (36 CFR 219.14).

Rationale: The Allowable Sale Quantity must be determined using only tentatively suitable lands

Tradeoff: Impacts of this assumption were not analyzed. All unsuitable lands are thus classified because of regeneration difficulty or wilderness designation. Use of these lands for timber would be contrary to National Forest Management Act.

3. Nondeclining Flow

Constraint: All alternatives discussed in the FEIS have nondeclining flow constraints on sawtimber. This means that the harvest in any given decade cannot be less than that of the preceding decade

Purpose: To meet the timber scheduling requirements of National Forest Management Act (36 CFR 219 16(a)(1)).

Rationale: To provide a steady supply of timber

Tradeoff: The impact of this constraint would vary among alternatives For Alternative F, relaxing this constraint to a 20 percent upper and lower bound in the first decade resulted in an increase of 0 14 percent in present net value, an increase of allowable sale quantity in the first decade of 6 9 percent, and a decrease in total allowable sale quantity over 15 decades of 0 05 percent.

4. Long-term Sustained Yield Capacity

Constraint: The harvest level of the last harvest period will be less than or equal to long-term sustained yield.

Purpose To meet the timber scheduling requirements of National Forest Management Act (36 CFR 219 16(a)(1)).

Rationale: This constraint, in combination with the nondeclining flow constraint, ensures that timber harvest will never exceed the long-term ability of the Forest to supply timber.

Tradeoff. The impact of this constraint was not analyzed separately

5. Ending Inventory Volume

Constraint. Control the amount of inventory volume left at the end of the planning horizon

Purpose: Assure that the total inventory volume left at the end of the planning horizon will equal or exceed the volume that would occur in a regulated forest

Rationale: The ending inventory constraint controls age-class distribution through the planning horizon to assure that the base harvest schedule concludes with a regulated volume in perpetuity.

Tradeoff: Present net value and allowable sale quantity may be reduced in certain decades due to maintaining the proper age-class distribution for future harvests. The specific impacts are unquantified, however.

6. Minimum Rotation Length

Constraint. Timber stands could not be scheduled for harvest prior to reaching 95 percent of culmination of mean annual increment

Purpose To comply with the National Forest Management Act regulations (36 CFR 219.16(a)(2)(iii))

Rationale. Timber stands could potentially be scheduled for harvest as soon as they met minimum merchantability requirements, particularly under an objective of *present net value maximization*

Tradeoff: This constraint results in small reductions in present net value. Biological production is increased over time, however.

7. Dispersion

Constraint A dispersion constraint was used in all alternatives to achieve cutting-unit sizes that did not exceed 40 acres in size for clearcuts and left logical cutting units in between Similarly, an 80-acre constraint was used for shelterwoods and overstory removals

Purpose To comply with the National Forest Management Act regulations (36 CFR 219 27(d) and (f)) and to address watershed, wildlife diversity, and visual management concerns

Rationale The model potentially could have harvested an entire analysis area in one decade without such a constraint

Tradeoff The impact of this constraint would vary among alternatives. It resulted in a 2.45 million cubic feet reduction in average annual production when applied to Benchmark 3, Max PNV without MRs.

8. Diseased Lodgepole

Constraint A constraint was applied to force all disease-susceptible lodgepole stands to be harvested in the first decade.

Purpose: To restore lodgepole stands on the Forest to a healthy condition.

Rationale. Using a minimum volume constraint of small (2 7 million cubic feet) magnitude in FORPLAN accomplishes the objective

Tradeoff: Impact of this constraint is insignificant in any alternative. The result of not implementing this action would be to prolong the disease problems with adverse future impacts.

Note. This constraint applies to the benchmarks only. For the alternatives, all the diseased lodgepole is removed by the prior harvest update before the start of the planning period.

9. Mixed Conifer Steep Ground Harvest

Constraint: For all alternatives, a constraint was applied to force the harvest of at least 10,000 acres of mixed conifer on steep ground in each decade.

Purpose: To assure consistency between level- and steep-ground harvest from period to period, and to lessen impacts on operations.

Rationale. Using this minimum area constraint accomplishes the stated purpose. Omitting it causes steep-ground harvest volumes to fluctuate in an unacceptable manner.

Tradeoff: The constraint has no significant effect on overall outputs in any alternative. It does improve the accuracy of representing the actual situation in the model.

Note· This constraint was not necessary in the revised (watershed based) Forplan model, since satisfactory harvest distribution was obtained without its use

10. Riparian

Constraint: For all alternatives, the Riparian Management Area prescriptions for non-anadromous (MA 3A) and anadromous streams (MA 3B) were applied to a variable width area around riparian zones.

Purpose· To meet management requirements for soil and water (36 CFR 219.27(e)).

Rationale: Less intensive management practices than might otherwise be applied are necessary in these areas to meet management requirements

Tradeoff: The impact of this constraint would vary among alternatives. It resulted in a 0 6 million cubic feet reduction in average annual production when applied to Benchmark, Max PNV without MRs.

Note: Additional changes were made since the publication of the Draft EIS. They are (1) removal of the stream channel area from the tentatively suitable land base, and (2) adoption of modified prescriptions to extend rotations and leave more structural material on site Change (1) results in a reduction of about 0.2 million cubic feet, and (2) in a reduction of about 80 percent in riparian timber outputs. These changes apply to the alternatives, but not to the benchmarks. See process paper "Calculation of fractions of riparian analysis areas sent to MINLVL" (Lindley, 2/2/90).

11. Old Growth

Constraint: Old-growth units are dedicated and managed according to Regional guidelines for distribution and amount to meet Management Requirements for old-growth dependent species See the Old-Growth Management Area (MA 13) in the Forest Plan for a detailed description (except Alternative NC).

Purpose: To meet Management Requirements for old-growth dependent species (36 CFR 219 27(e))

Rationale: Old-growth units of the proper size and distribution might not have been maintained without this constraint. This was the most efficient way to meet Management Requirements for old-growth-dependent species.

Tradeoff. The impact of this constraint varies among alternatives. It results in a 2.6 million cubic feet reduction in average annual production when applied to Benchmark, Max PNV without MRs

12. Scenic

Constraint. Harvest scheduling constraints were applied to the Scenic Viewshed Management Area (MA 14) in every alternative No more than 25 percent of the area assigned to the Scenic Viewshed Management Area could be harvested in any given decade In addition, uneven-aged timber management was used in foreground areas

Purpose. To meet the visual resource quality objectives of the prescriptions.

Rationale. The model could have scheduled a level of timber harvest that would not have met the objectives of these prescriptions without the constraints

Tradeoff: There are timber harvest reductions, and consequently present net value reductions, due to the selection of prescriptions which result in less intensive timber management.

13. Wild & Scenic Rivers

Constraint. Areas designated as wild and scenic rivers were treated as visual corridors and assigned to visual prescriptions.

Purpose. To comply with the Omnibus Oregon Wild and Scenic Rivers Act of 1988

Rationale. Not applicable

Tradeoff Not applicable

The items discussed above are common to all the alternatives The variation in the alternatives occurs largely as a result of applying different Management Prescriptions to different areas of the Forest

C. DEVELOPMENT OF ALTERNATIVES

Benchmarks defined the minimum and maximum output levels of Forest resources and the outputs associated with current management. The Maximum PNV benchmark (Benchmark 7) identified the most efficient land assignment and schedule of activities and outputs, given the information quantified in FORPLAN. This provided a starting point for the formulation of each alternative Land assignments and output levels were varied by alternative to better resolve mixes of issues, concerns, and opportunities This resulted in a decrease in present net value compared to the Maximum PNV benchmark However, many of the changes which reduce present net value result in increases in net public benefits due to improving factors which are not valued in the present net value calculation. The constraints associated with each alternative reflect the Forest Management Team's best estimate of the most cost-efficient method of achieving the goals and objectives of the alternative.

The following discussions focus on the development of each alternative. Numerous repetitions occurred for some alternatives where prescriptions or schedules were adjusted to better accomplish goals and objectives. The final sets of constraints and objectives for each alternative follow Each alternative has a unique blend of constraints, resulting in differences in economic value among the alternatives. Consequently, the cumulative effect of constraints is displayed, for specific information on individual constraints, refer to the benchmark analysis section. Detailed descriptions of the alternatives are found in Chapter II of the Final Environmental Impact Statement

For information on the effect of the culmination of mean annual increment constraint, refer to Section VI, Timber Policy Constraints Section.

1. Alternative A

This is the No Action Alternative It was formulated to maintain the current management direction of the Forest. Sources of that direction were· Timber Resource Management Plan (1979), John Day Unit Plan, Malheur-Silvies Unit Plan, and North Fork Unit Plan. This direction was updated to comply with current law and regulations.

Alternative A portrays how these plans would influence the flow of goods and services over the life of this plan (10-15 years) based upon the use of current National Forest Management Act of 1976 planning data It also approximates the current budget. Management Requirements were included as constraints in this alternative.

a. Criteria and Assumptions

The criteria and assumptions underlying the development of this alternative are.

- Achieve the common alternative constraints discussed earlier.

- Simulate the management most likely to be carried out into the future if current direction is followed.

- Visual quality objectives reflect the current management of the Forest

- Suitability for timber production is based on the latest study, not the currently approved Timber Resource Management Plan

- Classified Special Area The Vinegar Hill-Indian Rock Scenic Area is included in Management Area 7 (Scenic Viewshed)

- Special Interest Areas· Magone Lake, Cedar Grove, and Tex Bridge are included in Management Area 8.

Land assignment is defined by currently approved plans, as follows.

- Except where needed to meet multiple-resource management objectives, all tentatively suitable timber lands are assigned to Timber Production Management Emphasis.

- Some harvested areas are managed intensively for range. Grass and grass-like forage is utilized to 70 percent in riparian areas

- Snag habitat is managed at 40 percent of potential population in timber and range emphasis areas, and 60 percent of potential population in wildlife emphasis areas.

- Elk winter range is managed to maintain winter range habitat within wildlife emphasis areas. To achieve desired HEI values, satisfactory cover within winter range only is maintained at 10% minimum (i e. 15 +/- 5%), and total cover at 40 +/- 10% on winter range and 40 +/- 15% on summer range, where site conditions do not impose lower limits.

- All sensitive Forest travel corridors are managed for visual quality using unit plan boundaries.

- The North Fork Malheur, McClellan Mountain, Malheur River, Pine Creek, Vinegar Hill-Indian Rock Scenic Area, and Glacier roadless areas are retained as roadless areas, using boundaries displayed in unit plans (Total of 58,600 acres.)

b Constraints

In addition to the common alternative constraints, the following additional constraint was used to meet the criteria and assumptions are:

Prescriptions were constrained to analysis areas to reflect the current land assignment The acreage by Management Prescription is shown in Chapter II, Table II-4

- o Percentage of manageable understories set by watershed to be consistent with 62 percent overall

Present net value is reduced by 36 percent compared to the Maximum PNV benchmark (Benchmark 7). (See Table B-30.) Many factors which are not accounted for in the PNV calculation are significantly improved under Alternative A (e. g., more visually pleasing Forest landscape). Table II-5 in Chapter II of the Final Environmental Impact Statement presents a wide range of outputs and effects for this alternative and the Maximum PNV benchmark The differences between them are due to differences in land assignments.

TABLE B-30
COMPARATIVE ECONOMICS OF ALTERNATIVE A

FORPLAN RUN	Present Net Value $MM	Discounted Costs $MM	Discounted Benefits $MM	1st Decade ASQ MMCF/Yr
Benchmark 7 1/ (Maximum PNV)	472	302	774	47 7
Alternative A with land assignment constraints	300	277	577	38.6

1/Derived from Draft EIS FORPLAN model

2. Alternative B-Mod

This alternative emphasizes the production of resources such as timber, forage, developed recreation, minerals, and other resources which have the potential to return revenue to the Federal Treasury and local counties. Management of other resources is at economically and environmentally feasible levels consistent with the emphasis on market-oriented outputs. This alternative also reflects timber industry input and the attributes of the Preferred-Plus alternative.

This alternative was developed to meet the 1980 Resources Planning Act program which has been assigned to the Forest through the Regional Guide

a Criteria and Assumptions

The criteria and assumptions underlying the development of this alternative are:

- Achieve the common alternative constraints discussed earlier.
- Achieve 1980 Resource Planning Act targets as allocated to the Forest by the Regional Guide.

- Emphasize market-oriented outputs

Land assignments are as follows:

- Except where needed to meet multiple-resource management objectives, all tentatively suitable timber lands are assigned to Timber Production Management Emphasis.

- Meadows of less than 35 percent slope, and some harvested areas, are managed intensively for range. Livestock use is excluded immediately adjacent to anadromous fish streams in unsatisfactory condition.

- Old-growth and snag habitat is provided at minimum viable population level Forest-wide (40% of potential population level). Riparian areas and areas immediately adjacent to riparian areas are managed at 80 and 50 percent of potential population levels, respectively.

- Elk winter range is managed to maintain winter range habitat on 11 of 14 potential winter range areas. Satisfactory cover is maintained at a minimum of 5% on winter and summer range.

- State highways and critical county and Forest travel corridors are managed for visual quality.

- The Vinegar Hill-Indian Rock Scenic Area (16,400 acres) is the only roadless area outside designated wilderness retained as a roadless area.

b. Constraints

In addition to the common alternative constraints, the constraints utilized to meet the criteria and assumptions are·

(1) Prescriptions are constrained to analysis areas to reflect a high commodity emphasis, such as intensive range management The acreage by Management Prescription is shown in Chapter II, Table II-4.

- o Percentage of manageable understories set by watershed to be consistent with 62 percent overall

Present net value is reduced by 28 percent compared to the Maximum PNV benchmark (Benchmark 7). (See Table B-31) Many factors which are not accounted for in the present net value calculation are significantly improved under Alternative A Table II-5 in Chapter II of the Final Environmental Impact Statement presents a wide range of outputs and effects for this alternative and the Maximum PNV benchmark. The differences between them are due to differences in land assignments.

(2) First-decade allowable sale quantity must equal or exceed 43.8 MMCF per year.

TABLE B-31
COMPARATIVE ECONOMICS OF ALTERNATIVE B-MODIFIED

FORPLAN Run	Present Net Value $MM	Discounted Costs $MM	Discounted Benefits $MM	1st Decade ASQ MMCF/Yr
Benchmark 7 1/ (Maximum PNV)	472	302	774	47 7
Alternative B	350	304	654	44 0

1/Derived from Draft EIS FORPLAN model

3. Alternative C-Mod

This alternative assigns all currently roadless areas outside the existing wildernesses to a Management Prescription which will maintain their roadless status. It also emphasizes the protection of natural scenery, fish and wildlife habitat, and other amenity values Management of other resources would be at economically and environmentally feasible levels consistent with the emphasis on *amenity values This alternative reflects input from the environmental community* and attributes of the Citizens Multiple Use Alternative

a Criteria and Assumptions

The criteria and assumptions underlying the development of this alternative are.

- Semi-Primitive Non-Motorized and Motorized recreation

- High levels of fish and wildlife habitat

- Large, open, park-like, mature ponderosa pine stands.

- Big game winter range.

- Scenic quality.

Land assignments are as follows

- Except where needed to meet multiple-resource management objectives, all tentatively suitable timber lands are assigned to Timber Production Management Emphasis.

- Timber prescriptions are designed to emphasize the production of large-diameter ponderosa pine trees

- Pastures that contain unsatisfactory riparian areas are removed from use.

- All riparian zones are removed from scheduled harvest.

- Snag habitat is provided at 60 percent of potential population levels Forest-wide. Riparian areas and acres immediately adjacent to riparian areas are managed at 80 and 50 percent of potential population levels, respectively.

- Old growth is provided at 50 percent above minimum viable population levels.

- Elk winter range is managed to maintain winter range habitat on nine potential winter range areas and managed to enhance winter range on five areas. Seventy-five percent of proper use level of forage is assigned to big game.

Satisfactory cover is maintained at a minimum of 15% where possible, or at the maximum feasible elsewhere. For details see "Cover constraints for Alternative C-Mod" (Lindley, 12/28/89)

- All sensitive travel corridors are managed for visual resource quality

- All roadless areas outside designated wilderness are retained as roadless areas (193,100 acres). Pine Creek is recommended for wilderness designation

b Constraints

In addition to the common alternative constraints, the constraints utilized to meet the criteria and assumptions are.

(1) Acreages are assigned to Elk Winter Range prescriptions by geographic watershed. Cover constraints are provided to assure that elk habitat objectives are met within these areas.

(2) All suitable mixed conifer stands are replanted with ponderosa pine after final harvest. For details see "Pine conversion for Alternative C-Modified" (Lindley, 12/21/89)

(3) Pine stand-rotation lengths are increased so the average diameter at harvest is 26 inches. Uneven-age management is applied to approximately 100,000 acres in order to preserve a population of large trees until the longer rotations become effective for this purpose. For details see "Alternative C-Mod long rotation prescriptions" (Lindley, 12/21/89)

(4) Old-growth ecosystems are set at levels to provide habitat at 50 percent above minimum levels on managed acres outside semiprimitive areas and wilderness A comparison between Alternative C and the Max PNV benchmark is displayed in Table B-32

- o Percentage of manageable understories set by watershed to be consistent with 62 percent overall.

TABLE B-32
COMPARATIVE ECONOMICS OF ALTERNATIVE C-MODIFIED

FORPLAN Run	Present Net Value $MM	Discounted Costs $MM	Discounted Benefits $MM	1st Decade ASQ MMCF/Yr
Benchmark 7[1/] (Max PNV)	472	302	774	47 7
Alternative C	126	241	367	25.5

1/Derived from Draft EIS FORPLAN model

4. Alternative F

This alternative balances land assignment between amenity values and commodity-production emphasis This was the preferred alternative in the Draft EIS. It has been updated to comply with current law and regulations

a Criteria and Assumptions

Land assignments are as follows

- Except where needed to meet multiple-resource management objectives, all tentatively suitable timber lands are assigned to Timber Production Management Emphasis.

- Riparian pastures in unsatisfactory condition are utilized at 0-40 percent

- Old growth is provided at 30 percent above minimum viable population level.

- Snag habitat is provided at 40 percent of potential population levels Forest-wide. Riparian areas and acres immediately adjacent to riparian areas are managed at 80 and 50 percent of potential population levels, respectively.

- *Elk winter range is managed to maintain winter range habitat on all potential* winter range areas Satisfactory cover is maintained at 10% minimum (15 +/- 5%) on winter range and 5% minimum on summer range, and total cover at 40 +/- 10% on winter range and 40 +/- 15% on summer range.

- Some sensitive Forest travel corridors are managed for visual resource quality.

- Aldrich, McClellan Mountain, Glacier Mountain, Myrtle-Silvies, North Fork Malheur River, Malheur River and the Vinegar Hill-Indian Rock Scenic Area are retained as roadless areas, using manageable boundaries (66,000 acres)

b Constraints

In addition to the common alternative constraints, the following additional constraints was used to meet the criteria and assumptions: (1) Old-growth ecosystems are set at levels to provide habitat at 30 percent above minimum levels on managed acres outside semiprimitive areas and wilderness A comparison between Alternative F and the Max PNV benchmark is displayed in Table B-33

- o Percentage of manageable understories set by watershed to be consistent with 62 percent overall.

TABLE B-33
COMPARATIVE ECONOMICS OF ALTERNATIVE F

FORPLAN Run	Present Net Value $MM	Discounted Costs $MM	Discounted Benefits $MM	1st Decade ASQ MMCF/Yr
Benchmark 7[1/] (Max PNV)	472	302	774	47.7
Alternative F	328	283	611	40 9

1/Derived from Draft EIS FORPLAN model

5. Alternative I

This alternative balances land assignment between amenity values and commodity-production emphasis. It is the preferred alternative in the Final EIS.

a. Criteria and Assumptions

Land assignments are as follows

- Except where needed to meet multiple-resource management objectives, all tentatively suitable timber lands are assigned to Timber Production Management Emphasis.

- Riparian pastures in unsatisfactory condition are utilized at 0-35 percent.

- Old growth is provided at 30 percent above minimum viable population level.

- Snag habitat is provided at 40 percent of potential population levels Forest-wide. Riparian areas areas are managed at 60 percent of potential population levels No harvests are scheduled in anadromous riparian areas, or in the middle third of non-anadromous areas

- Elk winter range is managed to maintain a Habitat Effectiveness Index of at least 0 6 on all potential winter range areas. Satisfactory cover is maintained at 10% minimum (15 +/- 5%) on winter range, and 12% on summer range. Total cover is maintained at 40 +/- 10% on winter range and 40 +/- 15% on summer range. In wildlife emphasis areas, total cover is maintained at 40% minimum (see "Wildlife Emphasis in FORPLAN" (Lindley, 2/22/89)).

- Some sensitive Forest travel corridors are managed for visual resource quality.

- Aldrich, McClellan Mountain, Myrtle-Silvies, North Fork Malheur River, Malheur River, Shaketable, Baldy, and the Vinegar Hill-Indian Rock Scenic Area are retained as roadless areas, using manageable boundaries. Fifty-three percent of Glacier Mountain is retained, the remainder being managed as Roaded Natural. (79,900 acres total.)

Because of the many different land allocations in this alternative, some of the minimum level choices in FORPLAN were removed in order to keep the model size within the maximum bounds. These minimum level choices were never selected in similar alternatives, so there is no effect on the results. See "Removal of MINLVL choices from FORPLAN MIs" (Lindley, 1/29/89).

b Constraints

In addition to the common alternative constraints, the following additional constraints are used to meet the criteria and assumptions·

(1) Old-growth ecosystems are set at levels to provide habitat at 30 percent above minimum levels on managed acres outside semiprimitive areas and wilderness.

(2) Replacement for old-growth is provided to the extent of 50 percent of the existing old growth acreage.

(3) Minimum cover constraints are applied by watershed to maintain the desired Habitat Effectiveness Index

(4) Constraints are applied to achieve the following.

- o Uneven-aged management with a target tree size of 24" on 10 percent of harvested acres in the ponderosa pine and mixed conifer working groups An additional 90,000 acres of ponderosa pine working group is assigned to uneven-age management with 20" target tree size The development of composite yield tables for this purpose is described in "Combining 20" and 24" uneven-aged management yield tables" (Peterson, 7/89)

- o Overstory removal volume not to exceed 200 MMCF in decade 1 reducing to 100 MMCF in decade 5

- o Commercial thins to be at least 2000 acres per year in decade 1 increasing to 5000 acres per year in decade 3

- o Clearcuts to be at least 3000 acres per year in decade 1 increasing to 5000 acres per year in decade 5, in order to avoid sharp increases in later decades, as well as reflecting opportunities to employ the genetic tree improvement program.

- o Percentage of manageable understories set by watershed to be consistent with 62 percent overall

- o Fifty percent of mixed conifer stands are converted to pine on regeneration, based on suitability for site conversion.

A comparison between Alternative I and the Max PNV benchmark is displayed in Table B-38

TABLE B-34
COMPARATIVE ECONOMICS OF ALTERNATIVE I

FORPLAN Run	Present Net Value $MM	Discounted Costs $MM	Discounted Benefits $MM	1st Decade ASQ MMCF/Yr
Benchmark 7[1/] (Max PNV)	472	302	774	47.7
Alternative I	257	262	519	34.8

1/Derived from Draft EIS FORPLAN model

6. No Change Alternative

The No Change Alternative was developed in response to decisions made regarding appeal number 1588, brought by the Northwest Forest Resource Council on May 19, 1986. The appeal centered on a decision by Regional Forester James F. Torrence to "require inclusion of minimum Management Requirements in the Current Direction Alternative for each Forest Plan." In response to the appeal, a No Change Alternative was developed which represented the existing 1979 Timber Resource Management Plan Existing direction in applicable unit plans was also utilized when those plans did not contradict the direction of the Timber Resource Plan

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

was implemented, it would have to be amended or revised to comply with the law and regulations.

The timber management plan upon which the No Change Alternative is based was developed in 1979. The plan was not an integrated resource management plan, and consequently did not address all resource uses and outputs. The No Change Alternative was not modeled in FORPLAN, consequently, economic comparisons between this alternative and the Max PNV Benchmark are not strictly comparable

VIII. EFFECTS OF BENCHMARKS, CONSTRAINTS, AND ALTERNATIVES

A. INTRODUCTION

A comparative analysis among alternatives is the basis for evaluating alternatives and selecting a preferred alternative, planning steps 7 and 8. This chapter focuses on the differences among alternatives in terms of outputs and effects, objectives and constraints, and economic efficiency of alternatives. Some key items of Benchmark 7, the Max PNV with MRs and assigned values benchmark, are discussed as a reference point for comparison to the alternatives Note that the results of Benchmark 7 (as for all benchmarks) are based on the FORPLAN model used for the Draft Environmental Impact Statement, and have not been updated, as have the alternatives, for the changes between Draft and Final EIS Only technical and legislative changes would have affected the benchmark results, and it is estimated that the timber outputs (ASQ) would be approximately 4% less because of these This difference is not considered significant with respect to the use of benchmarks for comparison purposes, as these are not fully viable alternative designs.

For a more complete discussion of the rationale and tradeoffs of individual constraints, see Section VII of this Appendix. For a more complete discussion of the results of the benchmark analysis, see Section VI of this Appendix. See Chapter IV of the Final Environmental Impact Statement for a complete discussion of the environmental effects of the alternatives. Refer to Chapter II of the Final Environmental Impact Statement for a complete display of cash flows and other economic information by alternative.

B. EVALUATION OF CONSTRAINTS

The multiple resource management objectives associated with a particular benchmark or land management alternative were represented in FORPLAN as an objective function and a series of constraints. The ultimate objective function of each FORPLAN run was "maximize present net value" This objective function guided the model in selecting the most cost-efficient combination of prescriptions, activity schedules, and resource output levels capable of satisfying the resource management objectives (i.e constraints) of each specific benchmark or alternative.

Management objectives of benchmarks and alternatives were achieved by constraining FORPLAN as described in previous sections ("Analysis Prior to the Development of Alternatives" and "Formulation of Alternatives"). Within the FORPLAN model, application of the ultimate objective function (maximization of PNV) was subject to first satisfying all constraints used to represent resource management objectives that would not be accomplished under the objective function alone. The imposition of such constraints usually resulted in reduced PNV Such a reduction in PNV is called the "opportunity cost" associated with achieving the management objectives represented by the constraint in question.

To isolate the opportunity cost of a given constraint of set of constraints, the solutions of FORPLAN runs made with or without the constraint(s) being evaluated (e.g , big game emphasis) were examined for differences in PNV (and other outputs and effects of interest). When all other objectives are the same, the difference in outputs and effects is the opportunity cost of achieving the objective, given both solutions have cost-efficient prescriptions and constraints, and a Max Present Net Value objective function.

During benchmark analysis, constraint sets which were needed to achieve a variety of multiple resource management objectives were developed and evaluated in the manner described above. For example, the set of different constraints proposed for the purpose of achieving MRs was evaluated to determine the magnitude of the associated opportunity costs. Many discretionary constraints (those not legally required) were also examined to assess opportunity costs. The special management land allocations prescribed in current direction, for example, were evaluated in terms of the specific opportunity cost associated with this package of allocations. The policy constraints associated with nondeclining flow and rotations based on CMAI also were evaluated in the context of their effects on PNV and timber output levels.

Finally, sensitivity analyses were performed in order to provide information regarding the consequences involved with making assumptions about timber management costs and future stumpage values (i e., price trends). Refer to "Benchmark Analysis", section VI.C, for a discussion of the results of these analyses.

Opportunity costs were not determined for individual alternative objectives because of the prohibitive costs of analyzing every constraint used to develop alternatives. However, many of the constraints used in the formulation of alternatives were examined in benchmark analysis, thus enabling approximate determination of their opportunity costs in the context of the alternatives in which they were used. In addition, the development of many of the alternatives involved a series of FORPLAN runs, as this was often necessary in order to achieve a satisfactory final formulation of alternative goals, objectives and constraints Finally, many pairs of alternatives differ from each other only in terms of one specific constraint or constraint set, thereby enabling determination of the opportunity cost of such constraints in the context of those two alternatives. Refer to "Formulation of Alternatives", section VII.B, for discussion of the analysis of opportunity costs associated with constraints used in alternative formulation

Comparison of the outputs, effects, and present net values of the alternatives in their final form provides the means of assessing the economic tradeoffs resulting from the resource management objectives of each alternative, taken as a whole These economic tradeoffs can then be assessed in light of the environmental and socioeconomic consequences and nonpriced benefit outputs associated with each alternative, in order to help identify the alternative that comes closest to maximizing net public benefits. For example, the economic tradeoff of meeting some management objectives (e g , optimal wildlife habitat and riparian area improvement) can be determined by comparing FORPLAN solutions with various combinations of the two objectives The changes in present net value due to meeting only optimal wildlife habitat may be $10 million, and the change due to meeting riparian area improvement may be $20 million. However, taken together, the opportunity cost may not necessarily be the sum of the two objectives due to overlap or duplication In addition, the cost of meeting either objective in one alternative will not necessarily be the same as meeting the same objective in another alternative.

For more information on the constraint evaluation process (Management Requirements, legal, and policy constraints), refer to Sections VI and VII of this Appendix.

C. TRADEOFFS AMONG ALTERNATIVES

The major tradeoffs (differences) between the alternatives are tied to the resolution of questions contained in the issues This section summarizes the tradeoffs which occur between the various alternatives. The responses of each alternative to the issues are fully discussed in Chapter II of the Final Environmental Impact Statement

1. Economic Tradeoffs

The present net value calculations for the alternatives range from a high of $381 7 million for Alternative NC to a low of $126.4 million for Alternative C-Modified In general, the ranking of the alternatives by PNV reflects the amount of timber volume harvested, primarily in the first decade. The largest changes in total discounted costs and benefits are related to management of the timber resource. Correspondingly, benefits from range management will fluctuate as the timber output changes. Timber and forage production are part of the joint production structure of the forest ecosystem. Forage production from the transitory range following a timber harvest will change as the number of acres cut and, therefore, the total volume harvested, changes

Table B-35 displays a summary of economic tradeoffs for all alternatives and the Max PNV Benchmark (BM-7) The Max PNV Benchmark, which uses market values for priced resource outputs and assigns values for other resource outputs, is presented as a reference point only, it is not a viable alternative because some issues included in the planning topics are not addressed or resolved This benchmark represents the maximum net economic returns available if the Forest resources with market or assigned values were managed solely to maximize present net value.

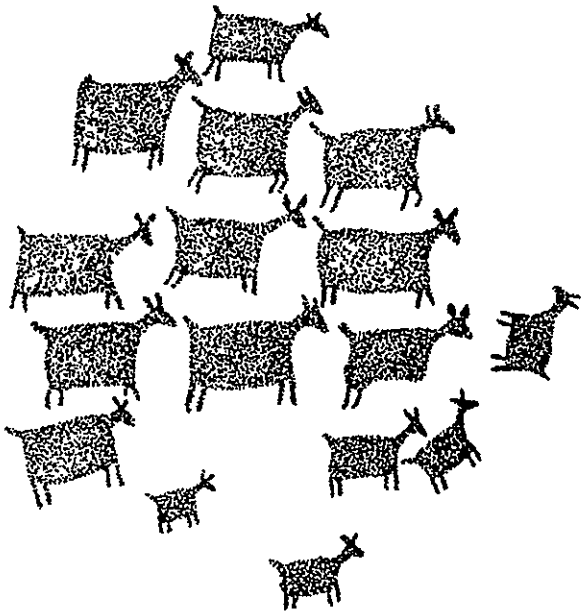


TABLE B-35
ECONOMIC TRADEOFFS
(Millions of 1982 Dollars)

Benchmark/ Alternative (Ranked in order of decreasing PNV)	Present Net Value		Opportunity Cost	Discounted Benefits		Discounted Costs	
	$MM	Change	$MM	$MM	Change	$MM	Change
Max PNV (w/MRs)	472.6	-90.9	0	774.3	-144.7	301.7	-53.8
NC[1/]	381.7	-31.2	90.9	629.6	+24.4	247.9	+55.6
B-Modified	350.5	-22 2	122 1	654 0	-42.3	303.5	-20.1
F	328.3	-28.1	144 3	611 7	-34.4	283 4	-6.3
A	300 2	-43.6	172 4	577.3	-58.8	277.1	-15.2
I (Preferred)	256.6	-130.2	216 0	518 5	-150.6	261.9	-20.4
C-Modified	126.4		346 2	367 9		241.5	

1/The No Change Alternative is based upon the 1979 Timber Resource Management Plan. The Timber Resource Plan was not an integrated resource management plan, and not all resource uses and outputs were valued Consequently, there are differences in economic assumptions underlying the present net value calculations of the No Change Alternative and all other alternatives.

2/ "Change" refers to line-to-line differences.

TABLE B-35 (continued)
ECONOMIC TRADEOFFS
(Millions of 1982 Dollars)

Benchmark/ Alternative (Ranked in order of decreasing PNV)	Decade 1							
	Gross Receipts	Change	Net Receipts	Change	Noncash Benefits	Change	Payments to Counties	Change
Max PNV (w/MRs)	27.9		13 9		6 3		7.0	
		N/A		N/A		N/A		N/A
NC	N/A		N/A		N/A		N/A	
		N/A		N/A		N/A		N/A
B-Modified	25.3		10.3		6 3		7 4	
		+1.9		+0.9		-0.3		-0 6
F	27 2		11.2		6.0		6 8	
		-1.9		-1.1		-0.2		-0.5
A	25.3		10.1		5 8		6.3	
		-1.7		-2 4		0 0		-0.4
I (Preferred)	23.6		7.7		5.8		5.9	
		-6.1		-2 5		-0.2		-1 5
C-Modified	17 5		5.2		5.6		4.4	

TABLE B-36
ECONOMIC TRADEOFFS (COSTS) BY RESOURCE GROUP
(Millions of 1982 Dollars)

Benchmark/ Alternative (ranked in order of increasing discounted costs)	Discounted Costs by Resource Group											
	Total Discounted Costs	Timber		Wildlife		Range		Recreation		Other Resources		Roads	
		Cost	Change	Cost	Change	Cost	Change	Cost	Change	Cost	Change	Cost	Change
No 1/ (No Change)	247.9	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
C-Modified	267 3	82.2	+84.8	10 7	+4.8	12.0	+24 1	19.6	-17.6	86.3	-61.6	56 5	+9 5
Max PNV (w/MRs)	301.7	167.0	-25.6	5.9	+2.2	36.1	-28.9	2.0	+15.2	24.7	+67.2	66.0	-6 7
I (Pref)	325 1	141 4	+11.7	8.1	-0.1	7.2	+10.6	17.2	+0.4	91.9	-13 9	59.3	-1.9
A	335.7	153.1	+2.2	8 0	+0 5	17 8	+1.3	17.6	+0.2	78.0	+5.5	61.2	+1 6
F	347.0	155 3	+16.1	8.5	+14 6	19.1	-4.1	17 8	-1 8	83 5	+0 5	62 8	+0.8
B-Modified	373 1	171.4		23.1		15 0		16.0		84.0		63 6	

1/The No Change Alternative is based upon the 1979 Timber Resource Management Plan The TRP was not an integrated resource management plan, and not all resource uses and outputs were valued. Consequently, there are differences in economic assumptions between the No Change Alternative and all other alternatives.

2/ "Change" refers to line-to-line differences.

Tables B-36 and B-37 display the alternatives ranked by increasing discounted costs and decreasing discounted benefits. Also displayed in these tables are the costs or contributions to the totals by individual resource group. These tables are useful for evaluating the major sources of costs and benefits among alternatives.

TABLE B-37
ECONOMIC TRADEOFFS (BENEFITS) BY RESOURCE GROUP
(Millions of 1982 Dollars)

Benchmark/ Alternative (ranked in order of decreasing discounted benefits)	Discounted Benefits by Resource Group									
	Total Discounted Benefits	Timber		Wildlife		Range		Recreation		Other Resources
		Benefits	Change	Benefits	Change	Benefits	Change	Benefits	Change	Benefit Change
Max PNV	774 3	612 4		81.6		54 9		20.4		5 0
(w/MRs)			-89 1		-9.7		-22 2		-0.8	+1 5
B-Modified	654.0	523.3		71 9		32.7		19 6		6 5
			N/A		N/A		N/A		N/A	N/A
NC[1/]	629.6	N/A		N/A		N/A		N/A		N/A
			N/A		N/A		N/A		N/A	N/A
F	611.7	483.2		73 4		30.6		18.4		6 1
			-22.5		-10.1		-1 8		-1.1	0.3
A	577.3	460.7		63 3		28.8		17 3		5 8
			-45.9		-6 3		-2 9		-1 7	0.6
I(Preferred)	518 5	414 8		57 0		25 9		15 6		5.2
			164 7		+16 6		3.8		+2 8	0.5
C-Modified	367 9	250 1		73.6		22 1		18.4		3.7

1/The No Change Alternative is based upon the 1979 Timber Resource Management Plan. The Timber Resource Plan was not an integrated resource management plan, and not all resource uses and outputs were valued Consequently, there are differences in economic assumptions between the No Change Alternative and all other alternatives

2/ "Change" refers to line-to-line differences.

2. Resource Tradeoffs

The resource tradeoffs vary widely for the range of alternatives considered The types of tradeoffs range from timber harvest to retained roadless areas to big-game use. Every alternative offers a different mix of goods and services, which results in tradeoffs (e.g., increasing timber harvests reduce roadless areas or old growth retained). Table B-38 displays the prominent resource tradeoffs between the alternatives with Benchmark 7 included as a reference The individual constraints which result in reductions in present net value are detailed in Section VII, the effects of the constraints are discussed after Table B-41 in individual alternative summaries.

TABLE B-38
RESOURCE OUTPUTS

Benchmark/ Alternative (Ranked in order of decreasing PNV	First-Decade Average Annual Timber Harvest(TSPQ) MMCF	Change	Long-Term Sustained Yield Capacity MMCF	Change	Suitable Timber Lands 1,000 Acres	Change	First-Decade Permitted Range Use 1,000 AUM	Change
Max PNV (w/MRs)	51.7		61 7		996.1		156	
		N/A		N/A		+120 5		N/A
NC[1/]	N/A		N/A		1,116.6		N/A	
		N/A		N/A		-159 8		N/A
B-Modified	48.6		50 6		956.8		120	
		-3.4		-3.6		-37.1		-3
F	45.2		47.0		919.7		117	
		-2.6		-1.7		-21.3		+14
A	42.6		45.3		898.4		131	
		-4.2		-4.6		-62.4		-18
I (Preferred)	38.4		40.7		836.0		113	
		-10.2		-12.7		-65.6		-37
C-Modified	28.2		28.0		770.4		76	

1/First decade annual timber harvest displayed for the No Change Alternative is the potential yield recorded in the 1979 Timber Resource Management Plan. The suitable acres for the No Change Alternative were established in that plan. Other resource outputs displayed for the No Change Alternative are dependent upon the 1979 Timber Resource Plan or applicable unit plans.

2/ "Change" refers to line-to-line differences.

TABLE B-38

RESOURCE OUTPUTS (continued)

Benchmark/ Alternative (Ranked in order of *decreasing* PNV)	First-Decade[1] Changes in Employment		Unroaded Areas Retained		Decade 1 Big-Game Use		Decade 1 Anadromous Fish Harvest		Decade 5 Old Growth Retained	
	Jobs	Change	1,000 Acres	Change	1,000 WFUDs	Change	1,000 Pounds	Change	1,000 Acres	Change
Max PNV	+554		0		N/A		N/A		44 8	
(w/MRs)		N/A		+54 2		N/A		N/A		+60 4
NC[2]	N/A		54 2		N/A		N/A		105.2	
		N/A		-40.9		N/A		N/A		-14 7
B-Modified	+235		13.3		121 7		40 1		90.5	
		-139		+53.7		-1 9		-5 7		+30.5
F	+96		67.0		119 8		34 4		121 0	
		-96		-7.8		-1 9		-7.6		-16 3
A	0		59 2		117.9		26 8		104 7	
		-161		+20 7		3 8		+10.2		+18 4
I	-161		79 9		121.7		37 0		123 1	
		-412		+113 2		-6 4		+7 9		+55 7
C-Modified	-573		193 1		115 3		44 9		178 8	

1/Relative rankings are valid although benchmark and alternative numbers are not strictly comparable

2/If the potential yield of 269 7 million board feet (specified in the 1979 Timber Resource Management Plan) were harvested annually, employment would increase by about 515 jobs

3/ "Change" refers to line-to-line differences

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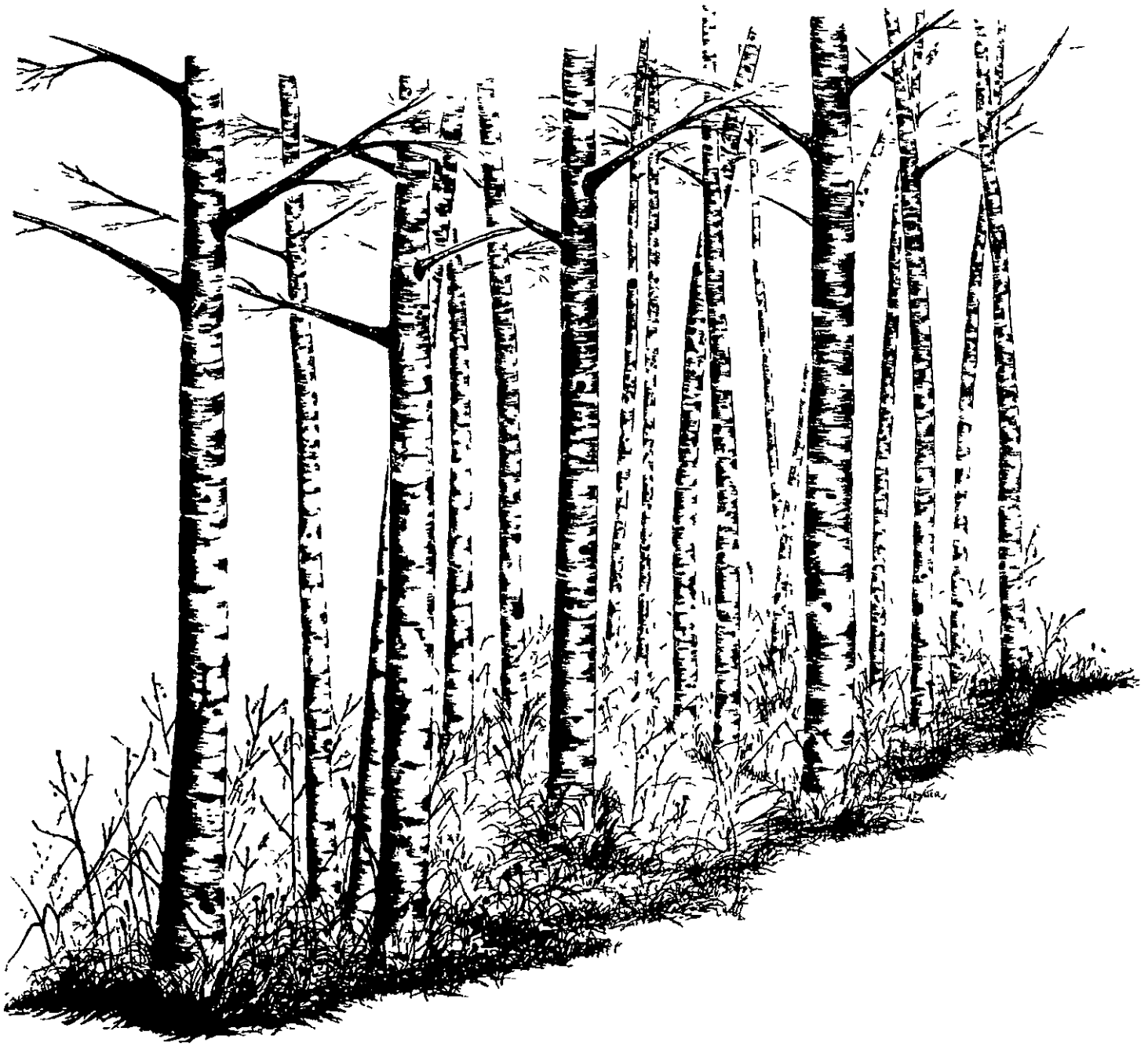

Appendix C

ROADLESS AREA DESCRIPTIONS AND DISPOSITION

APPENDIX C ROADLESS AREA DESCRIPTIONS AND DISPOSITION

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APPENDIX C ROADLESS AREA DESCRIPTIONS AND DISPOSITION

A. OVERVIEW

Determination of the future management of specific geographic areas on the Forest which are currently unroaded and undeveloped is one goal of this Environmental Impact Statement and Forest Plan.

Some people enjoy the recreation experience available in undeveloped areas. Areas maintained in an undeveloped condition will also be eligible for future wilderness designation Some people contend that the areas need to be managed so the resources available in them can contribute to local industrial and economic needs.

With the passage of the Oregon Wilderness Act of 1984, Congress found that the Forest Service was not required to review the wilderness option for the remaining Roadless Area Review and Evaluation (RARE II) areas, parcels less than 5,000 acres in size, and certain areas evaluated for wilderness in unit plans. Further Planning Areas will be considered for inclusion in the Wilderness Preservation System for this planning process Pine Creek is the only Further Planning Area on this Forest This law does provide that the areas still in an unroaded condition when this plan is revised shall be reviewed with wilderness as an option

According to the Oregon Wilderness Act of 1984

".. with respect to the National Forest System lands. which were reviewed by the Department of Agriculture 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 the Forest and Rangeland Renewable Resources Planning Act of 1974, as amended by the National Forest Management Act of 1976; provided that such areas need not be managed for the purpose of protecting their suitability for wilderness designation prior to or during revision of the land management plans " (Public Law 98-328)

The purpose of this appendix is to present a detailed and site-specific analysis of the RARE II areas and the Pine Creek Further Planning Area of the Malheur National Forest It includes a description of the resources, physiographic and biologic features, and the present management situation for each area. In addition, it specifically indicates how each area would be affected by the alternatives analyzed

Since Congress has not designated these areas as wilderness, this appendix does not make a recommendation on the wilderness option for the unroaded areas Congress has done that

This appendix does present information about the unroaded areas to disclose the environmental effects of continuing to manage each area in an unroaded condition and of developing all or a portion of each area

To do this, this appendix presents a description of the environment, presents the proposed management allocation for each of the alternatives, and discloses the environmental consequences of those alternatives for each area

If road building, timber harvest, or other development occurs in these areas, they will no longer be eligible for consideration for wilderness. This itself may be a significant environmental consequence For this reason, we are considering each area's attributes as a wilderness--such as its capability, availability, and need--so that any decision to designate the area for particular uses will be made with full knowledge of the environmental consequences.

B. BACKGROUND

The first Roadless Area Review and Evaluation (RARE Final Environmental Impact Statement, October 1973) identified 17 roadless areas on the Malheur National Forest. In 1976, RARE II was initiated and resulted in three additional areas being identified and added to the roadless inventory and additional acres added to previously identified areas. There were 20 roadless areas in the final RARE II (Final Environmental Impact Statement, January 1979) inventory in which one, Pine Creek, was designated for further planning and one, Strawberry Mountain, was partially recommended for wilderness. The remaining areas were recommended for nonwilderness management

Unit planning, which was completed on the Forest in December 1978, recommended management of these 20 roadless areas the same way as the RARE II Final Environmental Impact Statement (with Strawberry Mountain partially to wilderness, Pine Creek to further planning, and the remainder to nonwilderness uses).

Various pieces of legislation since RARE II have proposed areas for wilderness designation. Legislation in the House of Representatives in 1983 included Jumpoff Joe, Greenhorn Mountain, Strawberry Mountain, Glacier Mountain, and Monument Rock roadless areas at various times.

The Oregon Wilderness Act of 1984 designated additional acres to Strawberry Mountain and most of the Monument Rock area as wilderness The disposition of these areas was decided by this law This appendix does not include any further evaluation of these areas.

There are now 18 remaining roadless areas which were inventoried in RARE II. No new roadless areas have been identified on the Malheur National Forest since RARE II These areas are listed in Table C-1 and their locations are shown on Figure C-1.

Tables C-2, C-3, and C-4 following Figure C-1 provide information about the current recreational use of each area and its potential use as it exists today. Table C-2 displays the amount of use in Recreation Visitor Days (12 hours of use by one person or equivalent use). Table C-3 displays the acres of various types of recreational opportunity. Table C-4 displays the amount of use each area could provide if used to capacity, again in Recreation Visitor Days.

Table C-5 displays both total acreage and acres remaining roadless at the end of decades one, two, and five for each RARE II Area and alternatives

TABLE C-1

ROADLESS AREA ACREAGES

RARE II Number	Name	RARE II Acres	Current Net Acres	Reasons for Change
6233	Aldrich Mountain	4,826	4,951	More accurate measurement.
6242	Baldy Mountain	6,728	6,431	Previously logged and roaded areas and more accurate measurement.
6247	Cedar Grove	100	112	More accurate measurement
6243	Dixie Butte	17,142	12,110	Sold timber sales and more accurate measurement.
6236	Dry Cabin	13,269	12,221	Previously logged and roaded areas and more accurate measurement
6246	Flag Creek	7,933	7,789	Previously logged and roaded areas and more accurate measurement.
6245	Fox Creek	7,527	5,879	Previously logged and roaded areas and more accurate measurement
6239	Glacier Mountain	21,073	19,572	Big Cow Burn, previously logged and/or sold timber sales, and more accurate measurement
6252	Greenhorn Mountain	16,509	16,197	Previously logged and/or sold timber sales and more accurate measurement.
6251	Jumpoff Joe	3,968	4,006	Previously logged and roaded areas and more accurate measurement.
6234	Malheur River	6,719	6,984	Previously logged and roaded areas and more accurate measurement.
6237	McClellan Mountain	23,458	20,646	Previously logged and roaded areas and more accurate measurement
6232	Myrtle-Silvies	13,426	11,747	Previously logged and roaded sold timber sales and more accurate measurement.
6244	Nipple Butte	12,864	11,525	Previously logged and roaded areas and more accurate measurement
6241	North Fork Malheur River	18,735	18,276	Previously logged and roaded areas and more accurate measurement
6248	Pine Creek	5,400	5,420	More accurate measurement.
6235	Shaketable	8,024	7,137	Previously logged and roaded areas and more accurate measurement
6231	Utley Butte	12,022	9,945	Previously logged and roaded areas and more accurate measurement

FIGURE C-1
ROADLESS AREA LOCATIONS

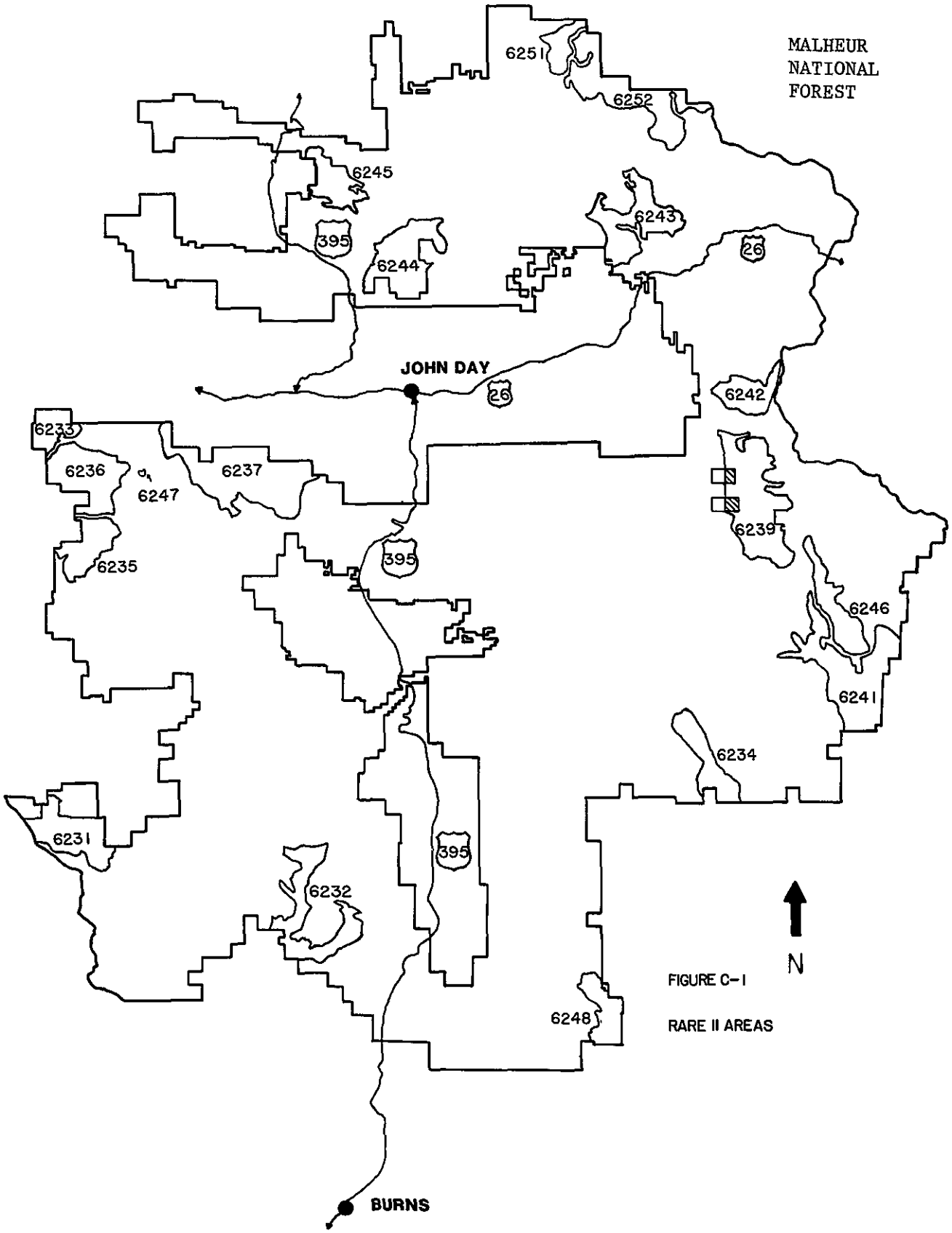


TABLE C-2

Recreation Visitor Days (RVDs) BY RECREATION OPPORTUNITY SPECTRUM - CURRENT USE

Roadless Area	RARE II Number	Roaded Modified	Roaded Natural	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Total
Aldrich Mountain	6233	--	61	--	428	489
Baldy Mountain	6242	--	135	408	--	543
Cedar Grove	6247	--	5	--	--	5
Dixie Butte	6243	35	512	2,108	--	2,655
Dry Cabin	6236	--	116	68	1,166	1,350
Flag Creek	6246	--	--	385	--	385
Fox Creek	6245	--	88	544	--	632
Glacier Mountain	6239	120	420	3,521	--	4,061
Greenhorn Mountain	6252	--	484	--	848	1,332
Jumpoff Joe	6251	--	207	--	--	207
Malheur River	6234	46	598	424	--	1,068
McClellan Mountain	6237	--	232	68	2,015	2,315
Myrtle-Silvies	6232	96	376	1,428	--	1,900
Nipple Butte	6244	6	35	1,020	--	1,061
North Fork Malheur River	6241	50	534	408	318	1,310
Pine Creek	6248	--	16	136	525	677
Shaketable	6235	12	76	68	535	691
Utley Butte	6231	--	57	68	954	1,079
TOTAL		365	3,952	10,654	6,789	21,760

TABLE C-3

RECREATION OPPORTUNITY SPECTRUM CURRENT SITUATION (ACRES)

Roadless Area	RARE II Number	Roaded Modified	Roaded Natural	Semi-Primitive Motorized	Semi-Primitive Non-Motorized	Total
Aldrich Mountain	6233	--	1,232	----	3,719	4,951
Baldy Mountain	6242	--	2,657	3,774	----	6,431
Cedar Grove	6247	--	112	----	----	112
Dixie Butte	6243	--	3,916	8,194	----	12,110
Dry Cabin	6236	--	2,327	947	8,947	12,221
Flag Creek	6246	--	----	7,789	----	7,789
Fox Creek	6245	--	1,472	4,407	----	5,879
Glacier Mountain	6239	1,190	4,164	14,218	----	19,572
Greenhorn Mountain	6252	--	9,641	1/	6,556	16,197
Jumpoff Joe	6251	--	4,006	----	----	4,006
Malheur River	6234	482	4,996	1,506	----	6,984
McClellan Mountain	6237	--	4,466	414	15,766	20,646
Myrtle-Silvies	6232	934	3,690	7,123	----	11,747
Nipple Butte	6244	129	691	10,705	----	11,525
North Fork Malheur River	6241	1,014	10,816	4,267	2,179	18,276
Pine Creek	6248	--	325	1,147	3,948	5,420
Shaketable	6235	239	1,513	1,015	4,370	7,137
Utley Butte	6231	--	1,175	895	7,875	9,945
Total		3,988	57,199	66,401	53,360	180,948

1/Area provides Semi-Primitive Motorized opportunities during the winter, when it is open for snowmobile use.

TABLE C-4
RECREATION VISITOR DAY CAPABILITY

Roadless Area	RARE II	Roaded Modified	Roaded Natural	Semi-Primitive Motorized	Semi-Primitive Non-motorized	Total
Aldrich Mountain	6233	----	4,307	----	2,797	7,104
Baldy Mountain	6242	----	9,566	3,350	----	12,916
Cedar Grove	6247	----	353	----	----	353
Dixie Butte	6243	---	18,070	9,319	----	27,389
Dry Cabin	6236	----	8,154	818	6,749	15,721
Flag Creek	6246	----	----	6,776	----	6,776
Fox Creek	6245	----	6,213	4,585	----	10,798
Glacier Mountain	6239	2,868	14,826	12,370	----	30,064
Greenhorn Mountain	6252	----	34,146	----	4,999	39,145
Jumpoff Joe	6251	----	14,141	----	----	14,141
Malheur River	6234	1,147	17,562	1,310	----	20,019
McClellan Mountain	6237	----	16,362	374	12,434	29,170
Myrtle-Silvies	6232	2,273	13,266	6,313	----	21,852
Nipple Butte	6244	311	2,453	9,361	----	12,125
North Fork Malheur River	6241	2,390	37,665	3,663	1,634	45,352
Pine Creek	6248	----	1,147	998	3,000	5,145
Shaketable	6235	574	5,366	888	3,336	10,164
Utley Butte	6231	----	4,077	766	5,882	10,725
Total		9,563	207,674	60,891	40,831	318,959

TABLE C-5
RARE II ACRES REMAINING ROADLESS BY ALTERNATIVES

Rare II Area	ALTERNATIVES NC No Change[1/]	B Modified	A No Action	F	I Preferred	C Modified
TOTAL RARE II ACRES						
Decade 1	84,332	16,663	59,291	85,011	77,482	180,948
Decade 2	84,332	16,663	59,291	67,074	77,482	180,948
Decade 5	84,332	16,663	59,291	67,074	77,482	180,948
Aldrich Mountain						
Decade 1	0	0	0	4,951	4,614[2/]	4,951
Decade 2	0	0	0	4,951	4,614	4,951
Decade 5	0	0	0	4,951	4,614	4,951
Baldy Mountain						
Decade 1	0	0	0	5,380	0	6,431
Decade 2	0	0	0	0	0	6,431
Decade 5	0	0	0	0	0	6,431
Cedar Grove						
Decade 1	112	112	112	112	112	112
Decade 2	112	112	112	112	112	112
Decade 5	112	112	112	112	112	112
Dixie Butte						
Decade 1	0	0	0	0	0	12,110
Decade 2	0	0	0	0	0	12,110
Decade 5	0	0	0	0	0	12,110
Dry Cabin						
Decade 1	0	0	0	0	0	12,221
Decade 2	0	0	0	0	0	12,221
Decade 5	0	0	0	0	0	12,221
Flag Creek						
Decade 1	0	0	0	0	0	7,789
Decade 2	0	0	0	0	0	7,789
Decade 5	0	0	0	0	0	7,789
Fox Creek						
Decade 1	0	0	0	0	0	5,879
Decade 2	0	0	0	0	0	5,879
Decade 5	0	0	0	0	0	5,879

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner

2/337 acres of the RARE II area will be assigned to Dry Cabin Wildlife Emphasis Area in Alternative I

TABLE C-5
RARE II ACRES REMAINING ROADLESS BY ALTERNATIVES

Rare II Area	ALTERNATIVES					
	NC No Change[1/]	B Modified	A No Action	F	I Preferred	C Modified
Glacier Mountain						
Decade 1	19,572	0	11,060	12,145	14,578	19,572
Decade 2	19,572	0	11,060	12,145	14,578	19,572
Decade 5	19,572	0	11,060	12,145	14,578	19,572
Greenhorn Mountain						
Decade 1	13,322	13,322	13,322	13,322	13,322	16,197
Decade 2	13,322	13,322	13,322	13,322	13,322	16,197
Decade 5	13,322	13,322	13,322	13,322	13,322	16,197
Jumpoff Joe						
Decade 1	0	0	0	0	0	4,006
Decade 2	0	0	0	0	0	4,006
Decade 5	0	0	0	0	0	4,006
Malheur River						
Decade 1	6,984	0	3,132	3,066	3,066	6,984
Decade 2	6,984	0	3,132	3,066	3,066	6,984
Decade 5	6,984	0	3,132	3,066	3,066	6,984
McClellan Mountain						
Decade 1	20,646	0	18,629	18,717	18,717	20,646
Decade 2	20,646	0	18,629	18,717	18,717	20,646
Decade 5	20,646	0	18,629	18,717	18,717	20,646
Myrtle-Silvies						
Decade 1	0	0	0	9,855	9,855	11,747
Decade 2	0	0	0	9,855	9,855	11,747
Decade 5	0	0	0	9,855	9,855	11,747
Nipple Butte						
Decade 1	0	0	0	0	0	11,525
Decade 2	0	0	0	0	0	11,525
Decade 5	0	0	0	0	0	11,525
North Fork Malheur River						
Decade 1	18,276	3,229	7,616	4,906	6,081	18,276
Decade 2	18,276	3,229	7,616	4,906	6,081	18,276
Decade 5	18,276	3,229	7,616	4,906	6,081	18,276

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner.

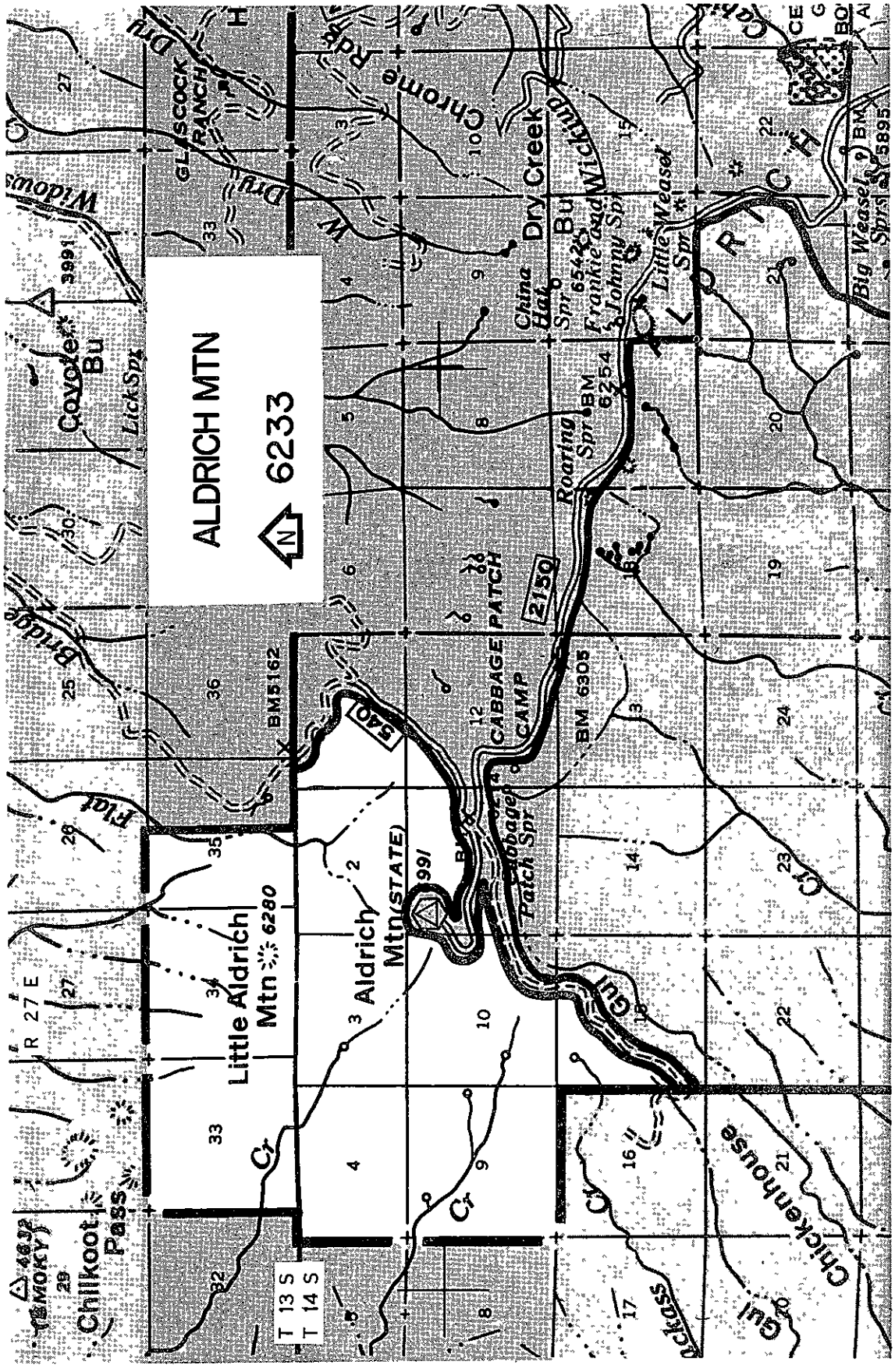
TABLE C-5

RARE II ACRES REMAINING ROADLESS BY ALTERNATIVES

Rare II Area	ALTERNATIVES					
	NC No Change[1/]	B Modified	A No Action	F	I Preferred	C Modified
Pine Creek						
Decade 1	5,420	0	5,420	5,420	0	5,420
Decade 2	5,420	0	5,420	0	0	5,420
Decade 5	5,420	0	5,420	0	0	5,420
Shaketable						
Decade 1	0	0	0	7,137	7,137	7,137
Decade 2	0	0	0	0	7,137	7,137
Decade 5	0	0	0	0	7,137	7,137
Utley Butte						
Decade 1	0	0	0	0	0	9,945
Decade 2	0	0	0	0	0	9,945
Decade 5	0	0	0	0	0	9,945

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner.

FIGURE C-2


ALDRICH MTN
6233
Chilkoot Pass
Little Aldrich Mtn 6280
Aldrich Mtn (STATE)
CABBAGE PATCH CAMP
Cabbage Patch Spr
Roaring Spr
Dry Creek
China Hat Spr
Frankie and Johnny Spr
Little Weasel Spr
Big Weasel Spr
Chromo Rd
Dry Creek Rd
Glascock Ranch
Coyote Bu
Lick Spr
Widow
Flat
Bridge
Chickenhouse
Gulch
Cr
BM 6305
BM 6254
BM 5895
BM 5162
540
2150
T 13 S
T 14 S
R 27 E

C. ALDRICH MOUNTAIN - 4,951 Acres
(RARE II No. 6233)

1. Description

a. History

This area was inventoried during the RARE II process Under direction in the South Fork Planning Unit Final Environmental Impact Statement and the RARE II Final Environmental Impact Statement, it has been managed for nonwilderness uses

b. Location and Access

Aldrich Mountain roadless area is located along the western edge of the Malheur National Forest, approximately 4 miles southeast of Dayville, Oregon, in Grant County. This area overlooks the John Day River and South Fork John Day River valleys. The area includes all or part of Sections 33, 34, and 35, T 13 S., R 27 E., and Sections 1, 2, 3, 4, 9, 10, 11, 12, and 15, T 14 S , R. 27 E , of the Willamette Meridian

Access is very limited Primary access from John Day, Oregon, is by Forest road No 2150, a minimally maintained, native-surface road Secondary access is over a Primitive jeep track from U S Highway 26.

c Geography and Topography

The terrain is extremely varied but primarily consists of steep and broken slopes on the west and south, and steep, bench slopes to the north. In addition, the area is highly dissected by minor streamcourses, including Aldrich, Flat, Smokey, Oliver, and Jackass Creeks Dominant peaks are Aldrich and Little Aldrich Mountains. Relief is about 2,600 feet, from 6,950 feet below the crest of Aldrich Mountain to less than 4,350 feet on Aldrich Creek. See Figure C-2.

d. Geology and Soils

The geology consists of hard-rock formations covered with a thin mantle (typically less than 24 inches) of volcanic ash from historic Mountain Mazama (present day Crater Lake) The dominant hard-rock formations are from the Columbia River Group, which consists of hard basalt and andesite with soft to moderate hard tuffaceous interflows. An undefined pyroclastic bedrock occurs north of Aldrich Mountains

The soils are predominantly (80 percent of the area) a silt loam textured volcanic ash over a gravelly to cobbly loam to clay loam subsoil. The other 20 percent of the area typically consists of a loam to gravelly loam over a gravelly to very gravelly loam to clay loam subsoil

e. Vegetation

The Aldrich Mountain area is approximately 84 percent forested Vegetation on the forested west- and south-facing slopes is predominantly ponderosa pine with Douglas-fir and white fir understories. The ground cover includes elk sedge, pinegrass, and wheatgrass The forested areas north of Aldrich Mountain are primarily white fir, Douglas-fir, western larch, and lodgepole pine, with a ground cover of huckleberry, pinegrass, and bromegrasses. The highest elevations are occupied by subalpine fir and/or alpine sage and other subalpine shrubs and grasses. The drier or nonforested sites on all aspects are vegetated with juniper, sagebrushes, mountain-mahogany, and some scattered ponderosa pine. Ground cover on these sites includes wheatgrasses, fescue, and bluegrass. This area has about 1,300 forested acres that meet the Pacific Northwest Region's definition of old growth.

f Current Uses

Recreational use of this area is limited by difficult access and the rugged nature of the countryside The primary use is big-game hunting Other uses include hiking, horseback riding, camping, photography, game bird hunting, and sightseeing from Aldrich Mountain lookout The proposed Pacific Crest-to-Desert Trail would pass along the southern boundary of this area (See Table C-2 for current recreation use data)

Wildlife in the area is highly varied from spring through fall Mammals include Rocky Mountain elk, mule deer, mountain lion, bighorn sheep, and black bear, as well as voles, marmots, and chipmunks The pine marten may be present in the old-growth forest on the north-facing slopes Bird species are numerous and include songbirds, raptors, game birds such as the blue grouse and mountain quail, and possibly pileated woodpeckers During winter, elk range on the lower slopes of the north and southwest portions of the area Native rainbow trout occur in some portions of the streams within this area

There is one grazing allotment in the area providing about 125 Animal Unit Months each year. Livestock use is limited due to the rugged terrain

2. Wilderness Capability

a Manageability and Boundaries

The present boundary does not follow natural physical characteristics but is logical and easy to locate on the ground The boundary on the east consists of two north-south roads, on the south, west, and north, the boundary is the Forest boundary All within these limits is included except for Aldrich Mountain Lookout and its access road

The area is marginal in size and only 4,900 acres meet wilderness criteria The State of Oregon manages 200 acres of land which have received timber harvest activities Additional area could be gained by including the north-south roads There is some essentially unroaded Bureau of Land Management, administered land adjacent to this area That area, on its own, is too small for consideration by the Bureau of Land Management, and it is not being considered here in conjunction with Aldrich Mountain area

A large unroaded tract of land adjacent to and east of the Aldrich RARE II area, locally known as Aldrich Scarp, presents the opportunity to enlarge the manageable boundaries The total unroaded area is approximately 10,000 acres in size. This additional unroaded tract lies on the north slope of the Aldrich range and is very similar in description to the RARE II Area

b. Natural Integrity

Within the area, the natural integrity is extremely high With the exception mentioned above, the area is essentially untouched by human activity. The major impacts have been livestock grazing, fire management, and the introduction of a bighorn sheep herd

c Naturalness

The effects of grazing show the most impact on naturalness of the area These impacts include livestock water ponds, salting areas, and cattle trails, all of which are clearly unnatural and evident in their immediate vicinity.

The effects of fire suppression are not noticeable to the average visitor. Under more natural conditions, low-intensity wildfires would have maintained a ponderosa pine understory in ponderosa pine stands instead of the continued growth of fir species

d Opportunity for Solitude

The opportunity for solitude is excellent year-round During hunting season use increases; however, the remoteness and rugged terrain maintain opportunities for solitude. Most of the area is physically very demanding and there are no developed recreation facilities.

e Primitive Recreation and Challenge

The small size of the area and intrusion of the Aldrich Mountain Lookout and access road limit the possibility of a Primitive recreation experience, unless combined with the area in the Aldrich Scarp or the adjacent Dry Cabin roadless area.

f. Special Features

There is scenic variety in the area, ranging from forested benches to deep canyons with open slopes and forested bottoms The current visual resource variety class for the entire area is "A," distinctive

There are two possible cultural resource sites within the area; one prehistoric and the other historic There are no other identified sites, however, a traditional foraging area is adjacent to the area boundary This indicates at least travel through, and possible use by, American Indians and Europeans There are old mining and cabin sites in the general vicinity, but none are known to occur within this area

There are no known Threatened, Endangered, or Sensitive plant or animal species within this area.

3. Availability for Wilderness

a Resource Potentials

The area currently provides roaded natural and semiprimitive nonmotorized recreation opportunities. (See Table C-3) This area has a recreation visitor day capability of 7,104 (See Table C-4)

The area has no known locatable mineral potential and contains no mining claims The U S. Geological Survey indicates a potential for oil and gas in the western portion of the area but no potential for geothermal resources There are currently oil and gas leases in this general area

There are about 2,495 acres of forested land tentatively suitable for timber management activity. These timber stands consist primarily of mixed conifer, multistoried stands. The overstories are about 105 to 180 years old with understories of 70 to 80 years There is a current standing volume of 24 1 million board feet (4 2 million cubic feet). With the use of intensive timber management techniques, 120 thousand cubic feet (686 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 142 thousand cubic feet per year

b. Management Considerations

The Aldrich Mountain area is historically one of the hardest hit by lightning on the Bear Valley Ranger District each year. The hazard is high to very high South- and west-slopes are dry with flashy fuels, while north faces have dense concentrations of heavy fuels, primarily rotten white fir. Lack of access currently requires that most fires in the area be reached by helicopter or smokejumper crews.

Insect damage from western spruce budworm is widespread north of Aldrich Mountain At this time, tree mortality across the roadless area is considered insignificant The species involved are Douglas-fir and white fir. White fir has a high incidence of root rot in larger (12 inches diameter breast height) sized trees Indian paint fungus is present and known to exist in all size classes of white fir contributing to vast amounts of cull volume

There are 200 acres of land managed by Oregon Department of Fish and Wildlife within the roadless area boundary. There are three long-term, special-use permits on Aldrich Mountain

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 33 miles east of Aldrich Mountain, Monument Rock Wilderness is 65 miles east, North Fork John Day Wilderness is 60 miles northeast, and Black Canyon Wilderness is 8 miles west The ecosystems represented in this roadless area are also represented in these wildernesses

The closest major metropolitan centers are Portland, Oregon (260 miles northeast), and Boise, Idaho (200 miles east)

In the 1979 RARE II study, this area received 2,728 comments favoring wilderness designation, 26 favoring further planning, and 3,399 favoring nonwilderness management In recent Forest planning public involvement activities, this area received a low level of comment. Of the comments received, 2 8 were in favor of nonwilderness management for every 1 favoring wilderness designation.

The primary reason favoring wilderness was wildlife habitat protection, particularly for bighorn sheep. It was also suggested that this area be included with adjacent State of Oregon and Bureau of Land Management lands, and with Shaketable and Dry Cabin roadless areas The naturalness of the area and the recreation values also received comments.

The primary reasons opposing wilderness designation were the small size, the evidence of human activity, and a stated preference for roadless/wildlife management.

5. Environmental Consequences

Table C-6 displays the various management area assignments for this area by alternative

a. Vegetation/Trees

It is expected that the merchantable timber volume will be harvested over time in Alternatives A, B-Modified, and NC As this occurs, tree size, stand density, and composition will change to a managed forest appearance Approximately 620 acres of designated old growth will be retained as such in alternatives A and B-Modified Alternative NC retains approximately 290 acres of old growth The actual acres affected by timber harvest would vary between these alternatives with the exception of 337 acres under Alternative I (these acres are within the manageable boundary of Dry Cabin). Harvests are not scheduled and trees should retain present characteristics and appearance barring outbreaks of disease, insects, or fire under Alternatives C-Modified, F, and I. It is expected the Douglas-fir and white fir understories on the predominantly ponderosa pine south slopes will continue to increase due to exclusion of natural wildfires

Should Alternative A, B-Modified, or NC be selected, the north slopes consisting primarily of Douglas-fir, white fir, western larch, and lodgepole pine would be silviculturally treated by shelterwoods and clearcuts Tree vigor and age-class distribution would be improved through stocking level control on most of the forested area

b Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, and NC, forage for wildlife and livestock is expected to increase on forested areas where stocking level control is achieved The native forage species of elk sedge, pinegrass, brome, and wheatgrass are expected to naturally increase in vigor and density as timber stands are opened by harvest activities Seeding of introduced grass species will provide higher quality forage and change the composition of forage plants.

In Alternatives C-Modified, F, and I, forage production is expected to remain at present levels and may decrease as the tree canopy closes in.

c. Wilderness

Alternatives C-Modified, F, and I would preclude motorized vehicle use and timber harvest activities including construction of timber access roads Future wilderness consideration would remain a possibility

If Alternative A, B-Modified, or NC is selected, users would see motorized vehicles, timber harvest activities, and new timber access roads. The area would eventually have a managed forest appearance with human activities evident. Future wilderness consideration would be foregone by the end of the first decade.

d Recreation

The primary recreation use of big-game hunting would continue under all alternatives. Opportunity for a remote, nonmotorized hunting experience would decrease in Alternatives A, B-Modified, or NC, as additional access roads are constructed Hunter success may increase due to reduced hiding cover in harvested areas and easier access The recreation opportunity would be roaded modified with expectations of increased vehicle use.

In Alternatives C-Modified, F, and I, the recreation opportunity would be semiprimitive nonmotorized, and the user would experience more natural settings for recreational experiences Eventually, more trails may be constructed to accommodate users, and the natural setting for the proposed Pacific Crest-to-Desert Trail would be maintained

e Scenery

Scenic variety in the area, ranging from forested benches to deep canyons with open slopes and forested bottom lands, would be maintained under all alternatives. Viewers would see evidence of activities such as clearcuts and access roads in the forested areas should Alternative A, B-Modified, or NC be selected

In Alternatives C-Modified, F, and I, the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or wildfire

f. Wildlife

Old-growth timber and snags would be available to nongame wildlife to a greater extent in Alternatives C-Modified, F, and I Management standards would adequately protect key habitats for all wildlife under all alternatives. Approximately 620 acres of old growth in this area are designated in Alternatives A and B-Modified, to meet management requirements for pileated woodpecker and pine marten habitat Alternative NC retains approximately 290 acres of designated old growth.

Elk winter range occurs in about 40 percent of the area. Removal of some hiding and thermal cover by harvest activities would, in turn, increase forage in Alternatives A, B-Modified, and NC. Timber harvest activities on north slopes would improve the cover/forage ratio by reducing the amount of overstory and understory, which would improve forage on deer and elk summer range Wildlife snag levels would be maintained by Alternatives C-Modified, I, and NC, and would be reduced by Alternative B-Modified

g Water, Riparian, Fisheries — Due to the small amount of riparian and fisheries habitat in the area, there are no significant effects and/or differences between alternatives Moreover, management standards will adequately protect streamside areas under all alternatives.

h Cultural Resources — All alternatives are similar in effects on cultural resources There is no discernible difference between alternatives when considering existing regulations, laws, and management standards The treatment alternatives present the greatest risk of inadvertent damage to the resource They also present the greatest opportunity for discovery and interpretation of cultural resources.

i Soils — Alternatives A, B-Modified, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities All of the alternatives adequately protect the resource through application of management standards

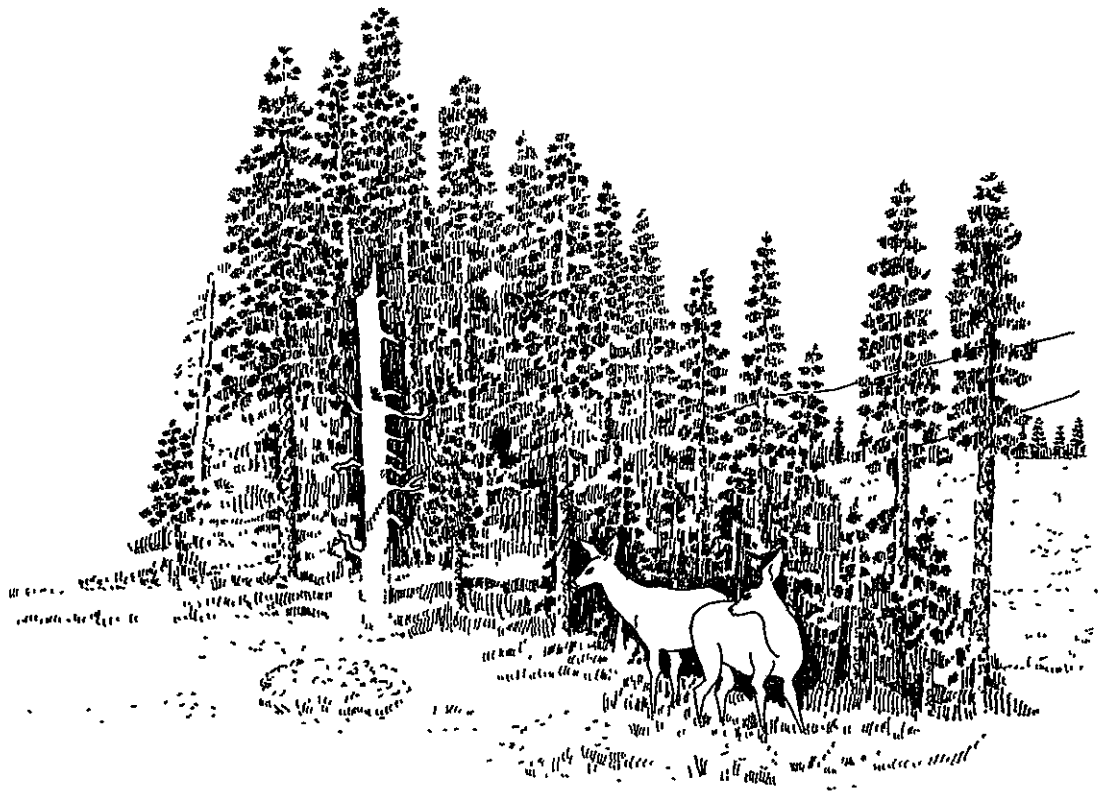
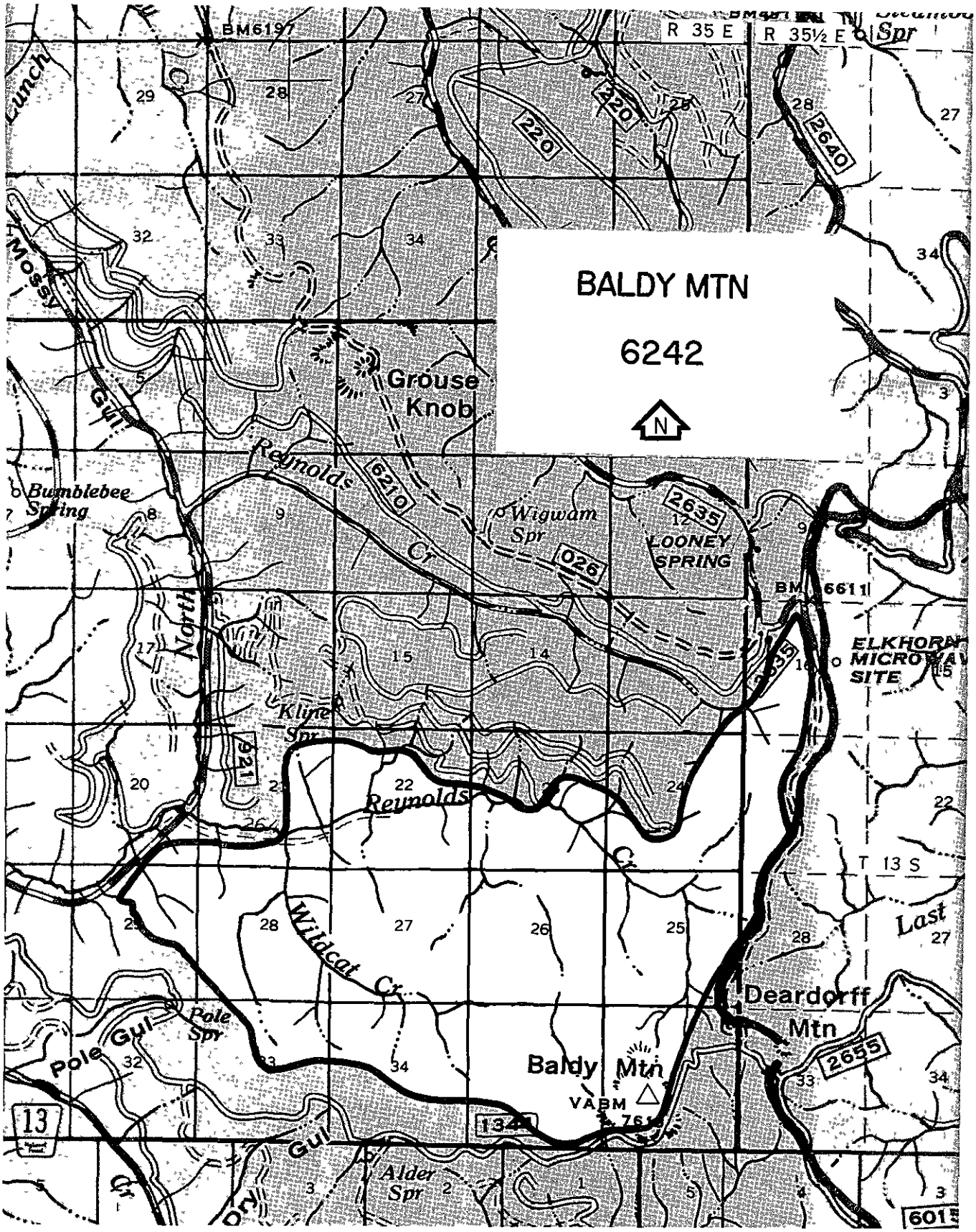


TABLE C-6
ALDRICH MOUNTAIN MANAGEMENT BY ALTERNATIVE
(Acres)

	Alternatives					
	NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1. General Forest	N/A	962	2,416			
2. Rangeland		585	607			
3 Riparian Areas		213	209			
4A. Big-Game Winter Range			710			
4B. Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mt Wilderness						
6B. Monument Rock Wilderness						
6C Pine Creek						
7. Scenic Area						
8 Special Interest Area						
9. Research Natural Area						
10 Semi-Primitive Non-Motorized				4,951	4,951	4,614
11. Semi-Primitive Motorized						
12. Developed Recreation						
13 Old Growth	N/A	620	620			
14 Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas	N/A	2,166				
16. Minimum Level Management		405	389			
17 Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20 Wildlife Emphasis Areas with Scheduled Harvest						337[2/]
21 Wildlife Emphasis Area, Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	4,951	4,951	4,951	4,951	4,951

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner As a result, these acreages are not available.
2/These acres are included in the manageable boundary of Dry Cabin roadless area.

FIGURE C-3


BALDY MTN
6242
N
R 35 E
R 35½ E
BM6197
Grouse Knob
Reynolds
Cr
6210
Bumblebee Spring
Wigwam Spr
026
2635
LOONEY SPRING
BM 6611
ELKHORN MICROWAVE SITE
North
Kline Spr
921
Reynolds
Cr
T 13 S
Wildcat Cr
Pole Gul
Pole Spr
Baldy Mtn
VABM 7614
Deardorff Mtn
2655
2640
220
320
Alder Spr
Gul
13
1340

D. BALDY MOUNTAIN - 6,431 Acres
(RARE II No. 6242)

1. Description

a. History

This area was identified in the RARE process and additional area added in the RARE II process Under direction in the John Day Planning Unit Plan and RARE II Final Environmental Impact Statement, this area has been managed for nonwilderness uses

b Location and Access

The area is located in the northern part of the Prairie City Ranger District and bounds the Wallowa-Whitman National Forest on the east (T 15 S., R 35 E , of the Willamette Meridian)

Access is by secondary Forest roads surrounding the area Reynolds Creek Trail follows Reynolds Creek on the north edge for 1-1/2 miles.

c. Geography and Topography

The area is a moderately steep to very steep, heavily forested north slope of Baldy Mountain and adjacent ridges and subridges broken by two streams--Reynolds Creek and Wildcat Creek (a tributary to Reynolds Creek) which drain into the John Day River. See Figure C-3

d. Geology and Soils

The geology consists of hard-rock formations covered with a thin mantle (typically less than 24 inches) of volcanic ash from historic Mount Mazama (present day Crater Lake) The bedrock is primarily from the Columbia River Group which consist of hard basalt and andesite with soft to moderately hard tuffaceous rhyolite interflows. There is a small area near Baldy Mountain where the bedrock has not been identified.

The soil is typically a silt loam textured volcanic ash over a gravelly and cobbly loam subsoil. The ash surface soil typically ranges in depth from 6 to 24 inches.

e Vegetation

About 98 percent forested, the area supports extensive stands of mixed conifers with inclusions of ponderosa pine on the open, less steep benches Steep northern exposures hold dense mixed conifers Riparian vegetation exists intermittently along Reynolds Creek About 1,800 acres meet the Pacific Northwest Region's definition of old growth.

f. Current Uses

Hunting and fishing are the primary activities in this area which receives only light recreation use (see Table C-2)

The area provides summer habitat for deer and elk, old growth within the area is habitat for the pine marten and pileated woodpecker Reynolds Creek provides spawning habitat for steelhead trout

The area provides 104 Animal Unit Months of forage for livestock in the Reynolds Creek allotment. However, cattle rarely, if ever, utilize this portion of the allotment due to dense tree vegetation and lack of access, except that the Reynolds Creek riparian area receives heavy use along its lower portion.

The major attraction of the area is the opportunity for hunting and fishing in an unroaded area with old-growth forest

2. Wilderness Capability

a Manageability and Boundaries	The current RARE II boundaries would be difficult to manage, the former RARE boundaries follow more clearly defined topographic features
b Natural Integrity	All ecosystems in the area are intact However, lack of fire has encouraged fir encroachment under the ponderosa pine stands Under natural conditions, low-intensity wildfires would have selectively maintained ponderosa pine understories
c. Naturalness	The area appears very natural to users The effects of fire exclusion are too subtle to be noticed by most users
d Opportunity for Solitude	The opportunities for solitude are good particularly near the center of the area and in the lower elevations and within the draws
e. Primitive Recreation and Challenge	The Primitive recreation opportunities are very limited due to the small size of the area. Opportunities for challenge are limited to an area on the north side of Baldy Mountain where mountaineering is a potential activity
f. Special Features	*Threatened, Endangered, or Sensitive plant or animal species are not known to* exist in the area No surveys have been conducted in this area There is a low probability of occurrence of cultural sites as verified by a cultural resource inventory survey along Reynolds Creek

3. Availability for Wilderness

a Resource Potentials	The area currently provides roaded natural and semiprimitive motorized recreation opportunities (see Table C-3), and has a capability of providing 12,916 *Recreation Visitor Days per year (See Table C-4)*
	There are 5,000 acres of forested land which are tentatively suitable for timber management activities These timber stands are primarily mixed conifer with some ponderosa pine and lodgepole pine The average overstory age is 140 years, the *average understory age is 65 There is a standing volume of 65 89 million board* feet (11 52 million cubic feet) With the use of intensive timber management techniques, 240 thousand cubic feet (1,373 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 285 thousand cubic feet per year
	The area has no known locatable mineral potential and contains no mining claims The U S Geological Survey does not indicate a potential for oil and gas or for geothermal resources
b Management Considerations	There are no power withdrawals, irrigation systems, or impoundments within the area. There is an electronic site and powerline special-use near the area There is one administrative withdrawal
	Indian paint fungus is present and may be found in all size classes of the fir species. Much of the Douglas-fir (especially that found on the rockier, drier soils) is infected with dwarf-mistletoe Mistletoe patches of varying severity can be found. Root rots are present to varying degrees but are not considered a problem

Due to high amounts of Douglas-fir and other fir species in the area, all the timber stands are highly susceptible to tussock moth and western spruce budworm Western Spruce budworm is presently in the area, and in some cases, is quite severe. Western pine beetle can be found in the area, but is generally confined to a few old-growth ponderosa pine trees of low vigor Mountain pine beetle outbreaks are occurring in lodgepole pine.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness lies 10 miles to the southwest, the Monument Rock Wilderness lies 10 miles to the southeast, the North Fork John Day Wilderness is 24 miles to the northwest, and the Black Canyon Wilderness is 55 miles to the west. The Glacier Mountain roadless area lies 5 air miles due south. Ecosystems of this area are already represented in the Strawberry Mountain and Monument Rock Wildernesses. The Baldy Mountain roadless area would provide additional recreation opportunities.

Bend and Ontario, Oregon, are the nearest minor metropolitan areas (120-150 miles). Portland, Oregon and Boise, Idaho are the nearest major metropolitan areas (180-280 miles).

In the 1979 RARE II study the area received 128 comments favoring wilderness, 2,579 comments favoring further planning, and 3,435 comments opposing wilderness designation.

In recent Forest planning public involvement, Baldy Mountain was among the group of areas receiving a low level of response In addition, those comments on this area were 5.3 to 1 opposed to wilderness designation. Among these, there was some support for continued roadless management.

5. Environmental Consequences

Table C-7 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

Significant changes in tree sizes, stand density, and composition are expected to occur in all alternatives except C-Modified The predominantly mixed conifer old-growth stands would be harvested over time in Alternatives A, B-Modified, F, I, and NC, with silvicultural prescriptions for shelterwoods and clearcuts The 760 acres of designated old growth will be retained as such in most of these alternatives. Alternative NC retains approximately 560 acres of old growth Tree vigor and age-class distribution would be improved through understory stocking level control. Risk of loss to insects and/or diseases would be reduced. The actual acres affected by timber harvest would vary between these alternatives. These changes would not occur until the second decade under Alternative F.

Under Alternative I, timber harvests would be on a non-scheduled basis and would be used only to meet a wildlife and/or fish habitat objectives. When timber harvesting is warranted silvicultural prescriptions will be designed to meet these objectives utilizing both even-aged and uneven-aged management techniques. The environmental changes, although similar to those in Alternatives A, B-Modified, F, and NC, as expressed in the above paragraph, would not occur as rapidly as in these other alternatives

In Alternative C-Modified, tree stands would be managed for uses other than timber production This would occur on the entire area in Alternative C-Modified. The old-growth trees and understory would be left in a natural state. Naturally occurring wildfires would be suppressed, further encouraging more fir encroachment under the ponderosa pine stands.

b. Vegetation/Grass and Shrubs

In all alternatives, except C-Modified, forage for livestock and wildlife is expected to increase where the overstory timber is harvested and stocking level control are achieved in the understory Forage species such as elk sedge and pinegrass will increase as tree canopies are reduced Changes in forage species composition are expected when introduced grass species are seeded following timber harvest. Openings created by clearcuts will increase forage production even more and improve present cover/forage ratios for big game All of these forage increases are considered short term on transitory range such as this, since forage production will decrease as tree canopies close and shade the understory plants Changes as a result of Alternative F would not occur until the beginning of the second decade

In Alternative C-Modified, forage production is expected to remain at present levels, and may decrease as fir tree species increase under the ponderosa pine stands

c. Wilderness

Alternative C-Modified would preclude timber harvest on all of the area but would permit motorized vehicle use Future wilderness consideration would remain a possibility for the area within these boundaries Except for motorized vehicle use, wilderness experience expectations would be met and the area would continue to appear very natural to users

In Alternatives A, B-Modified, F, I, and NC, users would see timber harvest activities, new road construction, and increased motorized vehicle use However, under Alternative I, road construction would be minimized with newly constructed roads being obliterated following timber harvest Future wilderness consideration would be foregone by the end of the first decade for all alternatives except F, by the end of the second decade for Alternative F

d Recreation

Hunting would continue as the primary recreation activity under all alternatives Alternative C-Modified would provide a semiprimitive motorized recreation opportunity and would offer a more natural environment to users than other alternatives, while Alternative I would provide semiprimitive nonmotorized recreation opportunity Moreover, access during periods other than summer would be limited by the weather

In all other alternatives, recreation experiences would be in a roaded modified setting Road access would be available to more kinds of vehicles over a longer period of time These changes would occur after the first decade for Alternative F.

e. Scenery	Scenic variety and the panoramic view from Baldy Mountain would be maintained under Alternative C-Modified, and to a lesser degree under Alternative I. Under Alternatives A, B-Modified, F, I, and NC, viewers would see evidence of a managed forest including clearcuts and shelterwoods. With Alternative I, harvest units would be limited in size to 10 acres or less and shaped to provide for a natural appearing setting. The effects on scenery in the long term would be less old growth to view, more access roads, and less naturalness. The effects of Alternative F would not occur until after the first decade. In Alternative C-Modified, most of the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire.
f. Water, Riparian, Fisheries	The riparian vegetation, anadromous fish habitat, and water quality of Reynolds Creek would be least affected should Alternative C-Modified, or I be selected, although management standards would adequately protect these resources under all management alternatives. There would be increased accessibility and use in the other alternatives as a result of timber harvest and road construction. These effects would be seen after the first decade for Alternative F
g. Cultural Resources	All alternatives are similar in effects on cultural resources. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards. Alternatives A, B-Modified, F, and NC present the greatest risk of inadvertent damage to the resource. They also present the greatest opportunity for discovery and interpretation of cultural resources These risks and opportunities would not occur under Alternative F until the beginning of the second decade.
h Soils	Alternatives A, B-Modified, F, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities All of the alternatives adequately protect the resource through application of management standards This risk would not occur under Alternative F until the beginning of the second decade.

TABLE C-7

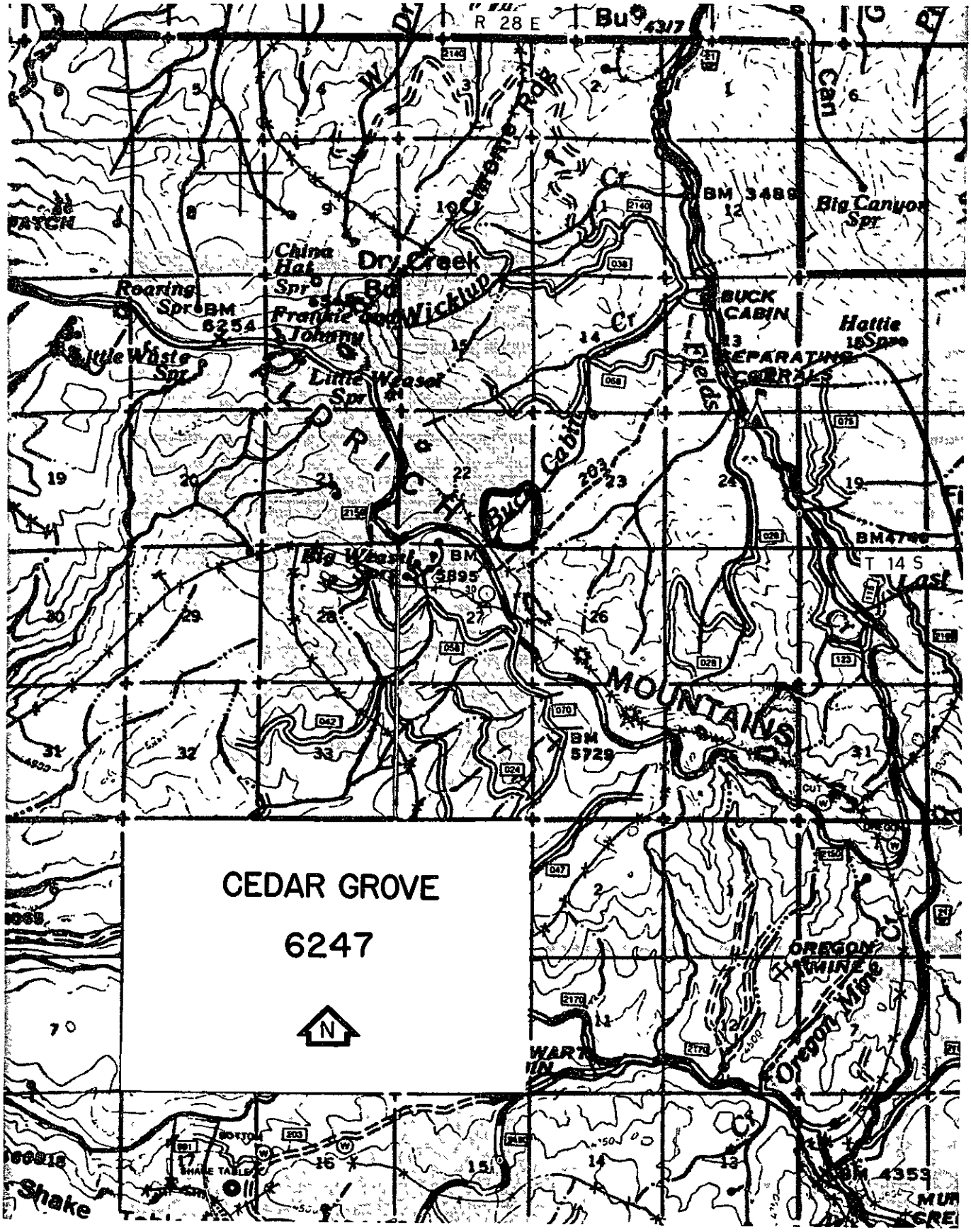
BALDY MOUNTAIN MANAGEMENT BY ALTERNATIVE

(Acres)

		Alternatives					
		NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1	General Forest	N/A	933	4,846		4,874	873
2	Rangeland		32	40		32	5
3	Riparian Areas		285	276		240	86
4A	Big game Winter Range						
4B	Big game Winter Range Enhancement						
5.	Bald Eagle Winter Roost						
6A	Strawberry Mt. Wilderness						
6B	*Monument Rock Wilderness*						
6C	Pine Creek						
7	Scenic Area						
8	Special Interest Area						
9	Research Natural Area						
10	Semi-Primitive Non-Motorized						
11	Semi-Primitive Motorized				6,431		
12	Developed Recreation						
13	Old Growth	N/A	760	760		760	
14.	Visual Corridors						
15	Unit Plan Wildlife Emphasis Areas	N/A	3,930				
16.	Minimum Level Management		491	509		525	87
17	Byram Gulch Municipal Supply Watershed						
18.	Long Creek Municipal Supply Watershed						
19	Administrative Sites						
20	Wildlife Emphasis Areas with Scheduled Harvest						
21.	Wildlife Emphasis Area, Non-Scheduled Harvest						5,380
22.	Wild and Scenic River						
TOTAL ACRES		N/A	6,431	6,431	6,431	6,431	6,431

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner As a result, these acreages are not available

FIGURE C-4


R 28 E
Bu
Can
Clarence Rose
Cr
BM 5489
Big Canyon Spr
Dry Creek
China Hat Spr
Roaring Spr
BM 6254
Frankie Johnny
Wicklup
BUCK CABIN
Hattie Spr
Little Whistle Spr
Little Weasel Spr
Fields
Buck Cabin
BM 5895
T 14 S
MOUNTAINS
BM 5729
CEDAR GROVE
6247
N
Oregon Mine Cr
Shake
BM 4353

E. CEDAR GROVE - 112 Acres
(RARE II No. 6247)

1. Description

a History — The RARE II inventory criteria allowed this area to be inventoried as a roadless area because of the uniqueness of a stand of Alaskan yellow cedar far from its native range. The John Day Planning Unit Plan designated it as a Special Interest (Botanical) Area. RARE II designated the area to nonwilderness uses.

b Location and Access — This area is located in the western portion of the Malheur National Forest about 12 miles southwest of Mt. Vernon, Oregon, in eastern Grant County, Oregon.

c. Geography and Topography — The area is on the northeast slope of Aldrich Mountain at the head of Buck Cabin Creek (T 14 S., R. 28 E., of the Willamette Meridian). It is confined to the steep narrow canyon formed by the creek, which is fed by a series of permanently flowing springs in the area. See Figure C-4.

d. Geology and Soils — The geology consists of bedrock formations covered with a thin mantle (15-25 inches) of volcanic ash from historic Mount Mazama (present-day Crater Lake) The bedrock is highly stratified and variable The soils consist of 15-24 inches of silt loam textured ash over a variety of subsoil material The area is covered by Eocene volcanic sediments and flows.

e Vegetation — Tree species, other than Alaska yellow cedar, in the area include Douglas-fir, western larch, and lodgepole pine. Ground vegetation consists of huckleberry, pinegrass, and Columbia brome. Mule deer, Rocky Mountain elk, and other mammals include this area within their habitat The area is 100 percent forested, 80 acres of which meet the Pacific Northwest Region's definition of old growth.

f Current Uses — Recreational uses are primarily day-hiking, viewing scenery, and enjoyment of a unique, pleasant spot. (See Table C-2.)

There is no livestock grazing within this area; it is generally unsuitable for cattle grazing.

The area is a steep, densely-vegetated grove with a stream through it Users walk through open forest and open, grassy hillsides, with views of the rural, populated valley below, to reach this cool oasis. The main attractions of the area are the unique stand of trees and the quiet, peaceful, surroundings.

2. Wilderness Capability

a Manageability and Boundaries — The boundary of the area does not follow any particular topographic feature and is situated on a sideslope. There is little opportunity to modify the boundary.

b Natural Integrity — The natural integrity of the area is extremely high. The major impact is the presence of a high standard, well-maintained trail including constructed wooden bridges

c Naturalness — The area appears to be very natural except for the trail and bridges.

d Opportunity for Solitude

Vegetation and topography within the center of the area provide good opportunity for solitude; however, the trail tends to concentrate use and reduces this opportunity significantly. The remainder of the area is fairly open and easily accessible

e. Primitive Recreation and Challenge

There is no opportunity for Primitive or challenging recreation.

f. Special Features

While the views provide a feeling of spaciousness, they also indicate proximity to civilization The area is only 1/4 mile from a road The sounds of off-site activities would be heard. The trail is easily managed by an average hiker.

There are no Threatened, Endangered, or Sensitive plant or animal species in the area There are no opportunities for historical study

The special nature of the area is the stand of Alaska yellow cedar, offering excellent opportunity for scientific study of a unique ecological feature

3. Availability for Wilderness

a Resource Potentials

The entire 112 acres of this area provide roaded natural recreation It has a yearly capability of 80 Recreation Visitor Days.

The entire 112 acres are tentatively suitable for timber management activities The stand is multistoried with an overstory age of 180 and an understory age of 80 There is a standing volume of 1 40 million board feet (.25 million cubic feet) With the use of intensive timber management techniques, 5 thousand cubic feet (29 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long term sustained yield capacity from this area would be 6 thousand cubic feet per year The area has no known locatable mineral potential and it contains no mining claims. The U S. Geological Survey does not indicate a potential for oil and gas or geothermal resources.

b Management Considerations

The disease, Indian paint fungus, is present and can probably be found in all size classes of the true fir Due to high amounts of true fir and Douglas-fir in the review area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm Western spruce budworm is in the area now and, in some cases, is quite severe

There are no water impoundments or other planned water developments in the area.

There are no non-Federal lands within the area

4. Wilderness Evaluation

The Strawberry Mountain Wilderness lies 20 miles east, Monument Rock Wilderness lies 50 miles east, North Fork John Day Wilderness lies 55 miles northeast, and Black Canyon Wilderness lies 20 miles west. The ecosystem of this area is not represented by any of these wildernesses.

The nearest major metropolitan centers are Portland, Oregon (260 miles northwest), and Boise, Idaho (200 miles east).

This area does not have strong support as a wilderness area There is consensus that the area should be protected under a special interest designation

In the 1979 RARE II study, the area received 116 comments favoring wilderness, 20 comments favoring further planning, and 3,378 favoring nonwilderness management In recent Forest planning public involvement activities, this area received a moderate level of interest The comments were 2.7 to 1 opposed to wilderness designation The main reason opposing wilderness was the small size of the area There was overwhelming support for special designation to protect the unique ecosystem

5. Environmental Consequences

Table C-8 displays the various management area assignments for this area by alternative

a. Vegetation/Trees

All alternatives are alike in effects on trees. Little to no change in tree composition, size, and density is expected because all alternatives retain the area as a special interest area or semiprimitive nonmotorized recreation area.

b. Vegetation/Grass and Shrubs

Effects on grasses, forbs, and shrubs are similar for all alternatives. Composition and density are expected to remain similar to that now existing.

c Wilderness

Wilderness consideration remains a possibility under all alternatives. There are no development activities in any alternative for this area.

d. Recreation

The recreation opportunity is the same under all alternatives. All alternatives protect the special character of the unique stand of Alaska yellow cedar.

e. Scenery

Effects on scenery are the same under all alternatives The naturalness of the area will remain unchanged

f Wildlife

All alternatives retain existing wildlife habitat The changes that occur would be a result of natural succession.

g. Water, Riparian, Fisheries

Dry Cabin Creek flows from the area and will remain unaffected by the alternatives

h. Cultural Resources

There would be no effect on cultural resources in any alternative

i. Soils

There would be no effect on soils as a result of the alternatives.

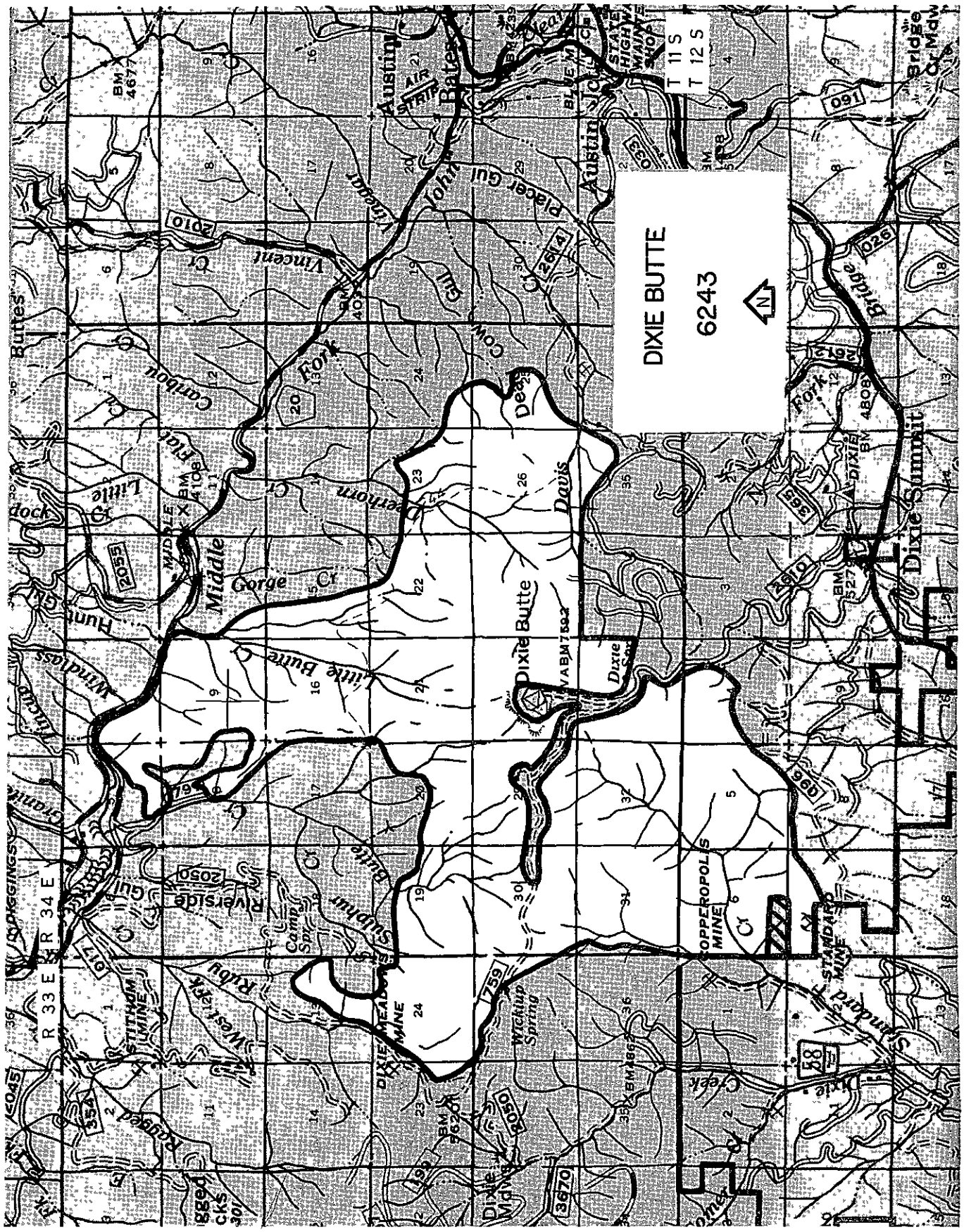
TABLE C-8
CEDAR GROVE MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	Alternatives					
	NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1. General Forest						
2. Rangeland						
3 Riparian Areas						
4A. Big-Game Winter Range						
4B. Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7 Scenic Area						
8. Special Interest Area	N/A	112	112	112	112	112[2/]
9. Research Natural Area						
10. Semi-Primitive Non-Motorized						
11 Semi-Primitive Motorized						
12. Developed Recreation						
13. Old Growth						
14 Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas						
16. Minimum Level Management						
17. Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20 Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area, Non-Scheduled Harvest						
22 Wild and Scenic River						
TOTAL ACRES	N/A	112	112	112	112	112

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner As a result, these acreages are not available.

2/These acres are within the manageable boundary of Aldrich Mountain.

FIGURE C-5


DIXIE BUTTE
6243
T 11 S
T 12 S
R 33 E
R 34 E
Austin
Bates
Dixie Butte
Dixie Summit
Middle Gorge
Little Butte
Davis
Dead
Vincent
Cow Gulch
Placer Gulch
Riverside
Rubyville
Subway
Dixie Meadows Mine
Copperopolis Mine
Standard Mine
Stithem Mine
Dixie
Creek
Austin Jct.
Bridge
Fork
Buttes
Dixie Mdw.
Witchup Spring
Dixie Spr.
Common Spr.
Rugged
Cks.
Granite
Hunter Cr
Windlass
Hillcrest
Little Buttercup
Cr
Ck
Gulch
Gulch
Canyon
Flat
Flat
Fork
Fork
Creek
Creek
Gulch
Gulch
Gulch

F. DIXIE BUTTE - 12,110 Acres
(RARE II No. 6243)

1. Description

a. History

This area was identified during the RARE process and increased in size during the RARE II process Under the John Day Planning Unit Plan and the RARE II Final Environmental Impact Statement, the area has been managed for nonwilderness uses.

b. Location and Access

The Dixie Butte roadless area is located in the northern portion of the Malheur National Forest in Grant County, about 6 miles north of Prairie City, Oregon (T. 12 S , R. 33 E , of the Willamette Meridian) The area has an irregular boundary that lies generally north and east of Dixie Butte. On the north, the boundary runs approximately 1.5 miles from the Middle Fork of the John Day River between Davis and Little Butte Creeks. Between Little Butte and Butte Creeks (approximately 2 miles), the boundary is the Middle Fork

c. Geography and Topography

This area consists of Dixie Butte (elevation 7,592 feet) and surrounding drainages to the Middle Fork John Day River (elevation 4,200 feet) in the north, and drainages to the mainstem John Day River in the south Dixie Butte is a prominent landmark above surrounding forested areas Sideslopes are steep at higher elevations and bench-like at lower elevations See Figure C-5.

d Geology and Soils

The geology consists of a variety of hard-rock formations covered with a thin mantle (typically less than 24 inches) of volcanic ash from historic Mount Mazama (present-day Crater Lake). Bedrock includes hard to moderately hard gabbro with minor amounts of serpentine and peridotite, hard andesite and basalt with soft to moderately hard interflows of tuffaceous rhyolitic material; argillite and other miscellaneous unidentified older metasedimentary rock; and others in minor amounts

The soil consists of from 6-24 inches of volcanic ash over a variety of subsoil material The ash is a silt loam textured soil that typically contains less than 5 percent gravel Subsoil material is typically a gravelly to cobbly loam to clay loam soil.

e. Vegetation

Vegetation on ridgetops and the summit of Dixie Butte is primarily subalpine fir and white bark pine with a ground cover of sagebrush, elk sedge, and fleeceflower. The area is about 94 percent forested with ponderosa pine, white fir, and Douglas-fir, and ground vegetation of elk sedge and pinegrass. Old growth forest occurs on about 3,700 acres, according to the Pacific Northwest Region definition

f. Current Uses

Recreational activities in the area include hiking, cross-country skiing, snowmobiling, hunting, prospecting, camping, and viewing scenery. (See Table C-2.)

The area provides summer habitat for mule deer and Rocky Mountain elk, and habitat for cougar, bear, bobcat, and other small game and mammals Butte Creek, Little Butte Creek, Deerhorn Creek, and Davis Creek flow north into the Middle Fork of the John Day River Standard and Dixie Creeks flow south into the mainstem of the John Day River. All these streams provide resident trout fishing as well as spawning and rearing habitat for steelhead. Some of the streams also provide rearing habitat for chinook salmon.

The area lies within two grazing allotments and provides an average of 500 Animal Unit Months per year

The surrounding area includes private land, logged forest land, and structures on Dixie Butte Summit Near the western edge of the area are located three highly developed mining sites, at least one of which was active in the recent past

The panoramic view from Dixie Butte is an attraction to visitors, however, access is difficult Hunting opportunities are probably the primary attraction of the area and, to a lesser degree, the opportunity to view a variety of wildlife

2. Wilderness Capability

a Manageability and Boundaries

Opportunity exists to improve manageability of the boundary by adjusting it to follow topographic features This would also remove some impacts to the natural integrity of the area, but it would reduce the size of the area

b. Natural Integrity

The area has been impacted by mineral developments, livestock grazing, a sheep driveway, constructed roads and jeep trails, timber harvesting, and a recreational trail The northern arm that extends down to the Middle Fork John Day River (Little Butte Creek) has been railroad-logged in recent history Dixie Butte Lookout and an electronic site occupy Dixie Summit A low-standard, constructed road accesses these sites

Mining impacts are numerous across the area The southern portion (south of Dixie Butte) is covered by active claims Some activity occurs each year in this area. Most of the area north of Dixie Butte does not presently have claims on it Impacts range from prospect holes to large pits and spoil banks.

Grazing impacts include water developments, salt grounds, fences, and the physical presence of cattle A sheep driveway still exists across the middle of the area from Wickiup Springs to just south of Dixie Butte The driveway was used to move sheep across the Middle Fork to the Greenhorn Mountain area

Timber harvesting impacts are old (railroad logging) and limited to (1) the arm of the roadless area that extends to the Middle Fork, and (2) a thin fringe that borders Butte Creek on the north The suppression of fire has also altered the natural succession of vegetation in the area Under natural conditions, low-intensity fires on pine sites would have selectively retained a ponderosa pine understory.

There is one unimproved jeep track in the western section of the area

There are also some impacts due to recreational use. There is one maintained trail through the center of the eastern section which is popular with snowmobilers and trailbike riders There are numerous trails along drainages, which are not maintained and appear similar to game trails There are undeveloped hunter camps throughout the area with associated fire rings, Primitive game racks, etc The area most highly impacted by hunter camps is around Wickiup Springs in the northwest portion of the area along the main access road (T 11 S , R. 33 E., Section 25)

c. Naturalness

The naturalness of the area has been altered by the many factors mentioned previously. Most of these impacts would not be noticeable to the average visitor. The most noticeable impacts (timber harvest, unimproved roads, livestock grazing, and mineral development) would also require difficult, costly, and/or lengthy processes to mitigate.

d. Opportunity for Solitude

Almost no portion of the area is more than two miles from a road. Vegetative screening increases the opportunity to find solitude and the topography at higher elevations further enhances this opportunity. Even so, opportunity for solitude would be considered moderate.

e. Primitive Recreation and Challenge

While there are many and varied opportunities for dispersed outdoor recreation, this area does not lend itself to a Primitive experience. There are few challenges offered, perhaps the most challenge would be to cross-country skiers due to the difficulty of access in winter

f Special Features

There are no known Threatened, Endangered, or Sensitive plants or animals in this area

There is an opportunity for historical study of railroad logging, although not many of the physical structures are still in evidence A similar possibility exists for historic mining activity, however, this area would not be as good as the Susanville and Greenhorn mining districts There are no known prehistoric cultural resource sites within the area

There is a potential for scientific study of ecological features. A possible Research Natural Area has been identified near the summit of Dixie Butte. This area was considered a moderate candidate; the cells it represents were better represented by other potential research natural areas in the Blue Mountains.

3. Availability for Wilderness

a Resource Potentials

This area currently provides roaded natural and semiprimitive motorized recreation opportunities. (See Table C-3) If left undeveloped, the area is capable of providing 27,389 Recreation Visitor Days (See Table C-4.)

The old railway system up Little Butte Creek was constructed to yard and haul timber to the sawmill once located at Bates. The rails and all but a few remnant ties are gone; the only evidence of this past activity is the railroad grade

The grades were designed at a very slight slope (no greater than four to five percent) to accommodate steam engines This network of railroad grades contouring the terrain at relatively flat slopes provides an excellent opportunity to develop a trail network for mountain bikes, all-terrain vehicles, snowmobiles, and cross-country skiers This network could be managed to protect its historic significance, provide interpretation, and provide unique recreation opportunities

This area provides excellent opportunities for recreational activities in a semiprimitive motorized setting. There are old roads in the area that are unsurfaced and best driven with a four-wheel drive or off-road vehicle. The Davis Creek Trail passes through the area and can be utilized by hikers or trail bikers

There are 10,700 acres of forested land tentatively suitable for timber management activities. These trees are predominantly mixed conifer with some lodgepole and ponderosa pine. The stands are multistoried, with an average overstory age of 140 and an average understory age of 65. There is a standing volume of 125 3 million board feet (21.9 million cubic feet) With the use of intensive timber management techniques, 514 thousand cubic feet (2,940 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 610 thousand cubic feet per year.

This area includes part of the old Quartzburg mining district. Mineralization consists of narrow gold-quartz veins with north-northeasterly strikes, found in all of the pre-Cretaceous rocks, copper-gold-cobalt veins and stringers are found in irregular east-northeasterly trending quartz-tourmaline replacement bodies within the metavolcanics Placer gold is found along Davis Creek and the Middle Fork John Day River Portions of the area have high and moderate potential for gold, silver, copper, and cobalt. Numerous mining claims are located within the area The U.S Geological Survey considers the area prospectively valuable for geothermal resources but not for oil and gas

b Management Considerations

Indian paint fungus is present and can probably be found in all size classes of fir species Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe. Mistletoe patches can be found, varying from fairly light to quite severe Root rots can be found to varying degrees but, at present, are not considered a problem

Due to high occurrence of Douglas-fir and other fir species in the area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm Western spruce budworm infestation of varying severity is presently within the area Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor Mountain pine beetle outbreaks can be found in lodgepole pine

Two special uses, a telephone line and an electronic site, as well as a road right-of-way occur within this area. Mineral rights are reserved on several hundred acres. One 120-acre administrative site exists in the area.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 22 miles southwest, Monument Rock Wilderness is 27 miles southeast, and North Fork John Day Wilderness is 9 miles northeast of the Dixie Butte roadless area. The ecosystems present in the Dixie Butte area are also well represented in these three existing wildernesses, including low-elevation (for the Blue Mountains) Forest

The nearest major metropolitan centers include Portland, Oregon and Boise, Idaho, 260 and 200 miles distant, respectively

In the 1979 RARE II Study, there were 2,714 comments in favor of wilderness designation, 21 comments favoring further planning, and 3,456 favoring nonwilderness management. In recent Forest planning public involvement activities, this area was in the group receiving a moderate level of comments Of those comments, 4 8 responses opposed wilderness to every 1 favoring it

The primary reasons favoring wilderness centered on the fish and wildlife habitat, watershed protection, and proximity of the area to the Greenhorn Mountains. The reasons opposing wilderness designation included timber and mineral values and evidence of human activity which detracts from the natural setting. There was some support for roadless management of part of the area

5. Environmental Consequences

Table C-9 displays the assignment of management areas by alternative.

a. Vegetation/Trees

Over time, overstory trees would be harvested and the understory thinned in Alternatives A, B-Modified, F, I, and NC As this occurs, the tree sizes, and stand density and composition will have the appearance of a managed forest About 1,130 acres of old growth will be retained in most alternatives with no significant effects Additional old growth may occur within the semiprimitive motorized and wildlife emphasis designations Actual acres affected by timber harvest would vary between these alternatives.

In Alternatives A, B-Modified, F, I, and NC, the north slopes consisting primarily of Douglas-fir, white fir, western larch, and lodgepole pine would be silviculturally treated over time with shelterwoods and clearcuts. Tree vigor and age-class distribution would be improved through stocking-level control (thinning) on most of the forested areas.

In Alternative C-Modified, more of the trees would retain present characteristics and appearance since timber harvest would not occur. Outbreaks of insects and diseases are expected to be greater with this alternative

In Alternative I, timber harvests would be on a non-scheduled basis within the southwest portion of the roadless area. Within this portion silvicultural treatments would be designed to meet wildlife objectives with effects similar to timber management allocation However, with this alternative, harvests will occur at a reduced rate.

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC, forage for wildlife and livestock is expected to increase in forested areas where the overstory is removed and the understory is thinned Significant increases are expected in forage production on north-facing slopes as tree canopies are opened by shelterwoods and clearcuts Long term effect on this transitory range should be a gradual decrease in forage production as tree canopies again close and shade the understory Seeding of introduced forage species will provide higher quality and quantity of forage and change the present plant composition Native forage species of elk sedge, pinegrass, and brome are also expected to increase in vigor and density as tree canopies are opened and thinning occurs in harvest areas The increase in forage is not expected to be as rapid in Alternative I due to the reduced rate of timber harvest

In Alternative C-Modified, forage production is expected to remain at present levels and may decrease as Douglas-fir and white fir further encroach under the ponderosa pine on south slopes.

c Wilderness

Nonconforming wilderness activities such as timber harvest and road construction would not occur under Alternative C-Modified, however, motorized vehicle use would be allowed. Future wilderness consideration would have the greatest possibility under Alternative C-Modified

In Alternatives A, B-Modified, F, I, and NC, users would see timber harvest activities, new road construction, and motorized vehicle use in all of the area. The area would eventually have a managed forest appearance with human activities evident in forested areas Future wilderness consideration would be foregone by the end of the first decade

In Alternative I, timber harvests activities and new road construction would be evident within the area, with the wildlife emphasis portion having a more natural appearance. Future wilderness consideration would be forgone by the end of the first decade.

d. Recreation

In Alternatives A, B-Modified, F, and NC, the recreation opportunity would be roaded modified with expectations of increased vehicle use. The recreation opportunity would be roaded natural in the wildlife emphasis portion under Alternative I Big-game hunter success is expected to increase due to reduced hiding cover in harvested areas and easier access The opportunity for remote, nonmotorized hunting would decrease as additional access roads are traveled by more hunters.

Alternative C-Modified offers a semiprimitive motorized recreation opportunity which would provide a more natural setting to users than the above alternatives. Moreover, road access during periods other than summer months would be limited by weather and used by more specialized vehicles such as four-wheel drives. All the above alternatives allow use of snowmobiles and motorbikes

e Scenery

Scenic variety and the panoramic view from Dixie Butte would be maintained under all alternatives Under Alternatives A, B-Modified, F, I, and NC, viewers would see evidence of a managed forest, including clearcuts and shelterwoods. The long-term effects on scenery would be less old growth to view, more access roads, and less naturalness

In Alternative C-Modified, most of the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire

f Wildlife

Alternative C-Modified would retain the largest acreage of old growth and the most wildlife snags. Old-growth timber and snags would be less available in Alternatives I and NC, and be affected most by Alternatives A, B-Modified, and F Alternative NC is expected to remove the most wildlife snags Management standards would adequately protect key habitats for all wildlife under all alternatives Moreover, at least 1,130 acres of old growth are designated in Alternatives A, B-Modified, and F to meet habitat needs of pileated woodpecker, pine marten, and other wildlife. Alternative NC retains approximately 760 acres.

All alternatives, except C-Modified, would likely reduce the amount of mixed conifer old growth in the long term and, thereby, improve the cover/forage ratio where forage is deficient on the north slopes Increases in the available wildlife forage would improve summer habitat for deer and elk The area does not provide any big-game winter range

g. Water, Riparian, Fisheries

The riparian vegetation, anadromous fish habitat, and water quality of six streams which flow into the Middle Fork and mainstem of the John Day River would be affected most by Alternatives A, B-Modified, F, I, and NC, and least affected by Alternative C-Modified, although management standards would adequately protect these resources under all alternatives There would be increased accessibility and use as a result of timber harvest and access roads

h. Cultural Resources

All alternatives are similar in effects on cultural resources, since impacts to the numerous historic structures (i e., mining cabins, railroad logging spurs, and unknown prehistoric cultural resources) would be avoided and/or mitigated when ground-disturbing activities are planned There is no discernible difference between alternatives when considering existing regulations, laws, and management standards applicable to cultural resources.

i Soils

Effects on soils are mitigated through application of management standards which adequately ensure protection under all alternatives. The highly erosive ash soils around the upper and north sides of Dixie Butte would be affected by management activities; however, no activities are foreseen in that area. There is no discernible difference between alternatives when considering existing regulations and management practices.

TABLE C-9

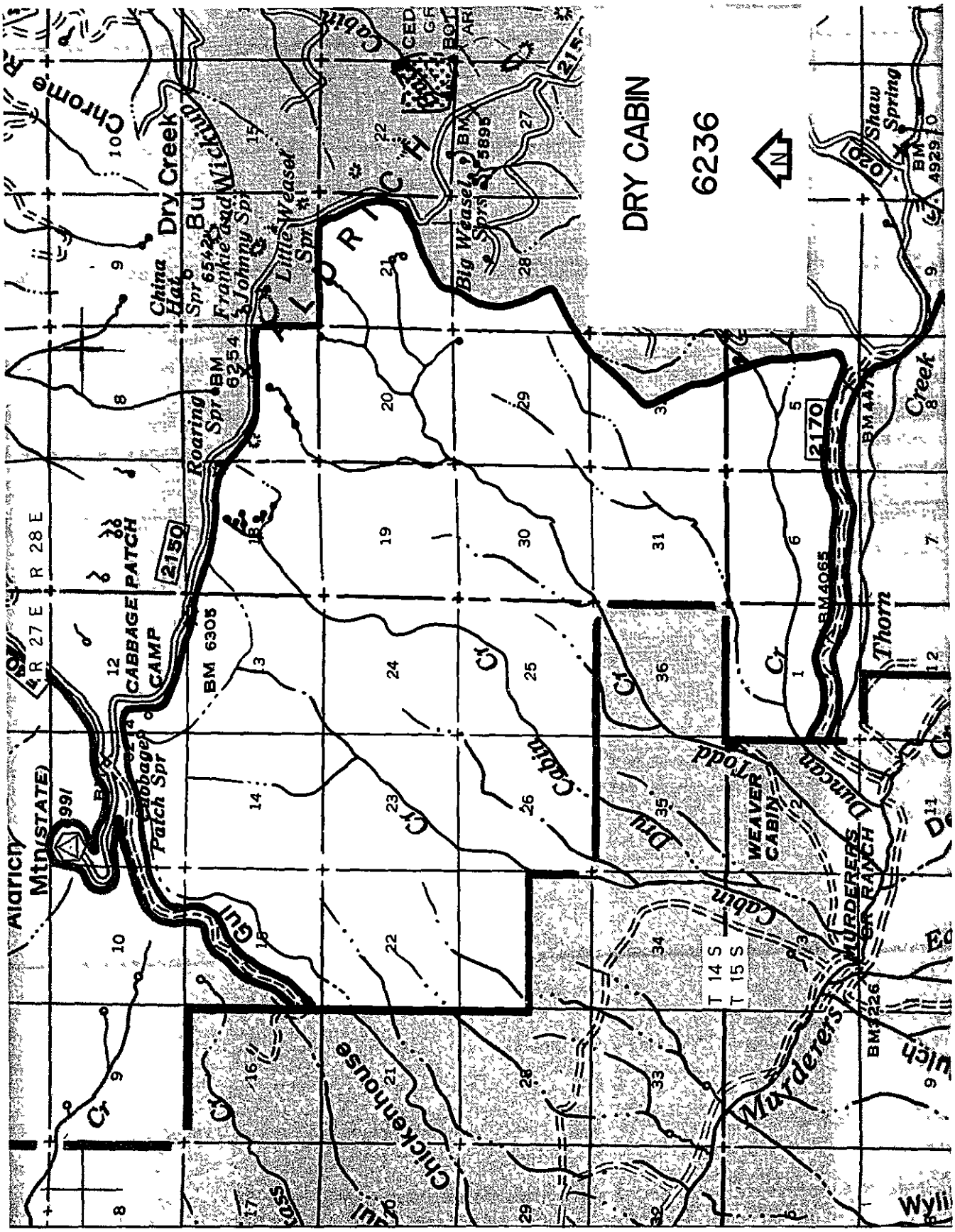
DIXIE BUTTE MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1 General Forest	N/A	7,078	7,053		7,093	2,646
2. Rangeland		417	449		419	195
3 Riparian Areas		783	770		717	247
4A. Big game Winter Range						
4B. Big game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7 Scenic Area						
8 Special Interest Area						
9. Research Natural Area						105
10 Semi-Primitive Non-Motorized						
11 Semi-Primitive Motorized				12,110		
12. Developed Recreation						
13. Old Growth		1,130	1,130		1,130	460
14 Visual Corridors		1,694	1,905		1,862	1,562
15 Unit Plan Wildlife Emphasis Areas						
16 Minimum Level Management		1,008	803		889	
17. Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area, Non-Scheduled Harvest						6,895
22. Wild and Scenic River						
TOTAL ACRES	N/A	12,110	12,110	12,110	12,110	12,110

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available

FIGURE C-6


DRY CABIN
6236
Dry Creek
Roaring Spr
BM 6254
Little Weasel Spr
Big Weasel Spr
BM 5895
Johnny Spr
Frankie and Wickiup
China Hat Spr
Cobin
Chrome
Shaw Spring
BM 4929
BM 4471
Creek
Thorn
BM4065
2170
2150
CABBAGE PATCH CAMP
Cabbage Patch Spr
BM 6305
Alarich Mt (STATE)
9911
R 27 E
R 28 E
T 14 S
T 15 S
Cabin
Todd
Duncan
WEAVER CABIN
MURDERERS CR RANCH
Murderers
Chickenhouse
Gul
Wyli

G. DRY CABIN - 12,221 Acres
(RARE II No. 6236)

1. Description

a. History

This area was inventoried during the RARE process and during the RARE II process Under the South Fork Planning Unit Environmental Impact Statement and the Environmental Impact Statement for RARE II, this area has been managed for nonwilderness uses

b. Location and Access

Dry Cabin area is located on the northwestern edge of the Malheur National Forest, the south side of the Aldrich Mountain Range, about 10 miles southeast of Dayville, Oregon, in Grant County (T 14 S , R 27 E , T 14 S , R. 28 E , T 15 S., R 27 E., T 15 S., R 28 E., of the Willamette Meridian)

Access is via Forest road No 2150 on the north and No 2150039 on the northwest; Forest road Nos 14320, 14024, and 2170042 on the east; and Forest road No 2170 on the south.

c Geography and Topography

The terrain is extremely variable The dominant landform is long, south and west, with steep sideslopes to streams in the bottom Streamcourses include Chickenhouse Gulch and Cabin, Dry Cabin, Todd, North Duncan, and Duncan Creeks, plus many unnamed tributaries Relief is approximately 3,000 feet, from about 6,440 feet below Little Weasel Spring to less than 3,440 feet on Duncan Creek See Figure C-6

d Geology and Soils

The predominant geologic formation is Columbia River Group basalt and andesite. Soils are primarily volcanic ash surface soils with a variety of subsoils on forested sites and loamy and clayey soils on the nonforested areas. The volcanic ash soils are variable in depth to bedrock but are generally about 18 inches, while the loamy and clayey soils range from 8-18 inches in depth The area is covered by Miocene-age basalt flows and Pliocene- to Pleistocene-age welded tuff and sediments (See Chapter III of the Final Environmental Impact Statement for more description of forest soil characteristics.)

e Vegetation

The Dry Cabin area is approximately 77 percent forested Ponderosa pine is the dominant species, associated with Douglas-fir and white fir on the moist sites, and white fir, Douglas-fir, and larch on the upper-elevation sites The Dry Cabin area contains excellent examples of healthy, old-growth ponderosa pine and ponderosa pine, Douglas-fir, and white fir on approximately 850 acres These acres meet the Pacific Northwest Region's definition of old growth.

f. Current Uses

Wildlife is plentiful with high spring, summer, and fall use by many species including wild/free-roaming horses, elk, mule deer, black bear, mountain lion, and possibly bighorn sheep (from the Aldrich herd), as well as many small nongame animals Birdlife is primarily songbirds but includes others such as raptors and game birds Much of the area includes elk winter range (along the south and southwest portions) and is included in the Murderers Creek Coordinated Resource Management Area. Streams contain both native trout and steelhead

Recreation use is light and consists primarily of big-game hunting. There are minor amounts of hiking, backpacking, sightseeing, and game bird hunting Most activity occurs on the north end of the unit along the Aldrich Mountains crest (See Table C-2)

The unit contains portions of two grazing allotments and contributes an average of 550 Animal Unit Months annually Availability of water and the terrain generally concentrate livestock use in stream bottoms.

Attractions include the opportunity to be in wild and rugged country with no intrusions from others The area offers solitude, peace, and quiet. The area will also continue to be used by big-game hunters.

2. Wilderness Capability

a Manageability and Boundaries — The present boundary follows natural physical characteristics, roads, or the Forest boundary.

b. Natural Integrity — Natural integrity is extremely high. With the exception of minor, Primitive jeep roads, the area is essentially untouched by human activities. The major human impacts have been livestock grazing and fire management.

c. Naturalness — The natural appearance within the area is virtually intact. Human activities are not apparent to the average visitor. The area adjacent to the eastern boundary of the roadless area is in a timber sale; however, this does not interfere with the appearance of the unit itself because of the size of the unit and lay of the land. Although there are several roads forming the boundaries of the roadless area, they receive little use Primary human impacts on the area consist of livestock use and hunter roads on two ridgetops

d Opportunity for Solitude — The opportunity for solitude is excellent. The exceptions may be during hunting season when the area receives more use and some highway noise from U.S. 26, approximately 5 miles away. Because the area is large and diverse, intervention by other persons is remote.

e. Primitive Recreation and Challenge — The opportunity for hiking, hunting, backpacking, and riding horses is excellent; most of the area is physically demanding because of the steepness and ruggedness of the terrain. There are no maintained recreation facilities.

f. Special Features — There is great scenic variety, ranging from forested benches and broad ridgetops to deep canyons with open slopes and forested bottom lands. The majority of forest stands are open with some very large trees, and many contain large areas with a park-like setting.

There are no Threatened, Endangered, or Sensitive plant or animal species within this area. There are no identified cultural resource sites within the unit; however, the probability of both historic and prehistoric properties is high. An identified prehistoric gathering area is adjacent to the northeast boundary, and several others are just outside the unit.

3. Availability for Wilderness

a. Resource Potentials — The potential for increased livestock use is low. Terrain and lack of adequate forage (apart from the stream bottoms) are the primary limiting factors.

The area currently provides a roaded natural recreation experience, a semiprimitive nonmotorized recreation experience, and a semiprimitive motorized experience. (See Table C-3.) The area is capable of providing 15,721 Recreation Visitor Days annually (See Table C-4.)

There are 5,888 acres of forested land which is tentatively suitable for timber management activities. These tree stands are primarily mixed conifer. Many have a ponderosa pine overstory with mixed conifer species growing in the understories The average age of the overstories is 140 years, the understories acreage 75 years There is a standing volume of 52.2 million board feet (9.17 million cubic feet) With the use of intensive timber management techniques, 283 thousand cubic feet (1,619 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 336 thousand cubic feet per year.

The area has no known locatable mineral potential and contains no mining claims. The U.S. Geological Survey considers the area to be prospectively valuable for oil and gas but not for geothermal resources. There are current oil and gas leases on 11 sections and some testing in conjunction with these leases has occurred.

b Management Considerations

The Aldrich Mountain Range is historically one of the hardest hit by lightning on the Bear Valley Ranger District. The hazard is high to very high. The south and west slopes are dry with flashy fuels, while the timbered bottom lands have dense concentrations of heavy fuels. Lack of access requires that most fires in the unit be attacked by helicopter or smokejumper crews

Insect damage from the western spruce budworm is not widespread on the south face of the Aldrich Mountain Range, however, there is a population present in the mixed conifer stands. Tree mortality across the Forest is considered insignificant and affected timber appears to be recovering The white fir component in the unit, as with most of the general area, has a high cull factor from root rots in greater than 12 inch diameter classes

There are no present or planned impacts on the water resource in terms of impoundments, power withdrawals, etc., nor are there any measuring sites. There is little potential to increase streamflow and little demand for supply other than for livestock use. These streams make significant contributions to the local fisheries.

There are no non-Federal lands within the roadless area. Private and Bureau of Land Management lands adjoin the roadless area boundary on the south

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 24 miles east, Monument Rock Wilderness is 55 miles east, North Fork John Day River Wilderness is 50 miles northeast, and Black Canyon Wilderness is 8 miles west of the Dry Cabin roadless area The ecosystems present in Dry Cabin are represented in those wildernesses

The nearest major metropolitan areas are Portland, Oregon (260 miles northwest), and Boise, Idaho (200 miles east).

In the 1979 RARE II study, this area received 2,732 comments favoring wilderness, 25 favoring further planning, and 3,388 favoring nonwilderness management. In recent Forest planning public involvement activities, the area was among those receiving a low level of interest. The comments received were almost equally divided between wilderness advocacy and nonwilderness advocacy, with a respective ratio of 1.1.4

The primary reasons supporting wilderness were wild horse protection and inclusion in a proposed wilderness complex with Shaketable and Aldrich. The primary reason opposing wilderness was low opportunity for Primitive recreation in a natural setting There was support for special management considerations for fish and wildlife in this area.

5. Environmental Consequences

Table C-10 displays the management area assignment by alternative.

a Vegetation/Trees

Significant changes in tree size, density, and composition are expected in Alternatives A, B-Modified, F, I, and NC as the overstory is removed and stocking level control is achieved As this occurs, stand characteristics will change to a managed forest appearance Old growth will be retained on 1,200 acres for Alternatives A, B-Modified, F, and I. Alternative NC would retain approximately 960 acres of old growth Under the above alternatives, the predominant mixed conifer and ponderosa pine overstories would be treated silviculturally by shelterwoods and clearcuts Risk of loss to insects and/or diseases would be reduced The actual acres affected by timber management activities would vary between these alternatives, in Alternative F approximately 2,700 acres would be affected in the first decade

Under Alternative I, timber harvests would be on a non-scheduled basis and would be used only to meet fish and/or wildlife habitat objectives. When timber harvesting is warranted, silvicultural prescriptions will be designed to meet these objectives utilizing both even-aged and uneven-aged management techniques The environmental changes, although similar to those in Alternatives A, B-Modified, F, and NC, as expressed in the above paragraph, would not occur as rapidly as in these other alternatives.

In Alternative C-Modified the tree stands would progress through the natural successional cycle All naturally occurring old growth would be retained in these alternatives (this applies to the Wildlife Emphasis portion only).

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC forage for wildlife and livestock is expected to increase in forested areas where harvests occur As tree cover is reduced, native forage plants such as elk sedge, pinegrass, wheatgrass, and fescue will increase naturally Where prescribed, seeding of introduced forage species will provide higher quality forage and change the plant composition present In the long term, a gradual decrease in forage plants is expected as the tree cover gradually increases again and shades the understory

In Alternative C-Modified forage production is expected to remain at present levels and may decrease as Douglas-fir and white fir further encroach under the ponderosa pine-dominated south and westerly slopes.

c Wilderness

Alternative C-Modified would preclude nonconforming activities such as timber harvest but permit motorized vehicle use Future wilderness consideration would remain a possibility under Alternative C-Modified

In Alternatives A, B-Modified, F, I, and NC, visitors would see timber harvest activities, new road construction, and increased motorized vehicle use. By the end of the first decade, future wilderness consideration would be foregone as the activities change the character of the area

d. Recreation

In Alternatives A, B-Modified, F, NC, and in the NE portion under I, the recreation experience would be roaded modified with expectations of increased vehicle use. Greater hunter success may occur in the short term as hiding cover is reduced by harvest activities and easier road access is provided In the long term, opportunity for a remote, nonmotorized hunting experience may decrease if more hunting pressure occurs and new access roads are traveled by more hunters.

Alternative C-Modified offers a semiprimitive motorized recreation opportunity which would provide a more natural setting to users than Alternatives A, B-Modified, F, or NC Moreover, road access during periods other than summer months is expected to be limited and used by more specialized vehicles such as four-wheel drives All of the above alternatives would permit other motorized vehicles including snowmobiles and motorbikes.

Alternative I presents a roaded natural recreation opportunity on 7,000 acres within the roadless area

e Scenery

In Alternatives A, B-Modified, F, I, and NC, viewers would see evidence of a managed forest The long-term effects on scenery would include younger, managed tree stands, more access roads, and less naturalness

In Alternative C-Modified most of the present scenery would be retained and no noticeable changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire

f Wildlife

Alternative C-Modified would retain the largest acreage of old growth and the most wildlife snags In other alternatives, most of the old growth except for 1,200 acres (962 acres in Alternative NC) would be harvested over time. Wildlife snag levels would vary between 20 and 60 percent under Alternatives NC, A, B-Modified, F, and I Management standards would adequately protect key habitat for all wildlife under all alternatives. The areas designated as old growth in each alternative are expected to meet minimum habitat requirements of pileated woodpecker, pine marten, and other wildlife species

About one-half of the area in the south and west portion is considered elk winter range The habitat would be affected in Alternatives A, B-Modified, F, I, and NC by removal of some hiding and thermal cover by harvest activities and a resulting increase in forage

g Water, Riparian, Fisheries

The anadromous fish habitat in the lower reaches of Duncan and Cabin Creeks, the riparian vegetation along six streams, and the water quality of all streams in the area would be least affected by Alternative C-Modified. Management standards will adequately protect the streamside area under all alternatives There would be increased accessibility and use indirectly associated with timber harvest and road construction in Alternatives A, NC, B-Modified, F, and I.

h Cultural Resources — All alternatives are similar in effects on cultural resources. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards. Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the resource. They also present the greatest opportunity for discovery and interpretation of cultural resources.

i. Soils — Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities All of the alternatives adequately protect the resource through application of management standards.

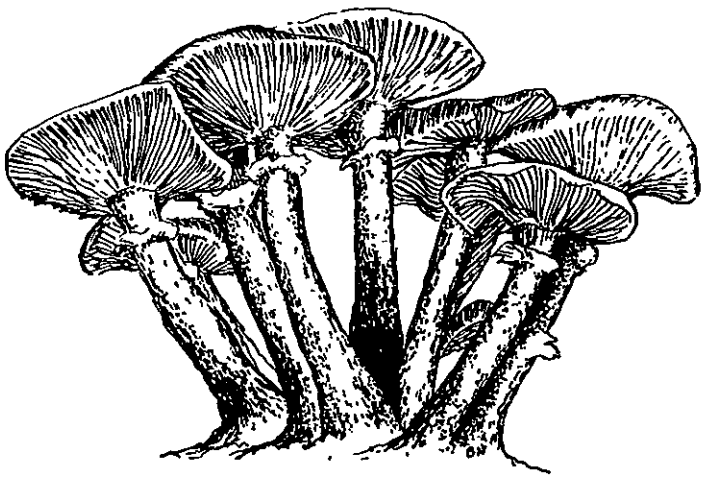
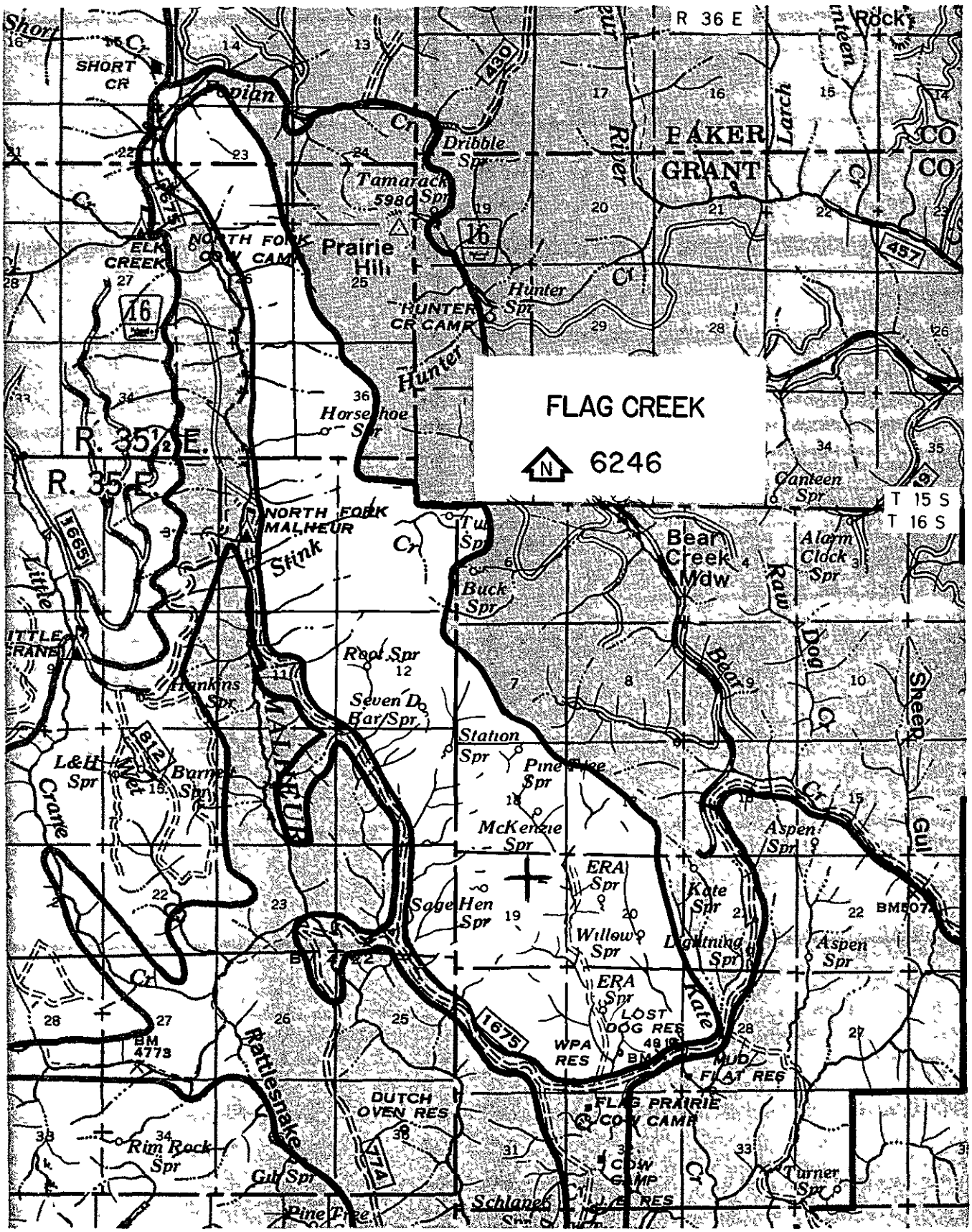


TABLE C-10
DRY CABIN MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
			Alternatives			
1. General Forest			5,465		5,491	
2. Rangeland			813		759	
3 Riparian Areas	N/A	730	717		668	
4A. Big-Game Winter Range	N/A		3,247		3,268	
4B. Big-Game Winter Range Enhancement	N/A					
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. *Scenic Area*						
8 Special Interest Area						
9. Research Natural Area						
10. Semi-Primitive Non-Motorized						
11. Semi-Primitive Motorized				12,221		
12. Developed Recreation						
13. Old Growth	N/A	1,200	1,200		1,200	1,200
14 Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas	N/A	9,467				
16. Minimum Level Management		824	779		835	
17. Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						11,021
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	12,221	12,221	12,221	12,221	12,221

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-7


FLAG CREEK
6246
R 36 E
R. 35½ E.
R. 35 E.
T 15 S
T 16 S
BAKER
GRANT
CO
CO
Prairie Hill
Tamarack Spr
Dribble Spr
Hunter Spr
HUNTER CR CAMP
NORTH FORK COW CAMP
ELK CREEK
Horseshoe Spr
NORTH FORK MALHEUR
Stink Cr
Buck Spr
Bear Creek Mdw
Canteen Spr
Alarm Clock Spr
Root Spr
Seven D Bar Spr
Hankins Spr
Station Spr
Pine Tree Spr
McKenzie Spr
Aspen Spr
ERA Spr
Kate Spr
Sage Hen Spr
Willow Spr
Lightning Spr
LOST DOG RES
WPA RES
MUD FLAT RES
FLAG PRAIRIE COW CAMP
DUTCH OVEN RES
Rim Rock Spr
Gut Spr
Pine Tree
Schlanes
Turner Spr
L&H Spr
Barney Spr
BM 4773
BM 5071
Little Crane
Crane
Malheur
Rattlesnake
Kate
Gut
Sheep
Ram
Dog
Bear
Larch
Rock
Short
Poplar
River
Cr
1665
812
1675
74
457
430
16

H. FLAG CREEK - 7,789 Acres
(RARE II No. 6246)

1. Description

a. History

The area was identified in the RARE process; it was not included in the final designations of the Oregon Wilderness Act Under the Silvies-Malheur Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement this area has been managed for nonwilderness uses.

b Location and Access

This area is located in the center of the Prairie City Ranger District along the North Fork Malheur River (T 15 S , R 35 E., T 15 S , R 35 1/2 E , T. 15 S., R 36 E and T 16 S , R 35 E , T 16 S , R 35 1/2 E., and T 16 S , R. 36 E., of the Willamette Meridian). Access is by secondary Forest road on the west and jeep trails on the east

c. Geography and Topography

The area comprises the eastern slope of the North Fork Malheur River Canyon and some adjoining sage/juniper flats in the northern part of Flag Prairie, with trees in the bottoms and on the sideslopes, and flat gentle ridges with grass and low shrubs See Figure C-7.

d. Geology and Soils

Soils are well drained loams of varying depths, moderate permeability, and containing gravels and cobbles The entire area is covered with Miocene-age volcanic flow rocks.

e Vegetation

The area is 53 percent forested Approximately 950 acres meet the Pacific *Northwest Region's definition of old growth The northern two-thirds of the area* supports ponderosa pine-associated stands. The southern one-third supports sage/juniper/mountain-mahogany, grasslands, and very scattered ponderosa pine

f Current Uses

Hunting is the primary recreational use, largely due to the narrow shape of the area and lack of year-round water Other incidental uses include hiking, horseback riding, and snowmobiling The potential route of the Pacific Crest-to-Desert Trail follows the river along the western edge

The area provides habitat for mule deer, Rocky Mountain elk, cougar, bear, small game, and birds Additionally, the area includes spring and fall migration routes for elk and deer

The area contains portions of two grazing allotments and contributes an average of 450 Animal Unit Months per year

The area itself appears untrammeled by human use It is so narrow that human activities can be seen from nearly everywhere in the area

The major attraction is the North Fork Malheur River on the western edge of the area.

2. Wilderness Capability

a Manageability and Boundaries

Boundaries of the area could be adjusted, however, any changes would further diminish the area's size and narrow shape. Exclusion of off-road vehicles in the *flatter southern portion of the area may be difficult.*

b. Natural Integrity	Fire exclusion has enhanced the development of the fir understory in the pine type, and juniper and sage encroachment in the grassland. However, to the untrained eye these effects are too subtle to detect
c. Naturalness	The area contains nine miles of fences and corrals and several water developments for livestock. Sagebrush-control activities have occurred in the area. Under natural conditions, low-intensity wildfires would have selectively maintained ponderosa pine understories and grassland instead of sage/juniper.
d. Opportunity for Solitude	The opportunities for solitude are very low due to the long, narrow shape of the area and immediate accessibility of the area to roads for its entire length.
e. Primitive Recreation and Challenge	Primitive recreation opportunities are also very limited with no opportunity for challenging experiences
f. Special Features	No Threatened, Endangered, or Sensitive plant or animal species exist within the area. There are no known cultural resource sites within the area; however, it lies adjacent to a historic nomadic migration route. There are no non-Federal lands within this area.

3. Availability for Wilderness

a. Resource Potentials	This area provides semiprimitive motorized recreation opportunities. (See Table C-3.) It has a yearly recreation visitor day capability of about 6,776. (See Table C-4.) There are 3,900 acres of forested land which are suitable for timber management activities. These timber stands are primarily mixed conifer with some ponderosa pine and lodgepole pine The overstory is frequently ponderosa pine with a mixed conifer understory. Average age of the overstories is 140 years; the understories average 65 years. There is a standing volume of 42.39 million board feet (7 41 million cubic feet). With the use of intensive timber management techniques, 187 thousand cubic feet (1,070 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long term sustained yield capacity from this area would be 222 thousand cubic feet per year There is no known, locatable mineral potential and no mining claims The U.S. Geological Survey does not consider the area to have potential for oil and gas or for geothermal resources. There are nine sections with oil and gas leases
b. Management Considerations	Indian paint fungus is present and can probably be found in all size classes of true fir. Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe. Mistletoe patches of varying severity can be found. Root rots can be found to varying degrees but at present are not considered a problem.

Due to high amounts of Douglas-fir and other fir species in the review area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm A western spruce budworm infestation of varying severity is presently within the area. Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor Mountain pine beetle outbreaks can be found in the lodgepole pine

There is one administrative site, a transportation right-of-way, and eight sections of acquired land on which mineral rights are reserved until 1990. There are no power withdrawals, irrigation systems, or impoundments (other than small stock ponds) within the area

4. Wilderness Evaluation

Strawberry Mountain Wilderness lies 10 miles northwest of the area, Monument Rock Wilderness lies 4 miles northeast, North Fork John Day Wilderness lies 40 miles north, and Black Canyon Wilderness lies 60 miles west The North Fork Malheur Wild and Scenic River is immediately adjacent to the west side of most of the area The ecosystem types in this area are already represented in these existing wilderness areas.

Bend or Ontario, Oregon, are the nearest minor population centers (130-150 miles); Portland, Oregon or Boise, Idaho are the nearest major population centers (280-180 miles)

In the 1979 RARE II study, the area received 117 responses in favor of wilderness designation, 2,580 preferring further planning status, and 3,409 preferring nonwilderness uses of the area.

In the most recent public involvement activity concerning unroaded areas on the Forest, this area received a low level of response In addition, those responses were 4 to 1 opposed to wilderness designation of the area

There have been suggestions to include this area with the North Fork Malheur River area to the southwest and the Monument Rock Wilderness to the northeast as a wilderness "complex." There is also support for retaining the area in roadless status as protection of the river canyon, and a level of concern for the scenic values of this area as seen from the river and nearby roads

5. Environmental Consequences

Table C-11 displays the various management area assignments to this area by alternative.

In all alternatives 1,070 acres are managed to be within the North Fork Malheur Scenic River corridor, in accordance with the Omnibus Oregon Wild and Scenic Rivers Act of 1988, which declared the river to be a part of the Wild and Scenic River System.

The following discussion pertains to those acres outside the river corridor.

a. Vegetation/Trees

Significant changes in tree sizes, and stand density and composition are expected in Alternatives A, B-Modified, F, I, and NC, as the overstory is removed and stocking level control is achieved in the understory. As this occurs, the forest characteristics will change to a managed-forest appearance. The amount of old growth retained would range between 108 acres for Alternative B-Modified and 390 acres for Alternative A Additional old growth may also exist in the semiprimitive motorized acres for Alternative C-Modified. The actual acres affected by timber harvest would vary between Alternatives A, B-Modified, F, I, and NC. In Alternative F, approximately 1,800 acres would be affected. In the above alternatives, the predominant ponderosa pine overstories would be removed. Risk of loss to insects and/or diseases would be reduced The estimated standing volume is expected to eventually be harvested in Alternatives A, B-Modified, F, I, and NC, and remain unharvested in Alternative C-Modified

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC, forage for wildlife and livestock is expected to increase in forested areas when the overstory is removed and the understory is thinned As tree canopies are opened, native forage plants such as elk sedge, pinegrass, wheatgrass, and fescue will increase naturally. Seeding of introduced forage species will provide higher quality and quantity of palatable plants. In the long term, a gradual decrease in forage plants is expected as the tree canopies again close and shade the understory.

In Alternative C-Modified forage production is expected to remain at present levels and may decrease as Douglas-fir and white fir further encroach under the ponderosa pine dominated stands.

c Wilderness

Future wilderness consideration would remain a possibility under Alternative C-Modifed.

In Alternatives A, B-Modified, F, I, and NC, users would see timber harvest activities, new road construction, and increased motorized vehicle use. Future wilderness consideration would be foregone by the end of the first decade.

d. Recreation

In Alternatives A, B-Modified, F, I, and NC, the recreation experience would be roaded modified with increased vehicle use The effect on big-game hunting, the primary recreation activity, is expected to be greater hunter success in the short term as hiding cover is reduced by harvest activities and easier road access occurs. In the long term, the opportunity for a remote nonmotorized hunting experience will decrease as more hunting pressure occurs and new access roads are built.

Alternative C-Modified offers a semiprimitive motorized recreation opportunity which would provide a more natural setting to users than the other alternatives. Moreover, road access during periods other than summer months is expected to be limited by weather and used by more specialized vehicles such as four-wheel drives. All of the alternatives would permit motorized vehicles, including snowmobiles and motorbikes.

e. Scenery

Under Alternatives A, B-Modified, F, I, and NC, viewers would see evidence of a managed forest. Long-term effects on scenery would be less old growth to view, more access roads, and less naturalness

In Alternative C-Modified most of the present scenery would be retained and no noticeable changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire

f Wildlife

Alternative C-Modified would retain the largest acreage of old growth and the most (100 percent) wildlife snags. Under other alternatives, most of the old growth except that designated, would be harvested Wildlife snag levels would vary between 20 and 60 percent in Alternatives A, B-Modified, F, I, and NC. Management standards would adequately protect key habitat for all wildlife in all alternatives. The areas designated as old growth in each alternative are expected to meet the minimum requirements of pileated woodpeckers, pine marten, and other wildlife species.

About 20 percent of the area in the southern portion is considered elk winter range. In Alternatives A, B-Modified, F, I, and NC, removal of some hiding and thermal cover by harvest activities would increase the amount of forage

g. Water, Riparian, Fisheries

The area contains few year-round streams; the major ones are Flag Creek and Stink Creek. Riparian areas and fisheries are also limited in size. All alternatives are considered to be equal in effects on these resources since management standards would adequately protect them There is no discernible difference between alternatives when management standards are applied

h Cultural Resources

All alternatives are similar in effects on cultural resources There is no discernible difference between alternatives when considering existing regulations, laws, and management standards Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the resource They also present the greatest opportunity for discovery and interpretation of cultural resources

i. Soils

Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities. All of the alternatives adequately protect the resource through application of management standards.

TABLE C-11

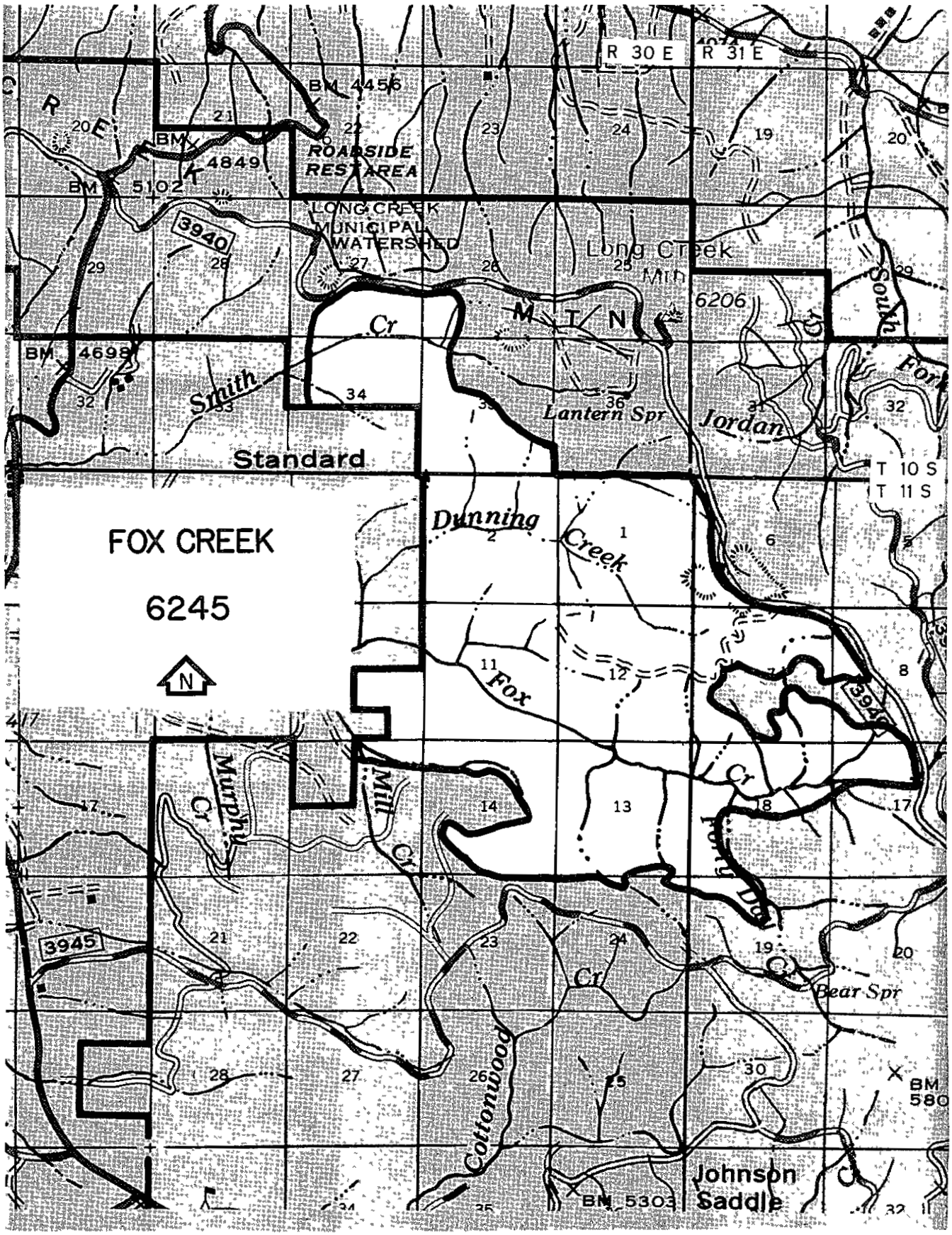
FLAG CREEK MANAGEMENT BY ALTERNATIVE

(Acres)

MANAGEMENT AREA	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1. General Forest	N/A	2,802	3,084		2,627	2,627
2 Rangeland		2,766	3,037		1,479	1,479
3. Riparian Areas		72	94		66	66
4A. Big-Game Winter Range	N/A				1,635	1,635
4B Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B Monument Rock Wilderness						
6C Pine Creek						
7. Scenic Area						
8 Special Interest Area						
9. Research Natural Area						
10. Semi-Primitive Non-Motorized						
11. Semi-Primitive Motorized				6,719		
12. Developed Recreation						
13. Old Growth	N/A	390	108		300	300
14. Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas						
16 Minimum Level Management		689	396		612	612
17. Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20 Wildlife Emphasis Areas with Scheduled Harvest						
21 Wildlife Emphasis Area, Non-Scheduled Harvest						
22. Wild and Scenic River		1,070	1,070	1,070	1,070	1,070
TOTAL ACRES	N/A	7,789	7,789	7,789	7,789	7,789

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-8


R 30 E
R 31 E
BM 4456
BM 4849
BM 5102
ROADSIDE REST AREA
LONG CREEK MUNICIPAL WATERSHED
3940
Long Creek
Mtn
6206
Cr
BM 4698
Smith
Standard
Lantern Spr
Jordan
T 10 S
T 11 S
FOX CREEK
6245
N
Dunning
Creek
Fox
3945
Murphy
Cr
Mill
Cr
Cottonwood
Cr
Bear Spr
BM 5303
Johnson Saddle
BM 580

I. FOX CREEK - 5,879 Acres
(RARE II No. 6245)

1. Description

a. History

This area was inventoried in RARE and carried forward into RARE II with some increase in size. Under the John Day Planning Unit Environmental Impact Statement and RARE II Environmental Impact Statement, this area has been managed for nonwilderness uses.

b Location and Access

The Fox Creek roadless area is located in the northern portion of the Malheur National Forest about 13 miles northwest of John Day, Oregon, in Grant County (T. 10 S., R 30 E , T. 10 S , R. 31 E., T 11 S., R. 30 E., T. 11 S , R 31 E., of the Willamette Meridian).

c. Geography and Topography

This area is located in the headwaters of Fox Creek, Smith Creek, Dunning Creek, and Day Creek, tributaries to the John Day River System These drainages are narrow and relatively short, except for Fox Creek The area is primarily south- and west-facing Elevation varies from 4,700 to 6,000 feet See Figure C-8.

d. Geology and Soils

Loamy and ash soils predominate Deeper ash soils are found on north-facing slopes Bedrock is composed of hard basalt and andesite with some soft to moderately tuffaceous interflow material The area is covered with Miocene basalt flows.

e. Vegetation

The area is 82 percent forested. Of these acres, 2,000 meet the Pacific Northwest Region's definition of old growth Lodgepole pine generally occurs within the Fox Creek drainage. Juniper, mountain-mahogany, and ponderosa pine occur on west- or south-facing slopes. Douglas-fir, white fir, and western larch occur on the cool, moist, north-facing slopes Understory vegetation is primarily elk sedge, pine grass, wheatgrass, huckleberry, and bluegrass

f Current Uses

The area provides spring, summer, and fall habitat for mule deer and Rocky Mountain elk as well as year-round habitat for small game and other mammals. Fox Creek provides spawning and rearing habitat for steelhead and resident trout

The principal recreational use is big-game hunting. Other recreation use is extremely light and may consist of fishing, and viewing and photographing wildflowers and birds. (See Table C-2 for current use figures.)

The area is within one grazing allotment and provides an average of 350 Animal Unit Months annually for livestock

This area is very similar to surrounding areas with dense, forested areas intermingled with open, grassy ridges Ridgetop views of Fox Valley expose a rural, high mountain meadow

The major attraction of the area appears to be the opportunity to hunt big game.

2. Wilderness Capability

a. Manageability and Boundaries	This area is one to three miles wide and four miles long. The boundary of the review area consists of Forest roads and Forest boundary The area is accessible from all sides. There is an opportunity to improve the manageability of this boundary.
b Natural Integrity	The natural integrity of the area has been impacted by human activities The principal impact is also the least noticeable to the average visitor. Fire suppression has altered the natural succession of the area Under natural conditions, periodic low-intensity fires would have selectively thinned fir species from ponderosa pine stands Grazing impacts in the area include fences, stock water ponds, salt grounds, and some alteration of plant species composition and vigor There is one unimproved road into the center of the area.
c Naturalness	The most obvious unnatural impacts are the road, fences, and the presence of cattle. Other than these, the area appears very natural.
d. Opportunity for Solitude	There are numerous, sharply dissected draws which provide some vegetative and topographic screening, especially on the north- and east-facing slopes. The small size of the area and the views to surrounding rural areas and developed forest lands tend to reduce opportunity for solitude
e Primitive Recreation and Challenge	The small size of the area and the previously mentioned factors limit opportunity for a Primitive or challenging recreation experience.
f Special Features	No Threatened, Endangered, or Sensitive plant or animal species exist within this area There are no special features or cultural resource sites inventoried However, this area was a popular summer hunting, fishing, root digging, and berry picking area for the Umatilla, Cayuse, Warm Springs, and Mid-Columbia tribes, so the likelihood of sites is high

3. Availability *for Wilderness*

a. Resource Potentials	The area currently provides roaded natural and semiprimitive motorized recreation opportunities (See Table C-3) The area is capable of providing 10,798 recreational visitor days annually (See Table C-4.) There are 4,100 acres of forested land tentatively suitable for timber management activities These trees are growing in multistoried stands of predominantly mixed conifer species with some lodgepole and ponderosa pine There is a standing volume of 53 37 million board feet (9.33 million cubic feet) With the use of intensive timber management techniques, 197 thousand cubic feet (1,127 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 234 thousand cubic feet per year.

This area does not provide any opportunity to increase or improve big-game winter range. Retained in an undeveloped state, this area has the potential to contribute forested old growth in a distribution pattern which would benefit wildlife such as pileated woodpeckers.

The area has no known potential for locatable minerals and contains no mining claims The U S. Geological Survey considers the northern part of the area to be prospectively valuable for oil and gas and the entire area to be prospectively valuable for geothermal resources There are 11 sections covered by oil and gas leases

b Management Considerations

Indian paint fungus is present and can be found in all size classes of true fir. Much of the Douglas-fir (especially that on rockier, drier sites) is infected with dwarf-mistletoe. Root rots can also be found to varying degrees but at present are not considered a problem

Due to the high amount of Douglas-fir and other fir species in the area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm Western spruce budworm infestation of varying severity presently exists within the area. Western pine beetle can be found in the area, but it is generally confined to a few old-growth ponderosa pines of low vigor. Mountain pine beetle can be found in the lodgepole pine.

One right-of-way and one water transmission special-use permit exist in the area.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 15 miles south, Monument Rock Wilderness is 40 miles southeast, North Fork John Day Wilderness is 30 miles northeast, and Black Canyon Wilderness is 30 miles southwest. The ecosystems of the Fox Creek area are represented in those wildernesses

This area lies about 20 road miles from John Day, Oregon The nearest major metropolitan centers are Portland, Oregon (260 miles northwest), and Boise, Idaho (200 miles east)

During the 1979 RARE II process, this area received 113 comments favoring wilderness, 2,582 favoring further planning, and 3,384 in favor of nonwilderness management.

In recent Forest planning public involvement activities, this area received the lowest number of comments of any area on the Forest These comments opposed wilderness designation 14 to 1.

No reasons were given by those supporting wilderness designation The reasons given by those opposing wilderness designation included the effects of human activity in the area, lack of Primitive recreation opportunities, and difficulty in managing the area as wilderness. There was some support for continued roadless area management for the purpose of fish and wildlife habitat protection

5. Environmental Consequences

Table C-12 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

Tree sizes, and stand density and composition will change more in Alternatives A, B-Modified, F, I, and NC than in Alternative C-Modified, since more acres are available for timber management. About 600 acres of old growth will be retained in all alternatives and that amount is expected to remain unchanged. An additional 1,400 acres of old growth will be provided in Alternative C-Modified The actual acres affected by timber harvest would vary between these alternatives. In Alternative F, approximately 280 acres would be affected in the first decade.

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC, forage for wildlife and livestock is expected to increase on forested areas where timber harvests and stocking level control occur. Significant increases are expected in forage production on north-facing slopes as openings of tree canopies by shelterwood and/or clearcut occur. The long-term effect on this transitory area is a gradual decrease in forage as tree canopies again close and shade the understory. Seeding of introduced grass species will provide higher quality forage and change the composition of forage plants. Native forage species of elk sedge, pinegrass, brome, and wheatgrass will also increase in vigor and density naturally as timber stands are opened.

In Alternative C-Modified forage production is expected to remain at present levels and may decrease as Douglas-fir and white fir further encroach under the ponderosa pine

c. Wilderness

In Alternatives A, B-Modified, F, I, and NC, users would see motorized vehicles, timber harvest activities, and new timber access roads in all or most of the area. The area would eventually have a managed-forest appearance with human activities evident Future wilderness consideration would be foregone by the end of the first decade

Alternative C-Modified would restrict such development but motorized vehicle use would be allowed. Future wilderness would remain a possibility in Alternative C-Modified.

d. Recreation

Hunting would continue under all alternatives as the primary recreation activity. Alternative C-Modified would provide a semiprimitive motorized recreation opportunity and offer a more natural environment to users than other alternatives on all or most of the area

In all alternatives except Alternative C-Modified, the recreation experience would be a roaded modified recreation opportunity. Road access would be available to more kinds of vehicles over a longer period of time each year

e. Scenery

The naturalness of the area would be maintained in Alternative C-Modified. Under Alternatives A, B-Modified, F, I, and NC, viewers would see evidence of a managed forest including clearcuts and shelterwoods The long-term effects on scenery would be less old growth to view, more access roads, and less naturalness.

In Alternative C-Modified most of the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire.

f Wildlife

Old-growth timber and snags would be available to nongame wildlife to a greater extent in Alternative C-Modified than in other alternatives All alternatives will retain adequate old growth to meet management requirements for indicator species such as pine marten and pileated woodpecker. Management standards would adequately protect key habitats for all wildlife under all alternatives.

All alternatives, except Alternative C-Modified, would reduce the amount of mixed conifer old growth and thereby improve the cover/forage ratio where forage is deficient. Improvement in available wildlife forage would improve summer habitat for deer and elk. The area does not provide any big-game winter range.

g. Water, Riparian, Fisheries

Riparian vegetation, anadromous fish habitat, and water quality would be least affected by Alternative C-Modified, and most affected by Alternatives A, B-Modified, F, I, and NC Although management standards would adequately protect these resources under all alternatives, there would be increased accessibility and use of these resources as a result of timber harvest and road construction.

h Cultural Resources

All alternatives are similar in effects on cultural resources There is no discernible difference between alternatives when considering existing regulations, laws, and management standards. Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the resource. They also present the greatest opportunity for discovery and interpretation of cultural resources.

i. Soils

Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities. All of the alternatives adequately protect the resource through application of management standards.

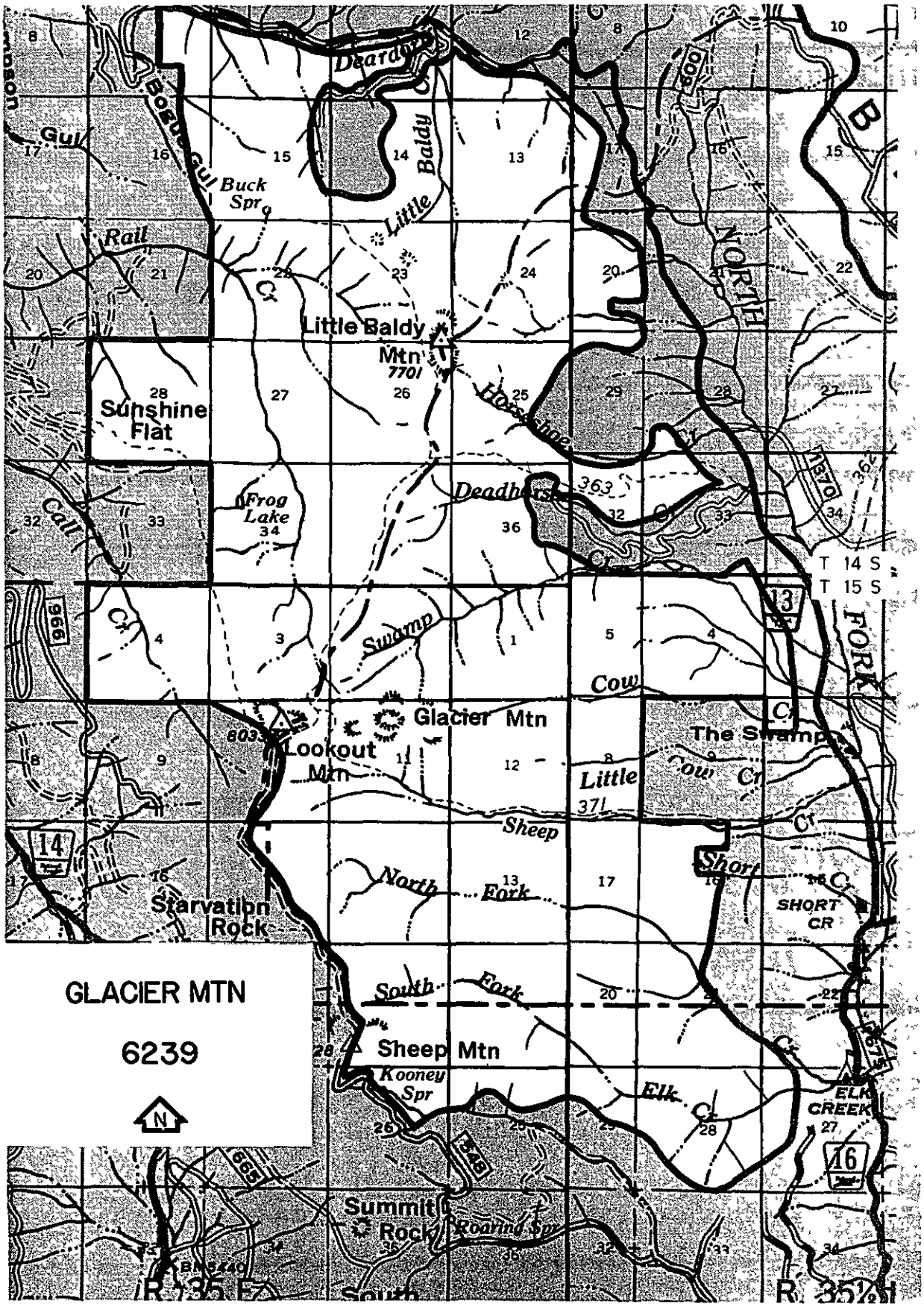
TABLE C-12
FOX CREEK MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
		Alternatives				
1. General Forest	N/A	2,930	2,918		2,938	2,938
2. Rangeland		773	833		777	777
3 Riparian Areas		316	311		290	290
4A Big-Game Winter Range						
4B Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B Monument Rock Wilderness						
6C Pine Creek						
7 Scenic Area						
8 Special Interest Area						
9 Research Natural Area						
10 Semi-Primitive Non-Motorized						
11. Semi-Pimitive Motorized				5,879[2/]		
12 Developed Recreation						
13 Old Growth	N/A	600	600		600	600
14. Visual Corridors		756	851		832	832
15 Unit Plan Wildlife Emphasis Areas						
16 Minimum Level Management		504	366		442	442
17 Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21 Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	5,879	5,879	5,879	5,879	5,879

1/The Timber Management Plan upon which the No Change Alternative is based was developed in 1979. The plan was not an integrated plan and consequently did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available

2/Included in this is 600 acres of dedicated old growth.

FIGURE C-9


GLACIER MTN
6239
Little Baldy Mtn
7701
Sunshine Flat
Frog Lake
Glacier Mtn
Lookout Mtn
Starvation Rock
Sheep Mtn
Summit Rock
Deadhorse
Swamp
Cow
The Swamp
Little Cow Cr
Sheep
North Fork
South Fork
Short Cr
SHORT CR
Elk Cr
ELK CREEK
Kooney Spr
Roaring Spr
Little Baldy
Buck Spr
Rail
Call
Horseshoe
NORTH FORK
T 14 S
T 15 S
R 35 E
R 35½ E

J. GLACIER MOUNTAIN - 19,572 Acres
(RARE II No. 6239)

1. Description

a. History

This area was inventoried during the RARE II process The Silvies-Malheur Planning Unit Environmental Impact Statement and RARE II Environmental Impact Statement designated the area to nonwilderness uses

b. Location and Access

This area is located in the eastern part of the Malheur National Forest about 11 miles southeast of Prairie City, Oregon Approximately three-quarters of the area is within Baker County and one-quarter is in Grant County, Oregon (T. 14 S., R. 35 E , T. 14 S., R 35 1/2 E., T. 15 S , R. 35 E., T 15 S., R. 35 1/2 E., of the Willamette Meridian).

c. Geography and Topography

The area's main feature is a deeply incised, high-elevation ridge running from Little Baldy Mountain in the north, through Glacier Mountain, to Sheep Mountain in the south Glaciated valleys lie to the east and west with year-round water courses. Rock outcroppings occur at the higher elevations. No glaciers exist here, however See Figure C-9

The area is located on the west side of the headwaters of the North Fork Malheur River and includes several tributaries to this System. The north and west portions of the area include the Rail and Deardorff Creek drainages, which are *tributaries to the mainstem of the John Day River*

d. Geology and Soils

Soils in the area are predominantly of volcanic ash composition. On the northerly slopes, they are two to three feet deep with a low mantle stability and high erosion hazard The mantle stability for south-facing slopes varies from low to moderate and the deeper soils are very productive.

At high elevations and along ridgetops, the soils are shallow, nonforested, and only marginally productive There are many rock outcrops, exposed bedrock, and talus slopes These soils are easily disturbed and have high rock fragment content.

All soils with volcanic ash content have a moderate-to-high susceptibility to erosion Because of the cool climate and short growing season, there is little vegetative protection at the high elevations of this area. At lower elevations, the soils have a low bulk density allowing them to hold water, reducing the water available for erosion and contributing to the perennial streams in the area. Miocene-age volcanic flows cover all of the area.

e. Vegetation

The high-elevation ridges support subalpine vegetation including subalpine fir, lodgepole pine, alpine sagebrush, and elk sedge. The northeastern portion of the area consists primarily of lodgepole pine which regenerated after the Big Cow Burn of 1939 The area is 95 percent forested and supports primarily Douglas-fir, white fir, larch, and lodgepole pine. Ground vegetation includes huckleberry, pinegrass, elk sedge, and Columbia brome Riparian areas contain some meadow vegetation and riparian shrub species There are about 2,200 acres of old-growth forest that meet the Pacific Northwest Region's definition of old growth

f. Current Uses

Big-game hunting and trout fishing are the primary recreational uses of the area. (See Table C-2) Hiking, backpacking, and camping also occur in the area along with enjoyment of subalpine wildflowers and other vegetation, and viewing a 360-degree panorama of scenic vistas Winter recreation use includes cross-country skiing and ski mountaineering and has included snowmobiling in the past The area provides spring, summer, and fall habitat for mule deer and Rocky Mountain elk. Bear, coyote, and cougar also inhabit the area Pileated woodpecker, pine marten, and other species which utilize old growth also occur.

The streams draining into the upper John Day River drainage support rainbow, cutthroat, and bull trout The streams draining into the North Fork Malheur River support inland native rainbow and bull trout Deardorff and Rail Creeks also provide steelhead spawning and rearing habitat

The area lies within three grazing allotments Deardorff, Rail Creek, and Spring Creek. In the Rail Creek allotment, it is unlikely that cattle would drift up into the roadless area The steep, north-facing, heavily forested slopes of this part of the Deardorff allotment also make it inaccessible to livestock. This portion of the Spring Creek allotment is currently grazed every other year

This area receives an average annual precipitation of approximately 29 inches Most of this occurs between October and April in the form of snow, with accumulations up to 5 feet not uncommon. The North Fork Malheur drainage provides water for Beulah Reservoir and downstream irrigation. The John Day River System provides water for irrigation the length of the John Day River, as well as for fisheries and recreational uses.

The deeply incised drainages are heavily forested, giving way gradually to sparse vegetation and rock outcrops of the four mountains and connecting ridgetops The area itself contains interesting diversity in vegetation and landforms with the rise in elevation; however, it is not uncommon in the local area.

This area is separated from the Strawberry Mountain Wilderness to the west by a paved Forest Service arterial road and about three air miles. It is also separated from the Monument Rock Wilderness to the east by a paved Forest Service arterial road and about seven air miles. Both designated wildernesses repeat the vegetation and topography of the Glacier Mountain area and contribute to the vistas available from open ridgetops

Big-game hunting is a major attraction. The splendid panorama, forested isolation, and perennial trout-bearing streams are also enticements to visitors.

2. Wilderness Capability

a. Manageability and Boundaries

The boundaries of this area are arbitrary, following no well-defined topographic features Adjustment to boundaries of the original area to improve manageability could either reduce or increase the size of the area.

b. Natural Integrity

Overall, the natural integrity of the area is largely intact, particularly at higher elevations.

Lower elevations show a history of fire suppression which has led to a gradual succession from ponderosa pine to white fir in some areas Under natural conditions, low-intensity ground fires would have selectively maintained ponderosa pine in these areas.

Grazing effects at lower elevations include concentrations of livestock along streams, salting grounds, dust beds, and cattle trails.

Within the interior of the area, an unimproved jeep track runs from Sheep Mountain to Little Baldy Mountain. Because of the fragile subalpine conditions, this wheel track is not likely to heal for many years. Along this track and scattered throughout the area are fire rings, charred wood, and game racks tacked up from hunter camps. These would not be difficult to repair, however, they are likely to reappear each year

Three low-standard foot trails bisect the area one north-south, the other trails cross east-west.

c. Naturalness

Most impacts to natural appearance are scattered throughout the area and could be easily mitigated The impact having the most unnatural appearance is the jeep track along the ridge

d Opportunity for Solitude

There are many opportunities for solitude within this area. The high mountain ridge is well removed from normal activities across the Forest, and most traffic on roads leading into higher elevations would have other destinations The deeply incised streamcourses provide topographic and vegetative screening from all surroundings

e. Primitive Recreation and Challenge

There are many opportunities for undeveloped recreation, including camping, hiking, and nature study Opportunity for Primitive recreation, however, is limited by the relatively small size of the area and ease of access There is no particularly difficult terrain or challenging aspect to this area.

f Special Features

There are no Threatened or Endangered plant or animal species present in this area. There is one Sensitive plant species occurring here

There are no unique opportunities for historical or scientific study in this area.

There are no known cultural resources located in this area and the likelihood of their occurrence is low.

3. Availability for Wilderness

a. Resource Potentials

The area currently provides roaded modified, roaded natural and semiprimitive motorized recreation opportunities. (See Table C-3.) The area is capable of providing 30,064 recreational visitor days (See Table C-4.) The proposed Pacific Crest-to-Desert Trail would pass through the north portion of this area near Little Baldy Mountain A potential developed downhill skiing site has also been proposed in the area

There are 17,800 acres of forested land tentatively suitable for timber management activities. These trees are growing in multistoried stands with overstories averaging 155 and understories averaging 65 years old. Mixed conifers are predominant with lodgepole pine also present. There is a standing volume of 174.00 million board feet (30.42 million cubic feet). With the use of intensive timber management techniques, 854 thousand cubic feet (4,885 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 1,152 thousand cubic feet per year.

There is no known locatable mineral potential and no mining claims. The U.S. Geological Survey does not indicate a potential for oil and gas but does indicate a potential for geothermal resources in the area.

b. Management Considerations

Indian paint fungus is present and can probably be found in all size classes of the fir species. Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe Mistletoe patches of varying severity can be found. Root rots can be found to varying degrees but are not considered a problem.

Due to high amounts of Douglas-fir and other fir species in the area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm. Western spruce budworm infestation of varying severity is present in the area. Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor. Mountain pine beetle can be found in the area wherever lodgepole pine occurs.

The western portion of this area contains approximately two sections of land (1,120 acres) owned by Crown Zellerbach Corporation. There are 14 sections of acquired land on which the mineral rights are reserved through 1988. There are 7 administrative withdrawals and some rights-of-way. There are no power withdrawals, irrigation systems, or impoundments within this area.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is located about three miles west and the Monument Rock Wilderness is about four miles east. The Glacier Mountain roadless area complements these two wildernesses and would provide continuation of that type of experience by providing a one-day hiking distance between each of them.

This area is about 10 miles south of Prairie City, Oregon. The two nearest major metropolitan areas are Portland, Oregon, about 280 miles northwest, and Boise, Idaho, about 180 miles east.

During the RARE II evaluation, responses were 2,795 in favor of wilderness or further planning and 3,369 in favor of a nonwilderness management decision.

During the recent public comment activity on roadless areas for this Forest, the Glacier Mountain area was among those receiving a moderate level of comment. These comments indicated a 3 to 1 preference for wilderness designation.

The primary reasons stated favoring wilderness were its value in providing Primitive recreation, naturalness, and opportunities for solitude. Supplementary reasons were protection of fish and wildlife habitat, the scenic value, and proximity to Strawberry Mountain Wilderness.

There were several suggestions that this area be included with Monument Rock and Strawberry Mountain Wilderness as a wilderness complex

The primary reasons opposing wilderness were value of the timber resource and evidence of human activity. Two opinions opposing wilderness stated a preference for a backcountry or roadless designation

During preliminary work on the Oregon Wilderness Act of 1984, the Glacier Mountain area was included with Monument Rock as a wilderness proposal Of the two, Glacier Mountain was the favorite of many. It did not survive to enactment of the bill, however.

5. Environmental Consequences

Table C-13 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

Significant changes in tree size, density, and composition are expected to occur in all alternatives except Alternative C-Modified. The predominant mixed conifer, multistoried stands are expected to be harvested over time Some designated old growth will be retained in all alternatives Those stands will progress through the natural successional cycle Alternative B-Modified retains 1,100 acres of dedicated old growth. Alternatives A, F, and I retain 460 acres of dedicated old growth Alternative NC would retain 880 acres of old growth Additional old growth may be provided within other management areas, such as semiprimitive areas

In Alternative C-Modified and the semiprimitive designations of the other alternatives, the trees are expected to retain present characteristics and a more natural appearance since the forested land would not be managed. Overstory trees, which average 155 years old, would be retained in their natural state, except that naturally occurring wildfires would be suppressed

b. Vegetation/Grass and Shrubs

In all alternatives except Alternative C-Modified, forage for livestock and wildlife is expected to increase as overstory timber is harvested and stocking level controls are achieved in the understory Forage species such as elk sedge and pinegrass will increase as tree canopies are reduced. Changes in forage species composition is expected when introduced grass species are seeded following timber harvest. Openings created by clearcuts will increase forage production even more and improve present cover/forage ratios for big game All forage increases are considered short term on transitory areas such as this, since forage production will decrease as tree canopies close and shade the understory plants.

In Alternative C-Modified, forage production is expected to remain at present levels and may decrease as fir tree species increase.

c. Wilderness

Nonconforming wilderness activities such as timber harvest, road construction, and motorized vehicle use would not occur in any part of this area in Alternative C-Modified In Alternative F, 12,145 acres would be precluded from development activities, while the remaining acres would be developed. On those acres, effects would be the same as those discussed for Alternative B-Modified below.

Alternative A would preclude 11,060 acres from development Alternative I would preclude 9,602 acres from development Use of motorized vehicles is allowed in Alternative I Future wilderness consideration based upon the size of the conforming area should have the highest possibility under Alternative C-Modified, less under Alternatives A, F, I, and NC.

In Alternative B-Modified users would see timber harvest activities, new roads, and motorized vehicle use on all acres within the area. The area would eventually have a managed-forest appearance, with human activities evident in forested areas Future wilderness consideration would be foregone with increased development activities by the end of the first decade.

d. Recreation

In Alternative B-Modified the recreation opportunity would be roaded modified with expectations of increased vehicle use. Big-game hunter success is expected to increase due to reduced hiding cover in harvested areas and easier access. Opportunity for a nonmotorized, remote hunting experience would decrease as additional access roads are traveled by more hunters

Alternative I offers a semiprimitive motorized recreation opportunity which would provide a more natural setting to users than Alternative B-Modified. Moreover, road access during periods other than summer months would be limited by the weather, providing use only for more specialized vehicles such as four-wheel drives. Alternatives B-Modified and I allow use of snowmobiles and motorbikes.

Alternatives A, C-Modified, F, and NC present a semiprimitive nonmotorized recreation opportunity on part of the area (all of the area in Alternative C-Modified) which would provide the most natural setting to users due to absence of motorized vehicles. Eventually more trails, including the Pacific Crest-to-Desert Trail, may be constructed to access new areas while maintaining semiprimitive conditions in a nonmotorized setting.

Additionally, Alternative I provides roaded natural recreational opportunities in the lower elevations of the eastern side of the RARE II area.

e. Scenery

Scenic views offered from the summits of Lookout Mountain and Little Baldy Mountain would be maintained under all alternatives. Under Alternative B-Modified viewers would see the greatest evidence of a managed forest, including clearcuts and shelterwoods. Long-tern effects on scenery would be less old growth to view, more access roads, and less naturalness.

In Alternatives A, C-Modified, F, I, and NC, the present scenery would be maintained at higher elevations and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire Under these alternatives, the scenery on approximately 7,500 to 8,500 acres would be altered by timber management.

f. Wildlife

Alternative C-Modified would retain the largest acreage of old growth and the most wildlife snags. Old-growth timber and snags would be less available in Alternatives F, and I, and be most affected by Alternatives A, B-Modified, and NC. Alternative B-Modified would remove the most wildlife snags. Management standards would adequately protect key habitat for all wildlife under all alternatives. Moreover, old growth is designated in each alternative to meet minimum habitat needs of pileated woodpecker, pine marten, and other wildlife. All alternatives except Alternative C-Modified would reduce the amount of mixed conifer old growth in the long term and thereby improve the cover/forage ratio where forage is deficient on north slopes. Increases in available wildlife forage would improve summer habitat for deer and elk. The area does not provide any big-game winter range.

g. Water, Riparian, Fisheries

The riparian vegetation, fish habitat, and water quality of streams which flow into the North Fork Malheur River and the mainstem John Day River would be affected most by Alternative B-Modified and least by Alternative C-Modified, although management standards would adequately protect the resources under all alternatives There would be increased accessibility and use as a result of timber harvest and access roads In Alternatives F, and I, upper portions of the streams within the manageable boundaries would be unaffected while lower portions would be impacted by harvest activities.

h. Cultural Resources

All alternatives are similar in effects on cultural resources Cultural resource inventory surveys will be required when ground-disturbing activities are planned Known cultural resources will be avoided or mitigated. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards applicable to cultural resources. Alternative B-Modified presents the most risk of inadvertent damage to cultural resources, as well as the most opportunity for discovery

i Soils

Effects on soils are mitigated through application of the Forest-wide Standards which adequately ensure protection under all alternatives There is no discernible difference between alternatives when considering existing regulations and management practices

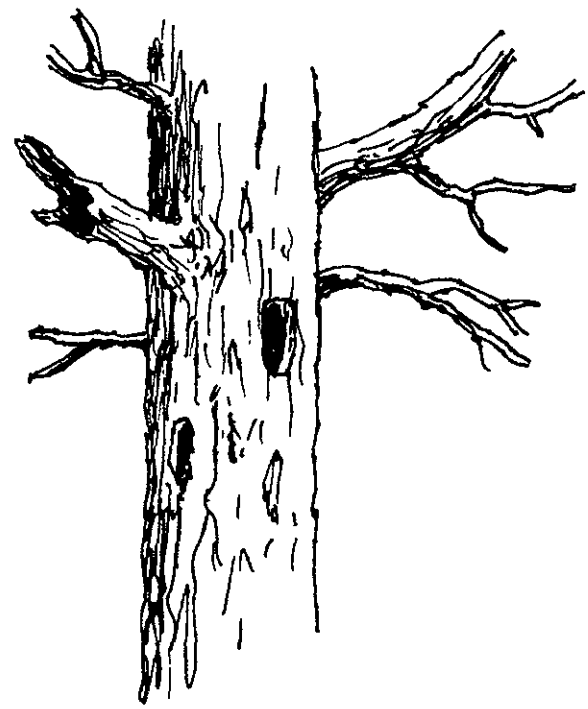


TABLE C-13

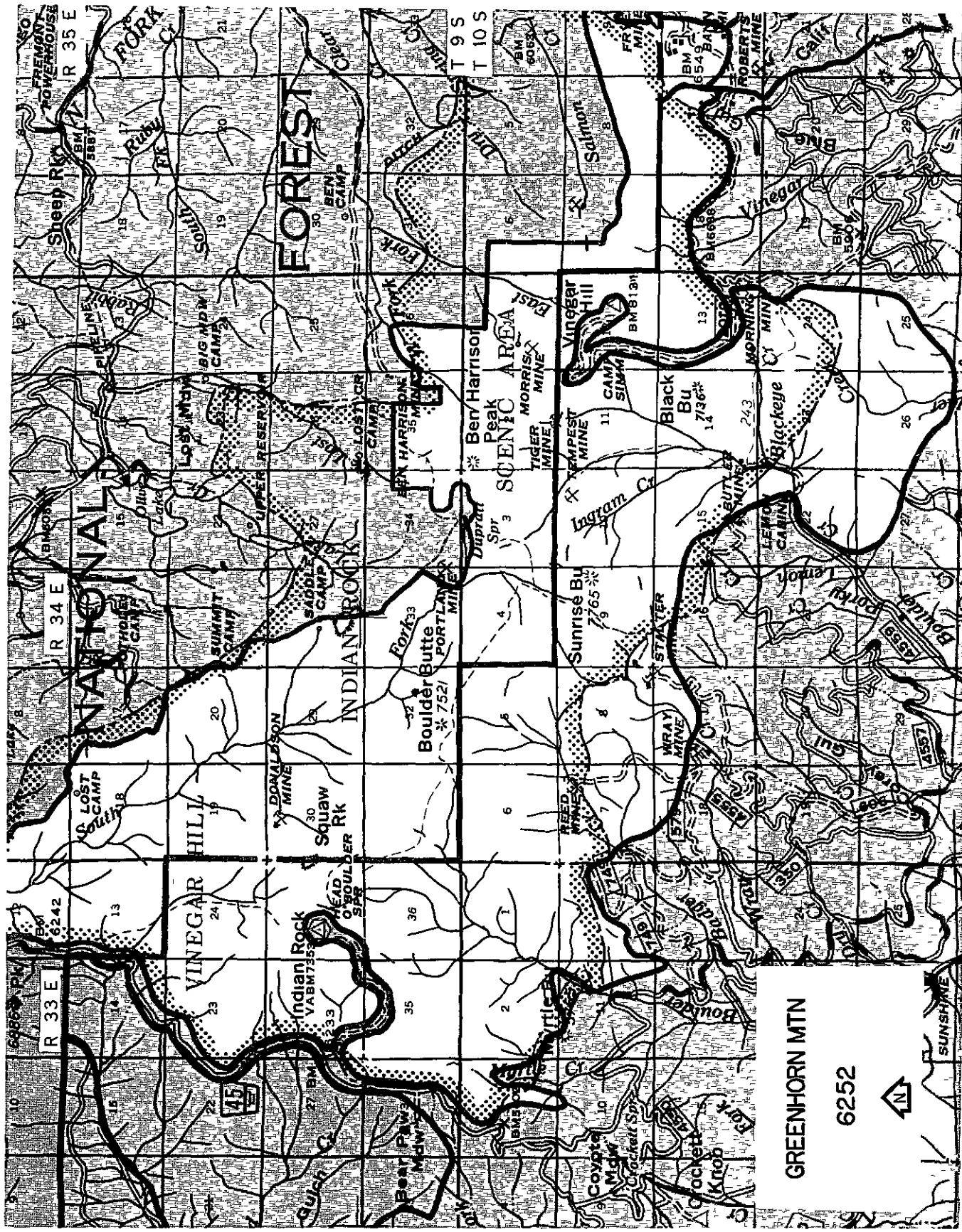
GLACIER MOUNTAIN MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1. General Forest	N/A	2,959	15,220		4,498	2,048
2 Rangeland		263	585		220	122
3. Riparian Areas		398	1,089		302	167
4A Big-Game Winter Range						
4B. Big-Game Winter Range Enhancement						
5 Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7 Scenic Area						
8. Special Interest Area						
9 Research Natural Area						
10. Semi-Primitive Non-Motorized	N/A	11,060		19,572	12,145	
11. Semi-Primitive Motorized						14,578
12. Developed Recreation						
13 Old Growth	N/A	460	1,080		460	460
14. Visual corridors		1,266			1,392	1,642
15 Unit Plan Wildlife Emphasis Areas	N/A	2,425				
16 Minimum Level Management	N/A	741	1,598		555	555
17. Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	19,572	19,572	19,572	19,572	19,572

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-10


GREENHORN MTN
6252
NATIONAL FOREST
INDIAN ROCK
VINEGAR HILL
Ben Harrison Peak SCENIC AREA
Boulder Butte
Sunrise Butte
Vinegar Hill
Black Butte
Blackeye
Indian Rock
Squaw Rk
Lost Camp South
Sheep Rk
Ruby Pk
Ingram Cr
Boulder Cr
Vinegar Cr
Coyote Mdw
Crockett Knob
R 33 E
R 34 E
R 35 E
T 9 S
T 10 S

K. GREENHORN MOUNTAIN - 16,197 Acres
(RARE II No. 6252)

1. Description

a History

This area was inventoried during RARE and enlarged in the RARE II inventory. The John Day Planning Unit Environmental Impact Statement and RARE II Environmental Impact Statement designated the area to nonwilderness uses.

b. Location and Access

This area is located along the northern boundary of the Malheur National Forest, in both Malheur and Umatilla National Forests and in both Grant and Baker counties (T. 10 S., R. 34 E. and R 35 E., and T 9 S., R. 33 E., of the Willamette Meridian)

Access consists of a Forest Service arterial road along the western edge of the area, with a local road to a lookout within the area, and two other Forest Service roads into the southern and eastern portions of the area. In addition, numerous unimproved roads lead to the areas perimeters.

c. Geography and Topography

Consisting primarily of alpine and subalpine areas in the Greenhorn Mountains, the highest elevation is 8,100 feet at Vinegar Hill, the lowest is 5,200 feet at the mouth of Black Eye Creek. See Figure C-10

Most of the area, on and near ridgetops, is undulating terrain of open, alpine meadows. Below these ridgetops, however, are sharp breaks in the terrain; particularly to the north, with dramatic, sharp, rock cliffs dropping away to steep drainages below

This area comprises the headwaters of Granite Boulder, Little Boulder, and Big Boulder Creeks, and numerous smaller streams which drain into the John Day River System. The area extends along the divide between the Middle and North Forks of the John Day River, where glacially carved granite meets Columbia Basalt

d. Geology and Soils

A wide variety of rock types are exposed within this area. Permian-age metavolcanic rocks cover much of the Vinegar Hill area, Permian and Triassic-age igneous and sedimentary oceanic rocks are exposed over much of the area; a Jurassic-to-Cretaceous-age intrusive is exposed around Sunrise Mountain; Eocene-to-Oligocene-age tuffaceous sedimentary rocks outcrop in a band east of Granite Boulder Creek, and Miocene-age basalt flows cover most of the southern portion Glacial till covers the head of Granite Boulder Creek and landslide deposits are found on the southeast slope of Vinegar Hill

Most soils consist of a silt loam surface derived from "recent" volcanic ash and a gravelly, cobbly subsoil derived from glacial activity or various bedrocks. Much of the soils occur in glacial troughs and are well drained

Volcanic ash soils are the most productive soils on the Forest. Under natural conditions, these soils have good vegetative and litter cover which protects the soils from wind and water erosion If the vegetative cover and litter are broken up by activities such as logging, livestock trailing, or fire, unacceptable erosion can occur, especially on steep slopes at higher elevations. Eroded areas are difficult to revegetate because of the short growing season and cold soils.

e. Vegetation

This area is 87 percent forested Of the forested portions, 2,900 acres meet the definition of old growth in the Pacific Northwest Region

Vegetation on ridgetops and sideslopes includes meadows of alpine sagebrush, elk sedge, and alpine fescue, as well as stands of whitebark pine and subalpine fir, and spruce bogs Upland flats and north-facing sideslopes support white fir, lodgepole pine, larch, and Douglas-fir, with ground covers of pine-grass, elk sedge, and huckleberry.

f Current Uses

The area is elk summer range and is also used by mule deer during the summer. The area also provides habitat for bear, pine marten, and bobcat as well as numerous smaller mammals The unique alpine habitat provides an opportunity to view uncommon bird life such as pine grosbeak and the northern three-toed woodpecker.

Many of the streams provide trout fishing opportunities and steelhead spawning and rearing habitat Clear Creek is particularly important for chinook salmon production

Big-game hunting and viewing scenery are currently the primary recreational uses of the area, with hunting predominant Other recreational uses include gold panning and recreational prospecting, fishing, hiking, backpacking, bird watching, photography, nature study, wildflower viewing, horseback riding, rock hounding, snowmobiling, cross-country skiing, and ski-touring None of these latter uses are considered "heavy use" at this time. (See Table C-2.) There are several trails traversing the area as well as opportunities for cross-country travel.

The area lies within two grazing allotments Current use averages 1,600 Animal Unit Months annually (Malheur National Forest side only), occurring primarily at lower elevations along the perimeter of the area

Indian Rock Fire Lookout is located on a high point in the interior of the area. This Lookout is staffed each summer

The high-elevation views of grassy, open alpine areas and subalpine trees provide a scenic and unusual contrast from adjacent forested areas. The major attraction of this area, aside from hunting opportunities, is the splendid 360 degree vista available from high-elevation viewpoints

2. Wilderness Capability

a Manageability and Boundaries

Boundaries are formed by logged areas and roads. Logical boundary adjustments would still be likely to cross drainages, there is little opportunity to increase manageability of the area's perimeter An improved boundary would reduce the size of the area Boundary adjustments have already separated the portions of the area, with some of the more obvious impacts (logging) on the area's naturalness.

b. Natural Integrity

The presence of unimproved roads throughout the area is the greatest impact to the natural integrity of the area These two-wheel tracks are particularly disturbing to shallow, eroded soils in the center of the area Motorized vehicle use has been prohibited for 10 years in these areas and the effects are beginning to heal, but their presence is still visible and unnatural to the average visitor.

Mineral developments have also impacted the natural integrity of the area. The most widespread impact (prospecting holes) is also the least apparent The more significant mining impacts are located principally along the southern and eastern portions of the area Some of these mines have removed soil to mineral rock and are quite visible Some mining exploration continues intermittently; other mines have not been used since the 1800's

Recreation and grazing use have made minor impacts on the natural integrity of the area The unimproved roads were used by off-road vehicles in the past Other recreational impacts consist of low-maintenance trails and hunter camps with fire pits, meat racks, etc The latter are easily removed, their impact is minimal.

Grazing use at higher elevations is largely incidental. The most unnatural impact would be the actual presence of cattle. At higher elevations, there is little other evidence of grazing use At lower elevations, grazing use becomes more concentrated, though still not heavy. Here, salting grounds and some evidence of cattle use are noticed.

Fire suppression in the area has had an impact on natural integrity of the north slopes and lower elevation forested area. Vegetative succession has been altered, although it would not be apparent to the average visitor

c. Naturalness

The area shows some evidence of human use and activities, but this remains substantially unnoticeable Overall, the area remains a large, relatively unspoiled tract of land. The most intrusive impacts would be the unimproved roads and mining activity. There is some historic/educational value in the past mining activity.

d Opportunity for Solitude

Topography and vegetation provide a screening effect from activities outside the area However, the size of the area and distance from the perimeter to the core of the area is generally less than three miles. The result is a moderate opportunity for solitude.

e. Primitive Recreation and Challenge

The only recreation facilities available are low standard trails There are outstanding opportunities for outdoor recreation. Opportunity for Primitive recreation, however, is fairly limited by the size and shape of the area. The most challenge is presented to cross-country skiers due to remoteness of the area during winter

f Special Features

Opportunities exist to designate an area of the Malheur and Umatilla National Forests as historic mining district The Greenhorn Area would be included within such a district. Even without such designation, there are opportunities for interpretation, and informal study of historical events and uses. There are prehistoric cultural resources within the area

There are no Threatened or Endangered wildlife species within this area. There is one potential peregrine falcon eyrie site, however, it has not had any historical use and the chance of utilization is marginal There is one Sensitive plant species found here

The area also provides a unique opportunity for scientific study of native plant communities in an alpine and subalpine ecosystem A potential Research Natural Area has been identified within this area, primarily located on the Umatilla National Forest portion

3. Availability for Wilderness

a. Resource Potentials

The area currently provides roaded natural, semiprimitive motorized, and semiprimitive nonmotorized recreational opportunities (See Table C-3) There is a yearly capability of 39,145 Recreation Visitor Days on the area (See Table C-4)

There are 13,200 acres of forested land tentatively suitable for timber management activities. These trees are predominantly mixed conifers with some lodgepole and ponderosa pine They are growing in multistoried stands with an average overstory age of 160 and an average understory age of 60. There is a standing volume of 152.67 million board feet (26.69 million cubic feet) With the use of intensive timber management techniques, 634 thousand cubic feet (3,626 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 752 thousand cubic feet per year.

"Numerous gold-silver lode deposits occur within this granitic intrusive and along its edges." (Gold and Silver in Oregon, Bulletin 61, Brooks and Ramp, State of Oregon Department of Geology and Mineral Industries, 1968.) Some people consider this area to have the best mineral potential of any on the Forest Most of the area has a moderate potential, and part a high potential for gold, silver, and copper lode deposits. It contains approximately 180 mining claims The U S. Geological Survey does not indicate a potential for oil and gas or geothermal resources

b Management Considerations

Indian paint fungus is present and can probably be found in all size classes of true fir Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe. Mistletoe patches of varying severity can be found. Root rots of varying degrees can be found, but are not considered a problem.

Due to high amounts of true fir and Douglas-fir in the area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm A western spruce budworm infestation of varying severity is presently in the area. Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor. Mountain pine beetle outbreaks are now occurring in the overmature and overstocked lodgepole stands.

There is one long-term special use for telephone lines and one 60-acre area withdrawn from mineral entry.

4. Wilderness Evaluation

This area is adjacent to the North Fork John Day River Wilderness. The Strawberry Mountain Wilderness is 25 miles southwest and Monument Rock Wilderness is 25 miles southeast. The alpine and subalpine habitats of this area are also represented within these other wildernesses.

This area is about 15 miles north of Prairie City, Oregon. The two nearest major metropolitan areas are Portland, Oregon, about 280 miles northwest, and Boise, Idaho, about 180 miles east.

There are proponents interested in retaining the wilderness options of the area. The North Fork John Day Wilderness, designated in 1984, includes portions of this original RARE II area.

During the RARE II inventory and evaluation, the area received approximately 1.5 times as many comments opposing wilderness as favoring wilderness

There is a high level of interest concerning the Greenhorn area In recent Forest planning public involvement, it received more comments than any other area on the Forest. These responses also indicated a definite lack of consensus about the wilderness suitability of the area (the responses were 1 2 in favor of wilderness to every 1 opposed). Several responses opposing wilderness designation for this area specifically supported a scenic or backcountry designation.

5. Environmental Consequences

Table C-14 displays the various management area assignments for the area by alternative.

a. Vegetation/Trees

Significant changes in tree sizes, and stand density and composition are expected to occur in all alternatives, except Alternative C-Modified. As this occurs, the affected acres would take on a managed forest appearance. The actual acreage affected by timber harvest would vary between these alternatives Over time, the appearance of the affected forested areas would change to a managed forest. Some old growth will be retained in all alternatives. Additional old growth may be provided within other Management Areas, such as semiprimitive areas

In Alternative C-Modified, little change in the trees is expected; present characteristics would be retained and naturalness overall would be unchanged, except effects of naturally occurring wildfires

b Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I and NC, forage for wildlife and livestock is expected to increase in forested areas when the trees are harvested and thinned The long-term effect on transitory areas should be a gradual decrease in forage production as tree canopies again close and shade the understory. Seeding of introduced forage species will provide higher quality and quantity of palatable plants and change the present composition of forage plants. Native forage species of elk sedge, pinegrass, and brome are also expected to increase in vigor and density as tree canopies are opened and thinning occurs in harvest areas

Forage production is expected to remain at present levels in Alternative C-Modified.

c. Wilderness

All alternatives would have less acreage retained in roadless condition except Alternative C-Modified Consequently, future wilderness consideration, based upon size of area, would be highest under Alternative C-Modified and wilderness consideration would remain a possibility for the Vinegar Hill/Indian Rock Scenic Area under all alternatives until the end of the first decade.

d. Recreation

In all alternatives, the recreation opportunity would be semiprimitive nonmotorized and Scenic Area designation would continue to be the primary recreational opportunity. All alternatives are expected to have similar effects on recreation.

e. Scenery

The high-elevation viewpoints, open alpine areas, and subalpine trees would continue to provide scenic opportunities in all alternatives. In all alternatives except Alternative C-Modified, viewers would see evidence of a managed forest, including clearcuts and shelterwoods on approximately 2,900 acres in the southeast portion of the area Long-term effects on scenery in this area would be less old growth to view, more access roads, and less naturalness

In Alternative C-Modified most of the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire

f. Wildlife

Alternative C-Modified would retain the largest acreage of old growth and the most wildlife snags, due to old growth under other management areas such as Scenic Area and Semi-Primitive Non-Motorized. Management standards would adequately protect key habitat of all wildlife under all alternatives.

g Water, Riparian, Fisheries

Riparian vegetation, anadromous fish habitat, and water quality of streams which flow into the Middle Fork John Day River would be affected most by Alternatives A, B-Modified, F, I, and NC, and least by Alternative C-Modified. Management standards would adequately protect these resources under all alternatives; however, accessibility and use would increase as a result of timber harvest and access roads. In all alternatives except Alternative C-Modified, upper portions of streams within the manageable boundaries would be unaffected while some lower portions would be impacted by harvest activities.

h. Cultural Resources

All alternatives will protect cultural resources through the application of laws and management standards Alternatives which allow timber harvest, Alternatives A, B-Modified, F, I, and NC, have the greatest risk of inadvertent damage to the resource as well as the greatest opportunity for resource discovery.

i. Soils

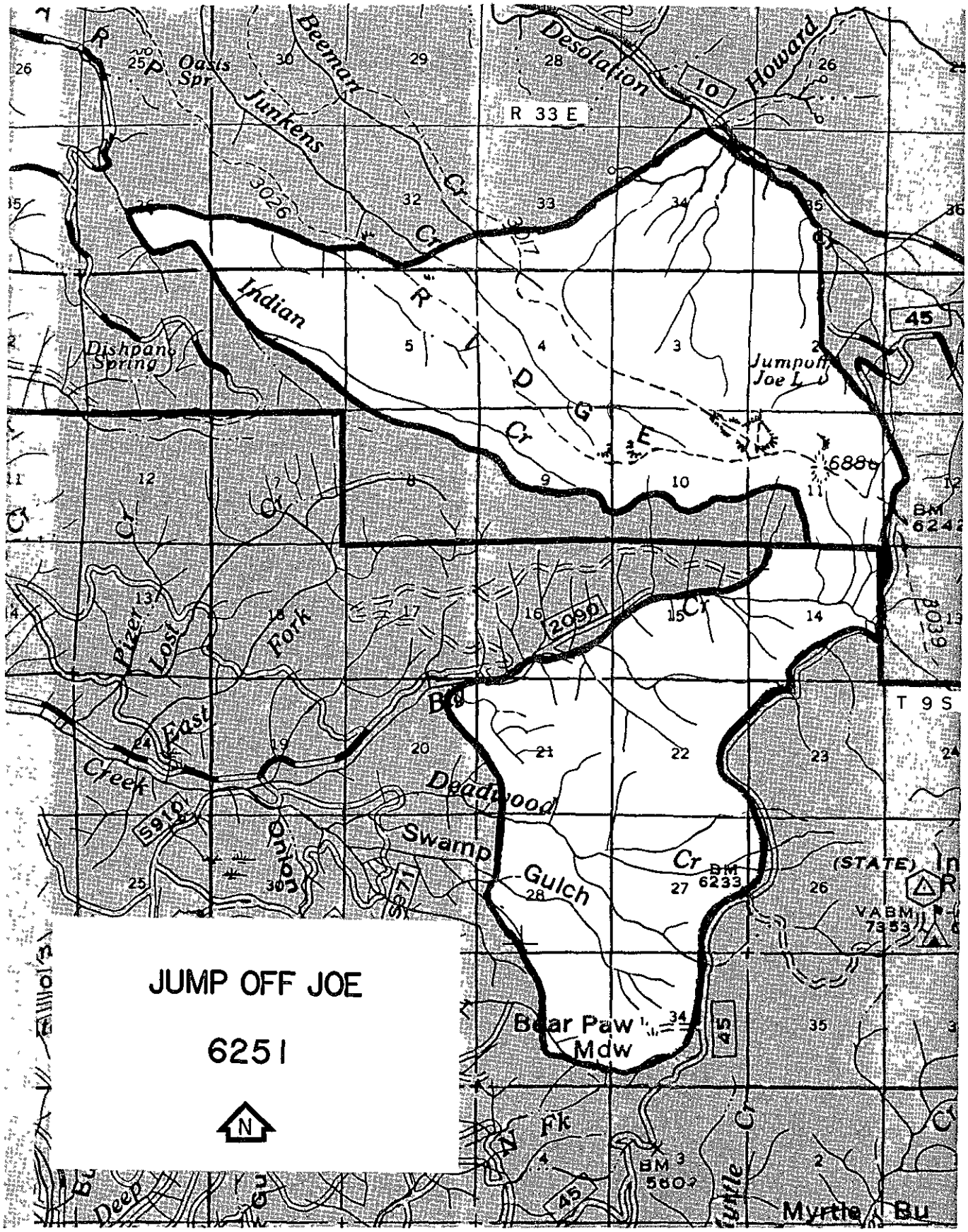
All alternatives will protect the soil resource through application of management standards The alternatives which allow timber harvest, Alternatives A, B-Modified, F, I and NC, have the greatest risk of inadvertent damage to the resource.

TABLE C-14
GREENHORN MOUNTAIN MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1 General Forest	N/A	1,768	1,762		1,825	1,825
2. Rangeland		177	200		195	195
3 Riparian Areas		247	242		229	229
4A. Big-Game Winter Range						
4B. Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. Scenic Area	N/A	13,322	13,322	13,322	13,322	13,322
8. Special Interest Area						
9. Research Natural Area						
10. Semi-Primitive Non-Motorized				2,875		
11. Semi-Primitive Motorized						
12. Developed Recreation						
13. Old Growth		300	300		300	300
14. Visual Corridors		66	74			
15. Unit Plan Wildlife Emphasis Areas						
16. Minimum Level Management		317	297		326	326
17. Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	16,197	16,197	16,197	16,197	16,197

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

PIGURE C-11


JUMP OFF JOE
6251
N
Oasis Spr
Beeman
Junkens
Desolation
Howard
R 33 E
Indian
Dishpan Spring
Jumpoff Joe L
Pizer
Lost
Fork
East
Creek
Deadwood
Swamp
Gulch
Bear Paw Mdw
Myrtle
(STATE)
BM 6233
BM 6242
6884
7353
5602

L. JUMPOFF JOE - 4,006 Acres (RARE II No. 6251)

1. Description

a. History

This area was inventoried during RARE and continued during the RARE II inventory. The Umatilla National Forest manages a large part of this roadless area. The John Day Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement designated this area to nonwilderness uses.

b. Location and Access

This area is located on both sides of the northern boundary of the Malheur National Forest with the Umatilla National Forest in Grant County, Oregon (T. 8 S., R. 32 E., T. 8 S., R. 33 E., T 9 S., R. 32 E , T. 9 S, R. 33 E., of the Willamette Meridian).

Access to the area consists of a Forest Service arterial road along the eastern edge of the area Numerous secondary and local roads lead to the perimeter of the area.

c. Geography and Topography

The portion of the area on the Malheur National Forest straddles the Big, Deadwood, and Swamp Gulch Creeks and is connected to the portion on the Umatilla National Forest by a narrow strip. The area does not have prominent geographic features and is a series of glacial troughs and outwashes, high elevation rolling ridges, and drainages Sideslopes vary from moderately steep to gentle, primarily westerly facing. The most southerly portion of this area is immediately adjacent to the Susanville district of the Greenhorn Mountain area gold belt This area is a continuation of the granitic intrusion which makes up the Greenhorn Mountain roadless area. See Figure C-11.

d. Geology and Soils

Surface soil is a silt loam derived from volcanic ash and a cobbly clay loam derived from a variety of bedrock materials. The parent materials are basalt and andesite Ash soils in this area share the characteristics of volcanic ash soils in the Greenhorn area. Jurassic-to-Cretaceous-age intrusive rocks are exposed over most of the northwesterly portion of the area Miocene-age basalt flows cover most of the southern portion. Glacial till covers much of the northeasterly portion.

e. Vegetation

This area is 97 percent forested Of this, 1,300 acres meet the Pacific Northwest Region's definition of old growth. Ridgetops are forested with subalpine tree species. Lower elevations and drainages are heavily forested with white fir, Douglas-fir, lodgepole pine, and western larch Ground cover consists of huckleberry, pinegrass, and Columbia brome Small, open areas support alpine sagebrush, elk sedge, and alpine fescue

f. Current Uses

The area provides summer and fall range for mule deer and Rocky Mountain elk. The area also provides habitat for bear, pine marten, and bobcat. Trout inhabit Jumpoff Joe Lake as well as portions of Big Creek and Deadwood Creek These creeks also provide steelhead spawning and rearing habitat

The area's principal recreation use is big-game hunting and associated camping. Hiking the trail system and snowmobiling in winter are also popular. Hiking to fish the tiny Jumpoff Joe Lake is an important experience in this area. Off-road vehicle use occurs in the area, as well; this use is highest in association with big-game hunting. (See Table C-2.)

The Malheur National Forest portion lies within one grazing allotment Current use averages 150 Animal Unit Months by cattle each year

2. Wilderness Capability

a Manageability and Boundaries

The portion of this area on the Malheur National Forest is narrow and four miles long At its boundary with the portion on the Umatilla National Forest, it is less than one mile wide, at its widest, it is approximately two miles wide The shape of the area and terrain allow easy motorized access

A small (1/2 section) adjustment in the boundary at the southeastern corner of the area would eliminate that portion with high minerals potential and activity

b Natural Integrity

The area shows some evidence of human use and activities, but these are not *dominant over the substantially natural appearance of the area.*

Impacts on the natural integrity of the area include undeveloped hunter camps. These impacts constitute little of the total area and natural integrity is quite high

There are some impacts from grazing, primarily in the southern tip of the area These consist of dust beds created by livestock in the thick lodgepole pine stands.

The history of fire suppression has had an impact on the vegetation of the area, by altering the succession of vegetative types in the area

c. Naturalness

A boundary adjustment on the southern tip of the area, mentioned previously, separates most of the noticeable impacts from the remainder of the area The effects of fire suppression are not noticeable to the average visitor.

d. Opportunity for Solitude

The size and shape of the portion of this area on the Malheur National Forest does not lend itself to a high degree of solitude The gently rolling and sloping terrain does not add greatly to this opportunity The very dense lodgepole pine and white fir stands do provide vegetative screening which offsets these other factors to some degree During big-game hunting season, the use pattern would make opportunities for solitude very difficult

e Primitive Recreation and Challenge

There are many opportunities for outdoor recreation including camping, hiking, hunting, and snowmobiling However, the opportunities for a primitive recreation experience are limited by the size and shape of the area, the access to the perimeter, and the use pattern

This area does not present any uniquely challenging experiences to the average user.

If combined with the adjacent Greenhorn RARE II area, which ties into the North Fork John Day wilderness, the opportunity exists for increased primitive recreation experiences

f. Special Features

There are no known Threatened or Endangered plant or animal species within this area. There is one Sensitive plant which occurs in this area

There are no known cultural resources within the area.

3. Availability for Wilderness

a Resource Potentials

The area currently provides roaded natural recreational opportunities. This area is capable of providing 14,141 Recreation Visitor Days (See Table C-4.)

Of the Forested acres in this area, 4,000 are tentatively suitable for timber management activities These trees consist predominantly of mixed conifers with some lodgepole pine, growing in multistoried stands. The average overstory age is 150 and the average understory age 60 There is a standing volume of 43.2 million board feet (7.64 million cubic feet) With the use of intensive timber management techniques, 192 thousand cubic feet (1,098 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 228 thousand cubic feet per year.

The area has a moderate potential for placer gold and vein-type deposits of gold and silver. There are approximately 15 mining claims within the boundaries. The U S. Geological Survey does not indicate a potential for oil and gas or geothermal resources.

b. Management Considerations

Indian paint fungus is present and can probably be found in all size classes of true firs. Much of the Douglas-fir (especially that found on the rockier, drier soils) is infected with dwarf-mistletoe Mistletoe patches of varying severity can be found, from fairly light to quite severe. Root rots can be found to varying degrees but at this point are not considered a problem.

Due to the high amounts of true fir and Douglas-fir in the area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm. A western spruce budworm infestation of varying severity presently exists in the area Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor. Mountain pine beetle outbreaks are now occurring in the old growth and/or overstocked lodgepole pine stands.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 30 miles south, Monument Rock Wilderness is 40 miles southeast, North Fork John Day Wilderness is 6 miles north and east, and Black Canyon Wilderness is 65 miles southwest The ecosystems present in the Jumpoff Joe roadless area are well represented in these wildernesses.

The nearest major metropolitan centers are Portland, Oregon (280 miles northwest), and Boise, Idaho (180 miles east).

The Jumpoff Joe roadless area has fairly strong support as an addition to the North Fork John Day Wilderness complex. In the 1979 RARE II study, this area received 2,780 comments favoring wilderness designation, 24 favoring further planning, and 5,292 favoring nonwilderness management. In recent Forest planning public involvement activities, this area received a moderate level of response which showed a lack of consensus about the best use of this area. The comments received were equally balanced (1-1), for and against wilderness designation.

The primary reasons favoring wilderness for this area were the opportunities for Primitive, solitary recreation, fish and wildlife habitat, and watershed protection The natural character of the area and its size, especially combined

with Greenhorn as suggested, were also strongly supported. It was also suggested that the road between these two areas be closed.
The primary reasons opposing wilderness were the mineral resource potential, evidence of mining activity, and the value of the timber resource.

There was some support for managing the area as "roadless" with restrictions on consumptive uses.

5. Environmental Consequences

Table C-15 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

Significant changes in tree sizes, and stand density and composition are expected on forested areas in Alternatives A, B-Modified, F, I, and NC, changing to a managed forest. The actual acres affected by timber management activities will vary between alternatives. In Alternative F, approximately 1,490 acres would be affected in the first decade. Some old growth will be retained in all alternatives, and these areas would remain unchanged

Under Alternative I, timber harvests would be on a non-scheduled basis and would be used only to meet fish and/or wildlife habitat objectives. When timber harvesting is warranted, silvicultural prescriptions will be designed to meet these objectives utilizing both even-aged and uneven-aged management techniques. The environmental changes, although similar to those in Alternatives A, B-Modified, F, and NC, as expressed in the above paragraph, would not occur as rapidly as in these other alternatives.

In Alternative C-Modified little change in the trees is expected; present characteristics would be retained and naturalness overall would be unchanged, except for the effects of naturally occurring wildfires.

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC, forage for wildlife and livestock is expected to increase in forested areas where the trees are harvested and thinned. The long-term effect on transitory areas should be a gradual decrease in forage production as tree canopies again close and shade the understory. Seeding of introduced forage species will provide higher quality and quantity of palatable plants and change the present composition of forage plants. Native forage species of elk sedge, pinegrass, and brome are also expected to increase in vigor and density as tree canopies are opened and thinning occurs in harvest areas.

Forage production is expected to remain at present levels in Alternative C-Modified

c Wilderness

In Alternative C-Modified future wilderness consideration would remain a possibility, wilderness experience expectations would be met, and the area would continue to appear very natural to users.

In Alternatives A, B-Modified, F, I, and NC, the area would eventually have a managed forest appearance with human activities evident in forested areas. Motorized vehicles would be permitted and future wilderness consideration would be foregone by the end of the first decade.

d. Recreation

In Alternatives A, B-Modified, F, and NC, the recreational opportunity would be roaded modified with increased vehicle use. The recreational opportunity would be roaded natural under Alternative I. Big-game hunter success is expected to increase due to reduced hiding cover in harvested areas and easier access. The opportunity for remote, nonmotorized hunting will decrease as additional access roads are traveled by more hunters.

In Alternative C-Modified the effect would be a semiprimitive nonmotorized recreational opportunity which would provide the most natural setting to users. Eventually, more trails may be constructed to access new areas, while maintaining semiprimitive conditions in a nonmotorized setting

e Scenery

The scenery would be most affected by Alternatives A, B-Modified, F, and NC, where timber harvest activities would alter the natural appearance to that of a managed forest. Long-term effects on scenery in the forested areas which are harvested would be less old growth, more access roads, and less naturalness.

With Alternative I, harvests would be limited in size to 10 acres or less and shaped to provide for a natural appearing setting

In Alternative C-Modified the present forest scenery is expected to remain; no changes are anticipated, barring a major outbreak of insects, diseases, or catastrophic fire.

f. Wildlife

Alternative C-Modified would retain the largest acreages of old growth and the most wildlife snags. Management standards would adequately protect key habitat of all wildlife under all alternatives

Moreover, some old growth in all alternatives will be retained to meet requirements for habitat needs of pileated woodpecker, pine marten, and other wildlife Alternative B-Modified should affect wildlife to the greatest extent, followed by Alternatives A, F, and NC, which would retain more snags. Alternative I would provide for greatest quality of wildlife habitat of all the alternatives.

g Water, Riparian, Fisheries

Riparian vegetation, anadromous fish habitat, and water quality of streamflow into the Middle Fork John Day River would be affected most by Alternatives A, B-Modified, F, I, and NC, and least affected by Alternative C-Modified. Management standards would adequately protect these resources under all alternatives; however, there would be increased accessibility and use as a result of timber harvest and access roads.

h Cultural Resources

All alternatives will protect cultural resources through application of laws and management standards. Alternatives which allow timber harvest (Alternatives A, B-Modified, F, I, and NC) have greatest risk of inadvertent damage to the resource as well as the greatest opportunity for discovery of the resource.

i. Soils

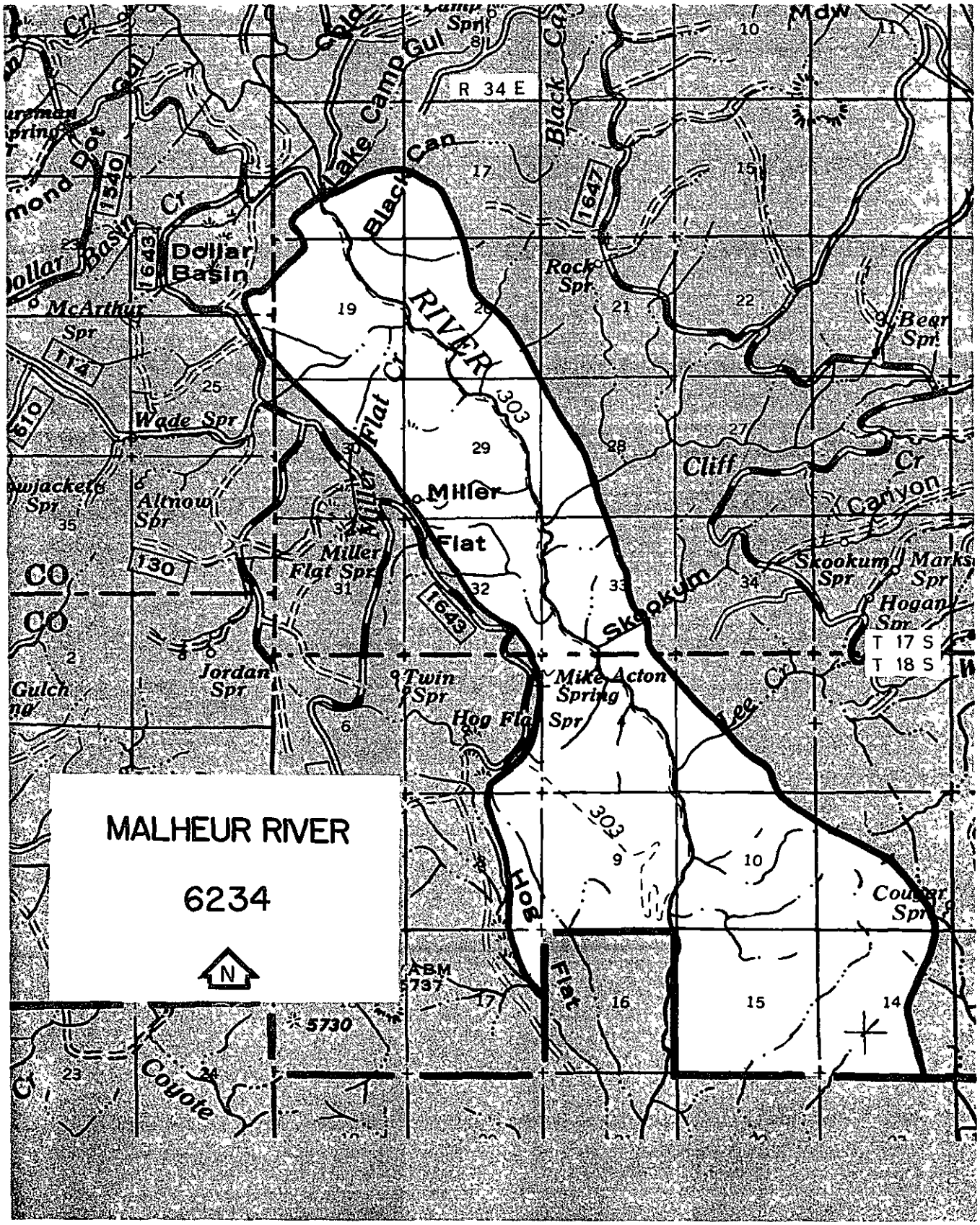
All alternatives will protect the soil resource through application of management standards. Alternatives which allow timber harvest (Alternatives A, B-Modified, F, I, and NC) have the greatest risk of inadvertent damage to the resource.

TABLE C-15
JUMPOFF JOE MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1 General Forest	N/A	2,649	2,613		2,627	
2. Rangeland		134	149		140	
3. Riparian Areas		549	557		519	
4A. Big game Winter Range			136		137	
4B Big game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. Scenic Area						
8 Special Interest Area						
9. Research Natural Area						
10. Semi-Primitive Non-Motorized				4,006		
11 Semi-Primitive Motorized						
12 Developed Recreation						
13. Old Growth	N/A	300	300		300	
14. Visual Corridors		126				
15. Unit Plan Wildlife Emphasis Areas						
16 Minimum Level Management		248	251		283	
17 Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21 Wildlife Emphasis Area, Non-Scheduled Harvest						4,006
22. Wild and Scenic River						
TOTAL ACRES	N/A	4,006	4,006	4,006	4,006	4,006

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-12


MALHEUR RIVER
6234
N
R 34 E
T 17 S
T 18 S
Dollar Basin
McArthur Spr
Wade Spr
Altnow Spr
Miller Flat
Miller Flat Spr
Jordan Spr
Twin Spr
Mike Acton Spring
Hog Flat Spr
Rock Spr
Bear Spr
Cliff Cr
Canyon
Skookum Spr
Marks Spr
Hogan Spr
Cougar Spr
Coyote
Lake Camp
Black Can
Flat Cr
Hog Flat
Skookum
RIVER
303
1643
1647
1540
1143
130
114
610
5730
ABM 737

M. MALHEUR RIVER - 6,984 Acres (RARE II No. 6234)

1. Description

a. History

This area was inventoried in RARE and enlarged in the RARE II inventory The Silvies-Malheur Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement designated the area to nonwilderness uses

b Location and Access

This area is located near the southeastern boundary of the Malheur National Forest in southern Grant County and northern Harney County, Oregon (T. 17 S., R 33 1/2 E , T 17 S , R 34 E , T. 18 S., R 33 1/2 E , T 18 S , R 34 E , of the Willamette Meridian).

Access to the area consists mainly of several unimproved roads to the boundary. A trail along the western edge of the Malheur River at the southern end of the area also provides access for horses and hikers The Malheur River area is about 5 miles long and 1-1/2 to 2 miles wide

c. Geography and Topography

The area is a deeply incised (500+ feet) plateau with a generally narrow (50-100 feet) rocky bottom along the Malheur River On the east side of the river are a series of steep hills which rise to the east away from the river

The area consists of the canyons of the Malheur River as well as some relatively flat table lands along portions of the Malheur Canyon rim The canyons are fairly wide and very steep with prominent rock outcroppings, particularly along the southwestern edge *See Figure C-12.*

d Geology and Soils

Soils in the Malheur River Canyon are those which are generally found on steep slopes of variable aspect. Soil texture varies from clay to loam and some have a recent volcanic ash surface layer The bedrock under the surface soils is quite variable Miocene-age volcanic-flow rocks cover most of the eastern portion of the area, with Pleistocene-age basalt flows on the west

e Vegetation

Vegetation on the northern and eastern slopes of the Malheur River consists mainly of ponderosa pine overstories with understories of Douglas-fir, grasses, and forbs. The area is about 40 percent forested The table lands and slopes on the east side of the river generally support some scattered ponderosa pine, juniper, mahogany, sagebrush, and a variety of bunchgrasses. The canyon bottoms extending a short way up the slopes are generally timbered with mature ponderosa pine The rest of the vegetation is grasses and low-lying shrubs Small, scattered meadows along the Malheur River support a variety of forbs, grasses, and shrubs. About 300 acres in this area meet the Pacific Northwest Region's definition of old growth

f Current Uses

This area provides year-round Rocky Mountain elk habitat with the lower one-fourth of the area identified as elk winter range Mule deer use this area during the spring, summer, and fall The close proximity of old-growth forest, rimrock, and riparian habitats in this area supports a majority of the species found in the *southern Blue Mountains The Malheur River supports an inland trout fishery.*

Big-game hunting and trout fishing are currently the main recreational uses of the area Other uses include camping, hiking, rafting, riding, recreational gold panning, photography, and nature study, however, all recreational use in the area is light. (See Table C-2) Access into the area is provided by a National Recreation Trail that follows the river course at a gentle grade suitable for an average hiker This trail provides early season hiking opportunities when many high elevation trails are still snowed in The Malheur River ford at the northern tip of the area is a very popular dispersed campsite.

Most of the area receives light or no use by livestock due to natural barriers, steep slopes, and limited forage Current use averages 400 Animal Unit Months annually by cattle on 2 different grazing allotments.

The table lands around the canyon rims have been logged and roads have been built throughout the area. In contrast to this, the bottom of the canyon provides a pleasant, remote area with a free-flowing river and views of an undisturbed ecological system.

The areas surrounding the review area, except for the southern boundary, have been logged The northwestern tip of the Bureau of Land Management's Bluebucket Wilderness Study Area touches the southeastern tip of this area

The major attraction of the area, in addition to the hunting and fishing opportunities, is described as a place to "get away from it all" and to enjoy "peace and quiet without motorized intrusion " Steep rock walls from the canyon rim to the river below may be photographed or used by those willing to find a challenge in rock climbing The Malheur River is a free-flowing river and a major attraction within the area

2. Wilderness Capability

a Manageability and Boundaries

There is general agreement that the boundary of the area should be adjusted. The boundary of the originally inventoried roadless area is difficult to locate on-the-ground and would be extremely difficult to manage. It would be possible to move the boundary to the canyon rims This would improve the locatability and manageability of the area by following topographic characteristics. This boundary change would also eliminate the majority of the area containing evidence of previous human activity (with the exception of the Malheur River Trail). There would be a resulting reduction of approximately 3,800 acres

b. Natural Integrity

Within the river canyon itself the natural integrity of the area is extremely high Natural processes have been virtually unhampered by human activities except for fire control and livestock grazing.

The history of fire suppression in the area has caused a gradual change in the understory vegetation from ponderosa pine reproduction to white fir and other tree species. Under natural conditions, low intensity wildfires would have selectively maintained ponderosa pine in the understories

The effects of grazing in the area are mostly concentrated along the streams. They include fences, salting grounds, cattle trails, some compaction and vegetative trampling, dust beds, the cattle themselves, and other evidence of their presence along the streams

c. Naturalness

Overall, the area within the river canyons appears extremely natural to the average user The effects of fire suppression would not normally be noticed by most users. The National Recreation Trail is maintained to a fairly low standard.

The impacts of past and present livestock grazing remain the most intrusive activity These appear unnatural to most visitors and would be extremely difficult to mitigate unless grazing were eliminated The impacts also occur in the portion of the area most likely to receive the majority of use.

d Opportunity for Solitude

Within the main canyons, the opportunities for solitude are very high, particularly along the stream bottoms The depth of the canyons and vegetative cover provide excellent screening. The rim tops offer a limited opportunity for solitude. The views give an impression of a vast, unspoiled canyon area, but there are intrusions from the adjacent table lands This is especially true during hunting season

e. Primitive Recreation and Challenge

Overall, Primitive recreation opportunities are limited due to the narrowness and irregular shape of the area. Topographic and vegetative cover are significant over much of the area, and trails tend to concentrate users in the stream bottoms or on the canyon rims.

The National Recreation Trail and one sanitary facility are the only recreation facilities The trail is not difficult because it follows the moderate stream grade The northern boundary of the review area is at the Malheur Ford Here, recreationists have placed rocks in the river forming a pool which is used for swimming

The lack of facilities and access does tend to increase opportunities for solitude and unconfined recreation, however, the opportunities for challenging experiences are limited

f. Special Features

There is scenic variety both vertically, from rimtops to canyon bottoms, and horizontally as the scene changes from microhabitat to microhabitat

There are no reports of Federally listed Threatened or Endangered Species occurring in this area One sensitive plant species is known to occur.

There is very limited opportunity for educational study In the past, the area immediately adjacent to the Malheur Ford was flooded, logs were stored in the water and then floated downstream of the Forest to a mill in the vicinity of Bluebucket Creek.

The probability of finding cultural sites is quite high because of fisheries in the Malheur River and the proximity of the area to the Harney Basin and Logan Valley. Several Class I sites have been located during recent surveys

3. Availability for Wilderness

a Resource Potentials

The area currently provides roaded modified, roaded natural and semiprimitive motorized recreation opportunities. (See Table C-3.) Left unchanged, the area has the potential to provide 20,019 Recreation Visitor Days. (See Table C-4.)

There are 2,500 acres of forested land tentatively suitable for timber management activities. These timber stands are predominantly ponderosa pine multistoried stands. The overstories have an average age of 140 years; the understories have an average age of 75 years. There is a standing volume of 26 7 million board feet (4.67 million cubic feet). With the use of intensive timber management techniques, 120 thousand cubic feet (686 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long term sustained yield capacity from this area would be 142 thousand cubic feet per year.

The area has no known locatable mineral potential and contains no mining claims. The U S. Geological Survey considers the area to be prospectively valuable for oil and gas but not for geothermal resources.

b. Management Considerations

During the last 10 years, 5 small fires have occurred in the area. Natural fuel loading in the area ranges from 5-10 tons per acre.

The western spruce budworm is probably prevalent in the Douglas-fir and white fir as it can be found throughout the Malheur National Forest. It is not known to what degree the budworm has infested this particular area. The Douglas-fir is infected with dwarf-mistletoe to varying degrees, and the western pine beetle can be found in the old-growth ponderosa pine

There are no private ownerships or other ownerships within the boundaries of the area On the southern end of the area, Bureau of Land Management, State, and private lands are adjacent to the Forest boundary.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 12 miles north, Monument Rock Wilderness is 23 miles northeast, Black Canyon Wilderness is 65 miles northwest, and North Fork John Day Wilderness is 55 miles north

The ecosystems present in this area are represented to some degree by the Black Canyon Wilderness They would also be represented by the BLM Bluebucket Wilderness Study Area if that area were designated wilderness.

During the 1979 RARE II study, there were 137 comments favoring wilderness designation, 2,583 comments favoring further planning, and 3,415 comments favoring nonwilderness management. In recent Forest planning public involvement activities, this area was among those receiving a moderate level of comment. The comments showed a definite lack of consensus about best use of the area. The ratio of comments favoring wilderness designation to those opposing it was 1 to 1.1.

Primary reasons for supporting wilderness were the naturalness and scenic quality of the area and opportunities for Primitive, solitary recreation Protection of fish and wildlife habitat and water quality were major concerns. The proximity of this area to the Bluebucket Wilderness Study Area also creates opportunity for a combined wilderness experience

The reasons for opposing wilderness designation were the small size of the area and a stated preference for management of the canyon area as a roadless or Primitive recreation/wildlife emphasis area.

The nearest major metropolitan centers are Portland, Oregon (280 miles northwest), and Boise, Idaho (180 miles east).

5. Environmental Consequences

Table C-16 displays the various management area assignments for this area by alternative.

In all alternatives 3,066 acres are managed to be within the Wild and Scenic River management area, in accordance with The Omnibus Oregon Wild and Scenic Rivers Act of 1988 which declared the Malheur River to be a part of the Wild and Scenic River System

The following discussion pertains to those acres outside the river corridor.

a. Vegetation/Trees

Significant changes in tree sizes, and stand density and composition are expected in all alternatives except Alternative C-Modified About 63 percent of the forested acres are affected in Alternatives A, F, I, and NC, and virtually 100 percent in Alternative B-Modified. The appearance of the affected forested areas would change to a managed forest setting

In Alternative C-Modified, little change is expected. Present characteristics would be retained and naturalness overall would be unchanged, except the effects of naturally occurring wildfires.

b. Vegetation/Grass and Shrubs

In Alternatives A, B-Modified, F, I, and NC, forage for wildlife and livestock is expected to increase in forested areas where the overstory is removed and the remaining trees are thinned. Seeding of introduced forage species will provide higher quality and quantity of palatable plants and change the present composition of forage plants. Native forage species of elk sedge, pinegrass, and brome will also increase in vigor and density as tree canopies are opened and thinning occurs in harvest areas.

In Alternative C-Modified, forage production and species composition are expected to remain as they are at present.

c. Wilderness

Alternatives, other than Alternative C-Modified, would retain less acreage in a roadless condition Under all other alternatives, except Alternative B-Modified, the area could be considered for future wilderness but would be smaller in size.

In Alternative B-Modified users would see timber harvest activities, new road construction, and increased motorized vehicle use Future wilderness consideration would be foregone within the first decade

d. Recreation

The recreational opportunity varies among alternatives from semiprimitive nonmotorized in Alternatives A, C-Modified, and NC, to semiprimitive motorized in Alternative F, to roaded modified in Alternative B-Modified.

In a semiprimitive nonmotorized setting, users would experience a more natural surrounding without motorized intrusion within the canyon walls. Eventually more trails may be constructed to accommodate more users and the present National Recreation Trail would be improved to a higher standard The primary recreation opportunities of fishing and big-game hunting would remain unchanged

Within a semiprimitive motorized setting, users could expect to see and hear trail bikes within the canyon The National Recreation Trail, which is presently maintained to a low standard, would provide a challenge to off-road cyclists seeking such experience in a vast, unspoiled canyon area.

Within a roaded modified recreation opportunity, there would be increased vehicle use and sounds along timber access roads constructed along the canyon rims or river benches. Removal of old-growth ponderosa pine would cause the area to appear unnatural and may provide for higher hunter success due to reduction in hiding cover

e. Scenery — The scenic views of a vast, unspoiled canyon would be retained under all alternatives except Alternative B-Modified. Above canyon rims the scenic variety of open slopes to forested table lands would be least affected by Alternative C-Modified and equally affected to a greater degree by all other alternatives. Viewers would see evidence of activities such as timber harvest and access roads above the canyon rims in all alternatives except Alternative C-Modified. Naturalness and scenic views would be affected to the greatest extent by Alternative B-Modified, which would change the areas within the canyon, as well as the table lands above the canyon, to a managed forest appearance.

f. Wildlife — Old-growth timber and snags would be available to a greater extent in Alternative C-Modified, to a lesser extent in Alternatives A, F, I, and NC, and least in Alternative B-Modified Management standards would adequately protect key habitats of all wildlife under all alternatives. Old growth is retained in all alternatives to meet guidelines for pileated woodpecker and pine marten habitat. Elk winter range covers the lower one-fourth of the area and would be affected by timber harvest activities. In all alternatives except Alternative C-Modified, hiding and thermal cover would be decreased, and forage would increase

g Water, Riparian, Fisheries — The Malheur River is the only major stream which supports trout and a riparian zone in addition to small scattered meadows All alternatives are considered to be equal in effects on these resources since management standards would adequately protect the resources.

h. Cultural Resources — All alternatives are similar in effects on cultural resources. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards affecting cultural resources Alternatives A, B-Modified, F, and NC present the greatest risk of inadvertent damage to the resource. They also present the greatest opportunity for discovery and interpretation of cultural resources.

i. Soils — Alternatives A, B-Modified, F, and NC present greater risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities. All of the alternatives adequately protect the resource through application of management standards

TABLE C-16

MALHEUR RIVER MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1 General Forest	N/A	1,043	1,516		975	975
2 Rangeland		1,871	672		1,297	1,297
3 Riparian Areas		228	394		219	219
4A. Big-Game Winter Range					826	826
4B. Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A Strawberry Mountain Wilderness						
6B Monument Rock Wilderness						
6C Pine Creek						
7 Scenic Area						
8 Special Interest Area						
9 Research Natural Area						
10 Semi-Primitive Non-Motorized	N/A	66		3,918		
11 Semi-Primitive Motorized						
12 Developed Recreation						
13 *Old Growth*	*N/A*		*300*			
14 Visual Corridors		197	594		109	109
15 Unit Plan Wildlife Emphasis Areas						
16 Minimum Level Management		513	442		492	492
17 Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20 Wildlife Emphasis Areas with Scheduled Harvest						
21 Wildlife Emphasis Area Non-Scheduled Harvest						
22 Wild and Scenic River	N/A	3,066	3,066	3,066	3,066	3,066
TOTAL ACRES	N/A	6,984	6,984	6,984	6,984	6,984

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

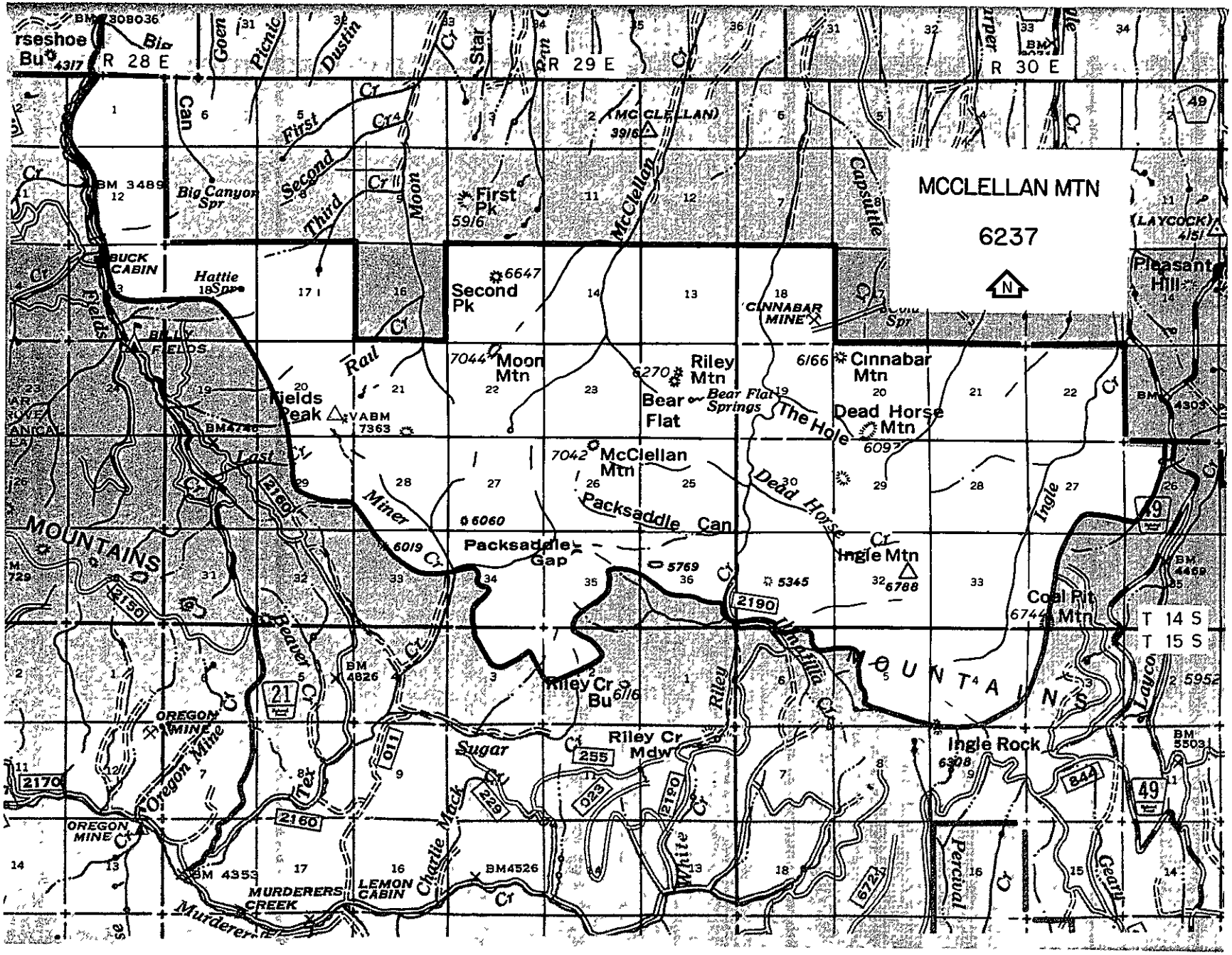

MCCLELLAN MTN
6237
R 28 E
R 29 E
R 30 E
T 14 S
T 15 S
Second Pk
6647
First Pk
5916
Moon Mtn
7044
Riley Mtn
6270
Cinnabar Mtn
6766
Bear Flat
Bear Flat Springs
Dead Horse Mtn
6097
McClellan Mtn
7042
Fields Peak
VABM 7363
Packsaddle Gap
6060
5769
5345
Ingle Mtn
6788
Coal Pit Mtn
6744
Riley Cr Bu
6166
Riley Cr Mdw
Ingle Rock
6308
5952
Pleasant Hill
4151
(LAYCOCK)
CINNABAR MINE
BUCK CABIN
LEMON CABIN
MURDERERS CREEK
OREGON MINE
Big Canyon Spr
Hattie Spr
BM 3489
BM 4746
BM 4826
BM 4353
BM 4526
BM 4303
BM 4469
BM 5503
MOUNTAINS
Cr
Creek

FIGURE C-13

N. McCLELLAN MOUNTAIN - 20,646 Acres (RARE II No. 6237)

1. Description

a. History

This area was inventoried in RARE and enlarged in the RARE II inventory. The John Day Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement designated the area to nonwilderness uses The Forest currently manages a portion of the higher elevation area as unroaded

b Location and Access

This area is located about five miles south of Mt. Vernon, Oregon, in the Aldrich Mountain Range, on the boundary of the Malheur National Forest overlooking the John Day River valley (T. 14 S , R. 28 E., T 14 S , R. 29 E., T. 14 S , R. 30 E., T. 15 S , R. 30 E , of the Willamette Meridian).

Forest road Nos 21 and 1458 provide access to the northwest corner, while a trail from Forest road No. 2160212 accesses Fields Peak. Access from the south is by Forest roads Nos 2190, 2100011, and 4900845 The Ingle Creek and Dead Horse Mountain trails are accessed from Forest road No. 49. Off-Forest roads from U.S. 26 up Moon, Riley, McClellan, and Harper Creeks provide access to the northern boundary.

c. Geography and Topography

The extremely varied terrain is primarily steep and broken slopes highly dissected with streamcourses, including Hattie, Hells Canyon, Miner, Tex, Ingle, Moon (and tributaries), McClellan, Buck Gulch, Riley, and Harper Creeks. Dominant high points are McClellan, Moon, Riley, Dead Horse, Cinnabar, Ingle, and Coal Pit Mountains as well as Fields and Second Peaks, and two other unnamed peaks approaching or exceeding 7,000 feet Relief is approximately 4,160 feet, from 7,363 feet at Fields Peak to about 3,200 feet on Fields Creek. See Figure C-13.

d Geology and Soils

General geologic formations are Fields Creek Formation, a conglomerate of mudstone, shale, graywacke, and tuff; and the Laycock Graywacke, a massive graywacke and tuff formation

Soil types are predominantly gravelly loam and silty loam textured soils, both forested and nonforested Most of the types are loamy and clayey or volcanic ash nonforested soils, interspersed with large areas of forested volcanic surface soils. Soil depth is variable but is generally 8 to 18 inches. Triassic-age sedimentary rocks cover most of the area with some foliated sedimentary and volcanic rocks of Paleozoic age on the east, Cretaceous-age intrusives in the central portion, and Triassic-age oceanic crustal rocks in the northwest portion of the area

e. Vegetation

This area is 47 percent forested. Of these acres, 1,500 meet the Pacific Northwest Region's definition of old growth. Vegetation on the forested west- and south-facing slopes is primarily ponderosa pine with mixed conifer understories (Douglas-fir and white fir) The ground cover includes elk sedge, pinegrass, and wheatgrass. Forested areas north of McClellan Mountain are primarily white fir, Douglas-fir, western larch, and lodgepole pine, with a ground cover of huckleberry, pinegrass, and bromegrass The highest elevations are occupied by subalpine fir and/or alpine sage and other subalpine shrubs and grasses. The drier or nonforested sites on all aspects are vegetated with juniper, sagebrushes, mountain-mahogany, and some scattered ponderosa pine Ground cover on these sites includes wheatgrass, fescue, and bluegrass

f Current Uses

Big-game hunting is the primary recreational use of the roadless area. (See Table C-2) There is also limited hiking, horseback riding, game bird hunting, and sightseeing The area provides excellent opportunities for backcountry ski-touring, cross-country skiing, and snowshoeing. The proposed Pacific Crest-to-Desert Trail would pass through the southern part of the area.

Wildlife in the area is varied, the most visible being mule deer and elk. There have been mountain lion, black bear, and bighorn sheep (possibly from the Aldrich Mountain herd) reported within the roadless area Bird species are numerous and include songbirds, raptors, game birds such as the blue grouse and mountain quail, and possibly the pileated woodpecker, a resident of old-growth forests. Mammals range from big game to voles, marmots, and chipmunks A "seed" herd of bighorn sheep is planned for introduction on McClellan Mountain. Pine marten may be present in the old-growth forests on north-facing slopes Elk winter range exists on lower slopes of the northern portions of the area Two and one half miles of Riley Creek provide limited trout fishing. Tex, Riley, and McClellan Creeks provide steelhead spawning and rearing habitat.

There are four grazing allotments providing an average of 1,400 Animal Unit Months annually. Livestock use is limited because of the terrain.

Attractions include the opportunity to be in some very wild and rugged country with no intrusions from others The area offers solitude, peace, and quiet. There are many unusual geologic formations, as well as numerous high-vantage points. The area will continue to be used by big-game hunters.

2. Wilderness Capability

a. Manageability and Boundaries

The present boundary does not follow natural physical characteristics in many places and often is located midslope, which prevents easy location on the ground. Boundary changes would improve manageability and separate many of the impacts of human activity They would also reduce the size of the area

b. Natural Integrity

Natural integrity is very high There are some Primitive jeep trails along the southern boundary of the area. These could easily be separated from the area by a slight boundary adjustment.

c. Naturalness

The effects of grazing have had the most impact on the area's naturalness Stock ponds are scattered throughout the southern third of the area. Fencing, mostly in the southern portion of the area, could easily be removed. The impact of the fence is low The presence of cattle and evidence of their use, such as salt grounds, dust beds, etc , remain the most visible impact

There is some scattered evidence of recreational use, such as primitive game racks and hunter camp areas. These are low impacts and could easily be corrected. There are several foot trails throughout the area which are not maintained and appear similar to game paths One trail, Fields Peak, is maintained and is recommended for trailbike riders. This trail could also be separated from the area or managed for nonmotorized use

The effects of fire suppression are not noticeable to the average visitor. Under natural conditions, low intensity fire would have selectively maintained ponderosa pine in the understories rather than allowing the conversion to fir species.

d Opportunity for Solitude

Opportunities for solitude are excellent. The deep canyons, vegetation, and rough, broken terrain provide excellent screening from distractions. The area is large enough to reduce the chance of human interaction

e. Primitive Recreation and Challenge

The opportunities for Primitive hiking, hunting, backpacking, and similar activities is good, and the steep, rugged terrain is physically demanding although not particularly challenging

There is great scenic variety, ranging from forested benches to deep canyons with open slopes and forested bottom lands. The current visual resource variety class is A, distinctive

Located within the unit are 13 possible cultural resource sites (11 prehistoric and 2 historic) There are no other identified sites This indicates travel through, and use by, American Indians and Europeans. There is at least one old mining and cabin site in the area.

f Special Features

There are no Threatened or Endangered Species present within this area. One Sensitive plant species is found here An area in the northeastern portion of McClellan Mountain has been identified as a high priority candidate for proposal as a Research Natural Area

3. Availability for Wilderness

a Resource Potentials

The area currently provides roaded natural, semiprimitive motorized, and nonmotorized recreation opportunities. (See Table C-3.) This area could provide 29,170 Recreation Visitor Days per year. (See Table C-4.)

There are 4,108 acres of forested land tentatively suitable for timber management activities. These timber stands are multistoried and consist primarily of mixed conifer Average overstory age is 160 years, average age of the understory is 75 years *There is a standing volume of 30 4 million board feet (5 3 million cubic* feet) With the use of intensive timber management techniques, 197 thousand cubic feet (1,127 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 234 thousand cubic feet per year

The area has no known locatable mineral potential, although an old mercury *prospect covered by one mining claim is located on Cinnabar Mountain at the* northeast corner of the area The U S. Geological Survey does not consider the area to have potential for oil, gas, or geothermal resources.

The potential for increased livestock use is low Terrain is one limiting factor.

b Management Considerations

The Aldrich Mountain Range, historically, is one of the hardest hit by lightning on the Bear Valley Ranger District The hazard is high to very high The south and west slopes are dry with flash fuels, while the north faces have dense concentrations of heavy fuels Lack of access requires that most fires in the unit be attacked by helicopter or smokejumper crews.

Insect damage from the western spruce budworm is widespread on the northern face of the Aldrich Mountain Range. At this time, mortality is considered insignificant and the trees appear to be recovering. Species involved are Douglas-fir and white fir. The white fir component has a high cull factor in the greater than 12-inch diameter classes from root rots.

There are no present or planned impacts on the water resource in terms of impoundments, power withdrawals, etc , nor are there any measuring sites

There are no lands of other ownership within the roadless area. Private, Bureau of Land Management (BLM), and Oregon Department of Fish and Wildlife (ODF&W) managed lands adjoin the roadless area boundary on the north.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 8 miles east, Monument Rock Wilderness is 32 miles east, North Fork John Day Wilderness is 38 miles northeast, and Black Canyon Wilderness is 16 miles west The ecosystems present in this area are also represented in these wildernesses.

The nearest major metropolitan centers are Portland, Oregon (260 miles northwest) and Boise, Idaho (200 miles east).

In the 1979 RARE II study, there were 154 comments favoring wilderness and 2,585 comments favoring nonwilderness management. In recent Forest planning activities, this area received a moderate level of comments at a ratio of 1.3 opposing wilderness designation for every 1 favoring it--almost equally balanced.

The primary reasons favoring wilderness for this area included the opportunity for solitary, Primitive recreation and the natural character of the area. Fish, wildlife, and water quality were also strong concerns.

The primary reasons opposing wilderness were the potential mineral resource values, some evidence of mining activity and off-road vehicle use, and a stated preference for scenic-Primitive or roadless designation.

There was support particularly for special management of the higher elevation areas.

5. Environmental Consequences

Table C-17 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

In Alternative B-Modified merchantable timber volume is expected to be harvested over time. The tree sizes, stand density and composition would change to a managed forest appearance as the overstory is removed and remaining trees are thinned. Designated old growth would be retained in all alternatives and would continue to progress through the natural successional cycle.

In Alternatives A, C-Modified, F, I, and NC, little change in trees/vegetation is expected; present characteristics would be retained and naturalness overall would be unchanged, except the effects of naturally occurring wildfires.

b Vegetation/Grass and Shrubs

In Alternative B-Modified forage for wildlife and livestock is expected to increase on forested areas where the overstory is removed and the understory is thinned The long-term effects on this transitory forage is a gradual decrease in forage as tree canopies again close and shade the understory Seeding of introduced grass species will provide higher quality forage and change the forage species composition The native forage species of elk sedge, pinegrass, brome, and wheatgrass are also expected to increase in vigor and density naturally as the timber stands are opened by harvest activities

In Alternatives A, C-Modified, F, I, and NC, forage production is expected to remain at present levels and may decrease as Douglas-fir and white fir further encroach under the ponderosa pine on south slopes.

c Wilderness

Alternatives A, C-Modified, I, and NC, would preclude motorized vehicle use and timber harvest activities, including construction of timber access roads on the area managed as semiprimitive Future wilderness consideration would remain a possibility The area would continue to appear very natural to users

In Alternative B-Modified users would see motorized vehicles, timber harvest activities, and new timber access roads The area would eventually appear managed with human activities evident in the forested areas Future wilderness consideration would be foregone by the end of the first decade

In Alternative F use of motorized vehicles would be allowed (although on only a portion of the area), otherwise it is similar to Alternatives A, C-Modified, I, and NC

d Recreation

In Alternative B-Modified the recreational opportunity would be roaded modified with expectations of increased vehicle use Big-game hunting is the primary recreation activity and hunter success is expected to increase due to reduced hiding cover in timber harvest areas and easier access The opportunity for a nonmotorized backcountry hunting experience would decrease as additional access roads are traveled by more hunters

Alternatives A, C-Modified, I, and NC offer a semiprimitive nonmotorized recreation opportunity, which would provide a more natural setting to users.

Alternative F offers both semiprimitive nonmotorized and motorized recreational opportunities. Visitors would use and/or encounter snowmobiles, motorcycles, and vehicles in areas accessible to them Road access should remain Primitive as it now exists, new road construction is not expected and access would be limited by weather to specialized vehicles, especially during periods other than summer Eventually, more trails may be constructed to accommodate users, and the natural environment of the area protected for the proposed Pacific Crest-to-Desert Trail

e. Scenery

The scenic variety in the area, ranging from forested benches to deep canyons with open slopes and forested bottom lands, would be maintained under all alternatives Viewers should expect to see evidence of activities such as clearcuts and access roads in the forested areas in Alternative B-Modified The naturalness of the area would be affected more by the above alternative than by Alternatives A, C-Modified, F, I, and NC Over the long term, users would see managed forest served by a network of access roads for the removal of timber.

In Alternatives A, C-Modified, F, I, and NC, the present scenery would be maintained and no significant changes are foreseen, barring a major outbreak of insects, diseases, or wildfire, except for about 2,000 acres which would be developed under these alternatives.

f Wildlife

Old-growth timber and snags would be available to nongame wildlife to a greater extent in Alternatives A, C-Modified, F, I, and NC. Management standards would adequately protect key habitats of all wildlife under all alternatives. Moreover, old growth is designated in all alternatives to meet requirements for pileated woodpecker and pine marten habitat Thirty percent of the area is in elk winter range. This range would be affected by removal of some hiding and thermal cover by harvest activities; forage would increase in Alternative B-Modified. Timber harvest activities on the north slopes would improve the cover/forage ratio by reducing the amount of trees and improving forage on deer and elk summer range. Wildlife snag levels would be least affected by Alternatives A, C-Modified, F, I, and NC and would be most affected under Alternative B-Modified.

g Water, Riparian, Fisheries

There are no significant differences between alternatives on effects to streams. Management standards will adequately protect the streamside areas under all alternatives. Increased accessibility and use indirectly associated with timber harvest and access roads is expected in Alternative B-Modified.

h. Cultural Resources

All alternatives are similar in effects on cultural resources. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards related to cultural resources.

i. Soils

All alternatives are similar in effects on soils. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards.

TABLE C-17

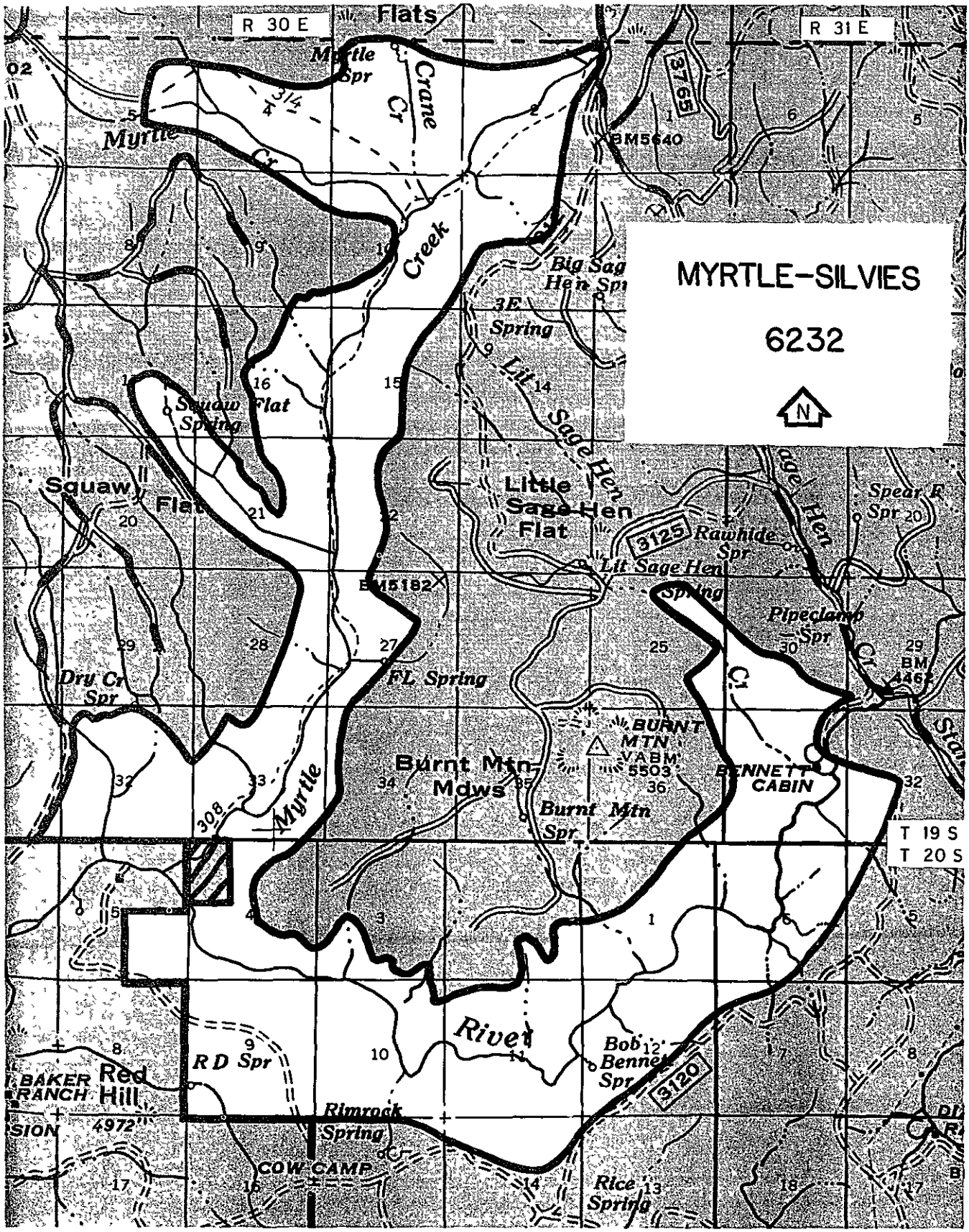
McCLELLAN MOUNTAIN MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1 General Forest	N/A	543	2,702		509	509
2. Rangeland		789	7,511		752	752
3. Riparian Areas		85	397		74	74
4A Big-Game Winter Range			561			
4B. Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mt. Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. Scenic Area						
8. Special Interest Area						
9. Research Natural Area			940			
10. Semi-Primitive Non-Motorized	N/A	18,629		20,646	10,676	18,717
11. Semi-Primitive Motorized					8,041	
12. Developed Recreation						
13. Old Growth	N/A	320	1,400		320	320
14. Visual Corridors			4,750			
15. Unit Plan Wildlife Emphasis Areas						
16. Minimum Level Management		280	2,385		274	274
17 Byram Gulch Municipal Supply Watershed						
18 Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21 Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	20,646	20,646	20,646	20,646	20,646

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available

FIGURE C-14


MYRTLE-SILVIES
6232
N
R 30 E
R 31 E
T 19 S
T 20 S
Flats
Myrtle Spr
Crane Cr
Myrtle Cr
Creek
BM5640
3765
Big Sage Hen Spr
3E Spring
Lit Sage Hen
Squaw Flat Spring
Squaw Flat
Little Sage Hen Flat
3125
Rawhide Spr
Lit Sage Hen Spring
Spear R Spr
Pipeclamp Spr
BM5182
FL Spring
Dry Cr Spr
Burnt Mtn Mdws
BURNT MTN VABM 5503
BENNETT CABIN
Burnt Mtn Spr
Myrtle
308
Rivet
Bob Bennett Spr
3120
RD Spr
Red Hill
4972
BAKER RANCH
Rimrock Spring
COW CAMP
Rice Spring

O. MYRTLE-SILVIES - 11,747 Acres (RARE II No. 6232)

1. Description

a. History

This area was inventoried in the RARE process Under the Silvies-Malheur Planning Unit Environmental Impact Statement and RARE II Environmental Impact Statement, the area has been managed for nonwilderness uses.

b Location and Access

The area is located near the southern boundary of the Malheur National Forest in northern Harney County, Oregon (T. 19 S , R 30 E , T 20 S., R. 30 E., of the Willamette Meridian) Access consists of unimproved roads to the canyon rims, trails along Myrtle and West Myrtle Creeks in the canyon bottoms, and the "Silvies River Jeep Trail," a four-wheel drive, two-track road which extends approximately 3 miles.

c. Geography and Topography

The area consists of canyons of the Silvies River and Myrtle Creek drainages. The canyons are fairly wide and very steep with prominent rock outcroppings. The area is a deeply (600 feet plus) incised plateau with a narrow valley (50-200 feet) in the bottom. The canyons average 1 mile from rim-to-rim, with benchlike sideslopes in some areas; long, smooth slopes in others See Figure C-14.

d. Geology and Soils

The plateau of table lands at the top of the canyons is formed from a resistant cap of welded tuff about 30-50 feet thick Below this is a slope-forming, water-laid ash deposit about 40-60 feet deep. Below this is a ledge-forming layer of basalt Below this basalt is another layer of welded tuff and another ash deposit These latter layers are permeable materials and where they meet impervious basalt, ground water seeps to the surface Below these, and for the remaining 400-500 feet, is a series of slope-forming tuffs. On the north- and east-facing slopes, particularly, boulders and blocks of the welded tuff persist from the top of the canyon sidewall to the bottom The basalt flow also frequently produces a talus slope of loose rock and soil Miocene-age volcanic-flow rocks outcrop in most of the canyon area, with Miocene- to Pliocene-age tuffaceous sediments in the canyon toward the south. Pliocene-age welded tuff is exposed in higher elevations, and some Pliocene-age tuffaceous sediments are found in the extreme southern portion of the area

e Vegetation

This area is 79 percent forested. According to the Pacific Northwest Region's definition of old growth, about 200 of these acres are old-growth forest. Sideslopes on the west side of Myrtle Canyon have pine and fir with a grass, forb, and shrub understory. The east side of Myrtle Canyon is ponderosa pine and Douglas-fir with grass and sedge Also found on the east side are numerous areas of juniper, sagebrush, and bunchgrass The north slopes along the Silvies Canyon support ponderosa pine and Douglas-fir with fir understories intermingled with mountain-mahogany

f Current Uses

Big-game hunting, and fishing for trout and small-mouth bass are currently the primary recreational uses of the area Other uses include Silvies River rafting or canoeing during the spring high-water periods, picnicking, camping, hiking, recreational gold panning, photography, and nature study. All recreational use in the area is light Access is limited to trails that follow the streamcourses; these are generally at a gentle grade and suitable for an average hiker.

Approximately 1,900 Recreation Visitor Days occur annually, with approximately 75 percent of these being in a semiprimitive setting and 25 percent being in a roaded natural setting.

This area provides year-round Rocky Mountain elk habitat with winter range encompassing the entire area Mule deer are in the area during spring, summer, and fall. The canyon rims provide habitat for black bear, bobcat, Canadian geese, prairie falcon, and turkey vulture. The area provides for a wide spectrum of wildlife viewing, as the canyons support riparian, cliff, and montane habitat (including old growth) in close proximity. Most bird and mammal species associated with the southern Blue Mountains can be found in the area

The area lies within 4 grazing allotments Current use averages about 500 Animal Unit Months annually by cattle.

The canyon bottom provides a pleasant, remote area with free-flowing streams and views of an undisturbed ecological system The canyon walls range from rock walls to smooth sideslopes Some talus slopes are visible from the creek bottom. Myrtle Creek has large old-growth forest stands while the Silvies River canyon has more open slopes and stringers of trees.

The predominant high points adjacent to the area are Burnt Mountain Lookout (abandoned) and West Myrtle Butte Lookout (currently in service during fire season) The southern boundary of the area is adjacent to private land.

The major attraction of this area, in addition to hunting and fishing opportunities, is simply a place to "get away from it all" and enjoy "peace and quiet without motorized intrusions "

2. Wilderness Capability

a Manageability and Boundaries

There is general agreement that the boundaries of the area should be adjusted. The boundaries of the original inventoried review area are difficult to locate on-the-ground and would be extremely difficult to manage. There is not consensus on where adjusted boundaries should be located. Moving the boundary to the canyon rims would improve locatability and manageability of the area by following topographic characteristics, but would also reduce the size of the area by about 2,080 acres

b. Natural Integrity

Within the river canyons themselves, natural integrity of the area is extremely high. Natural processes have been virtually unhampered by human activities with the exception of trail maintenance, livestock grazing, fire management, one unimproved road, and camping and associated activities.

Fire suppression in the area has caused a gradual change in the understory vegetation from ponderosa pine to white fir and other tree species. Under natural conditions, low intensity wildfires would have selectively maintained ponderosa pine in the understories.

The effects of grazing in the area are mostly concentrated along streams. They include fences, salt grounds, cattle trails, some compaction and vegetative trampling, dust beds, the cattle themselves, and other evidence of their presence along the streams

There is one unimproved jeep track for several miles along the Silvies River This is utilized for only one mile until after spring runoff, at which time it is possible to travel an additional two miles of the track with off-road vehicles

c Naturalness

Overall, the area appears extremely natural to the average user. The effects of fire suppression would not normally be noticed by most users The impact of the unimproved road along the Silvies River is localized to that area Foot trails along streams are maintained to a fairly low standard

The impacts of livestock grazing remain the most intrusive activity. These appear unnatural to most visitors and would be extremely difficult to mitigate unless grazing were eliminated Livestock grazing occurs in the portion of the area most likely to receive a majority of visitor use

d Opportunity for Solitude

Within the canyons, opportunities for solitude are very high, especially along stream bottoms The depth of the canyons and the vegetative cover provide excellent screening Rim tops offer limited opportunity for solitude and viewing the canyons. The views give an impression of a vast, unspoiled canyon area, but intrusions from the adjacent table lands occur, especially during hunting season.

e Primitive Recreation *and Challenge*

Overall, Primitive recreation opportunities are limited by the narrowness and irregular shape of the area. Topographic and vegetative cover are significant *over much of the area, and trails tend to concentrate users in stream bottoms or* on canyon rims

Trails are the only recreation facility present and they are low standard. They are not difficult, however, as they follow the moderate stream grade.

The lack of facilities and access does tend to increase opportunities for solitude and unconfined recreation Challenge to physical ability would be classified as moderate to high, particularly for the areas with rock cliffs and very steep slopes

f. Special Features

There is scenic variety both vertically, from rimtops to canyon bottoms, and horizontally as the scene changes among microhabitats

Much of the timber in the canyons provides old growth No Threatened or Endangered Species are known to use the area, however, there is a potential for bald eagle winter roosts at the mouth of both Silvies and Myrtle Canyons No Sensitive species are known to occur in the area.

Myrtle and Silvies Canyons were occupied by Native Americans at various times. A cultural resource survey was conducted in Myrtle Canyon in 1980, isolated chips and flakes were found No historic sites were found There is a high probability of locating additional prehistoric sites in the Silvies River Canyon because of its proximity to Silvies Valley The canyon bottoms along Myrtle and West Myrtle Creeks also have as high potential for locating cultural resources

3. Availability *for Wilderness*

a Resource Potential

Currently the area provides roaded modified, roaded natural and semiprimitive motorized recreation opportunities. (See Table C-3.) This area has a potential of *21,852* Recreation Visitor Days per year. See Table C-4

There are 7,200 acres of forested land suitable for timber management activities. These trees are predominantly ponderosa pine and mixed conifer species growing in multistoried stands The average age of the overstory is 140, the average age of the understory is 60 There is a standing volume of 92.1 million board feet (16.10 million cubic feet) With the use of intensive timber management techniques, 346 thousand cubic feet (1,979 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 410 thousand cubic feet per year.

The area has no known potential for locatable minerals and contains no mining claims, although four claims are located close to the eastern boundary. The U S. Geological Survey does not consider it to be prospectively valuable for oil and gas. An industry respondent has identified the area as having moderate potential for oil. There are seven sections under oil and gas leases.

b Management Considerations

The western spruce budworm can be found throughout the entire area In those areas inhabited primarily with fir, infestation is quite severe Much of the Douglas-fir is infected with dwarf-mistletoe, especially that found on the drier slopes of Myrtle Canyon Myrtle Canyon also has numerous old-growth ponderosa pine trees that have been killed by western pine beetle.

There are no special-use permits or other special land use authorizations in the area There is one ditch or canal right-of-way that was retained for the "Bennett Cabin" property when it was deeded to the Forest Service. There are no planned power withdrawals, proposed impoundments, existing irrigation reservoirs, or distribution systems. There are no known non-Federal lands in the review area

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 30 miles northeast, Monument Rock Wilderness is 55 miles northeast, North Fork John Day Wilderness is 75 miles northeast, and Black Canyon Wilderness is 45 miles northwest The ecosystems of this area are represented in the Black Canyon Wilderness.

The nearest major metropolitan centers are Portland, Oregon (300 miles northwest), and Boise, Idaho (180 miles east).

There is no consensus about the best use of the Myrtle-Silvies area In the 1979 RARE II study, this area received 144 comments favoring wilderness designation, 2,590 comments favoring further planning, and 3,395 comments favoring nonwilderness management activities During recent Forest planning public involvement, this area was among those receiving a high level of response. That response echoed the lack of consensus with a ratio of 1 to 1.6, favoring wilderness.

The primary reasons favoring wilderness for this area were the solitude and opportunities for Primitive recreation. The naturalness of the area was a strong factor, as was protection of fish and wildlife habitat.

The primary reasons opposing wilderness for this area were the value of the timber resource, evidence of human activity, and difficulty of managing the boundaries of the area

There was strong support from all respondents for protecting the river canyons.

There was a comment that if the area is declared wilderness, the private land to the south will suffer from public use.

5. Environmental Consequences

Table C-18 displays the various management area assignments for this area by alternative

a. Vegetation/Trees

It is expected that the trees will be harvested in Alternatives A, B-Modified, and NC As this occurs, tree size, stand density, and composition will change to a managed forest appearance The actual amount of timber harvested would vary by alternative Old growth designated for wildlife will be retained on about 1,200 acres in Alternatives A and B-Modified Alternative NC would retain approximately 830 acres. Additional old growth may occur outside designated areas in other management areas

The effects of harvesting would be less in Alternatives F and I, especially from the water's edge up to the canyon breaks which would not be harvested Alternative C-Modified would affect trees the least of all alternatives No timber harvest would occur in this alternative

b. Vegetation/Grass and Shrubs

The greatest change in forage for livestock and wildlife is expected in Alternatives A, B-Modified, and NC, within forested areas When overstory trees are removed and the remaining trees thinned, significant increases are expected in forage production. In areas supporting fir trees, there will be large increases in forage production with a long-term gradual decrease as tree canopies again close and shade the understory Seeding of introduced grass species will provide higher quality and quantity of palatable plants and change the present grass species composition Native bunchgrasses and shrubs will increase naturally as tree canopies are opened and thinning occurs in harvest areas

There will be less change in grasses and shrubs in Alternatives F and I and even less change in Alternative C-Modified. The amount of change is directly proportional to the amount of acres harvested

c. Wilderness

Future wilderness consideration, based upon size of area, would be least affected by Alternative C-Modified, followed by Alternatives F and I. By the end of the first decade, future wilderness consideration would be foregone in Alternatives A, B-Modified, and NC. Motorized vehicle use would be permitted in Alternatives A, B-Modified, F, and NC

d. Recreation

The recreation opportunity varies in alternatives from semiprimitive nonmotorized in Alternatives C-Modified, F, and I, to roaded modified in Alternatives A, B-Modified, and NC.

In a semiprimitive nonmotorized setting, within the canyons users would experience natural surroundings without motorized intrusion Eventually more trails may be constructed to accommodate more users and existing trails improved to a higher standard The primary recreation opportunities of fishing and big-game hunting would remain unchanged

Within a roaded modified setting, there would be increased vehicle use and sounds on timber access roads constructed along the canyon rims or river benches Removal of old-growth ponderosa pine would cause the area to appear unnatural and provide for higher hunter success due to reduced hiding cover

e. Scenery

The scenic views of the canyon would be retained under Alternatives C-Modified, F, and I. Under Alternatives A, B-Modified, and NC, viewers would see evidence of a managed forest as the canyon slopes are harvested and timber access roads are constructed. Long-term effects on scenery would be less old growth to view, more access roads, and less naturalness.

In Alternatives C-Modified, F, and I, most of the present scenery would be maintained and no significant changes are foreseen barring a major outbreak of insects, diseases, or catastrophic fire, except for approximately 1,900 acres above the canyon rim which would be developed in these alternatives

In all other alternatives, the scenery viewed from the bottom of the canyon would remain unchanged.

f. Wildlife

Old-growth timber and snags would be available to nongame wildlife to a greater extent in Alternative C-Modified, lesser in Alternatives F and I, and least in Alternatives A, B-Modified, and NC Management standards would adequately protect key habitats for all wildlife under all alternatives. Old growth is designated in all alternatives to meet the needs of pileated woodpeckers and other wildlife. The area is completely within elk winter range Removal of some hiding and thermal cover by harvest activities increases forage on winter range

g. Water, Riparian, Fisheries

Myrtle Creek and Silvies River would be the most affected by Alternatives A, B-Modified, and NC through timber harvest activities, although management standards would adequately protect these resources under all alternatives. There would be increased accessibility and use as a result of timber harvest and road construction. All other alternatives are considered to be equal in effects as harvest activities would occur outside the canyon and away from streamside areas.

h. Cultural Resources

Those alternatives with the most development present the greatest risk for inadvertent damage to the resource Because of greater activity, they also present the greatest opportunity for discovery of cultural resources There is no discernible difference between alternatives when considering existing laws, regulations, and management standards which specifically protect them.

i. Soils

All alternatives are similar in effects on soils. There is no discernible difference between alternatives when considering existing regulations, laws, and management standards.

TABLE C-18

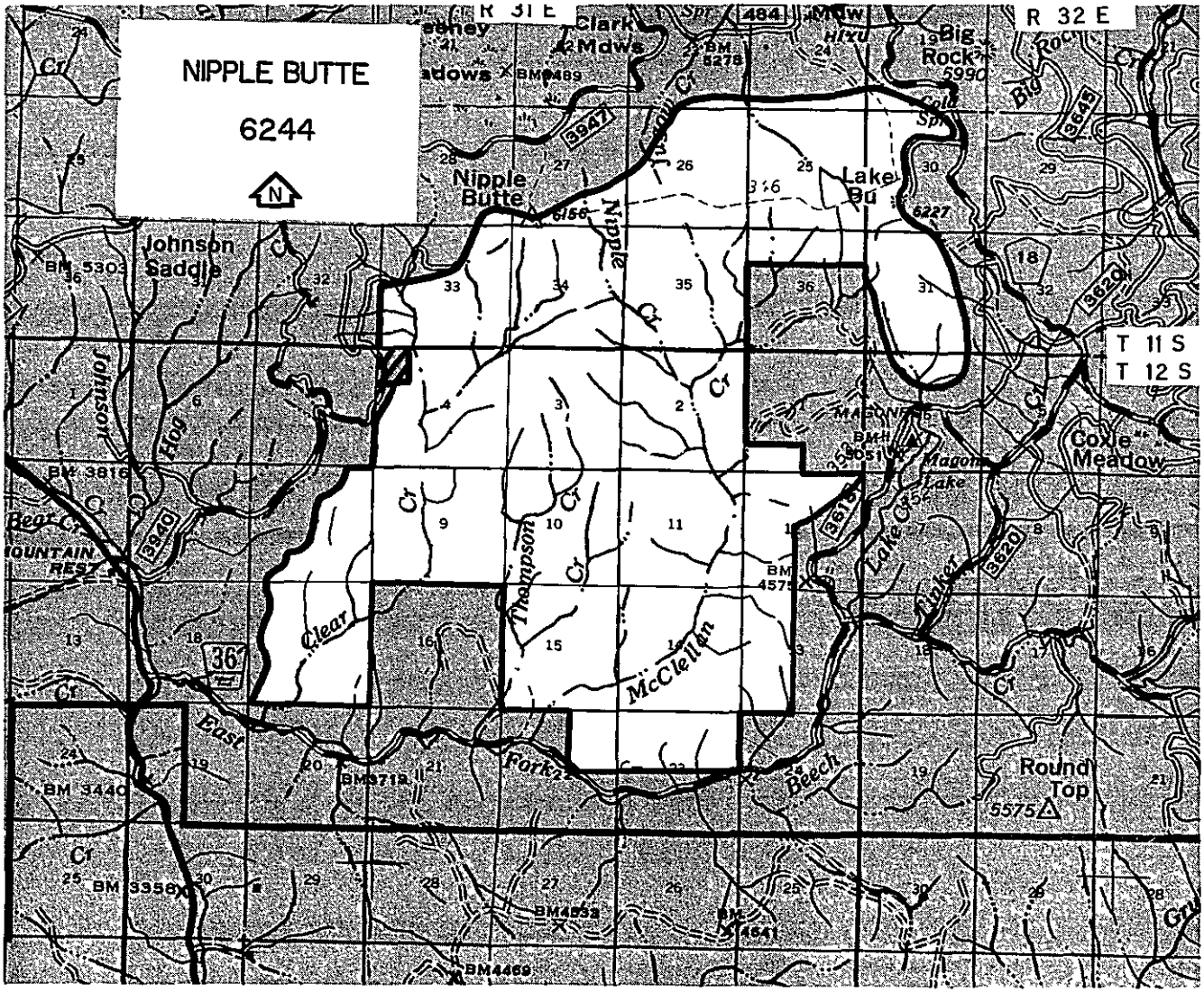
MYRTLE-SILVIES MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area	Alternatives					
	NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1. General Forest			6,115		873	873
2. Rangeland		2,587	2,808		194	194
3. Riparian Areas		489	493		93	93
4A Big game Winter Range					590	590
4B. Big game Winter Range Enhancement						
5. Bald Eagle Winter Roost	N/A	537	537			
6A Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7 Scenic Area						
8 Special Interest Area						
9 Research Natural Area						
10. Semi-Primitive Non-Motorized				11,747	9,855	9,855
11. Semi-Primitive Motorized						
12 Developed Recreation						
13 Old Growth	N/A	1,200	1,200			
14 *Visual Corridors*		131				
15 Unit Plan Wildlife Emphasis Areas	N/A	6,020				
16 Minimum Level Management		783	594		142	142
17 Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20 Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22 Wild and Scenic River						
TOTAL ACRES	N/A	11,747	11,747	11,747	11,747	11,747

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner As a result, these acreages are not available.

FIGURE C-15


NIPPLE BUTTE
6244
R 31 E
R 32 E
T 11 S
T 12 S
Nipple Butte
Johnson Saddle
Lake Bu
Big Rock
Coxie Meadow
Round Top
5575
Clear
Thompson
McClellan
East
Fork
Beech
Lake
Hog
Jolinson
Nipple
Cr
Ck
Mdws
Spr
Mtn
Lk
Trl
Rd
BM 3816
BM 3440
BM 3358
BM 4553
BM 4641
BM 4469
BM 4571
BM 5278
BM 5303
BM 5051
BM 9718
3547
3940
3618
3620
3645
3620
36

P. NIPPLE BUTTE - 11,525 Acres (RARE II No. 6244)

1. Description

a History

This area was inventoried in RARE and enlarged in the RARE II inventory The John Day Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement designated the area to nonwilderness uses.

b. Location and Access

The Nipple Butte Roadless Area is in the northern portion of the Forest, about seven miles north of John Day, Oregon. The area is accessed by Forest roads along or near the entire boundary

c. Geography and Topography

This rugged area is about 6 miles long and 4 miles wide Comprised primarily of steep, mountainous terrain, the rugged area is dissected by Clear Creek and McClellan Creek drainages. Elevation of the area varies from 6,000 feet near Lake Butte to 3,000 feet at the mouth of Clear Creek See Figure C-15

d. Geology and Soils

Soils in the area are moderately deep, silt loam to clay in texture. The erosion hazard is moderately high to high, the mantle stability hazard is high. Volcanic flow and sedimentary rocks of Eocene age cover much of the area. An associated volcanic plug forms Nipple Butte. Miocene-age basalt flows and water-laid tuffs are exposed in the southwestern portion An associated volcanic vent is located on lower Clear Creek.

e. Vegetation

This area is 83 percent forested Of these acres, about 2,000 meet the Pacific Northwest Region's definition of old growth. Vegetative cover is varied, with trees in the bottom and lower slopes while ridges and steeper sideslopes are grass covered Juniper, sagebrush, and mountain-mahogany occur on the south-facing, nonforested areas Ponderosa pine is the predominant tree species. It is intermingled with juniper and mountain-mahogany on some upland flats and sideslopes. Other areas support ponderosa pine, white fir, and Douglas-fir with pinegrass and elk sedge ground cover.

f Current Use

The principal recreation use of the area is big-game hunting Other uses include fishing, bird-watching, photography, hiking, and viewing scenery from Nipple Butte.

The area provides year-round habitat for mule deer, Rocky Mountain elk, bear, small mammals, and birdlife. Clear Creek and McClellan Creek contribute to the flow of East Fork Beech Creek These streams provide spawning and rearing habitat for steelhead and resident trout

The surrounding area consists of managed National Forest System lands The Magone Lake Recreational Area is adjacent to one point on the eastern boundary

The major attraction of this area is the opportunity for big-game hunting

2. Wilderness Capability

a Manageability and Boundaries

The boundary of this area could be adjusted to improve manageability; however, this would reduce the size of the area

b Natural Integrity	The natural appearance of the area has been impacted by grazing, recreation, and fire suppression Grazing effects include cross-fencing through the center of the area, stock-water troughs, salt and dusting grounds, vegetative trampling, and physical presence of cattle These impacts are few and well scattered Recreational use impacts include a few fire rings and undeveloped hunter camps with soil compaction and Primitive game racks There are also several unmaintained trails in the area. Fire suppression has altered the natural succession of the area Under natural conditions, low intensity fire would have selectively maintained ponderosa pine in the understory instead of allowing the encroachment of firs Most other impacts affect only the immediate vicinity The effects of fire suppression are not noticeable to average users
c Naturalness	The natural integrity of the area within the reduced boundary would be fairly high. The natural appearance of the area would be very high.
d. Opportunity for Solitude	Although the distance from the perimeter to the core of the area is less than three miles, opportunity for solitude is very good. Topographic screening is provided by highly broken country with rock outcrops and narrow draws with brush and trees.
e. Primitive Recreation and Challenge	There are no developed facilities within the area, but the opportunity for Primitive recreation is low There is little diversity in the area and no particularly challenging features.
f. Special Features	There are no Threatened, Endangered, or Sensitive plant or animal species within the area There are no other special or unique features
3. Availability for Wilderness	
a. Resource Potential	This area currently provides roaded modified, roaded natural and semiprimitive motorized recreation opportunities (see Table C-3) It is capable of providing 12,125 Recreation Visitor Days per year (see Table C-4) There are 8,200 acres of forested land tentatively suitable for timber management activities. These trees are predominantly mixed conifer species, with some lodgepole and ponderosa pine. Average age of the overstory is 135 years, that of the understory is 65 years. There is a standing volume of 99 64 million board feet (17 42 million cubic feet) With the use of intensive timber management techniques, 394 thousand cubic feet (2,254 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 467 thousand cubic feet per year The area has no known potential for locatable minerals and contains no mining claims The U.S Geological Survey considers the area to be prospectively valuable for geothermal resources but not for oil and gas There are 11 sections under oil and gas leases

This area contains portions of 2 grazing allotments and contributes an average of 750 Animal Unit Months of forage for cattle annually

b. Management Considerations

Indian paint fungus is present and can probably be found in all size classes of the true fir Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe. Mistletoe patches of varying degree can be found, from fairly light to quite severe Root rots can be found to varying degrees but at this point are not considered a problem

Due to high amounts of true fir and Douglas-fir, all the timber stands are highly susceptible to tussock moth and the western spruce budworm. Western spruce budworm presently infests the area with varying degrees of severity. Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor. Mountain pine beetle is currently attacking lodgepole pine.

There is one water transmission use and one telephone/telegraph line through the area.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 13 miles south, Monument Rock Wilderness is 40 miles southeast, and North Fork John Day Wilderness is 25 miles northeast. The ecosystems of this roadless area are represented within those wildernesses.

This area lies 20 road miles from John Day, Oregon The nearest major metropolitan centers are Portland, Oregon (260 miles northwest), and Boise, Idaho (200 miles east).

In the 1979 RARE II study, there were 2,707 comments favoring wilderness, 16 favoring further planning, and 3,415 favoring nonwilderness management. Recent Forest planning public involvement activities resulted in this area receiving a low level of response. Those responses were 3 to 1 opposed to wilderness designation.

The reasons favoring wilderness designation cited natural qualities, scenic and recreation values, and fish and wildlife habitat protection The reasons opposing wilderness designation cited poor opportunities for solitude and Primitive recreation, and evidence of human activity It was also stated that resources other than wilderness need to be enhanced through management. Geothermal potential was mentioned. There was some support for continued roadless status

5. Environmental Consequences

Table C-19 displays the various management area assignments for this area by alternative.

a. Vegetation/Trees

Significant changes in tree size, stand density, and composition will occur in all alternatives, except Alternative C-Modified, as trees are harvested and thinned The Forested acres will change to a managed forest appearance in Alternatives A, B-Modified, F, I, and NC. Less forested acres are affected in Alternative I, and fewer yet in Alternative C-Modified. Old growth designated for wildlife will be retained at 920 acres in all alternatives except Alternatives NC, C-Modified, and I, Alternative NC retains 802 acres, Alternative I contains 460 acres of designated old growth. Additional old growth will be retained under Alternative C-Modified in the semiprimitive area, and in the wildlife emphasis area of Alternative I.

For 5,795 acres under Alternative I, timber harvests would be on a non-scheduled basis and would be used only to meet fish and/or wildlife habitat objectives When timber harvesting is warranted silvicultural prescriptions will be designed to meet these objectives utilizing both even-aged and uneven-aged management techniques. The environmental changes, although similar to those in Alternatives A, B-Modified, F, and NC, as expressed in the above paragraph, would not occur as rapidly as in these other alternatives.

b Vegetation/Grass and Shrubs

The greatest change in forage for livestock and wildlife will occur within forested areas and will be most extensive in Alternatives A, B-Modified, F, I, and NC. In areas supporting fir trees, there will be a large increase in forage production with a long-term gradual decrease as tree canopies again close and shade the understory. Seeding of introduced grass species will provide higher quality and quantity of palatable plants and change the present species composition Native grasses, shrubs, and forbs will increase naturally as tree canopies are opened and thinning occurs in harvested areas

c Wilderness

Future wilderness consideration will be foregone by the end of the first decade in all alternatives except Alternative C-Modified, as timber harvest activities occur and access roads are constructed. Alternative C-Modified would allow for future wilderness consideration on 11,525 acres

d. Recreation

In all alternatives except Alternative C-Modified, the recreation experience would be roaded modified with expectations of increased vehicle use. The effect on big-game hunting, the primary recreation activity, is expected to be greater hunter success in the short term as hiding cover is reduced by harvest activities and easier road access is created The opportunity for a nonmotorized hunting experience will be decreased as new access roads are traveled by more hunters Alternatives C-Modified and I offer a semiprimitive motorized recreation opportunity which would provide a more natural setting to users. Under Alternative I, the recreation experience would be semiprimitive motorized on 5,795 acres with the remaining acres under roaded modified. Road access during periods other than summer months would be limited by weather. All alternatives would permit motorized vehicles,including snowmobiles and motorbikes

e Scenery

In all alternatives except Alternative C-Modified, viewers would see a managed forest, less old growth, more access roads, and less naturalness. Alternative C-Modified would remain natural-appearing over time.

f. Wildlife

Alternative C-Modified would have the largest acreage of old growth retained and the most wildlife snags Snag levels are expected to be at 100 percent in Alternative C, 20 percent in Alternative B-Modified, 60 percent in Alternative I, and 40 percent in Alternatives A, F, and NC The old growth designated in Alternatives A, B-Modified, F, and NC would meet management standards About one-half of the area is within elk winter range Hiding and thermal cover in the winter range would be equally affected by all alternatives except Alternative C-Modified. In Alternatives A, B-Modified, F, I, and NC, harvest activities would reduce hiding and thermal cover and increase forage.

g. Water, Riparian, Fisheries

Clear Creek and McClellan Creek are the watercourses most affected by all alternatives except Alternative C-Modified Management standards would adequately protect these resources under all alternatives; however, there would be increased accessibility and use as a result of timber harvest and road construction.

h Cultural Resources — Alternatives with the greatest amount of development present the greatest risk of inadvertent damage to the resource. Because of the greater activity, they also present the greatest opportunity for discovery of resources. There is no discernible difference between alternatives when considering existing laws, regulations, and management standards which specifically protect them.

i. Soils — Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities. All of the alternatives adequately protect the resource through application of management standards.

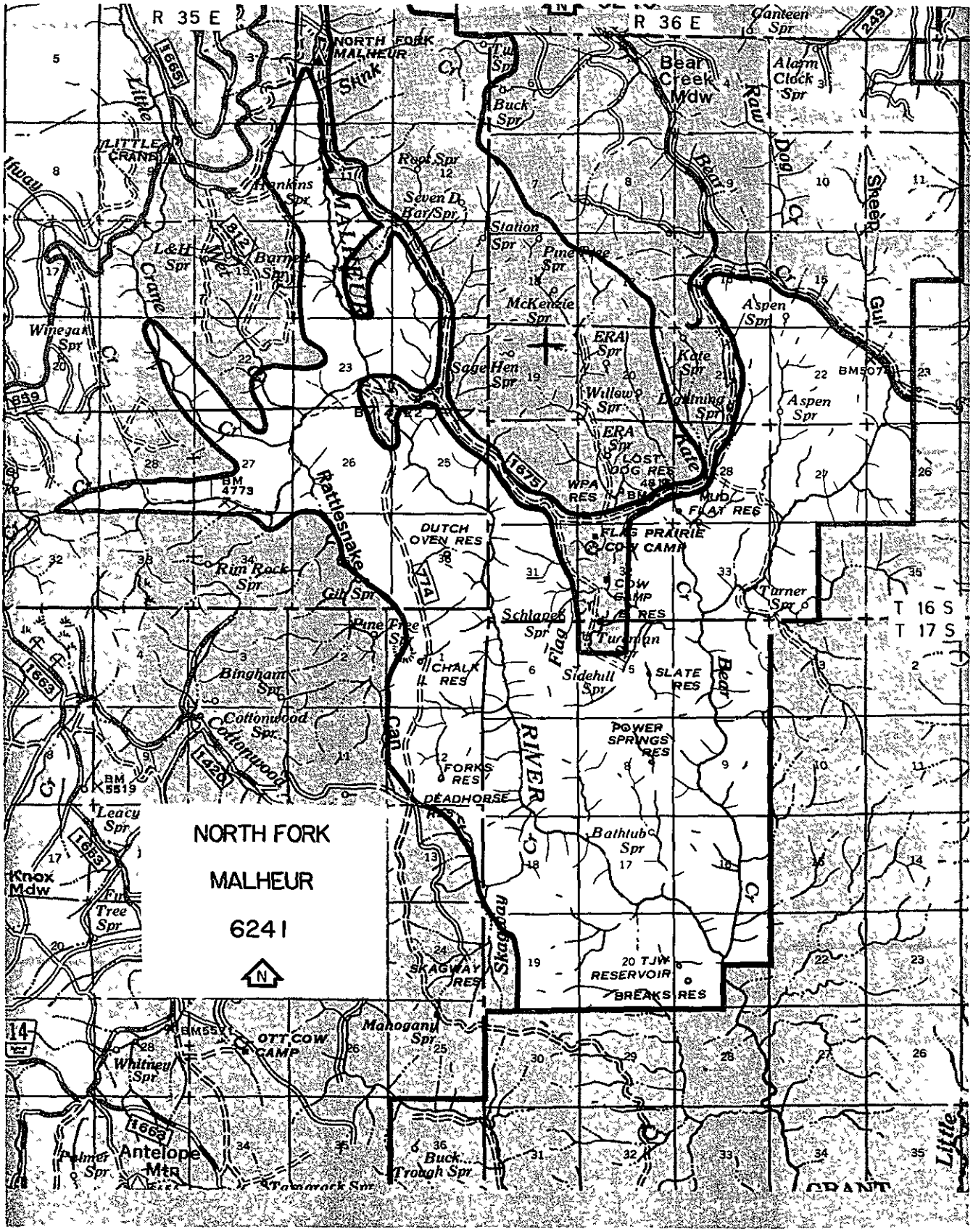
TABLE C-19
NIPPLE BUTTE MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area		NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1	General Forest	N/A	1,778	4,883		4,910	2,695
2.	Rangeland		1,484	755		704	567
3	Riparian Areas		751	738		687	260
4A	Big-Game Winter Range			3,004		3,019	825
4B	Big-Game Winter Range Enhancement						
5	Bald Eagle Winter Roost						
6A	Strawberry Mountain Wilderness						
6B.	Monument Rock Wilderness						
6C.	Pine Creek						
7.	Scenic Area						
8	Special Interest Area						
9.	Research Natural Area						
10	Semi-Primitive Non-motorized						
11	Semi-Primitive Motorized				11,525		
12	Developed Recreation						
13	Old Growth	N/A	920	920		920	460
14.	Visual Corridors		329	370		362	
15	Unit Plan Wildlife Emphasis Areas	N/A	5,333				
16	Minimum Level Management		930	855		923	923
17	Byram Gulch Municipal Supply Watershed						
18	Long Creek Municipal Supply Watershed						
19	Administrative Sites						
20	Wildlife Emphasis Areas with Scheduled Harvest						
21	Wildlife Emphasis Area Non-Scheduled Harvest						5,795
22	Wild and Scenic River						
TOTAL ACRES		N/A	11,525	11,525	11,525	11,525	11,525

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979 The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available

FIGURE C-16


NORTH FORK MALHEUR
6241
R 35 E
R 36 E
T 16 S
T 17 S
NORTH FORK MALHEUR
Little Malheur
Shink Cr
Bear Creek Mdw
Raw Dog Cr
Sheep Gulch
Canteen Spr
Alarm Clock Spr
Buck Spr
Rose Spr
Seven D Bar Spr
Station Spr
Pine Tree Spr
McKenzie Spr
ERA Spr
Aspen Spr
Kate Spr
Lightning Spr
Willow Spr
Sage Hen Spr
L&H Spr
Barrel Spr
Franklins Spr
Winegar Spr
Crane Cr
BM 4773
BM 5071
Rattlesnake Cr
Rim Rock Spr
Gilt Spr
Pine Tree Spr
Bingham Spr
Cottonwood Spr
Cottonwood Cr
BM 5519
Leacy Spr
Knox Mdw
Fir Tree Spr
Whitney Spr
Palmer Spr
Antelope Mtn
Tamarack Spr
Buck Trough Spr
Mahogany Spr
BM 5551
OTT COW CAMP
FLAG PRAIRIE COW CAMP
Flag Cr
Schlagel Spr
Turcman Spr
Sidehill Spr
Turner Spr
Bear Cr
Kane Spr
Lost Dog Res
WPA Res
Mud Flat Res
DUTCH OVEN RES
CHALK RES
FORKS RES
DEADHORSE RES
POWER SPRINGS RES
SLATE RES
BREAKS RES
20 TJW RESERVOIR
SKAGWAY RES
Skagway R
Bathtub Spr
Little Crane
Crane Cr
Gulch
Little
GRANT
1665
812
1675
959
1663
1662
1420
174
249

Q. NORTH FORK MALHEUR RIVER -
18,276 Acres (RARE II No. 6241)

1. Description

a. History

This area was inventoried in RARE and enlarged during the RARE II inventory Under the Silvies-Malheur Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement, the area has been managed for nonwilderness uses.

b. Location and Access

The area is located on the southern boundary of the Malheur National Forest in the southeast corner (T 16 S., R. 35 E , T. 16 S., R. 36 E , T. 17 S., R. 35 E , T. 17 S., R 36 E., of the Willamette Meridian). Access is by secondary Forest roads on the northern and western edges and trails on the east and south.

c. Geography and Topography

The area consists of steep, rugged river canyons and basalt rimrocks with plateaus above the rivers. The canyons are 500-800 feet deep. See Figure C-16.

d. Geology and Soils

Soils are gravelly, cobbly loams with much surface fragment material. Soils are excessively drained and moderately permeable Derivatives are weathered basalt and andesite The erosion hazard is high on the steep canyon slopes, but low on the flat, southeast portion of the area. Annual average precipitation of the area is about 14 inches with most of the water yield contributing to Beulah Reservoir, located 12 miles southeast. The entire area is covered with Miocene-age volcanic-flow rocks.

e. Vegetation

This area is 43 percent forested. Of these acres, about 1,200 meet the Pacific Northwest Region's definition of old growth Ponderosa pine is scattered throughout the canyon bottoms in stringers and patches. Intervening areas are sagebrush/juniper/mahogany complexes Grasslands are dominant on the top plateaus

f Current Uses

Hunting, fishing, backpacking, horseback riding, photography, picnicking, and nature study are all recreational uses of this area, with hunting and fishing predominant (See Table C-2.) The hiking aspect of the fishing use is an important part of that experience The proposed Pacific Crest-to-Desert Trail follows the North Fork Malheur River through the heart of this area.

The area provides year-long elk range, spring-summer-fall deer range, and summer range for antelope It also provides habitat for coyote, bear, small animals, and birds. Inland native trout and bull trout are abundant in the river and tributaries.

The major attractions of the area are North Fork Malheur River and the rugged canyon lands along the river

The canyons are very crooked and long views of the river are rare. Each bend in the river brings another scene into view which, while similar to preceding views, shows new microenvironments and diverse canyon scenes

2. Wilderness Capability

a. Manageability and Boundaries

Boundaries are not readily manageable against motor vehicle entry There is an opportunity to move the boundaries to the rims of the river canyons. This would eliminate much of the human impact and greatly reduce intrusion of outside influences. It would also reduce the size of the area by 12,865 acres.

b. Natural Integrity

Human impacts are readily visible in the form of fences, stockwater developments, campsites, livestock concentration areas, unimproved roads, and sagebrush control.

All ecosystems are intact. However, fire suppression has encouraged encroachment of sage and juniper in the grasslands Under natural conditions, low intensity wildfires would have selectively maintained the grasslands

c. Naturalness

The canyon area appears very natural to users. The effects of fire exclusion are too subtle to be noticed by most users.

d. Opportunity for Solitude

The canyons provide very effective topographic screening and provide a high degree of solitude, but the plateaus have low opportunity for solitude

e Primitive Recreation and Challenge

Primitive recreation opportunities include backpacking and cross-country travel. The area is large enough to provide a Primitive experience Climbing out of the canyons during cross-country travel would provide a challenging experience.

f Special Features

No Threatened or Endangered plant or animal species are known to exist in this area There is one Sensitive plant species located in this area.

The southern portion of this area was previously included in the Paiute Indian Reservation. The river through the area provided a migration route between summer and winter encampments; however, there are no known cultural sites within the area.

3. Availability for Wilderness

a. Resource Potentials

This area currently provides roaded modified, roaded natural, semiprimitive motorized, and semiprimitive nonmotorized recreation opportunities (See Table C-3.)

There are 6,800 acres of forested land tentatively suitable for timber management activities. These trees are growing in multistoried stands of predominantly ponderosa pine. The overstories average 140 years old and the understories average 75 years old There is a standing inventory of 65.89 million board feet (11.52 million cubic feet). With the use of intensive timber management techniques, 326 thousand cubic feet (1,865 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The. long-term sustained yield capacity from this area would be 388 thousand cubic feet per year.

There is no known locatable mineral potential and no mining claims. The U.S Geological Survey considers the southern half of the area to have potential for oil and gas but no potential for geothermal resources. There are 12 sections

covered by oil and gas leases and 19 sections of acquired land on which the mineral rights are reserved until 1988
The area is included in 3 grazing allotments and provides approximately 650 Animal Unit Months per year

b Management Considerations

The western Spruce budworm is probably present in the Douglas-fir and white fir Extent of infestation is not known. The Douglas-fir is infected with dwarf-mistletoe to varying degrees, and western pine beetle can be found in old-growth ponderosa pine.

There are no non-Federal lands within this area Bureau of Land Management, State of Oregon, and private lands are adjacent to the Forest boundary on the southern end of this area There are two administrative withdrawals and two rights-of-way

4. Wilderness Evaluation

The existing Strawberry Mountain Wilderness is 15 miles northwest, Monument Rock Wilderness is 9 miles northeast, Black Canyon Wilderness is 64 miles north, and North Fork John Day Wilderness is 62 miles northwest This area provides a unique canyon experience at lower elevations

Bend or Ontario, Oregon are the nearest minor population centers (110-150 miles); Portland, Oregon or Boise, Idaho, are the nearest major population centers (300-180 miles)

In the 1979 RARE II study, there was 149 comments favoring wilderness, 2,584 favoring further study status, and 3,407 opposed to wilderness designation

In the most recent public involvement activity for Forest planning, this area was among those receiving a moderate level of comments. These comments showed a decided lack of consensus with a ratio of 1.6 comments opposed to wilderness for every comment in favor In both categories of response, however, there was strong support for protection of the river and canyons and an emphasis on the importance of fish and wildlife habitat within the area

There have been suggestions to include this area with the Flag Creek Roadless Area and the Monument Rock Wilderness to the northeast as a wilderness "complex "

5. Environmental Consequence

Table C-20 displays the various management area assignments for this area by alternative

In all alternatives 3,577 acres are managed to be within the Wild and Scenic River management area, in accordance with The Omnibus Oregon Wild and Scenic Rivers Act of 1988 which declared the North Fork of the Malheur River to be a part of the Wild and Scenic River System

The following discussion pertains to those acres outside the river corridor

a Vegetation/Trees

Significant changes in tree sizes, stand density, and composition will occur in all alternatives except Alternative C-Modified, as trees are harvested and thinned. Timber harvest is scheduled for suitable forested land on the plateau in all alternatives except Alternative C-Modified Where timber harvests and stocking levels occur, tree vigor will increase reducing the risk of loss to insects and diseases. Acres affected by timber harvest vary between alternatives.

b. Vegetation/Grass and Shrubs

In all alternatives except Alternative C-Modified, the greatest change in forage for livestock and wildlife will occur within forested areas. Seeding of introduced grass species will provide higher quality and quantity of palatable plants and change the present plant composition. Native grasses and forbs will increase naturally as tree canopies are opened and thinning occurs in the understory

In Alternative C-Modified, no change is expected in the amounts and kinds of grasses, forbs, and shrubs existing now

c. Wilderness

In Alternatives A, F, I, and NC, future wilderness consideration would remain a possibility until the end of the first decade on 4,906 to 7,616 acres, compared to 18,276 acres in Alternative C-Modified. Wilderness consideration would be foregone in Alternative B-Modified

d. Recreation

The recreational opportunity would vary from roaded modified in Alternative B-Modified, to semiprimitive nonmotorized in all other alternatives Recreation experiences would involve increased vehicle use in Alternative B-Modified.

In a semiprimitive nonmotorized setting, users would experience a natural setting without motorized intrusion within the canyon walls. More trails would be constructed and consideration given to the proposed Pacific Crest-to-Desert Trail. The primary recreation uses of fishing, horseback riding, hiking, and hunting would remain unchanged

Within semiprimitive motorized and roaded modified settings, users would see and hear off-road vehicles within the canyon. The trail along the river would provide a challenge to off-road cyclists seeking such experience in a vast canyon area

In a roaded modified recreation opportunity, increased vehicle use and sounds on access roads constructed along the canyon rims or river benches would also occur.

e. Scenery

The scenic views of a vast, unspoiled canyon, as seen from the river bottom, would be retained in all alternatives except Alternative B-Modified Above the canyon rim, the scenic variety of open slopes to forested benches would be least affected by Alternative C-Modified, greater by Alternative A, and affected to an even greater degree by the other alternatives. The greatest affect on scenery would be in Alternative B-Modified, which would change the forest appearance within the canyon as well as the benches above the river Alternatives A, F, I, and NC would change the forest appearance above the canyon rims and would leave the area as seen from the bottom of the river unchanged.

f. Wildlife

Effects on old growth and snags would increase proportionately to the acres of timber harvested within each alternative. Alternative C-Modified, with no acres harvested, would have the least effect on these resources. Management standards would adequately protect key habitats of all wildlife under all alternatives. Old growth would be retained on a minimum of 300 acres in most alternatives to meet minimum requirements Elk winter range covers about 90 percent of the area. In alternatives allowing timber harvest (Alternatives A, B-Modified, F, I, and NC), hiding and thermal cover are decreased while forage is increased.

g	Water, Riparian, Fisheries	North Fork Malheur River, Bear Creek, and Crane Creek are the major streams which support trout and a riparian zone in addition to numerous small meadows. Management standards would adequately protect these resources in all alternatives Increased accessibility and use as a result of timber harvest and road construction would be greatest in those alternatives with the highest timber activity
h	Cultural Resources	The alternatives with the most development present the greatest risk of inadvertent damage to the resource Because of the greater activity, they also present the greatest opportunity for discovery of resources There is no discernible difference between alternatives when considering existing laws, regulations, and management standards which specifically protect cultural resources
i.	Soils	Alternatives A, B-Modified, F, I, and NC present the greatest risk of inadvertent damage to the soils as well as acceptable amounts of compaction as a result of harvest activities. All of the alternatives adequately protect the resource through application of management standards

TABLE C-20

NORTH FORK MALHEUR RIVER MANAGEMENT BY ALTERNATIVE

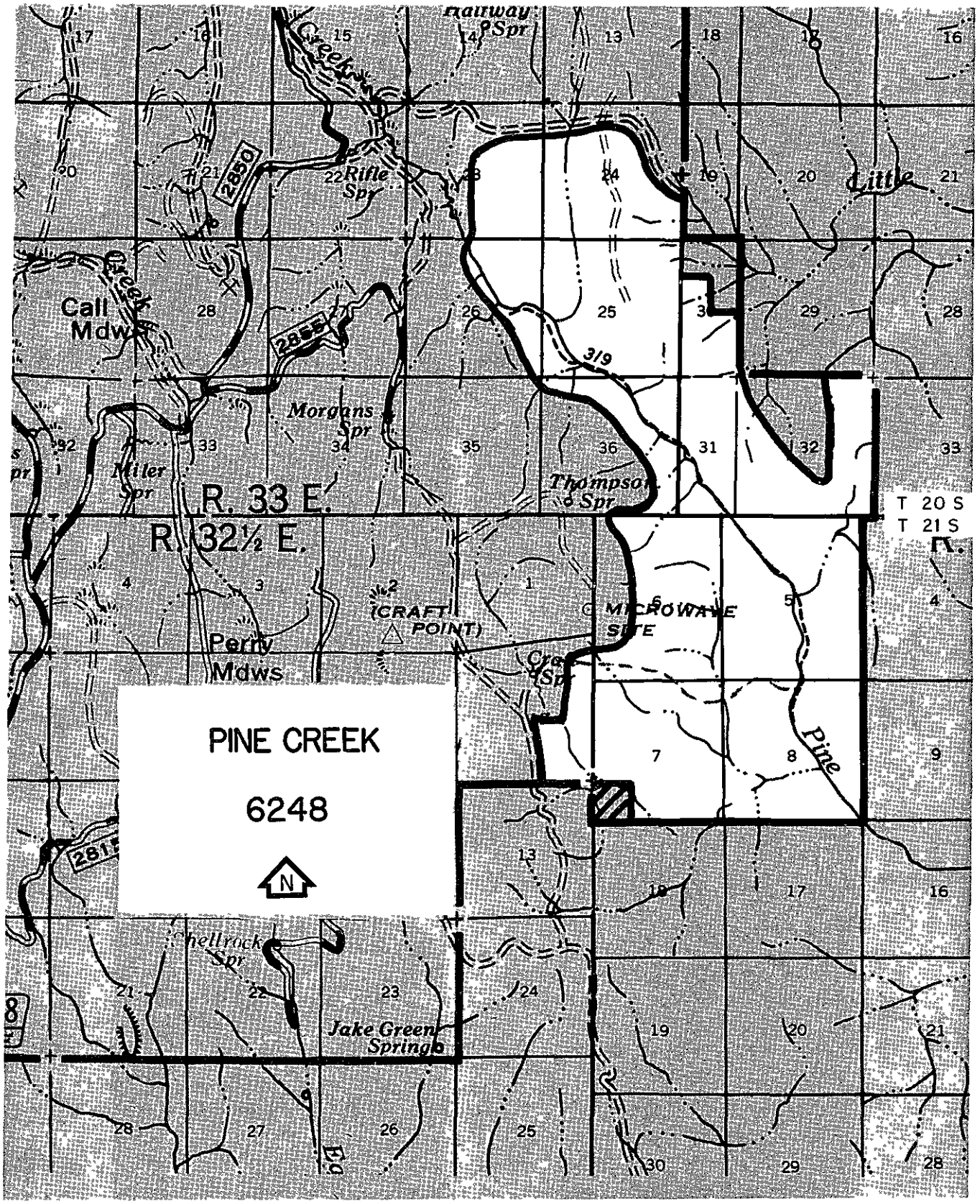
Acres)

Management Area		Alternatives					
		NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1	General Forest	N/A	2,956	4,140		2,281	2,281
2	Rangeland		5,035	7,690		217	217
3.	Riparian Areas		482	773		648	648
4A	Big-Game Winter Range					8,524	7,113
4B	Big-Game Winter Range Enhancement						
5.	Bald Eagle Winter Roost						
6A.	Strawberry Mountain Wilderness						
6B	Monument Rock Wilderness						
6C	Pine Creek						
7	Scenic Area						
8	Special Interest Area						
9.	Research Natural Area						
10	Semi-Primitive Non-Motorized	N/A	5,139		14,865		2,670[2/]
11.	Semi-Primitive Motorized					1,495	
12.	Developed Recreation						
13	Old Growth	N/A	300	600		300	600
14.	Visual Corridors			848		433	433
15.	Unit Plan Wildlife Emphasis Areas						
16.	Minimum Level Management		953	814		967	903
17	Byram Gulch Municipal Supply Watershed						
18.	Long Creek Municipal Supply Watershed						
19	Administrative Sites						
20	Wildlife Emphasis Areas with Scheduled Harvest						
21	Wildlife Emphasis Area Non-Scheduled Harvest						
22	Wild and Scenic River	N/A	3,411	3,411	3,411	3,411	3,411
TOTAL ACRES		N/A	18,276	18,276	18,276	18,276	18,276

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner As a result, these acreages are not available.

2/This area will be renamed Bear Creek Semi-Primitive Non-Motorized area.

FIGURE C-17


PINE CREEK
6248
N
R. 33 E.
R. 32½ E.
T 20 S
T 21 S
Call Mdws
Perry Mdws
Miler Spr
Morgans Spr
Rifle Spr
Thompson Spr
Railway Spr
Little
Pine
Jake Green Spring
Shellrock Spr
(CRAFT POINT)
MICROWAVE SITE
319
2850
2855

R. PINE CREEK - 5,420 Acres (RARE II No. 6248)

1. Description

a. History

This area was first inventoried late in the RARE II process. It was assigned to further planning in both an addendum to the Silvies-Malheur Planning Unit Environmental Impact Statement and in the RARE II Environmental Impact Statement because it did not have the advantage of full public review during unit planning.

b. Location and Access

The area is located near the southern boundary of the Malheur National Forest in northern Harney County, Oregon (T. 20 S , R. 33 E , T. 20 S., R. 33 1/2 E., T 21 S., R 33 E., T. 21 S., R. 33 1/2 E , of the Willamette Meridian). Access to the area consists of unimproved roads to the canyon rims and a trail along the creek in the canyon bottom. See Figure C-17

c. Geography and Topography

The area consists of the canyon of Pine Creek drainage and some relatively flat table land around canyon rims The south end of Pine Creek Canyon has steep walls with prominent rock outcroppings. The north portion encompasses gentle slopes and broad, flat canyon bottoms.

The topography of the area consists of a deeply (400+ feet) incised plateau with a narrow valley (50 feet) in the bottom. It is about 1/2 mile from rim-to-rim with benchlike sideslopes in some areas and long, smooth slopes in others. Pine Creek runs southeast through the center of the area. The northern portion of the area has gentle topography compared to the southern portion.

d Geology and Soils

The plateau of table land is formed from soils derived from tuffs and breccias. Some of these soils are excessively drained, and they are gravelly and could be plastic when wet. Layers below these clay soils are bedrock composed of hard tuffs, breccias, hard basalt, and andesite which is slightly fractured. The canyon walls are formed of highly stratified and variable bedrocks with a wide range of undefined soil characteristics. The area is covered with Miocene and younger volcanic flows and sediments.

e. Vegetation

This area is 60 percent forested. About 1,050 of these acres meet the Pacific Northwest Region's definition of old growth. Most of the area is a mixture of ponderosa pine, Douglas-fir, and white fir. Much of the white fir is confined to the north slopes leading into Pine Creek Canyon. Understories are generally Douglas-fir and white fir over grasses and shrubs. The south slopes into Pine Creek are mainly juniper, mountain mahogany, sagebrush, bunchgrass, and scattered ponderosa pine.

f. Current Uses

Big-game hunting and trout fishing are currently the primary recreation uses of the area. Other uses include camping, hiking, photography, and nature study. All recreation use of the area is light. (See Table C-2.) Access is limited to trails that follow the streamcourses, which are gentle in grade and suitable for the average hiker Approximately 1,200 Recreation Visitor Days occur annually, almost entirely in the semiprimitive nonmotorized ROS class. (See Table C-3.)

This area provides year-round Rocky Mountain elk habitat with winter range encompassing the entire area Mule deer use the area during spring, summer, and fall. Canyon rims and walls provide habitat for black bear, prairie falcon, and Canadian geese, and potentially provide habitat for bobcat and turkey vulture The close association of old-growth forest, sageland, riparian, and cliff habitats provides a wide spectrum of southern Blue Mountain plant and animal species. Pine Creek supports an inland native trout fishery.

Permitted grazing use of the Pine Creek area occurs under one grazing allotment. Current use averages 550 Animal Unit Months each year by cattle. Recreation stock grazing use is generally available in meadows near water.

There are no known hydroelectric withdrawals or any proposed impoundments Several livestock spring improvements exist, consisting of water troughs and several holding ponds to catch snowmelt. There are no known water measuring sites Pine Creek produces such a low volume of water that its main contribution is to off-forest irrigation of agricultural lands

Logging activities are adjacent to the northwest portion of the area. The south end of the area is remote and rugged The areas in Bureau of Land Management, State, or private ownerships along the eastern boundary of the area support sage, mountain mahogany, juniper, and patches of aspen.

The land west and north of the area has been logged repeatedly. The land east and south of the area is in Bureau of Land Management, State, or private ownership. Some logging has occurred on these lands.

The major attractions of this area are hunting and trout fishing. Trout fishing occurs along the north end of the area where access is best

2. *Wilderness* Capability

a Manageability and Boundaries

There is general agreement that the boundaries of the area should be adjusted. The boundaries of the original inventoried area are difficult to locate on the ground and would be difficult to manage Moving the boundary to a more easily managed location would slightly increase the size of the area.

b Natural Integrity

Within the canyons themselves, natural integrity of the area is extremely high. Natural processes have been slightly hampered by human activities

The major impacts to this portion of the area are exclusion of fire, a trail in the canyon bottom, livestock grazing, a low-standard road in the northern portion of the area, and some scattered water developments for livestock

Fire suppression in the area has resulted in a gradual change in the understory vegetation from ponderosa pine reproduction to white fir and other tree species. Under natural conditions, low-intensity wildfires would have selectively maintained ponderosa pine in the understories.

c Naturalness

Overall, the area appears extremely natural to the average user. The effects of fire suppression would not normally be noticed by most users. Foot trails along the streams are maintained to a fairly low standard

The impacts of livestock grazing remain the most intrusive activity. These appear unnatural to most visitors and would be extremely difficult to mitigate unless grazing were eliminated They also occur in the portion of the area most likely to receive the most use.

d Opportunity for Solitude

The roads leading to the boundary of the area provide ample access. The opportunity does not really exist to "get away from it all." The southern portion of the area would offer the best opportunity to retreat from human influences, but human influences would still be visible within two miles of the review area.

e Primitive Recreation and Challenge

Camping, hunting, trout fishing, and limited photography are activities which could take place in this area. There is also limited opportunity for rock climbing. No opportunity exists for water-related activities such as canoeing, boating, or river rafting due to lack of the water volume needed for such activities The trail along Pine Creek could be an opportunity for a one or two day overnight backpacking trip depending on the desire of the individual. The entire length of the area (barely five miles) limits the hiker to a very short day of recreation. One-day round trips, starting from either end of the review area, would be limited to 10 miles, a rather short day for the dedicated backpacker or hiker

Location, remoteness, and access to the review area provide little challenge to the more dedicated recreationist

f. Special Features

The majority of old-growth timber in the area is currently part of the Forest's old growth management system No Threatened or Endangered Species are known to occur in the area; however, there are potential bald eagle winter roosts near the southern one-fourth of the area A Sensitive plant species may exist in this area; however, no Sensitive plant surveys have been completed for the Pine Creek drainage.

There are no known opportunities for historical, educational, or scientific studies. No surveyed historical or cultural sites exist. This area was formerly included in the Paiute Indian Reservation It was also a migration route for tribes between the winter and summer camps The probability of cultural sites is very high.

3. Availability for Wilderness

a. Resource Potentials

The area currently provides roaded natural, semiprimitive motorized, and semiprimitive nonmotorized recreation opportunities The area is capable of providing 5,145 Recreation Visitor Days per year (See Table C-4)

There are 3,000 acres of forested land tentatively suitable for timber management activities. These stands are predominantly ponderosa pine with some mixed conifer. They are multistoried stands with an average overstory age of 150 years and an average understory age of 75 years. The standing volume amounts to 25.9 million board feet (4.52 million cubic feet) With the use of intensive timber management techniques, 144 thousand cubic feet (824 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade. The long-term sustained yield capacity from this area would be 171 thousand cubic feet per year.

No zones of alteration or mineralization were discovered by Bureau of Mines and U S Geological Survey studies, and those agencies concluded that the area had low potential for locatable minerals There are no mining claims within the area The U S. Geological Survey does consider the entire area to be prospectively valuable for oil and gas and the southern half of the area to be prospectively valuable for geothermal resources. There are nine sections under oil and gas leases

b Management Considerations

There have been four small fires in the last 10 years Natural fuel loading in the area should be less than 10 tons per acre. Very little logging has taken place within the area and only light fuels (grass and sagebrush) cover large expanses of the review area

The area contains many pine snags which have been killed by western pine beetle Much of the Douglas-fir is infected with dwarf-mistletoe On the drier soils, the infection is quite severe

There are no special-use permits or other special land-use authorizations in the area. The closest other land use is the electronic site on Craft Point (1/4 mile outside the present Pine Creek area boundary). This permit authorizes Pacific Northwest Bell to use the area for a microwave telephone reflector This reflector can be seen from much of the southern portion of the area

There are no known non-Federal lands in the area

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 30 miles north, Monument Rock Wilderness is 45 miles northeast, North Fork John Day Wilderness is 75 miles northeast, and Black Canyon Wilderness is 70 miles northwest The ecosystems of the Pine Creek area are represented to some degree in the Black Canyon Wilderness

The nearest major metropolitan centers are Portland, Oregon (300 miles northwest), and Boise, Idaho (180 miles east).

In recent Forest planning public involvement activities, this area received a low level of interest The comments received were in a ratio of 2 4 comments opposed to wilderness designation for every 1 favoring it.

The primary reasons favoring wilderness for this area were to protect wildlife habitat and the natural appearance of the creek canyon

The reasons opposed to wilderness were that the area lacked opportunities for solitary, Primitive recreation in a natural wilderness setting and a stated preference to manage the area as roadless

5. Environmental Consequences

Table C-21 displays the various management area assignments for the area by alternative

a. Vegetation/Trees

Significant changes in tree sizes, stand density, and composition are expected in the first decade for Alternatives B-Modified and I in which timber stands in this area would be harvested and change the area to a managed forest appearance. These changes would not occur until the second decade under Alternative F. Old growth would be retained on 900 acres for Alternatives F and I. Alternative A may contain additional old growth within the Semi-Primitive Motorized Management Area. In Alternative B-Modified, 600 acres of old growth will be retained at the management requirement level (minimum viable population level).

Alternatives A, C-Modified, and NC would not result in harvest of the suitable forested acres. These tree stands would progress through natural successional cycles and add to the 600 acres of old growth available.

b. Vegetation/Grass and Shrubs

The greatest change in forage for livestock and wildlife would occur in those alternatives with timber harvest activities. Grasses, forbs, and shrubs would increase as openings in tree canopies occur and tree stands are thinned. Seeding of introduced forage species would provide higher quality and quantity of palatable plants. Native forage species would increase in vigor and density as timber harvest activities occur. Changes as the result of Alternative F would not occur until the beginning of the second decade. In Alternatives A, C-Modified, and NC, no timber harvest will occur and little change in vegetation will result.

c. Wilderness

Timber harvest activities and road construction will virtually eliminate the area from wilderness consideration in Alternatives B-Modified, F, and I. Future wilderness consideration would remain possible under Alternatives A, C-Modified, F, and NC for the first decade, and for Alternatives A and NC after the first decade of the planning period This area is recommended for wilderness designation in Alternative C-Modified.

d. Recreation

The future recreation opportunity will be from roaded modified in Alternatives B-Modified and I, and, after the first decade, Alternative F. Semiprimitive nonmotorized recreation opportunities will be provided in Alternatives A and NC, and after the first decade in Alternative F Within a roaded modified setting, the effects would be increased vehicle use including off-road vehicles along Pine Creek Trail. Visitors would also be likely to see vehicles on access roads along the canyon rims Within the semiprimitive nonmotorized and wilderness settings, users would experience natural surroundings without motorized intrusions. The major recreation attractions of hunting and fishing would remain unchanged.

e. Scenery

Because the area is 60 percent forested, the greatest effect would be in those alternatives which allow timber harvest activities (Alternatives B-Modified, F, and I). In these alternatives, the viewer would see a managed forest appearance, fewer old growth trees, more access roads, and more human influences. In Alternative F, effects on visual resource quality would not occur until the beginning of the second decade. In Alternatives A, C-Modified, and NC, the present scenery would remain unchanged

f. Wildlife	Effects on old growth and snags are greatest in those alternatives which allow timber harvest. Alternatives B-Modified, C-Modified, F, and I would retain 900 acres of old growth ; in alternatives with timber harvest (Alternatives B-Modified, F, and I), only that amount will be retained. Although present levels of old growth and snags will decrease in these alternatives, habitat needs of wildlife species will be met through the application of standards. All of the area is included within elk winter range In those alternatives which allow timber harvest, hiding and thermal cover will decrease while forage will increase. Under Alternative F, old growth, snags, and thermal cover will decrease and forage will increase after the first decade.
g. Water, Riparian, Fisheries	Pine Creek is the only year-round stream in the area. All alternatives will protect this resource through standards. Increased accessibility and use will occur with road construction. In alternatives allowing timber harvest (Alternatives B-Modified, F, and I) these changes will occur in the first decade, in Alternative F, after the first decade
h. Cultural Resources	All alternatives will protect cultural resources through the application of management standards. The alternatives which allow timber harvest (Alternatives B-Modified, F, and I) have the greatest risk of inadvertent damage to the resource as well as the greatest opportunity for discovery of the resource These risks and opportunities would not occur under Alternative F until the beginning of the second decade.
i. Soils	All alternatives will protect the soil resource through application of management standards. The alternatives which allow timber harvest (Alternatives B-Modified, F, and I) have the greatest risk of inadvertent damage to the resource This risk would not occur under Alternative F until the beginning of the second decade.

TABLE C-21

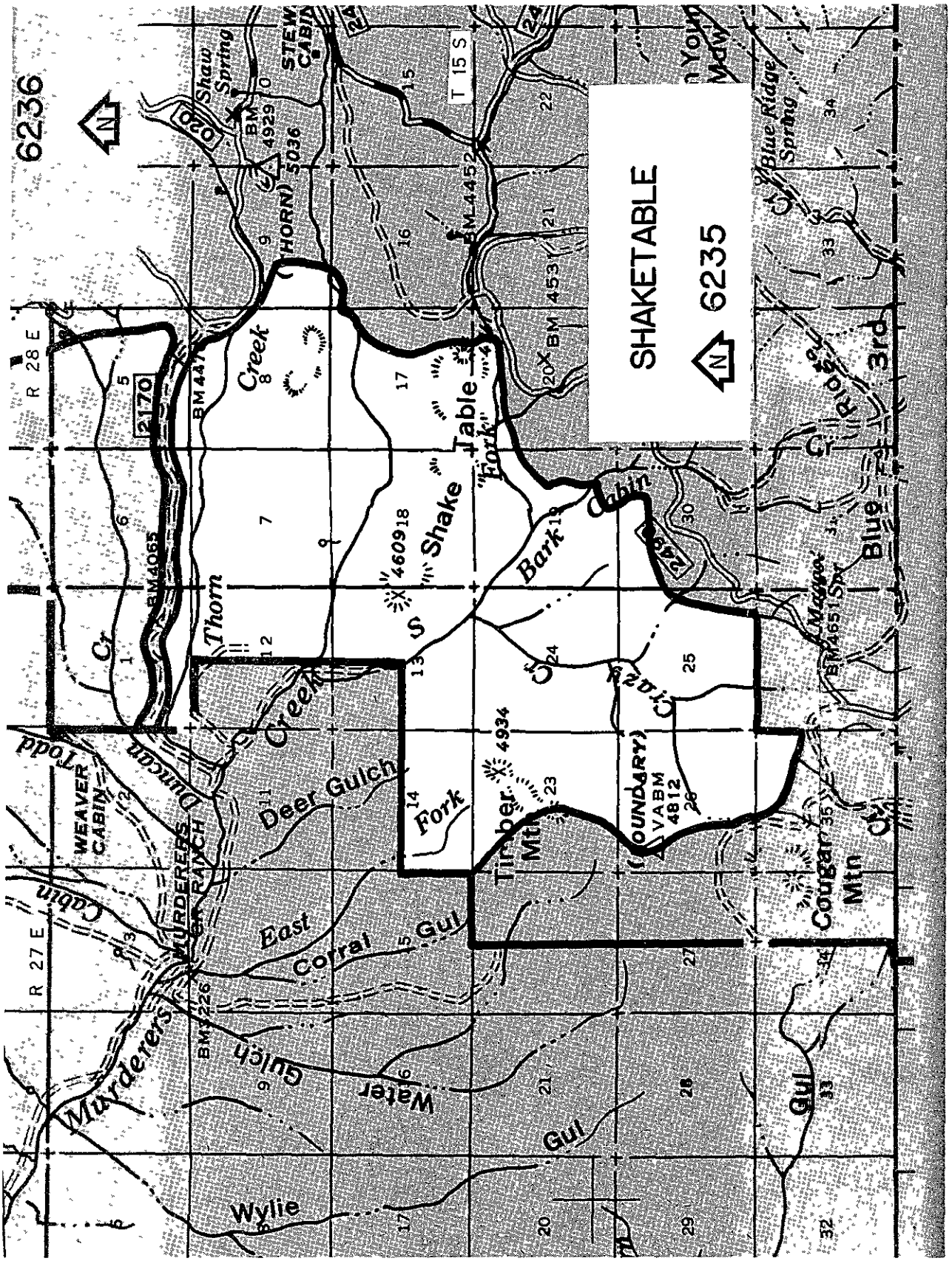
PINE CREEK MANAGEMENT BY ALTERNATIVE

(Acres)

Management Area		Alternatives				
		NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1	General Forest	N/A	10	1,686			
2	Rangeland	N/A	7	2,014			
3	Riparian Areas	N/A	1	23		21	21
4A	Big-Game Winter Range					3,296	3,296
4B.	Big-Game Winter Range enhancement						
5	Bald Eagle Winter Roost	N/A		906		906	906
6A	Strawberry Mountain Wilderness						
6B.	Monument Rock Wilderness						
6C	Pine Creek				5,420		
7	Scenic Area						
8.	Special Interest Area						
9.	Research Natural Area						
10	Semi-Primitive Non-Motorized	N/A	5,400				
11	Semi-Primitive Motorized						
12.	Developed Recreation						
13	Old Growth	N/A		600		900	900
14.	Visual Corridors						
15	Unit Plan Wildlife Emphasis Areas						
16	Minimum Level Management	N/A	2	191		297	297
17	Byram Gulch Municipal Supply Watershed						
18.	Long Creek Municipal Supply Watershed						
19.	Administrative Sites						
20	Wildlife Emphasis Areas with Scheduled Harvest						
21	Wildlife Emphasis Area, Non-Scheduled Harvest						
22.	Wild and Scenic River						
TOTAL ACRES		N/A	5,420	5,420	5,420	5,420	5,420

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-18


SHAKETABLE
6235
6236
T 15 S
R 28 E
R 27 E
Shaw Spring
STEW CABIN
THORN
BM 4929
BM 5036
BM 4452
BM 4531
Blue Ridge Spring
Blue Ridge Trail
Creek
Shake Table Fork
Bark Cabin
Thorn Creek
Deer Gulch
Fork
Timber Mtn
Cougar Mtn
Magpie Spr
BM 4651
BM 4065
BM 4411
2170
4609
4934
VABM 4812
(BOUNDARY)
WEAVER CABIN
MURDERERS CR RANCH
Murderers Cabin
Duncan
Todd
East Corral Gulch
Water Gulch
Wylie
Gul

S. SHAKETABLE - 7,137 Acres (RARE II No. 6235)

1. Description

a. History

This area was inventoried in RARE and enlarged in the RARE II inventory Under the South Fork Planning Unit Environmental Impact Statement and RARE II Environmental Impact Statement, the area has been managed for nonwilderness uses.

b. Location and Access

Shaketable roadless area is located on the western edge of the Malheur National Forest, approximately 12 miles southeast of Dayville, Oregon, in Grant County (T. 15 S., R. 27 E., and T 15 S., R. 28 E , of the Willamette Meridian).

Access is available to most of the unit. Primary access is by Forest road No. 2170 on the north and Forest road Nos. 2490 and 2490090 on the east. These roads are well maintained Access is also available by jeep trail on the west and a low-standard local road on the south (Forest Service road No. 2490269)

c. Geography and Topography

The terrain of this area varies from flat plateaus to deep canyons. Most of the area consists of steep sideslopes with streamcourses in the ravines The remainder is relatively flat upland. High points are Shaketable and Timber Mountain. The unit is dissected by several steep canyons containing Thorn, Murderers, South Fork Murderers, Bark Cabin, Crazy, Corral Gulch, and East Fork Corral Gulch creeks. Relief is approximately 1,565 feet, from 3,360 feet on Murderers Creek to 4,924 feet on Timber Mountain. See Figure C-18.

d Geology and Soils

General underlying geologic formations are Columbia River group basalts and andesites in the west and north with Vester formation conglomerates to the east and south.

Soil types are predominantly loamy and clayey, nonforested soils with a wide variety of characteristics. There are also some areas of deep volcanic ash soils. Most of the area is covered by Miocene-age basalt flows Some Triassic-age oceanic crustal rocks are found along the southeastern edge

e. Vegetation

The Shaketable unit is about 31 percent forested; this Forest is scattered throughout the area. Concentrations of timber types are on Timber Mountain, the north slopes of Shaketable, and the canyons of Crazy and South Fork Murderers Creeks. Ponderosa pine is the dominant species with Douglas-fir and white fir on the more protected sites. Ground cover in forested areas is primarily pinegrass and elk sedge. The nonforested lands are occupied by juniper, mountain-mahogany, sagebrushes, wheatgrass, fescue, bluegrass, and wild onion. There are about 750 forested acres in this area that meet the Pacific Northwest Region's definition of old growth.

f. Current Uses

Although access is good, this area does not receive a large amount of recreational use. (See Table C-2.) The principal use is big-game hunting. Horseback riding, off-road vehicle use, fishing, camping, and bird-watching are other activities that occur here to a limited extent.

Wildlife is varied and includes Rocky mountain elk, mule deer, mountain lion, black bear, antelope, and wild horses Birds in the area include songbirds, raptors, and game birds such as mountain quail, chukar, and mourning dove The entire area provides winter range for elk and deer There are native trout in the streams Murderers Creek is an important steelhead spawning and rearing habitat for the John Day River System.

The area lies within one grazing allotment with about 700 Animal Unit Months provided annually The principal area of livestock use is on Timber Mountain and the eastern portion of the area The entire area also lies within the Murderers Creek Coordinated Resource Management Unit and Murderers Creek Wild Horse Territory.

The primary attraction of the area is the opportunity for solitude in undeveloped canyon country Unusual rock formations and the creek canyons offer interesting geologic sites

2. Wilderness Capability

a. Manageability and Boundaries — The present boundary primarily follows natural or human-made characteristics. There are areas where there are cross- or mid-slope locations. The nature of the surrounding locale (maintained roads, timber sales, etc.) makes expansion of the area difficult; however, a more manageable boundary would increase the size of the area by 1,760 acres

b. Natural Integrity — About 60 percent of the area has been impacted by human activity, and natural integrity of the area is low.

c. Naturalness — Impacts include jeep trails, fences with evident clearing, wildlife guzzlers, livestock and their salt grounds and water developments. The canyons of Crazy, Thorn, and Murderers Creeks are virtually untouched. Bark Cabin and South Fork Murderers Creeks have trails along their lengths

d Opportunity for Solitude — The opportunity for solitude over the entire area is low because of the ability to see maintained roads and traffic from most of the unit.

e Primitive Recreation and Challenge — There is very little vegetative screening although there is some relief provided by the topography There is little or no opportunity for Primitive recreation Most of the area is visually common to this physiographic type There are distinct locations within this area which provide some challenge and scenic variety due to the steep, rugged sideslopes and changes in vegetation along the streams.

f Special Features — There are five possible cultural resource sites (one historical, four prehistoric) within this area There is high probability of other sites because of the travel through, and use of, the area by both American Indians and Europeans One Sensitive plant species occurs in this area

There is a potential for scientific study of ecological features. A candidate Research Natural Area has been identified in the area. This area is considered a good representative of low sage communities in the southern Blue Mountains

3. Availability for Wilderness

a. Resource Potential

This area currently provides roaded modified, roaded natural and semiprimitive motorized and nonmotorized recreation opportunities. (See Table C-3) It can provide 10,164 Recreation Visitor Days per year (See Table C-4.)

There are 1,755 acres of forested land tentatively suitable for timber management activities These trees are growing in multistoried stands consisting of both ponderosa pine and mixed conifer species There is a standing volume of 8.1 million board feet (1.42 million cubic feet). With the use of intensive timber management techniques, 84 thousand cubic feet (480 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 100 thousand cubic feet per year

The area has no known locatable mineral potential. One mining claim is located in the vicinity. The U S Geological Survey considers the area to be prospectively valuable for oil and gas but not for geothermal resources.

b. Management Considerations

Fire risk is moderate to high because of the flash fuels, relatively dry sites, and prevailing winds. There is a high amount of lightning activity in the area, especially in the higher elevations of Timber Mountain and Shaketable

There is some insect damage in the area but it is insignificant. There are also inconsequential root rots present in the white fir.

There are no non-Federal lands within this area. There is a section of land managed by the Oregon Department of Fish and Wildlife adjacent to the southeast corner

4. Wilderness Evaluation

Strawberry Mountain is 24 miles to the northeast, Monument Rock Wilderness is 55 miles east, North Fork John Day Wilderness is 50 miles northeast, and Black Canyon Wilderness is 8 miles west. The ecosystems represented in this area are also represented in those wildernesses

The nearest major metropolitan centers are Portland, Oregon (260 miles northwest), and Boise, Idaho (200 miles east)

Shaketable does not have strong support as a wilderness proposal. In the 1979 RARE II study, there were 116 comments favoring wilderness designation, 2,592 comments favoring further planning, and 3,436 comments favoring nonwilderness management In recent Forest planning public involvement activities, the area was among those receiving a low level of comment. Of the comments received, 2.2 favored nonwilderness management for every 1 favoring wilderness designation.

The reasons supporting wilderness designation were for special management and protection of fish, wildlife, and wild horses It was suggested that Shaketable, Dry Cabin, and Aldrich be combined.

The reasons opposing wilderness designation were the size, lack of opportunity for solitary, Primitive recreation, and the need to allow resource management activities to improve forage for livestock, wild horses, and wildlife, and activities which would improve wildlife habitat.

5. Environmental Consequences

Table C-22 displays various management area assignments for this area by alternative.

a. Vegetation/Trees

Significant changes in tree sizes, stand density, and composition will occur on the 1,939 forested acres in all alternatives except Alternatives C-Modified and I. These acres will produce about 8 1 million board feet of timber when harvested. On these acres the species mix will change from predominantly ponderosa pine to mixed conifer species in all alternatives, through either natural succession or harvest activities These changes would not occur until the second decade for Alternative F

b. Vegetation/Grass and Shrubs

The greatest change in grasses, shrubs, and forbs would occur within forested areas which are harvested in all alternatives except Alternatives C-Modified and I. Native bunchgrasses, forbs, and shrubs will increase as the tree canopy is opened and tree stands are thinned Seeding of introduced grass species will provide higher quality and quantity of palatable plants and change the species composition In Alternatives C-Modified and I, little change in forage species is expected. Changes in Alternative F would not occur until the second decade

c Wilderness

The opportunity for future wilderness consideration is foregone because of roading and timber harvest activities by the end of the first decade for all alternatives, except Alternatives C-Modified, F, and I. This opportunity will be foregone in Alternative F after the first decade.

d. Recreation

The recreation opportunity provided will be roaded modified in Alternatives A, B-Modified, F, and NC. Within this setting, the effects would be increased vehicle use, including off-road vehicles, along Buck Cabin and South Fork Murderers Creek The recreation user would see and hear vehicles on jeep tracks and new access roads, and more evidence of human activity. In Alternatives C-Modified and I, the area would provide a semiprimitive setting Visitors would still see and hear off-road vehicle use, however, there would be fewer access roads and a more natural setting Roaded modified recreation opportunities would be available under Alternative F after the first decade.

e Scenery

In all alternatives except Alternatives C-Modified, F, and I, the visual resource appearance of the area will change from a natural appearing environment to a managed forest setting by the end of the first decade, and in the second decade for Alternative F.

f Wildlife

Old growth would be retained in all alternatives In Alternatives C-Modified and I, the forested acres will not be harvested and will add to the available old growth Snags will also be more available in these two alternatives, however, management standards will ensure that minimum levels of snags will be maintained in all of the alternatives. The area is completely within elk winter range In Alternatives A, B-Modified, F, and NC, the forested habitat will be harvested, decreasing hiding and thermal cover for big game and increasing the forage available These changes will occur in Alternative F after the first decade

g. Water, Riparian,

Management standards will protect these resources in all of the alternatives

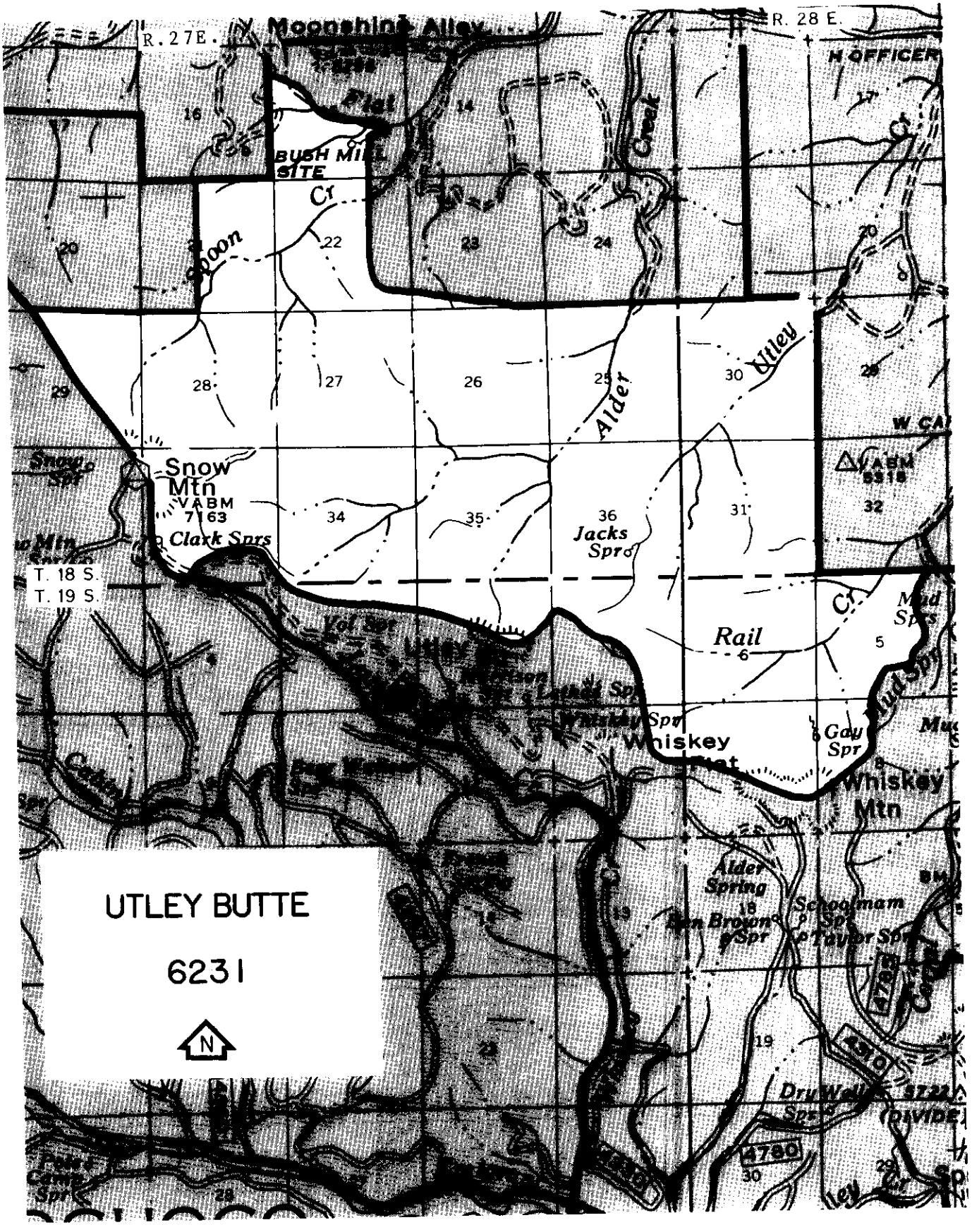
Fisheries	Increased accessibility to utilize and improve these resources would occur in Alternatives A, B-Modified, F, and NC. These changes would occur in the second decade for Alternative F, and in the first decade for all other alternatives which harvest timber.
h. Cultural Resources	All of the alternatives will protect these resources through application of laws and management standards Alternatives A, B-Modified, F, and NC constitute the greatest risk of inadvertent damage to the resource as well as the most opportunity for discovery. These risks and opportunities would not occur under Alternative F until the beginning of the second decade.
i. Soils	All of the alternatives protect the soil resource through application of management standards.

TABLE C-22
SHAKETABLE MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	Alternatives NC[1/]	A	B-Mod	C-Mod	F	I-Preferred
1. General Forest						
2. Rangeland						
3. Riparian Areas			410		382	
4A. Big game Winter Range			6,118		6,156	
4B. Big game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mt. Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. Scenic Area						
8. Special Interest Area						
9. Research Natural Area						375
10. Semi-Primitive Non-Motorized						6,762
11. Semi-Primitive Motorized				7,137		
12. Developed Recreation						
13. Old Growth	N/A					
14. Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas	N/A	6,499				
16. Minimum Level Management		638	609		599	
17. Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19. Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22. Wild and Scenic River						
TOTAL ACRES	N/A	7,137	7,137	7,137	7,137	7,137

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

FIGURE C-19


R. 27 E.
R. 28 E.
Moonshine Alley
BUSH MILL SITE
Cr
Spoon
Alder
Utley
Snow Mtn
VABM 7163
Clark Spr
Jacks Spr
Rail
Whiskey Spr
Whiskey Mtn
Alder Spring
Schoolmam Spr
Taylor Spr
Ben Brown Spr
Gay Spr
Dry Well Spr
T. 18 S.
T. 19 S.
UTLEY BUTTE
6231
N

T. UTLEY BUTTE - 9,945 Acres
(RARE II No. 6231)

1. Description

a. History

This area was inventoried in RARE and enlarged during the RARE II inventory. Under the South Fork Planning Unit Environmental Impact Statement and the RARE II Environmental Impact Statement, this area has been managed for nonwilderness uses.

b. Location and Access

The area is located in the southwestern corner of the Malheur National Forest on the Grant-Harney County line, Oregon (T. 18 S., R. 27 E., T. 19 S., R. 27 E., of the Willamette Meridian). Main access routes are Forest road Nos. 4330 and 43, and County Road 47.

c. Geography and Topography

The Utley Butte area is drained by Spoon, Alder, Utley, Rail, and Corral creeks all tributaries to the South Fork John Day River. The resulting draws are relatively steep near the southern boundary of the area. Snow Mountain (elevation 7,163) on the western edge of the area is the predominant landmark in this area. See Figure C-19.

The topography of the area can be described as steep, primarily north-facing slopes and flat-topped ridges. Elevation of the area ranges from 5,000 to 7,163 feet.

d. Geology and Soils

Soils in the area range in depth from 4 to more than 30 inches. There is a combination of soils derived from volcanic ash and loamy or loamy/clayey soils, with the ash soils being more productive. Ash soils are more predominant in the western and southern portions of the area, although they occur throughout. For the most part, the erosion hazard for the area is high; the compaction and displacement hazard is low to moderate. All of the area is covered by Tertiary-age volcanic-rocks, including Miocene-to-Pliocene and Pliocene volcanic flow rocks, and Pliocene welded tuffs.

e. Vegetation

This area is 77 percent forested. Of these acres, about 3,200 meet the Pacific Northwest Region's definition of old growth. Vegetative distribution on this north-facing area is characterized by trees in the bottoms, on sideslopes, and on gentle flat-topped ridges. Grass and low shrubs are found on steeper sideslopes and rock areas. Ridges and south slopes support ponderosa pine and juniper with a mountain-mahogany understory. Ground cover is usually sagebrush and bunchgrasses. Conifers are primarily confined to north slopes and drainages. Overstories consist of ponderosa pine and fir with some larch; understories are mainly white fir and Douglas-fir with grass and forbs as ground cover. Streamside vegetation generally consists of alder, willow, and some scattered mountain ash. This vegetation is mainly confined to upper drainages since lower drainages have little or no streamside vegetation.

f. Current Uses

Big-game hunters are offered an experience considerably different from that of hunting on intensively managed forest land. At present, recreation use is limited to hunting during the fall and some hiking and sightseeing during other seasons. (See Table C-2.)

This area provides year-round Rocky Mountain elk habitat with approximately 2.5 square miles of elk winter range within the area. Mule deer use the area during spring, summer, and fall. Old-growth and mature forest provide habitat for pileated woodpeckers, goshawks, and bear. Spoon Creek, Alder Creek, Utley Creek, and Rail Creek support native trout populations.

The area lies within one grazing allotment. Current use averages 700 Animal Unit Months annually by cattle.

There are no planned power withdrawals, proposed impoundments, existing irrigation reservoirs, or distribution systems. Spoon Creek is a major contributor to water flowing into the South Fork John Day River. The portions of Spoon, Alder, Utley, and Rail Creeks within the area are all free flowing and undisturbed.

The major attraction of this area is the large ponderosa pine. In addition, the roadless area offers opportunities for solitude and to "get away from it all" and to enjoy "peace and quiet without motorized intrusions." The main viewpoint is Snow Mountain Lookout.

The area provides scenic diversity in vegetation types with changes in elevation and aspect. There is additional variety provided between streamside and hillside views. Various species of big game animals are available for hunting, viewing, and photography.

2. Wilderness Capability

a. Manageability and Boundaries

The boundaries of the area have been adjusted to exclude the already developed land areas. For the past 20 years, the land south of the area has been extensively logged.

b. Natural Integrity

Within the draw bottoms themselves, natural integrity of the area is extremely high. Except for the extreme northern portion of the area, natural processes have been virtually unhampered by human activities. The major impacts in this portion of the area are livestock grazing, hunting camps, the Alder Creek Trail (not maintained), and an unimproved road on the ridge west of Alder Creek. Forest personnel estimate this road has not been used in at least 15 years and portions of it have been completely obliterated.

The effects of grazing in the area are mostly concentrated along streams. They include fences, salt grounds, cattle trails, some compaction and vegetative trampling, dust beds, the cattle themselves, and other evidence of their presence along the streams.

c. Naturalness

The area appears extremely natural to the average user. The impacts of livestock use remain the most intrusive activity. These would appear unnatural to most visitors and would be difficult to mitigate unless grazing were eliminated.

d. Opportunities for Solitude

Within the area the opportunities for solitude are very high, especially along stream bottoms. The experience of spaciousness and solitude is somewhat diminished by the adjacent management activities.

e. Primitive Recreation and Challenge

Opportunities for undeveloped recreation exist in the form of hiking, hunting backpacking, and wildlife viewing The lack of facilities and access tends to increase opportunities for solitude and unconfined recreation Primitive recreation experiences are limited by the size of the area and the intrusion of adjacent management activities Challenge to physical ability is moderate for cross-country travel.

f. Special Features

Some designated old-growth stands exist within the Utley Butte area. There are no records of Threatened or Endangered Species using this area, and there are no potential bald eagle roost sites. No Sensitive species were located during a field analysis for the proposed Spoon Creek Timber Sale.

One cultural resource site has been located. Opportunities for interpretation of this site would be very limited.

There may be some opportunities for scientific and educational studies, but a recent review by the Area 3 Ecologist relative to research natural areas states that, "While Utley Butte contained nice old-growth trees in good stand configurations, I did not believe the ecological condition of the component types was healthy enough for serious consideration (as a Research Natural Area)."

3. Availability for Wilderness

a Resource Potentials

This area currently provides roaded natural, semiprimitive motorized, and semiprimitive nonmotorized recreational opportunities (See Table C-3.) It has the potential to provide 10,725 Recreation Visitor Days annually (See Table C-4.)

Commercial timber species are ponderosa pine, Douglas-fir, white fir, and some western larch occurring on 6,900 acres of forested land tentatively suitable for timber management activities. These trees are growing in multistoried stands Ponderosa pine is generally 200-300 years old while fir is between 100 and 200 years old Volumes range from about 8 thousand board feet per acre to over 20 thousand board feet per acre. There is a standing volume of 78.42 million board feet (13.71 million cubic feet) of timber With the use of intensive timber management techniques, 331 thousand cubic feet (1,893 thousand board feet) would be contributed to the annual allowable sale quantity in the first decade The long-term sustained yield capacity from this area would be 393 thousand cubic feet per year The white fir is infected with Indian paint fungus and would yield very little volume.

The area has no known locatable mineral potential and contains no mining claims. The U.S Geological Survey considers the area to be prospectively valuable for oil and gas but not for geothermal resources An industry respondent has identified the area as having moderate potential for oil.

b. Management Considerations

There have been 20 small fires in the area over the last 10 years. Natural fuel loading in the area ranges from low to moderate

Indian paint fungus is prevalent and can probably be found in all size classes of the true fir Much of the Douglas-fir (especially on rockier, drier soils) is infected with dwarf-mistletoe. Mistletoe patches of varying degree can be found, from fairly light to quite severe Root rots can be found to varying degrees but, at this point, it is not considered a problem
Due to high amounts of fir trees and Douglas-fir in the review area, all the timber stands are highly susceptible to tussock moth and the western spruce budworm. The western spruce budworm is presently in the area and, in some cases, is quite severe Western pine beetle can be found in the area but is generally confined to a few old-growth ponderosa pine trees of low vigor.

There are no known non-Federal lands in the review area.

4. Wilderness Evaluation

The Strawberry Mountain Wilderness is 45 miles northeast, Monument Rock Wilderness is 70 miles northeast, North Fork John Day Wilderness is 85 miles northeast, and Black Canyon Wilderness is 35 miles northwest The ecosystems of the Utley Butte roadless area are not particularly well represented in any of these areas.

The nearest major metropolitan centers are Portland, Oregon (300 miles northwest) and Boise, Idaho (180 miles east).

In the 1979 RARE II study, there were 2,701 comments favoring wilderness designation, 29 comments favoring further planning, and 3,401 comments favoring nonwilderness management. In recent Forest planning public involvement activities, this area received a low level of response. Those responses were in a ratio of 2.8 opposing wilderness designation to every 1 favoring it A timber sale proposed for part of this area was appealed.

The reasons favoring wilderness for this area were wildlife habitat protection and Primitive recreation value Watershed protection and natural character of the area were also mentioned.

Reasons opposing wilderness were the presence of logging activity in the nonconforming areas now removed from the area, a preference for management as a roadless area, and the value of the timber resource.

5. Environmental Consequences

Table C-23 displays the various management area assignments for this area by alternative.

a Vegetation/Trees

Significant changes in tree sizes, stand composition, and density will occur in all alternatives except Alternative C-Modified. On the 5,967 forested acres, the predominantly ponderosa pine forest will become predominantly mixed conifer through natural succession and timber harvest activities in all alternatives. The actual acres affected by timber management activities will vary between alternatives. Alternative F would harvest approximately 940 acres in the first decade.

b. Vegetation/Grass, Forbs, and Shrubs	The greatest change to grasses, shrubs, and forbs results from timber-harvest activities. These naturally occurring forage species would increase as timber harvest and thinning open the tree canopy Seeding of introduced grass species would increase the quality and quantity of palatable forage species There would be little change in Alternative C-Modified, although forage will decrease in quantity as tree stands become more dense.
c Wilderness	The opportunity for future consideration of wilderness potential will be foregone by the end of the first decade in Alternatives A, B-Modified, F, I, and NC through timber harvest and roading activities
d. Recreation	The recreation opportunity provided by this area in Alternatives A, B-Modified, F, I, and NC is roaded modified Visitors would see and hear increased vehicle use, including off-road vehicles, and more evidence of human activity such as roads In Alternative C-Modified this area would provide semiprimitive motorized recreation opportunities. This setting would favor off-road vehicle and motorized as well as nonmotorized use in a natural setting
e Scenery	All of the Alternatives except Alternative C-Modified would alter the appearance of the area from its natural state to a managed forest setting
f Wildlife	All of the alternatives would retain at least 900 acres of old growth; in Alternatives A, B-Modified, F, and I, only that old growth will be retained in the area In Alternative C-Modified the forested acres will continue through natural succession and contribute to the old growth available Snags will also be more prevalent in Alternative C-Modified than in other alternatives, although all will provide for a minimum level of snags necessary to support wildlife dependent on such habitat. About 10 percent of the area is in elk winter range. On the forested acres within that area, timber harvest activities in all alternatives except Alternative C-Modified will decrease the hiding and thermal cover for big game, while increasing the forage available
g. Water, Riparian, Fisheries	All alternatives protect these resources through management standards and all except Alternative C-Modified provide increased use and improvement opportunities for these resources through improved access.
h Cultural Resources	All of the alternatives protect these resources through application of laws and management standards. Alternatives A, B-Modified, F, I, and NC constitute the most potential for inadvertent damage to the resource as well as the most opportunity for discovery.
i Soils	All of the alternatives protect the soil resource through management standards. Alternatives A, B-Modified, F, I, and NC present the most risk of damage to the resource

Table C-23
UTLEY BUTTE MANAGEMENT BY ALTERNATIVE
(Acres)

Management Area	NC[1/]	Alternatives A	B-Mod	C-Mod	F	I-Preferred
1. General Forest		5,807	5,166		5,195	
2. Rangeland	N/A	1,930	2,063		1,926	
3. Riparian Areas		624	614		572	
4A. Big-Game Winter Range			634		637	
4B Big-Game Winter Range Enhancement						
5. Bald Eagle Winter Roost						
6A. Strawberry Mountain Wilderness						
6B. Monument Rock Wilderness						
6C. Pine Creek						
7. Scenic Area						
8. Special Interest Area						
9. Research Natural Area						
10. Semi-Primitive Non-Motorized						
11 Semi-Primitive Motorized				9,945		
12. Developed Recreation						
13 Old Growth	N/A	900	900		900	900
14. Visual Corridors						
15. Unit Plan Wildlife Emphasis Areas	N/A					
16 Minimum Level Management		684	568		715	
17 Byram Gulch Municipal Supply Watershed						
18. Long Creek Municipal Supply Watershed						
19 Administrative Sites						
20. Wildlife Emphasis Areas with Scheduled Harvest						9,045
21. Wildlife Emphasis Area Non-Scheduled Harvest						
22 Wild and Scenic River						
TOTAL ACRES	N/A	9,945	9,945	9,945	9,945	9,945

1/The Timber Management Plan, upon which the No Change Alternative is based, was developed in 1979. The plan was not an integrated plan and, consequently, did not address all resource uses and outputs in an integrated manner. As a result, these acreages are not available.

Appendix D

STANDARDS FOR ALL ALTERNATIVES

APPENDIX D STANDARDS FOR ALL ALTERNATIVES

A. INTRODUCTION AND PURPOSE

Standards were developed to meet resource objectives, provide for resource protection, and mitigate environmental impacts They establish management direction and will guide Forest Service personnel as they implement the Forest Plan

These standards were developed by the Interdisciplinary and Forest Leadership Teams using the Forest Service Manual, various handbooks, the Regional Guide for the Pacific Northwest Region, national and regional direction letters, research publications, and public input as sources of information By using an interdisciplinary approach in developing these standards, they reflect multiple use principles.

B. FOREST-WIDE STANDARDS AND MANAGEMENT AREA DIRECTION THAT APPLY TO ALL ALTERNATIVES

The Forest-wide standards and management area direction that apply to all alternatives (except where superseded as described below) are found in Chapter IV of the Forest Plan The exception would be for the No Change Alternative, which would not necessarily have standards that comply with current requirements

C. STANDARDS WHICH ARE DIFFERENT FOR SOME ALTERNATIVES

Some standards vary by alternative These standards are discussed below for each alternative. See Table II-4 of this Final Environmental Impact Statement for acreage by management area for the alternatives

1. Alternative NC and Alternative A

The following standards apply to both Alternatives NC and A (see additional standards for Alternative A which supersede these under Section C 2).

Forest-wide Standards

Fish and Wildlife Provide snags to support 60 percent of potential populations of snag-dependent species in wildlife emphasis areas and 20 percent on other Forest lands The Forest-wide goal is to provide snags to support 40 percent of potential populations of snag-dependent species This is based on a requirement for 1 35 snags per acre in wildlife emphasis areas and 45 snag per acre on other Forest lands. This does not include provisions for snag replacement trees

Management Area 3 A&B

Delete standards under fish and wildlife.

Management Area 12

Recreation. Manage the following campgrounds to the reduced-service level Starr, Wickiup, Parish Cabin, Idlewild, Strawberry, Trout Farm, North Fork Malheur, Big Creek, Magone Lake, Yellowjacket, and Canyon Meadows.

Management Area 15

Description: Management Area 15 is composed of forested and nonforested portions of the Forest which have been determined to carry higher populations of old-growth dependent and cavity-nesting wildlife species Some of these acres are also used by elk as winter range A variety of physical and biological environments occur as determined by soil, slope, elevation (approximately 4,000 to 7,600 feet) and climatic factors The majority of Management Area 15 is unroaded.

Goals· Manage to improve the quality of habitat for deer and elk by optimizing the total cover to forage ratio Improve stream habitat and water quality to produce high-quality fish habitat. Leave higher levels of wildlife trees and old-growth timber stands than in the surrounding areas to better meet the needs of dependent species.

Standards: The Forest-wide management direction included in Chapter IV, Section E, of the Forest Plan applies to the Forest Management Area except where superseded by the following standards.

Wildlife Habitat Management:

1. Manage streamside areas by following streamside management unit guidelines

2. Schedule fish habitat improvements to enhance fish spawning, rearing, and migration habitat. Improvements will include instream structures, channel changes, and riparian revegetation.

3. Manage hiding and thermal cover to maintain optimum big-game total cover to forage ratios

4. Maintain a minimum of 10 percent of all acres in each of the 5 seral stages

5. Provide adequate timbered acres in an old-growth condition to meet minimum viable population of dependent species

6. Maintain wildlife tree levels at 60 percent of the potential level of cavity-nesting population, exclusive of provisions for snag replacements

Range:

1. Assure sufficient forage for wildlife when determining livestock needs

2 Locate and undertake improvement projects that are neutral or beneficial to wildlife species

Timber:

1. Lands in Management Area 15 are classified as both "suitable" and "unsuitable" for timber management The nonforest grasslands are classified as "unsuitable" for timber management.

2. Schedule timber harvest on "suitable" lands Design timber harvests to achieve desired combination of cover and forage Salvage will be allowed for those areas not in the "suitable" land base

3. Determine the silvicultural system to be used based on an on-the-ground, site-specific analysis.

Water, Soil, and Air·

1. Meet Oregon water quality standards through the application of best management practices Exceptions must be based on scientific rationale, fully maintain existing beneficial use of water, and be approved through an environmental assessment.

Minerals and Geology

1 Ensure that operating plans emphasize protection of and/or mitigation of impacts to riparian-dependent species and that water quality standards are met through the application of best management practices

2 Ensure that operating plans affecting anadromous fish habitat comply with applicable Oregon water quality standards pertaining to water quality and timing of instream activity

Facilities

1 Major and minor access road construction and reconstruction are permissible when these roads are necessary to meet the multiple use objectives on adjacent lands

2 Close roads when necessary to meet wildlife habitat goals

3. Reconstruct and maintain trails for access and to meet adjacent management area objectives, public safety, and reduction of environmental damage

Protection

1 Control, contain, or confine wildfires The specifics on implementation shall depend upon location, expected fire behavior, and values at risk Specify decision criteria in the fire management action plan

2. Use planned ignitions when within prescription to enhance resource values

2. Alternative A The following standards are add or supersede those listed under Alternative NC (see Sec C 2)

Forest-wide Standards

Fish and Wildlife Provide snags and snag replacements to support 60 percent of potential populations of snag-dependent species in wildlife emphasis areas and 40 percent on other Forest lands The Forest-wide goal is to provide snags to support over 40 percent of potential populations of snag-dependent species This will require more snag habitat than under previous land management plans (ie , No Change Alternative), the difference being provision for replacement snags

Management Area 3 A&B Schedule timber harvest in riparian zones for all Class I, II, and III streams classified as "suitable" for timber management as defined in Table II-4 of FEIS

Management Area 15

Wildlife Habitat Management.

1 Manage open road densities, forage and cover to maintain optimum big-game habitat effectiveness, using the Habitat Effectiveness Index.

2 Maintain wildlife tree levels in perpetuity at 60 percent of the potential level of cavity-nesting population.

3. Alternative B-Modified

Forest-wide Standards	Fish and Wildlife. Provide snags and snag replacements to support 80 percent of potential populations of snag-dependent species in riparian zones, at 50 percent adjacent to riparian zone areas, and 40 percent on other Forest lands. The Forest-wide goal is to provide snags to support about 40 percent of potential populations of snag-dependent species. Provide total cover for big-game animals at 40 percent plus or minus 15 percent on spring-summer-fall range, with a minimum of 5 percent in satisfactory cover
Management Area 3 A&B	Schedule timber harvest in riparian zones for all Class I, II, and III streams classified as "suitable" for timber management as defined in Table II-4 of FEIS
Management Area 4A	Delete standards under fish and wildlife.
Management Area 6A	The Berry Creek area will be managed for a wilderness primitive untrailed experience. The remainder of the wilderness will be managed for a wilderness semiprimitive experience.
Management Area 12	Recreation: Manage the following campgrounds to the reduced-service level: Starr, Wickiup, Parish Cabin, Idlewild, Strawberry, Trout Farm, North Fork Malheur, Big Creek, Magone Lake, Yellowjacket, and Canyon Meadows.

4. Alternative C-Modified

Forest-wide Standards	Fish and Wildlife. Provide snags and snag replacements to support 80 percent of potential populations of snag-dependent species in riparian areas, 50 percent within 600 feet of riparian areas, and 60 percent on other Forest lands. The Forest-wide objective is to provide snags to support 60 percent of potential populations of snag-dependent species. No timber harvest is to be scheduled in riparian areas
Management Area 3 A&B	Lands in Management Area 3 (A and B) are classified as "unsuitable" for timber management No timber harvest is to be scheduled for these lands. Salvage will be allowed for those areas in the "unsuitable" land base
Management Area 4B	Description· Management Area 4B is composed of nonclassified portions of the Forest which provide winter habitat for Rocky Mountain elk. These areas are primarily below 5,200 feet in elevation and include nonforested grasslands, bitterbrush and mountain mahogany brushfields, and timbered lands Nonforested areas are generally on southern and western aspects. Landtypes and slopes vary Goals: Enhance the quality of the winter range habitat for deer and elk through timber harvesting, prescribed burning, and other management practices. Standards: The Forest-wide management direction included in Chapter IV, Section E, of the Forest Plan applies to Management Area 4B except where superseded by the following standards:

Recreation

1. Manage for recreation ranging from semiprimitive to roaded modified

2 Discourage winter recreation activities

3. Close areas to use if harassment of big game occurs.

Range

1. Prioritize forage utilization for big-game species, at levels agreed upon between the Forest and the Oregon Department of Fish and Wildlife, for each area

2. Provide forage to meet the needs of that portion of the 100-head Murderers Creek wildhorse herd that graze on the Malheur National Forest

3. Manage livestock grazing at a level to utilize available forage while maintaining plant vigor

4. Schedule cost-efficient range improvements to improve range condition when and where needed

5. Design improvements to protect areas and/or to distribute livestock use

Wildlife.

1. Design and implement management activities to maintain at least 80 percent of the habitat carrying capacity (equivalent to HEI of 0.7 using the Habitat Effectiveness Index) of the winter range per decade through the planning horizon

2. Manage cover to meet size and distribution criteria as described in "Wildlife Habitats in Managed Forests - Blue Mountains of Oregon and Washington," Agricultural Handbook 553 (Thomas et al., 1979)

3. Manage so that a minimum of 15 percent of the forested area will be retained in satisfactory cover If this is not attainable because of low natural potential, create or maintain the highest percentage satisfactory cover attainable

4. Manage to maintain or establish a level of vegetative diversity at a minimum level of 10 percent of the total of each of the five seral stages through the planning horizon as shown below

Seral Stage	Age
I Grass/Forb	0 to 5 years
II Shrub/Seedling	5 to 10 years
III Pole/Sapling	11 to 40 years
IV Immature	41 to 80 years
V & VI Mature/Overmature	81 years plus

Timber:

1. Lands in Management Area 4B are classified as both "suitable" and "unsuitable" for timber management The nonforest grasslands and seral brushfields are "unsuited" for timber management. Schedule timber harvest on the portion of the Management Area classified as "suitable" for timber management.

2. Design scheduled timber harvests on suitable lands to achieve a Habitat Effectiveness Index of 0 7 (80% percent of potential site capability), of which a minimum of 15 percent of the land area will be maintained as satisfactory cover

3. Design silvicultural prescriptions to maintain and improve thermal cover conditions on timber lands Determine the silvicultural system to be used based on an approved, site-specific silvicultural prescription (see Appendix E)

4. Limit activities between December 1 to April 1 when needed to reduce wildlife harassment.

5. Design silvicultural prescriptions to provide for a prolonged period (10-20 years) of browse production Use site-preparation practices to stimulate browse production for wildlife

6. Extend rotations and defer commercial thinning where big-game cover is below an acceptable amount.

7. Utilize uneven-aged management timber harvest regimes where applicable.

Minerals and Geology·

1. Stipulate limiting activity between December 1 through April 1 in mineral leases if necessary to provide for wintering needs of big game. Negotiate the same limitation in operating plans for locatable mineral development

Facilities:

1. Manage transportation systems to eliminate stress on wintering big game.

Protection:

1 Control, contain, and confine wildfire The strategy selected and specifics on implementation shall depend upon location, expected fire behavior, and values at risk Specific decision criteria shall be in the fire management action plan

2. Use planned and unplanned ignitions, when within prescription, to achieve resource management objectives.

Management Area 6A

The Berry Creek area will be managed for a wilderness primitive untrailed experience. The remainder of the Wilderness will be managed for a wilderness primitive trailed experience

Management Area 6C

The Pine Creek Proposed Wilderness will be managed for a wilderness semiprimitive experience. See the standards for Management Area 6A in the Forest Plan for a description of management in a wilderness semiprimitive area.

5. Alternative F

Forest-wide Standards	Fish and Wildlife Provide snags and snag replacements to support 80 percent of potential populations of snag-dependent species in riparian areas, 50 percent within 600 feet of riparian areas, and 40 percent on other Forest lands The Forest-wide objective is to provide snags in perpetuity to support slightly more than 40 percent of potential populations of snag-dependent species Provide total cover for big-game animals at 40 percent plus or minus 15 percent on spring-summer-fall range, with a minimum of 5 percent in satisfactory cover
Management Area 3 A&B	Schedule timber harvest in riparian zones for all Class I, II, and III streams classified as "suitable" for timber management as defined in Table II-4 of FEIS
Management Area 4A	Delete standards under fish and wildlife

6. Alternative I

Forest-wide Standards	Fish and Wildlife Provide snags and snag replacements to support 60 percent of potential populations of snag-dependent species in riparian areas, and 40 percent on other Forest lands The Forest-wide objective is to provide snags to support slightly more than 40 percent of potential populations of snag-dependent species
Management Area 3(A&B)	Management Area 3 (A and B) contains lands classified as both "suitable" and "unsuitable" for timber management No timber harvest is to be scheduled in the interior one-third of all riparian zones in Class I, II, III or IV streams that support significant riparian vegetation In addition, no timber harvest is to be scheduled within the area of riparian influence of any Class I or II anadromous streams Salvage harvests are allowed in the lands classified as "unsuitable" for timber management
Management Area 12	Recreation· Manage all 20 campgrounds to the full service level:
Management Area 13	Provide old-growth replacement stands at one-half of the frequency of "dedicated" old growth stands within the managed forest land base Old-growth replacement stands are considered "suitable" for timber management
Management Areas 20A & 20B	Description Management Areas 20A and 20B are composed of unroaded portions of the Forest which provide wildlife habitat for Rocky Mountain elk, as well as dispersed, primitive recreation These areas are typically indicative of the natural conditions found on the Forest in grasslands, bitterbrush and mountain mahogany brushfields, and timbered lands Nonforested areas are generally on southern and western aspects Landtypes and slopes vary Goals Maintain the primitive recreational experience and maintain or enhance the quality of wildlife habitat, using the Habitat Effectiveness Index for guidance Standards. The management area direction included in Chapter IV, section E, of the Forest Plan applies to this management area except where superseded by the following standards Recreation Manage for dispersed semiprimitive recreation with emphasis on a high-quality big-game hunting experience

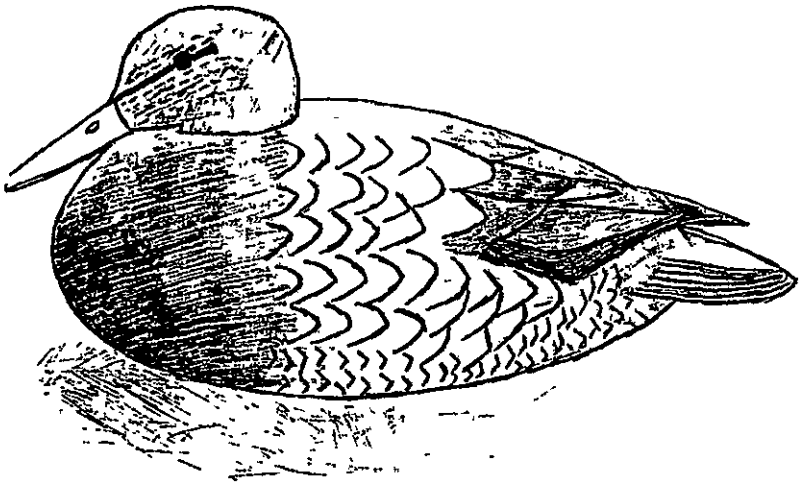
Range. Prioritize forage utilization for big-game species. Maintain livestock grazing at levels commensurate with providing available forage while ensuring plant vigor. Coordinate forage allocation in consultation with Oregon Department of Fish and Wildlife and Oregon Wildlife Commission for each area.

Fish and Wildlife: Manage to provide for high quality wildlife and fish habitat and water quality Manage elk habitat to provide at least 70 percent of elk habitat effectiveness while allowing for scheduled timber harvest

Timber: Timber harvest is to be designed to maintain a natural appearing landscape and high-quality wildlife habitat. Use of uneven-aged management and/or extended rotations is emphasized where applicable, based on site specific silvicultural prescriptions, in conjunction with wildlife habitat and visual recreation objectives.

Management Area 21

These lands are classified as "unsuitable" for timber management. No timber is scheduled on these lands, although harvest is not precluded Timber harvest may occur to accomplish wildlife habitat objectives, as established in a project level environmental analysis.



Appendix E

SELECTION OF HARVEST CUTTING METHODS

APPENDIX E SELECTION OF HARVEST CUTTING METHODS

A. HARVEST CUTTING METHODS

The intent of this appendix is to display the rationale for selection of broad regeneration harvest cutting methods to be applied on the Forest. Site-specific regeneration harvest methods (such as clearcutting, seed tree cutting, or group selection) will be selected and identified in environmental assessments or in silvicultural prescriptions written or approved by certified silviculturists.

The methods of regeneration harvest cutting available with the even-aged silvicultural system are clearcutting, seed tree cutting, and shelterwood cutting Uneven-aged silvicultural systems include the individual tree selection method and the group selection method

B. A DISCUSSION OF EVEN-AGED VERSUS UNEVEN-AGED SELECTION CRITERIA

The criteria used for selection of harvest cutting methods were developed using selection criteria identified in the Regional Guide for the Pacific Northwest Region (1984) and direction provided in 36 CFR 219 27(b) A brief description of the criteria follows A more detailed discussion can be found in those documents

1. Selection Criteria From The Regional Guide

The selected harvest cutting method

a Must permit the production of a volume of marketable trees sufficient to utilize all trees that meet utilization standards and are designated for harvest

b Must permit the use of an available, acceptable logging method which can *remove designated trees without excessive damage to the residual stand while* meeting other established land management objectives Table 3-1 in the Regional *Guide displays the compatibility of logging systems with common harvest cutting* methods. Generally, ground-based logging methods, helicopters, and cable methods using slack-pulling carriages are appropriate for all harvest methods, while cable methods without slack-pulling carriages and balloons are appropriate only for clearcuts.

c Must be capable of providing special conditions that are required to meet resource management objectives Table 3-2 in the Regional Guide displays commonly used harvest methods which achieve desired forest character Generally, both even-aged and uneven-aged methods can meet desired forest character with the exception of a mosaic of forested area and openings and desired wildlife species diversity. In that case, uneven-aged methods are not appropriate

d. Must permit control of vegetation to establish desired numbers and rates-of-growth of trees as well as other vegetation needed to achieve special management objectives Tables 3-3 and 3-4 in the Regional Guide outline these harvest cutting methods Generally, both even-aged and uneven-aged methods can be used in vegetation zones occurring on the Forest, however, uneven-aged methods are not applicable for wildlife forage production or optimum tree seedling and sapling growth

e. Must promote a stand structure and species composition which minimizes serious risk from insects, disease, animal damage, and wildfire, and will allow treatment of existing insect, disease, and fuel conditions. Table 3-5 in the Regional Guide displays harvest cutting methods favorable to the reduction and treatment of these items. Generally, uneven-aged methods are not applicable where dwarf-mistletoe and root disease present serious risks.

f. Must meet multiple use management objectives identified in the Regional Guide and Forest Plan An exception occurs where harvest cutting methods are otherwise provided for by legislation or regulation.

2. Selection Criteria From 36 CFR 219.27(b)

The seven criteria identified in 36 CFR 219 27(b) which direct management prescriptions for the manipulation of tree cover are summarized below

The selected harvest cutting method must:

a. Be best suited to multiple use goals considering biological, environmental, engineering, economics, and other impacts

b. Assure that lands can be adequately restocked.

c Not be chosen primarily because of the greatest dollar return or timber output, although these factors should be considered.

d. Consider the potential impacts on residual trees and adjacent stands

e. Avoid permanent reduction of site productivity and ensure conservation of water and soil.

f. Provide the desired effects to meet special management objectives.

g. Be practical in terms of transportation and harvesting requirements and total costs of timber sale preparation, logging, and administration

3. Combined Selection Criteria

The criteria identified in the Regional Guide and in 36 CFR 219.27(b) were subsequently combined to eliminate duplication of intent and simplify the rationale for selecting the harvest cutting methods used to implement the Forest Plan These seven combined criteria are summarized below:

The selected harvest cutting method

a. Must produce a volume of marketable trees that meet utilization standards and are designated for harvest. (Regional Guide criterion 1.)

b. Must permit the use of an available and acceptable logging method. (Regional Guide· criterion 2; 36 CFR: criterion 4.)

c. Must be capable of meeting special management and multiple use objectives. (Regional Guide: criteria 3 and 6; 36 CFR: criteria 1 and 6)

d Must permit control of vegetation to establish desired species composition, density, and rates of growth (Regional Guide criterion 4; 36 CFR criteria 4 and 6)

e Must promote a stand structure and species composition which minimizes risks from insects, diseases, animal damage, and wildfire (Regional Guide criterion 5.)

f Must assure that lands can be adequately restocked (36 CFR criterion 2)

g Must be practical and economical in terms of transportation, harvesting, preparation, and administration of timber sales (36 CFR criterion 7)

h. Will not be,selected primarily because it will result in the greatest dollar return or provide the highest output of timber, or which permanently reduces site productivity, or could not assure conservation of the water and soil resources (36 CFR: criteria 3 and 5)

C. WORKING GROUPS AND MANAGEMENT AREAS

Both even-aged and uneven-aged harvest cutting methods were available and evaluated for selection within the Forest's species working groups and Management Area combinations The three working groups and their applicable Management Area combinations are summarized as follows

Working Group	Management Area Number(s)
Ponderosa Pine	1, 3A&B, 4A, 5, 13, 14, 20A&B, 21, 22
Mixed Conifer	1, 3A&B, 4A, 5, 13, 14, 20A&B, 21, 22
Lodgepole Pine	1, 3A&B, 4A, 13, 14, 20A&B, 21, 22

D. RATIONALE FOR SELECTION OF HARVEST CUTTING METHODS

The following analysis documents the rationale for selection of regeneration harvest cutting methods within each working group/Management Area based on those combined criteria which have a significant effect on the selection

1. Ponderosa Pine Working Group

a Ponderosa Pine/ Management Area 1

Lands within this Management Area will be managed for timber and forage production, wildlife habitat, dispersed motorized recreation, and visual quality Timber production will be based on the most productive and efficient silvicultural systems developed to their optimum potential Satisfactory tree growth-rates should be maintained and stands should be protected from insect, disease, animal, and wildfire damage Both even-aged and uneven-aged methods are biologically acceptable (Barrett, 1979; Burns, 1983). Even-aged methods generally provide enhanced forage production and may better optimize wildlife species diversity (combined criterion 3). Even-aged methods generally provide for enhanced seedling and sapling growth-rates because of the significant effect of mature or larger trees on height and diameter growth of the understory (Barrett, 1979) (combined criterion 4) For this reason, uneven-aged methods generally produce reduced timber volumes. Clearcutting and/or shelterwood cutting with interplanting allows the introduction of genetically improved stock Where dwarf-mistletoe and root diseases are present, uneven-aged methods are not applicable (combined criterion 5) Even-aged methods are more economical and practical in terms of transportation, harvesting, preparation, and administration (Barrett, 1979, Burns, 1983) (combined criterion 7) Within this working group, periodic use of

prescribed fire reduces fuel accumulations and eliminates undesirable competitive vegetation (Burns, 1983). Even-aged methods are more compatible with this treatment. Uneven-aged methods are biologically acceptable, they generally produce reduced big-game forage, reduced timber yields, increased risk of disease and wildfire, and a considerable increase in management costs and complexity Uneven-aged management can be used to meet special resource objectives in the Management Area (combined criterion 3) For these reasons, both even-aged and uneven-aged regeneration harvest cutting methods are selected for ponderosa pine/Management Area 1

b Ponderosa Pine/ Management Areas 3A and 3B

Lands within this Management Area will be managed for riparian habitat objectives and fisheries, wildlife, timber, and range production Providing vegetation to meet stream surface-shading requirements, water temperature standards, woody debris requirements, and instream habitat maintenance needs is required to meet resource management objectives Timber management, grazing systems, and visual quality objectives will be modified to meet these objectives Both even-aged and uneven-aged regeneration harvest cutting methods are biologically acceptable. Here, the special conditions required to meet management objectives take precedence over economic considerations or timber volume production (combined criterion 3). Uneven-aged methods can best provide for these special conditions by providing continuous site occupancy by vegetation (i e , trees). Tree growth-rates should be sufficient to produce the characteristic tree components needed for shade and large woody debris while maintaining acceptable stand vigor (combined criterion 4) In addition, trees should be managed to minimize risks from insect, disease, animal, and wildfire damage (combined criterion 5) Even-aged methods do not adequately provide for continuous site occupancy and are quite difficult to administer on-the-ground to meet the special conditions needed (combined criterion 7).

c Ponderosa Pine/ Management Areas 4A, 20A&B and 21

Within these Management Areas, the management objective will be to provide optimum and/or near-optimum habitat for big-game species while still producing timber volume, livestock forage, other wildlife habitat, and visual quality. Timber management and grazing systems, along with visual quality objectives, may be modified to meet big-game species objectives Special conditions required to meet the resource management objectives include providing hiding and/or thermal cover, as well as a vigorous forage base. Prescribed burning is often recommended for site preparation and forage enhancement Although both even-aged and uneven-aged regeneration harvest cutting methods are biologically acceptable, even-aged methods often best provide for the special conditions within these Management Areas (combined criterion 3). Uneven-aged methods are generally not applicable where the desired character is a mosaic of forest and openings. In addition, uneven-aged management generally reduces forage and may increase the risk of insect, disease, animal, and wildfire damage For these reasons, the even-aged methods are recommended, but not necessarily prescribed, for the ponderosa pine/Management Areas 4A, 20A&B, and 21.

d. Ponderosa Pine/ Management Area 5	Habitat management for bald eagles will emphasize large, overmature trees potentially useable as roost trees. Suitable trees should be available throughout time and should be widely distributed. A density of eight large trees per acre is satisfactory. Both even-aged and uneven-aged methods are biologically acceptable and can produce these small groups of large trees over time The selected harvest cutting methods must be capable of providing the special conditions which are required to meet the resource management objectives per the Pacific States Bald Eagle Recovery Plan, (combined criterion 3) Timber management systems will be designed to achieve these objectives and may not result in a system which maximizes present net value The selected method should be capable of developing large diameter ponderosa pine roost trees at the appropriate point in the rotation (combined criteria 3 and 4). Either even-aged or uneven-aged methods can be selected here The actual selection should be based on specific site and stand characteristics, and a silvicultural prescription will be developed and documented in an environmental analysis document No scheduled timber harvest activity will occur in this Management Area
e. Ponderosa Pine Management Area 13	Habitat management for old growth and old-growth replacement stands will emphasize large, overmature trees Suitable trees should be available throughout time and should be widely distributed across the Forest A density of 10 large trees per acre is satisfactory Both even-aged and uneven-aged methods are biologically acceptable and can produce large trees over time The selected harvest cutting methods must be capable of providing the special conditions which are required to meet the resource management objectives (combined criterion 3). Timber management systems will be designed to achieve these objectives and will not result in a system which maximizes present net value
f Ponderosa Pine/ Management Areas 14, 20A&B and scenic portions of 22	Ponderosa pine stands will be managed for visual quality, timber production, forage production, and wildlife habitats Management activities will provide a variety of species, snags, and size classes Large, old-growth trees will provide an important stand component in the foreground of the viewing area Both even-aged and uneven-aged regeneration harvest cutting methods are biologically applicable and can provide for the visual variety and maintenance of the large-tree component The special conditions required to meet visual management objectives are the primary consideration (combined criterion 3). While economic returns and timber volume production are also important, they will be modified to meet the visual quality levels of these Management Areas Tree growth-rates should be sufficient to produce the characteristic large-tree component within the rotation age and maintain trees in a healthy condition (combined criterion 4) In addition, trees should be managed to minimize risks from insect, disease, animal and wildfire damage (combined criterion 5) Either even-aged or uneven-aged methods may be selected here Uneven-aged methods may require artificial regeneration to maintain the appropriate species composition and may be restricted to sites where acceptable logging methods can be applied (combined criterion 2) Uneven-aged methods are not applicable where insect or disease conditions cannot maintain stands relatively free of risk (combined criterion 5). The actual selection should be based on specific stand and site characteristics, and a silvicultural prescription will be developed and identified in an environmental analysis document

The selected methods should be capable of producing large-diameter ponderosa pine trees at the appropriate point in the rotation (combined criteria 3 and 4) Either even-aged or uneven-aged methods can be selected here. The actual selection should be based on specific site and stand characteristics, and a silvicultural prescription will be developed and documented in an environmental analysis document. No scheduled timber harvest activity will occur in old-growth stands, but will occur in old-growth replacement stands.

2. Mixed Conifer Working Group

a. Mixed Conifer/ Management Area 1

Lands within this Management Area will be managed for timber and forage production, wildlife habitat, dispersed motorized recreation, and visual quality Timber production will be based on the most productive and efficient silvicultural systems developed to their optimum potential. Satisfactory growth rates should be maintained and stand species composition in this working group should be controlled to produce trees which can maintain satisfactory growth rates and be resistant to insect, disease, wildfire, and animal damage Both even-aged and uneven-aged methods are biologically acceptable. The selection decision is weighted heavily by successional trends and the relative shade tolerance of species present within the mixed conifer working group (Burns, 1983, Minore, 1979). Shade-intolerant species including ponderosa pine, Douglas-fir, western white pine, and western larch are considered more desirable and better meet management objectives for growth and resistance to insect, disease, and animal damage. Uneven-aged management can be used to meet special resource objectives in the Management Area (combined criterion 3). Even-aged management is most desirable to convert old-growth stands to vigorous stands of shade-intolerant species (Burns, 1983) (combined criteria 4 and 5). The even-aged methods are generally more practical and economical in terms of transportation, harvesting, preparation, and administration of timber sales (combined criterion 7). Both even-aged and uneven-aged methods are selected for the Mixed Conifer/Management Area 1.

b. Mixed Conifer/ Management Area 3A and 3B

Lands within these Management Areas will be managed for riparian habitat objectives and fisheries, wildlife, timber, and range production. Providing vegetation to meet stream surface-shading requirements, water temperature standards, woody debris requirements, and instream habitat maintenance needs is required to meet resource management objectives. Timber management, grazing systems, and visual quality objectives will be modified to meet these objectives Both even-aged and uneven-aged regeneration harvest cutting methods are biologically acceptable The special conditions required to meet management objectives take precedence over economic consideration or timber volume production (combined criterion 3) Uneven-aged methods can best provide for these special conditions through providing continuous site occupancy by vegetation (i.e , trees). Tree growth rates should be sufficient to produce the characteristic tree components needed for shade and large woody debris while maintaining acceptable stand vigor (combined criterion 4). In addition, trees should be managed to minimize risk from insect, disease, animal, and wildfire damage (combined criterion 5). Even-aged methods do not provide continuous site occupancy and are quite difficult to administer on the ground to meet the special condition called for (combined criterion 7). For these reasons, the uneven-aged methods are recommended for the Mixed Conifer/Management Area 3.

c. Mixed Conifer/ Management Areas 4A, 20A&B, and 21

Within these Management Areas, the primary management objective will be to provide optimum or near optimum habitat for big-game species while still producing timber volume, livestock forage, other wildlife habitat, and visual quality Timber management, grazing systems and visual quality objectives may be modified to meet big-game species objectives Special conditions required to meet the resource management objectives include providing hiding and/or thermal cover, as well as a vigorous forage base Prescribed burning is recommended for site preparation and forage enhancement Although both even-aged and uneven-aged harvest cutting methods are biologically acceptable, even-aged methods can best provide for the special conditions within this Management Area (combined criterion 3) Uneven-aged methods are generally not applicable where the desired character is a mosaic of forested areas and openings. In addition, uneven-aged management generally reduces forage and increases risk of insect, disease, animal, or wildfire damage. For these reasons, the even-aged methods are generally recommended for the Mixed Conifer/Management Areas 4A, 20A&B, and 21.

d Mixed Conifer/ Management Area 5

Habitat management for bald eagles will emphasize large, overmature trees potentially usable as roost trees Suitable trees should be available throughout time and should be widely distributed A density of eight large trees per acre is satisfactory Both even-aged and uneven-aged methods are biologically acceptable and can produce the small groups of large trees over time The selected harvest cutting methods must be capable of providing the special conditions which are required to meet the resource management objectives, per Pacific States Bald Eagle Recovery Plan (combined criterion 3) Timber management systems will be designed to achieve these objectives and may not result in a system which maximizes present net value

The selected methods should be capable of producing large-diameter ponderosa pine roost trees at the appropriate point in the rotation (combined criteria 3 and 4) Either even-aged or uneven-aged methods can be selected here. The actual selection should be based on specific site and stand characteristics, and a silvicultural prescription will be developed and documented in an environmental analysis document. No scheduled timber harvest activity will occur in this Management Area

e. Mixed Conifer/ Management Area 13

Habitat management for old growth and old-growth replacement stands will emphasize large, overmature trees. Suitable trees should be available throughout time and should be widely distributed across the Forest. A density of 15 large trees per acre is satisfactory. Both even-aged and uneven-aged methods are biologically acceptable and can produce large trees over time The selected harvest cutting methods must be capable of providing the special conditions which are required to meet the resource management objectives, per Pacific States Bald Eagle Recovery Plan (combined criterion 3) Timber management systems will be designed to achieve these objectives and may not result in a system which maximizes Present Net Value.

The selected methods would be capable of producing large-diameter Douglas-fir, white fir, or ponderosa pine trees at the appropriate point in the rotation (combined criteria 3 and 4) Either even-aged or uneven-aged methods can be selected here The actual selection should be based on specific site and stand characteristics, and a silvicultural prescription will be developed and identified in an environmental analysis document No scheduled timber harvest activity will occur in old-growth stands, but will occur in old-growth replacement stands

f. Mixed Conifer/ Management Areas 14, 20A&B and scenic portions of 22

Mixed conifer stands will be managed for visual quality, timber production, forage production, recreation, and wildlife habitat, with visual quality being the primary management objective Management activities will provide a variety of species, snags, and size classes. Large old-growth trees will provide an important stand component in the foreground of the viewing area Both even-aged and uneven-aged regeneration harvest cutting methods are biologically applicable and can provide for visual variety and maintenance of the large-tree component.

The special conditions required to meet visual management objectives are the primary consideration (combined criterion 3) While economic returns and timber volume production are also important, they will be modified to meet the visual objectives of this Management Area Tree growth-rates should be sufficient to produce the characteristic large-tree component within the rotation age and maintain trees in a healthy condition (combined criterion 4). In addition, trees should be managed to minimize risks from insect disease, animal, and wildfire damage (combined criterion 5). Either even-aged and uneven-aged methods may be selected. Uneven-aged methods may require artificial regeneration to maintain the appropriate species composition and may be restricted to sites where acceptable logging methods can be applied (combined criterion 2) Uneven-aged methods are not applicable where insect or disease conditions cannot maintain stands relatively free of risk (combined criterion 5) The ultimate selection should be based on specific stand and site characteristics, and a silvicultural prescription will be developed and documented in an environmental analysis document

3. Lodgepole Pine Working Group

a Lodgepole Pine/ Management Area 1

Lands within this Management Area will be managed for timber and forage production, wildlife habitat, dispersed motorized recreation, and visual quality Timber production will be based on the most productive and efficient silvicultural systems developed to their optimum potential Satisfactory growth-rates should be maintained and stands protected from insect, disease, animal, and wildfire damage. While some variation does occur, the lodgepole pine type is generally considered to be a pure, even-aged, single-storied, overly dense forest (Burns, 1983). This stand structure and condition have provided the setting for a catastrophic mountain pine beetle epidemic The mature infested and susceptible stands will be converted to less-susceptible, young stands within a 15- to 20-year period. Although both even-aged and uneven-aged regeneration harvest cutting methods are biologically acceptable (Burns, 1983), the current stand structure and catastrophic condition strongly favor even-aged methods

With an annual harvest program in lodgepole pine designed to change current susceptible stand structure and/or to salvage dead or dying lodgepole pine, strong consideration must be given to methods which are practical and economical in terms of transportation, harvesting, and timber sale preparation and administration (combined criterion 7). This is particularly significant in view of current, relatively low, stumpage values for lodgepole pine. Opportunities for forage production are generally more favorable using even-aged methods (combined criterion 3). Desired tree growth-rates and resistance to future mountain pine beetle epidemics can generally be maintained with greater success using even-aged methods (Schmidt and Alexander, 1985) (combined criterion 5). For these reasons, even-aged methods are recommended for the Lodgepole Pine/Management Area 1

b Lodgepole Pine/ Management Areas 3A and B	Lands within these Management Areas will be managed for riparian habitat needs and fisheries, wildlife, timber, and range production The lodgepole pine type is generally considered to be a pure, even-aged, single-storied, overly dense forest (Burns, 1983) Providing vegetation to meet stream surface-shading requirements, water temperature standards, woody debris requirements, and instream habitat maintenance needs is required to meet resource management objectives Timber management, grazing systems, and visual quality objectives will be modified to meet these objectives Both even-aged and uneven-aged harvest cutting methoo are biologically acceptable (Burns, 1983) The current stand structure and catastrophic mountain pine beetle epidemic conditions strongly favor even-aged methods Management will differ from timber production on the rest of the forest primarily in scale to meet special conditions and maintain healthy vigorous, manageable stands (combined criteria 3, 4, and 5) For these reasons, the uneven-aged and even-aged methods with reduced cutting unit size are recommended for the Lodgepole Pine/Management Areas 3A and 3B
c Lodgepole Pine/ Management Areas 4A&B, 20A&B, and 21	Within these Management Areas, the management objective will be to provide optimum and/or near-optimum habitat for big game species while still producing timber volume, livestock forage, other wildlife habitat, and visual quality levels Timber management, grazing systems, and visual quality objectives may be modified to meet big-game species objectives Special conditions required to meet the resource management objectives include providing hiding and/or thermal cover, as well as a vigorous forage base Prescribed burning is recommended for site preparation and forage enhancement Although both even-aged and uneven-aged regeneration harvest cutting methods are biologically acceptable, the current stand structure, catastrophic mountain pine beetle epidemic, and special conditions strongly favor even-aged methods (combined criteria 3 and 5) Uneven-aged methods are generally not applicable to lodgepole pine type or where the desired character of the landscape is a mosaic of forested lands and openings In addition, uneven-aged management generally produces reduced amounts of big-game forage and has an increased risk of insect, disease, animal, and wildfire damage The transportation system and entry frequency necessary for the management of uneven-aged lodgepole pine stands may be uneconomical due to the low value of the species (combined criterion 7) For these reasons, the even-aged methods are recommended for Lodgepole Pine/Management Areas 4A and 4B
d Lodgepole Pine/ Management Areas 14, 20A&B and scenic portions of 22	Lodgepole pine stands will be managed for their site-specific visual quality objectives, timber production, forage production, recreation opportunities, and wildlife habitat While economic returns and timber volume production are also important, they will be modified to meet the visual quality levels of this Management Area Lodgepole pine will be managed to increase species and size-class diversity and maintain stands in a healthy condition The stand structure and condition as well as operational constraints common to the timber Management Area will apply Although both even-aged and uneven-aged methods are biologically acceptable (Burns, 1983), the even-aged method is strongly favored Management will differ from the general forest primarily in scale Emphasis will be placed on retention of islands of healthy, immature lodgepole pine, trees of other species, and native ground vegetation Even-aged methods are selected to meet these special management objectives (combined criterion 4).

E. SITE-SPECIFIC HARVEST METHOD SELECTION CRITERIA

Site-specific regeneration harvest methods (such as clearcutting, seed tree cutting, shelterwood cutting, selection or group selection) will be selected and identified in environmental assessments or in silvicultural prescriptions written or approved by certified silviculturists Overall guidance will be provided by the FORPLAN solution for a given alternative Various rationale for selecting a particular site-specific silvicultural prescription are as follow·

1. General - Vegetation Management Practices

All vegetative Management Practices on forested lands will be preceded by a silvicultural examination, an on-the-ground analysis of the area, and a site-specific prescription written or reviewed by a certified silviculturist The prescription process considers direction and objectives set forth in this appendix, Chapters II and III, site-specific factors, and a review of the applicable technical and scientific literature, as well as practical experience The prescription will detail the actual vegetative manipulation to be implemented on a case-by-case basis. The standards for all silvicultural systems in the Pacific Northwest Regional Guide will also be used in determining the silvicultural system to be implemented.

The silvicultural prescription process is a concurrent activity with the interdisciplinary team process in preparing projects Prescriptions are formulated within Forest Plan guidance to achieve specific objectives of Management Areas The full range of silvicultural systems (individual tree selection to clearcut) are available for use on the Malheur National Forest The selected vegetative Management Practices for individual sites will comply with Management Requirements listed in 36 CFR 219 27(b)

2. Regeneration

The following paragraphs discuss regeneration harvest method criteria The reader should note that in this Final Environmental Impact Statement, no attempt has been made to distinguish between the grand fir (Abies grandis) and the white fir (Abies concolor) species mix White fir and grand fir hybrids are known to occur east of the Oregon Cascade Mountain Range (Zobel, 1973)

a. Clearcutting

Clearcutting, as a silvicultural system, will be employed to harvest timber under this plan This method is selected on the basis of physical and biological site factors, and existing timber types, as well as overall economics Clearcutting will be selected only when it is determined to be the optimal silvicultural system.

Clearcutting allows considerable flexibility in determining the character and composition of future timber stands The species, degree of stocking, etc. can be controlled with various silvicultural techniques This is especially useful in situations where existing stands are occupied by less valuable and undesirable species, or the current species composition is at high risk for losses due to insects or disease

The clearcutting method, in general, is the most economical regeneration harvest system to employ Since all merchantable timber is removed, the volume and value per acre treated and accessed is maximized

Fuels treatment and subsequent silvicultural treatments are also less costly than with other systems, since there is a residual stand to be protected

Clearcutting can be detrimental if applied to sites where physical conditions will change to extremes of heat and cold if the Forest cover is totally removed In these cases, regeneration efforts can be difficult and costly Clearcutting may also be the most effective harvest method to achieve the desired multiple use objectives of a stand. An example is a big-game winter range where clearcutting is the most successful system for maximizing growth of suitable browse vegetation

Following are general descriptions of sites and situations when clearcutting may be selected as the optimal harvesting method. Not all possible sites and situations are listed; however, since site-specific, on-the-ground analysis may identify situations where clearcutting may be the optimal method, and conditions do not meet those in the following descriptions, it is also probable that clearcutting may not be the optimal method for all the lands that fit these broad descriptions.

(1) The moisture and temperature regimes of the site, following clearing, will be favorable for regenerating the desired species In general, north and east aspects fit this category, but conditions can vary by geographic location

(2) The existing stand is stocked with species that are not desired in the regenerated stand because of disease or insect susceptibility, or the physiological condition of the existing overstory is such that natural regeneration is unlikely to occur

(3) The change in forested appearance created by the harvest opening does not conflict with objectives for visual management

(4) Management objectives for the area can be better achieved by clearing all other trees in one operation (e g , increasing browse and forage for wildlife or livestock)

Clearcutting is most likely to be prescribed for the mixed conifer plant communities and it will also be the predominant silvicultural system for regenerating lodgepole pine stands Examples of these plant communities include

white fir/big huckleberry (Abies grandis/Vaccinium membranaceum),
white fir/twinflower/forb (Abies grandis/Linnaea borealis/forb),
ponderosa pine/Douglas-fir/ninebark (Pinus ponderosa/Pseudotsuga menziesii/Physocarpus malvaceus),
mixed conifer/pinegrass (Pseudotsuga/Abies/Calamagrostis)

b. Shelterwood

The shelterwood silvicultural system will also be used to harvest timber under this plan In a shelterwood system, the basic objective is to have the second crop of trees started on a site before all of the standing timber is removed

Shelterwood systems are used in situations where the physical site conditions created by clearcutting would be too harsh for tree regeneration or would not be favorable to the establishment and growth of the desired species The residual stand provides protection from temperature extremes on the site and modifies the climatic factors in general The shelterwood system also offers that opportunity to reduce regeneration costs, if factors are suitable for establishing natural regeneration from the seed source provided by the residual stand

Shelterwood systems can also be the most effective means of achieving multiple use objectives in some instances. One example is those cases where visual quality objectives are retention or partial retention. In many cases the larger, more commercially valuable trees are left standing after the initial harvest entry. This reduces the volume and value per acre removed in the initial harvest entry, thereby increasing the unit costs of access and harvesting in many cases.

Once regeneration is established, removal of the residual stand requires careful harvest planning and implementation to protect the new crop of trees.

Following is a list of general factors that will be considered when determining whether or not the shelterwood system will be applied to a specific site. A site-specific silvicultural prescription may consider additional factors and timber sale conditions.

(1) The existing stand is stocked with species that are desired in the regenerated stand and the physiological condition of the trees is such that seed production and successful regeneration are likely to occur.

(2) The moisture regimes and temperatures on the site are such that without some shading and cover, conditions will become too harsh for tree regeneration. South and west aspects generally fit into this category, but conditions can vary by location

(3) Management objectives for the area can best be achieved by maintaining some tree cover on the site until regeneration is established.

Shelterwood harvesting is most likely to be prescribed on the warmer/drier ponderosa pine and Douglas-fir plant communities. Some examples of these plant communities include:

ponderosa pine/Douglas-fir/elk sedge (Pinus ponderosa/Pseudotsuga menziesii/Carex geyeri)
ponderosa pine/Douglas-fir/snowberry-ocean spray (Pinus ponderosa/Pseudotsuga menziesii/Symphoricarpos-Holodiscus discolor)
mixed conifer/pinegrass (Pseudotsuga/Abies/Calamagrostis) (Hall, 1973)

In prescribing shelterwood harvest methods, consideration will be given to future harvests required. The feasibility of removing the residual overstory from an established stand of seedlings, effectiveness of site preparation/slash treatment, and options such as artificial shading shall be considered when prescribing shelterwood harvests.

c. Selection Harvests

Individual tree and group selection harvest methods may be applicable to certain combinations of timber management and other resource objectives identified by the land assignments in the Plan. The most probable situations for implementing these silvicultural systems would be in riparian areas and in areas with visual quality objectives of retention or partial retention. Selection harvest methods should be evaluated when harvesting is scheduled in areas with these resource objectives.

3. Intermediate Harvests

Intermediate harvests such as commercial thinnings will generally be prescribed only in stands that have not reached the culmination of mean annual increment Salvage or sanitation harvest may be considered as intermediate treatments in stands that have already culminated in growth, but cannot be harvested and regenerated because of multiple use constraints on scheduling (maintaining wildlife cover). This treatment may be considered in lodgepole pine stands that are considered high risk for mountain pine beetle infestation.

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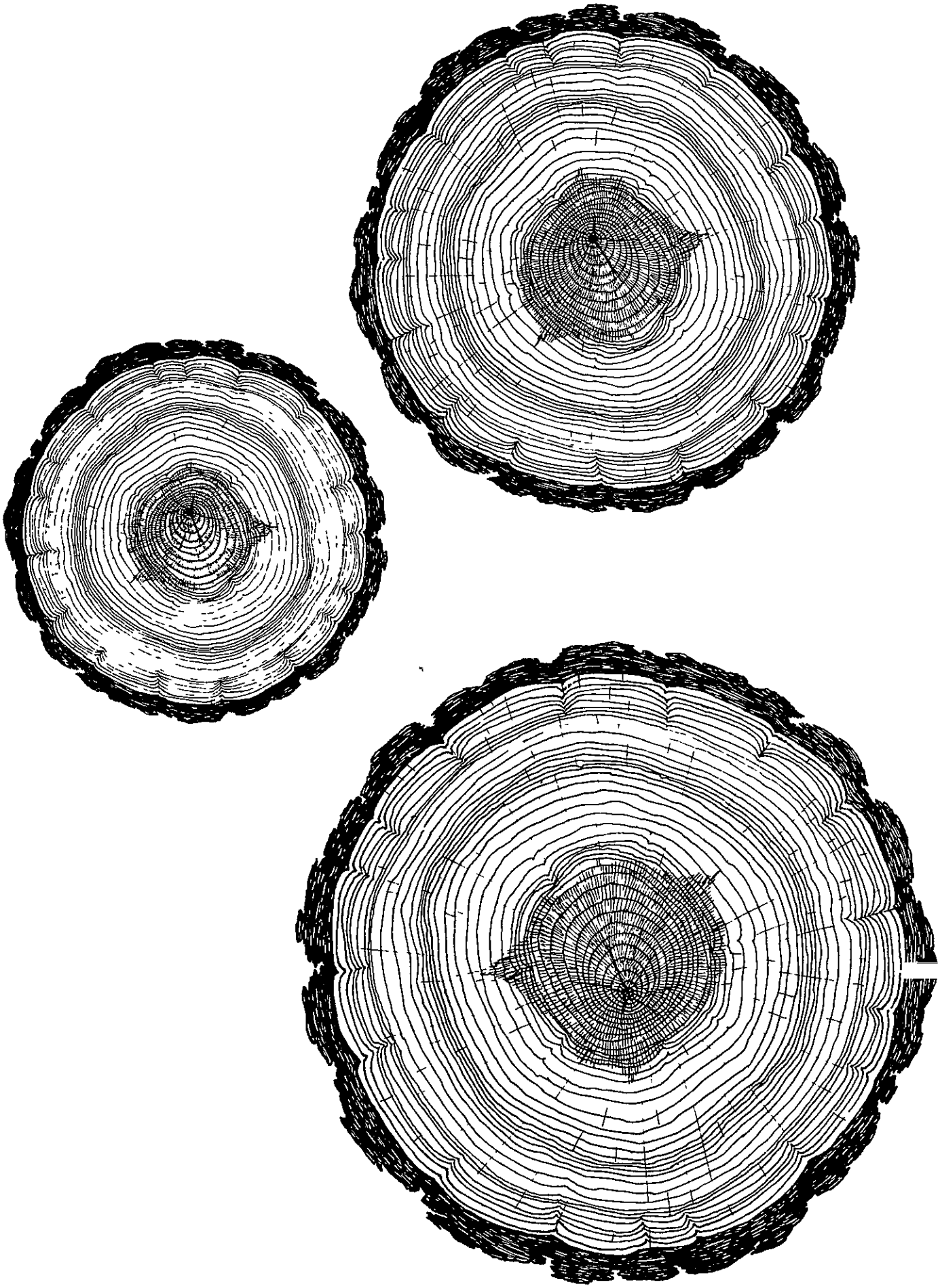


Appendix F

MINERALS

APPENDIX F MINERALS

A. ISSUES, CONCERNS, OPPORTUNITIES

Most of the region's income is derived from agriculture and the timber industry. The considerable undeveloped mineral potential of the region provides a significant employment opportunity. Concern about the possible environmental damage that could occur from mineral development (particularly open-pit or placer mining) has been expressed by the public. Today, mineral developers meet a number of environmental protection laws and restore the land to a usable form upon completion of their operations Environmental protection is monitored by Federal and State agencies

The Mining and Minerals Policy Act of 1970 states " . it is the continuing policy of the Federal Government .to foster and encourage private enterprise in (1) the development of economically sound and stable domestic mining [and] minerals . industries, [and] (2) the orderly and economic development of domestic mineral resources [and] reserves . to help assure satisfaction of industrial [and] security needs. . " Many support this position based on a desire to maintain a favorable balance of trade, to provide for the national defense, and to support the local economy Since the economics of mineral extraction is based almost entirely on external factors, there is little the Forest can do to encourage development other than to keep areas of mineral potential open and to make administrative processing of mineral activities as efficient as possible

A continuing concern of Forest management is mining law compliance. Occupancy of structures on mining claims provides a case in point. Under existing law, the holder of a valid claim may erect structures necessary for mineral development. However, there have been instances of structures being built and occupied on mining claims and being used for purposes unrelated to mining Abuses of this sort have been greatly reduced in recent years, and the effort is still underway to correct them.

Mineral resources are frequently located in areas which are valued for timber production, recreation, wildlife, and scenery The axiom that "gold is where you find it" applies to all other minerals as well. As long as there is a demand for minerals, there will be pressure to explore and develop them. As a land managing agency, the Forest Service must make sure adequate surface protection measures are included for the extraction of minerals and subsequent reclamation of National Forest land

B. CURRENT SITUATION

1. Locatable Minerals

Locatable mineral deposits on public domain lands may be prospected for and extracted under the 1872 mining law, as amended and supplemented. Administration of the general mining laws is the responsibility of the Bureau of Land Management, within the Department of the Interior. A 1957 memorandum of understanding between the Bureau of Land Management and Forest Service provides for joint administration of the mining laws on National Forest System lands. Regulations covering surface use of the National Forests under the mining laws were promulgated in 1974 to provide for orderly development of locatable mineral resources and for subsequent reclamation of the land

The Forest is in the heart of the most productive gold and silver region in the state of Oregon. Other metals including copper, chrome, mercury, and cobalt have also been produced in the Forest vicinity. (See discussion in Chapter III of the Environmental Impact Statement.) Both lode and placer mines have made substantial contributions to total production figures. At 1983 prices, northeastern Oregon's historic mineral production would have been worth over $1.9 billion. Historic metal production from the vicinity of the Forest would be worth $51 million. (See EIS Chapter III, Section D). There are currently 1,860 mining claims on the Forest.

Although metallic mineralization occurs in several areas across the Forest, the most productive deposits have been found in pre-Tertiary rocks on the margins of Mesozoic granitic intrusives, particularly on the south slope of the Greenhorn Mountains and in the vicinity of Canyon Mountain. The placer gold production from the old Canyon mining district makes that area the largest gold producer in the state.

Most of the mining activity in the area was stopped in 1942 when War Production Board Order L-208 closed all precious metals mines. Increased operating costs and a fixed gold price, together with the substantial expenditures necessary to reactivate mines neglected for several years, prevented the reopening of all but a few precious metals mines after the war. Only recently, with the increase in gold and silver prices, has the area re-emerged as a focus of mining interest. There are currently thousands of lode and placer claims in the mineral belt of northeastern Oregon and western Idaho.

Due to recent gold discoveries and encouraging exploration results, up to 40,000 new mining claims have been staked on the Bureau of Land Management land in southeastern and eastern Oregon. There are areas of similar geology in the southeastern and eastern portions of the Forest and future exploration in these areas is likely.

All lands on the National Forest are open to mining except those areas specifically withdrawn from mineral entry. Also, mineral reservations and outstanding mineral rights exist on some of the land on which the Forest administers the surface resources.

The Wilderness Act of 1964 allowed prospecting for locatable minerals and location of mining claims until December 31, 1983. The passage of that date has withdrawn the Strawberry Mountain Wilderness from mineral entry, and the Oregon Wilderness Act of 1984 has withdrawn considerable additional acreage Mining claims which predate withdrawal, including those within wilderness, may continue to be worked under the mining laws if they contain a valid discovery of a valuable mineral.

2. Leasable Minerals

Oil and Gas· The Forest Service has no statutory responsibility to issue leases or permits on lands reserved from the public domain. The Mineral Leasing Act of 1920 reserves this authority for the Secretary of the Interior. The Federal Onshore Oil and Gas Leasing Reform Act of 1987 provides the Secretary of Agriculture with consent authority for issuance of oil and gas leases on National Forest System lands. This Act also provides that permits to drill on an oil or gas lease will not be granted without the analysis and approval of the responsible Forest Service official. On acquired National Forest System lands, the Mineral Leasing Act for Acquired Lands of 1947 requires consent by the Secretary of Agriculture prior to leasing of the mineral estate.

Western portions of the Forest are within the Columbia Basin of Oregon and Washington. The basin has been recognized for many years to have a potential for oil and gas within or beneath the layers of lava known as the Columbia River Basalt. Exploration has been limited and sporadic due to the hard drilling in, and difficulty of exploring beneath, the basalt. Carbonaceous sediments provide a potential source of oil and gas, and porous volcanics provide suitable reservoirs. Recently, numerous interests including major oil companies, have obtained leases in the vicinity To date, no drilling has occurred.

Geothermal: Although a few hot springs are known to occur in and near the Forest, there does not presently appear to be a high potential for geothermal resource development Currently, there are no geothermal leases or lease applications within the Forest boundaries The U.S. Geological Survey considers some lands prospectively valuable for geothermal resources in the vicinity, some of which partially overlap the Forest boundaries Should an interest in geothermal exploration develop, the Geothermal Steam Act of 1970 requires that geothermal leasing on National Forest System lands be subject to the consent of and conditions prescribed by the Secretary of Agriculture

3. Mineral Materials

Sand, gravel, crushed rock, building stone, and some limestone occur within the Forest boundaries These are all low unit-value mineral materials which must be near transportation routes, and usually the point of consumption, to be utilized The Forest Service may dispose of obviously common varieties of mineral materials such as cinders, building stone used for construction purposes, river rock, and rock or sand to be used for aggregate or road construction.

Table F-1 displays evaluation criteria used to delineate and categorize mineralized areas in the Forest vicinity New discoveries could change the assessment of potential, as well as identify new areas outside those shown in this assessment.

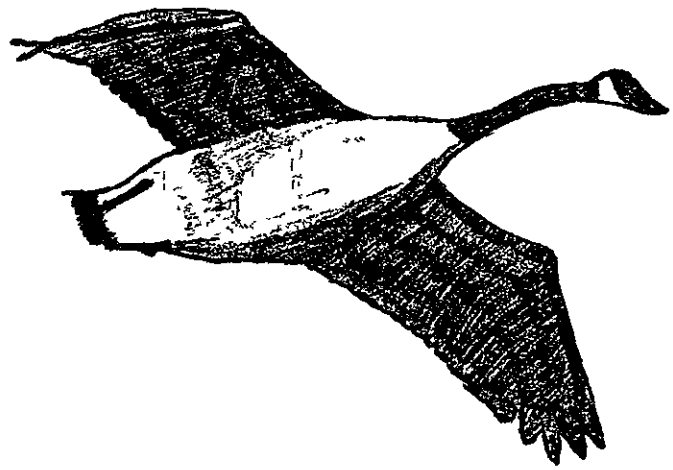


TABLE F-1

EVALUATION CRITERIA FOR LOCATABLE MINERALS

	CATEGORY	I	II
1	Potential for Substantial Development/ Production Within 10 Years	High	Moderately high
2.	Current Activity Level	Production or development in progress or pending investment decision.	Comprehensive exploration, development likely. May include some small-scale production.
3	Land Position	Long-term maintenance of claims by established mineral companies/ individuals.	Long term.
4.	Geology	Known and favorable for development of significant ore deposits.	Known and considered favorable from comparison with other producing districts.
5	Reserve/Resource	Ore reserves established. Will sustain significant production.	Presence of, or strong potential for, substantial resource May include small reserves.

*Includes all areas not in other categories.

III	IV	V *
Moderate	Low	Very low based on current knowledge
Exploration programs which may include sampling, geochemical and geophysical surveys, geologic mapping, reconnaissance drilling May include some hobby-size producers	Sporadic exploration with occasional isolated intense programs by companies or prospectors	Occasional interest by prospectors.
Intermittent by established mineral companies/individuals, long term by prospectors	Short term by established companies/individuals Intermittent by prospectors.	Sporadic.
Not well known, but appears to have favorable characteristics.	Not well known, some favorable characteristics.	Either unknown or unfavorable
Potential for large resource is unknown Small resources, possibly some very small pockets of reserves	Some mineral occurrences, but not to establish resources.	Unknown.

C. DESCRIPTIONS

Area boundaries were drawn on the basis of information gathered from the references at the end of the text. Factors taken into consideration include the geology, historical production information, available sample data, and present mining claim records derived from Bureau of Land Management files See Table F-1 for an explanation of the categories. Note that Category V includes "all other" areas, both unknown and unfavorable for mineral deposits. It would be difficult to differentiate these areas on a map, since new discoveries sometimes result in mines being located in areas previously considered unfavorable.

1. Ben Harrison Peak - Category II

This area is centered around Ben Harrison Peak in the Greenhorn Mountains and includes parts of the old Greenhorn and Desolation Creek mining districts. Most of the area is north of the Malheur within the Umatilla National Forest Dominant rock type is Jurassic or Cretaceous quartz diorite and granodiorite. Late Paleozoic and Triassic argillite, gabbro, serpentinite, and serpentinite matrix melange are exposed locally A few patches of tuffaceous sedimentary rocks and basaltic flows of Tertiary age locally cap the older rocks (Brooks et al., 1983).

Mineralization generally consists of sulfides in northeasterly striking quartz veins, stringers, and breccia zones. Silver is the dominant metal, but gold is also present. Ore minerals include pyrite, arsenopyrite, sphalerite, galena, tetrahedrite, chalcopyrite, molybdenite, stibnite, pyrargyrite, and stephanite (Brooks et al , 1983).

Mine	Location	Production	References
Morris	Sec 1, T. 10 S., R. 34 E	$48,400	Brooks and Ramp, 1968 Brooks et al., 1983
Silver Bell	Sec. 2, T 10 S., R. 34 E	$ 4,000	Brooks et al , 1983
Tempest	Sec. 10, T. 10 S , R. 34 E.	$10,000	Brooks et al., 1983; Lindgren, 1901
Total		$62,400	

Estimated metal content· 500 oz of gold; 96,000 oz. of silver

The area is currently heavily claimed and has recently been the subject of substantial exploration activity One mine, the Tempest, is being developed and mined on a small scale Continued exploration and development of the silver-gold properties in the area can be expected in the near future

2. Black Butte - Category IV

This is a small area located on the northwestern slope of Black Butte at the southeastern corner of Fox Valley It is well outside of all of the old mining districts, and there is little published reference to it other than old newspaper articles (OR Dept. Geol., 1984) The host rock is Tertiary rhyolite in which gold occurs locally along fractures. Placer gold was initially discovered and worked along Mine Creek, primarily at the Cohoe Mine. It was later traced to its source and the Black Butte Mine (lode) was developed There are no production records, although it is reported that small lode and placer operations were sustained for several years

A few lode and placer claims are currently held in the area, and a small seasonal production comes from the placer deposits The Black Butte Mine workings have been heavily disturbed by surface prospecting, making it difficult to interpret the geology of the deposit It is of interest in that it is one of very few Tertiary gold occurrences known in northeastern Oregon Some exploration of the lode mineralization and continued small-scale placer mining can be expected to continue.

3. Dixie - Category IV

This area is located south and east of Dixie Butte It joins the Quartzburg area on the west and the Middle Fork area on Davis Creek to the northeast. Most of the area is underlain by metavolcanics of Permian or Triassic age. Tertiary volcaniclastics cover the metavolcanics near Dixie Summit and along the upper portion of Davis Creek Andesitic flows of Tertiary age extend down Davis Creek toward the Middle Fork of the John Day River (Brown and Thayer, 1966) Scattered patches of gold-bearing gravels are found in the upper portion of the Davis Creek drainage

Most of the lode prospects are near the boundary of the adjacent Quartzburg area. None show evidence of production Placer deposits have been worked in the past along Davis Creek, but there is no record of production A few of the lode prospects are currently under claim, but there is little evidence of recent activity Placer claims are currently held along Davis Creek and the North Fork of Bridge Creek. The Davis Creek placers have been the subject of recent attempts at commercial scale mining Most of the near-term mining activity can be expected to take place along the upper portions of Davis Creek

4. Flagtail Mountain - Category IV

This area is north and east of Flagtail Mountain at the southern end of the old Murderers Creek mining district. Bedrock in the area is predominantly Triassic and Jurassic graywacke, siltstone, mudstone, shale, and tuff with some sandstone, limestone, and andesitic flows and breccia (Brown and Thayer, 1966). A few mercury and gold prospects are found in the area (Brooks, 1963) Mineralization occurs in shear zones and bedding plane fractures.

Past production:

Mine	Location	Production	References
Broadway	Sec. 7, T. 16 S., R. 29 E	21 lbs. Hg	Brooks, 1963
Roba-Westfall	Sec. 6, T. 16 S., R. 29 E.	8 fl. Hg	Ibid.

There currently are a few lode claims scattered through the area. The association of mercury and gold mineralization indicates some potential for epithermal gold deposits and may therefore invite exploration efforts.

5. Greenhorn - Category III

This area is in the vicinity and to the north of the historic mining town of Greenhorn, in the Greenhorn Mountains. It is largely within the Wallowa-Whitman and Umatilla National Forests, with only its southwestern-most portion extending onto the Malheur National Forest. It includes a portion of the old Greenhorn mining district. All of the bedrock in the Malheur portion of the area is late Paleozoic and Triassic in age. Dominant rock types are serpentinite and serpentinite matrix melange Metavolcanics, gabbro, and argillite are also found in the area (Brooks et al., 1983; Ferns et al , 1983).

Mineralization is confined to quartz veins and gouge zones in serpentinite which contain talc, carbonate, and sulfides, including chalcopyrite, and sphalerite (Ibid). Many more deposits in a variety of rock types are found within the area outside of the Malheur National Forest.

Estimates of past production from mines within and adjacent to the Malheur National Forest:

Mine	Location	Production	References
Diadem and Brindle Horse	Sec. 17, T. 10 S , R. 35 E.	$ 1,800	Brooks et al., 1983
Psyche	Sec. 17, T. 10 S., R. 35 E.	$90,000	Ibid.
Total		$91,800	

Estimated metal output. 4,400 oz of gold; 800 oz. of silver.

Numerous lode claims now cover the Malheur portion of this area, but only a limited amount of small-scale prospecting activity is currently taking place. The apparently small size of the mineral targets has discouraged larger companies from actively exploring the area. Continued prospecting and small-scale mining can be expected to take place, but largely to the north and east off the Malheur National Forest.

6. Idol City - Category III

This area is located approximately 15 miles north-northeast of Burns, and includes the old Harney or Idol City - Trout Creek mining district Rock is Tertiary andesite which has been mineralized along an altered northerly trending shear zone Mineralization consists of gold and silver associated with base metal sulfides (Parks and Swartley, 1916)

Past production estimates:

Mine	Location	Production	References
Trout Creek placers	Secs 4 and 5, T 21 S , R. 32 E.	$50,000	Parks and Swartley, 1916

Estimated metal content. 2,400 oz of gold; 600 oz of silver.

There was some development work on the lode deposits in the past, but no production.

Recently, the entire area has been under claim to one company actively exploring for epithermal gold deposits It is too early to determine the future of the property If exploration results should eventually prove favorable, development and some mining could take place within 10 years. With marginal or negative results, the area will probably remain the focus of sporadic exploration

7. Middle Fork - Category IV

This is an area of placer gravels along the Middle Fork of the John Day River and some of its tributaries, extending from Vinegar Creek on the east to the Forest boundary on the west Streams entering the Middle Fork from the north drain the old Susanville, New Eldorado, and part of the Greenhorn mining districts This area merges with the south slope area below the old settlement of Galena. Ruby Creek, flowing in from the south, drains the northern portion of the Quartzburg mining district. Most of the Middle Fork within the area flows over Tertiary volcanic mudflow deposits. Above Hunt Gulch, Tertiary basaltic to andesitic flows form the bedrock and below Camp Creek, late Paleozoic to Triassic argillite, phyllite, and chert are exposed (Brooks et al., 1983, Ferns et al., 1984). Most of the gold bearing gravels are in alluvium from the present drainage system Tertiary gravels in the upper portion of the Bear Creek drainage have been worked for placer gold.

Past recorded production:

Mine	Location	Production	References
Middle Fork dredging	Middle Fork Below Elk Creek & On DeWitt Ranch	$808,000	OR. Dept. Geol., 1984

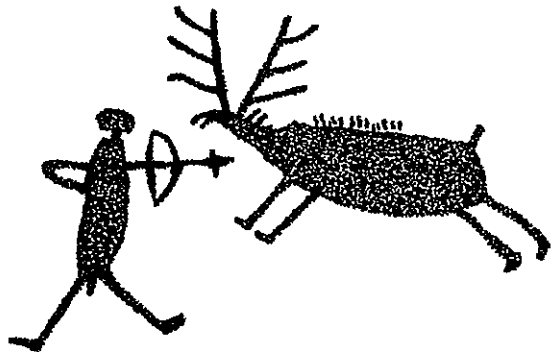
Estimated metal content: 23,000 oz. of gold; 3,900 oz. of silver.

Much of the Middle Fork has already been mined and/or is in private ownership. Land parcels along unmined stretches of the river which have been recently brought under Federal ownership have been claimed and some test pits have been dug. Given high enough gold prices, it is likely that there will be increased exploration and some mining of unworked gravels along the Middle Fork and its gold-bearing tributaries.

8. Quartzburg - Category III

This area is predominantly within the Dixie Creek drainage, north of Prairie City, west of Dixie Butte, and south of the Middle Fork of the John Day River. It includes the old Quartzburg mining district. A wide variety of rock types are exposed, including: Permian and Triassic metavolcanics, serpentinite, and sedimentary rocks; various Mesozoic intrusives; and Tertiary volcanic and sedimentary rocks. All of the rock types show localized alteration, but all of the known economic mineralization occurs within the pre-Tertiary rocks (Brooks et al., 1984).

Mineralization occurs along northeasterly trends in quartz-tourmaline replacement bodies and in narrow quartz vein-shear zones. Ore minerals include pyrite, chalcopyrite, arsenopyrite, marcasite, cobaltite, glaucodot, erythrite, tetrahedrite, bornite, malachite, sphalerite, galena, bismuthinite, and native bismuth (Brooks and Ramp, 1968; Brooks et al., 1984). The district has produced gold, silver, copper, and cobalt.



Past production estimates for properties on and adjacent to the Forest:

Mine	Location	Production	References
Copperopolis	Sec. 1, T 12 S , R 33 E	250 tons	Brooks and Ramp, 1968
Dixie Meadows	Secs 23 and 24, T 11 S , R 33 E	$100,000	Ibid.
Equity	Secs. 2 and 11, T 12 S , R 33 E	$500,000	Ibid
Keystone	Secs 2 and 11, T. 12 S , R 33 E	$ 37,800	Brooks et al , 1984
Standard	Sec 12, T 12 S , R. 33 E	$ 82,000	Ibid , OR Dept Geol. Files
Total		$719,800	

Estimated metal content· 31,800 oz of gold, 16,700 oz. of silver, 272,000 lbs of copper; unknown cobalt

Currently, mining claims are clustered around the Dixie Meadows Mine on the Forest and on Bureau of Land Management land just south of the Forest boundary. Other scattered prospects in the delineated area are also claimed The Dixie Meadows Mine receives most of the attention and has recently been explored by numerous companies which have taken an interest in the area. Continued exploration can be expected in the area, with the possibility of development and production on one or more of the properties

9. *South Slope* - Category IV

This is a large area predominantly along the south slope of the Greenhorn Mountains It connects with the Middle Fork area along some of the drainages and at the west end near Galena A portion of it extends into the Desolation Creek drainage north of Boulder Butte and is contiguous on the east with the Greenhorn-Whitney area on the Wallowa-Whitman National Forest Included are portions of the old Greenhorn, New Eldorado, and Susanville mining districts. A wide variety of rock types are exposed in the area, including late Paleozoic to Triassic argillites, cherts, metavolcanics, gabbro, serpentinite, and serpentinite-matrix melange; Jurassic or Cretaceous quartz diorite and granodiorite intrusives; and Tertiary volcaniclastics and flows and sedimentary units (Brooks et al., 1983; Ferns et al., 1983, Ferns et al., 1984; Brown and Thayer, 1966).

Numerous lode and placer prospects are scattered across the area. All known lode mineralization of economic significance occurs in quartz veins and shear zones in the pre-Tertiary rocks, although some local alteration and disseminated pyrite are found in the Tertiary volcanics. Several drainages have evidence of past placer mining on Quaternary and reworked Tertiary gravels.

Past production estimates:

Mine	Location	Production	References
Belmont	Sec 30, T. 10 S., R. 35 E.	$ 9,000	Brooks et al , 1983
Morning	Sec. 13, T. 10 S., R. 34 E.	$20,000	Ibid.
Total		$29,000	

Estimated metal content: 800 oz of gold, 2,700 oz of silver.

Numerous lode and placer claims are currently held in the area--particularly at the eastern and western ends. Activity consists of general reconnaissance, small-scale prospecting of lode deposits, and testing of placer gravels. Generally unsuccessful attempts have recently been made at commercial exploitation of placer gravels in the Big Creek drainage. A molybdenum anomaly in the upper portion of Big Creek has recently received exploration attention from a major mining company, but has been dropped. Continued lode exploration and small-scale placer development/production can be expected in the near future.

10. Strawberry - Category III

This is a large area along the north slope of the Strawberry Mountains, extending from just west of John Day and Canyon City to Indian Creek on the east. The old Canyon City mining district is included in the area Bedrock over most of the area is Triassic gabbro, peridotite, dunite, and serpentinite, with a few patches of Permian metavolcanics (Brown and Thayer, 1966). Canyon Creek (within the area, but outside the Forest) has had very substantial placer gold production. Portions of the area within the Forest are known primarily for their chromite occurrences, although some gold prospects are located on the Forest near Little Canyon Mountain. Chromite occurs as irregular lenses and pods in the peridotite, dunite, and serpentinite (Thayer, 1940). Gold mineralization occurs in pockety quartz-calcite veins in gabbro, pyroxenite, and serpentinite (Brooks and Ramp, 1968).

Past production from mines within or adjacent to the Forest·

Mine	Location	Production	References
Celebration	Sec. 30, T 14 S , R 33 E	684 lt 40% Cr ore	Thayer et al., 1981
Chambers	Sec. 13, T 14 S., R 32 E	6,000 lt 32% Cr ore	Thayer, 1940
Dry Camp	Sec 8, T. 14 S., R 33 E.	363 lt 40% Cr ore	Ibid
Iron King	Sec. 18, T 14 S , R 32 E	6,500 lt 32% Cr ore	Ibid
Kingsley	Sec 9, T 14 S , R 32 E	200 lt 45% Cr ore	Ibid
Marks and Thompson	Sec 10, T 14 S., R 33 E	400 lt 30% Cr ore	Ibid
Ray	Sec 20, T. 14 S., R. 33 E.	965 lt 38% Cr ore	Thayer et al., 1981
Total		15,112 lt 33% Cr ore*	

• Chromic oxide (Cr_2O_3)

There are currently many claims located on or near known chrome occurrences within the Forest Most of the claims for gold are outside the Forest boundaries A resource of 208,000 tons of 22 percent chromic oxide was identified in this area by the Bureau of Mines through field work conducted between 1939 and 1942. Less than 1,000 tons has since been mined (Hundhausen et al , 1956; Thayer et al , 1981) The recent interest in chrome as a strategic metal caused an increase in claim staking and exploration However, the limited size, spotty distribution, and difficulty in exploring concealed deposits reduce the attractiveness of the area as a source for major chrome production

11. Susanville - Category II

This area is centered around the old mining camp of Susanville in the Susanville mining district. Dominant rock types are late Paleozoic and Triassic metamorphic rocks including phyllite, quartzite, and schist, with some slate, greenstone, serpentinized peridotite, and gabbro Numerous aplite dikes of Jurassic or Cretaceous age cut the older rocks Tertiary volcaniclastics and flows cover the pre-Tertiary rocks in the eastern part of the area (Brown and Thayer, 1966) Mineralization occurs in quartz veins related to northeasterly trending fault zones which roughly parallel the schistosity of the metamorphic rocks Some mineralization is related to the aplite dikes Ore minerals include pyrite, marcasite, arsenopyrite, pyrrhotite, sphalerite, galena, stibnite, tetrahedrite-tennantite, and chalcocite (Brooks and Ramp, 1968).

Past production:

Mine	Location	Production	References
Badger	Sec. 7, T. 10 S., R. 33 E.	$ 500,000	Brooks and Ramp, 1968
Misc. lode mines	Secs. 5-8, T. 10 S., R 33 E.	$ 600,000	Ibid.
Susanville	Elk Creek plus others	$ 50,000	Ibid.
Total		$1,150,000	

Estimated metal content: 40,000 oz. of gold; 646,000 oz. of silver.

The area is presently covered with lode and a few placer claims, including mineral trends extending under the Tertiary volcanic cover. One company has been aggressively exploring the area around the old Badger Mine. Given satisfactory results, development and production could reasonably be expected within a few years. The indications of mineralization are sufficient to maintain an interest in the area even if the present program fails to develop a mine.

12. Unity - Category II

This area just touches the extreme eastern point of the Malheur National Forest and is predominantly on the Wallowa-Whitman National Forest. The southern end of the area, in the vicinity of the Malheur, includes hydrothermally altered wacke and siltstone of Jurassic age and diorite and quartz diorite of Cretaceous age. Disseminated copper-molybdenum mineralization has been found within the altered zone (Brooks and Ferns, 1979).

The Malheur portion of the area is away from any historic mining activity, and it is unlikely that any substantial mining activity will take place in this vicinity in the immediate future. All of the mining claims are held by one company which has maintained an interest in the area for several years.

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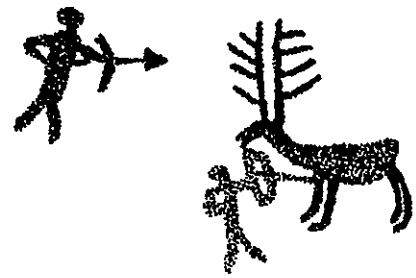


Appendix G

INFORMATION REGARDING MANAGEMENT REQUIREMENTS

APPENDIX G INFORMATION REGARDING MANAGEMENT REQUIREMENTS

A. PURPOSE

This appendix is included in the Environmental Impact Statement (EIS) 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 "Management Requirements" (MRs) in Forest Plan alternatives The appellant requested that the appropriateness of the MRs 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 (or specifications) for implementation of the Management Requirements are found in Appendix D of this Environmental Impact Statement

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 G, "Sensitivity Analysis for Management Requirements" located in the Environmental Impact Statement is not brought forward into the Environmental Impact Statement as no changes have been made to it

B. BACKGROUND OF MANAGEMENT REQUIREMENTS

1. 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 Management Requirements (MRs) 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 (MRs)" will be used in this appendix to refer to these NFMA regulations instead of "Minimum Management Requirements" (MMRs) used in the Draft Environmental Impact Statement and 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 Chapter II and 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:

a Maintenance of habitat to assure viable populations of fish and wildlife populations, particularly mature and old-growth habitat,

b. Protection of water resources, particularly water temperatures; and

c Size and dispersion of created openings (harvest dispersion).

These Management Requirements are described in greater detail in later sections of this appendix. Management Requirements for 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.

2. Legal Requirements vs. Implementation Methods

The Management Requirements from National Forest Management Act 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 in the Regional Guide. Additional specifications identified on the Forest are listed as Standards in EIS, Appendix D 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. 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 Value (PNV) or Allowable Sale Quantity (ASQ) involved.

The distinction between "ends" and "means" is not always clear. The National Forest Management Act and implementing regulations clearly describe the "end" regarding viable populations of vertebrate species. However, in the case of harvest dispersion Management Requirement, the "end" is not well defined. National Forest Management Act specifies that harvest openings be limited to a prespecified size and be dispersed, but does not specifically state the reason (or end) to be accomplished by doing so The implementing regulations and the Regional Guide comply with NFMA by specifying maximum size of created openings (harvest units), and describing how they are to be implemented to achieve a dispersed standard Limited size and dispersal of harvest openings have no clear precedent regarding "means" or "ends" though for the purpose of this analysis it is treated as though it were an "end" in itself

3. How Implementation Methods Are Developed To Meet The Management Requirements

The selection of means sufficient to meet Management Requirements is based on effectiveness in meeting resource protection and on minimizing reductions to Present Net Value or Allowable Sale Quantity. The general process used in evaluating alternative ways of meeting the Management Requirements is as follows.

a. Identify the desired "end" for each Management Requirement.

b. Assemble existing information about the resources addressed by the Management Requirements

c. 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 G-1.

d. Develop various ways or means to meet the Management Requirement See Table G-2.

e. Evaluate the effectiveness of the alternative means in meeting the Management Requirements Estimate the environmental effects of each set of means.

f. Estimate, for each set of means, 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).

g. Where opportunity costs of meeting a Management Requirement exceed two percent of Present Net Value or Allowable Sale Quantity 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 and reductions in Allowable Sale Quantity that result from implementing resource protection measures (means or ways) to meet the Management Requirements set forth in National Forest Management Act regulations In order to provide protection for water quality and wildlife habitat on Malheur 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 G-1 summarizes each of the Management Requirements (ends) subject to analysis of opportunity costs on the Malheur National Forest and summarizes the specifications or standards of achievement for those ends. Table G-2 shows the alternative means considered for implementing each Management Requirement where the opportunity costs exceeded two percent. (Note: Two percent was the threshold defined as significant.)

TABLE G-1

SUMMARY OF MANAGEMENT REQUIREMENTS AND ASSOCIATED SPECIFICATIONS

MANAGEMENT REQUIREMENTS		SUMMARY OF SPECIFICATIONS	
1	Protect Water Quality	a	Dissolved oxygen concentrations not less than 75% of saturation at low flow, and not less than 95% of saturation during spawning and incubation periods
		b	Temperature increase of two degrees F or less when 66 degrees F. or less and no measurable increase when 68 degrees F or more
		c	Turbidity increases of 10% or less
		d	pH within range of 6.5 to 8.5 in John Day River basin and 7.0 to 9.0 in Malheur River basin
2	Habitat provided that maintains viable populations of existing native and non-native vertebrate species -Pileated woodpecker and pine marten	a	Maintain mature conifer stands of adequate size and distribution to allow interaction among breeding pairs of dependent species [See G-6, 7 and 8]
3	Openings created by timber harvest activities are dispersed and limited in size	a	Maximum created openings of 40 acres (with some exceptions)
		b	Limited to 1/3 size and perimeter of adjacent natural openings
		c.	Corners of two or more created openings may touch, but considered a single opening and cannot exceed 40 acres (with some exceptions) if they are not stocked with trees 4 1/2 feet tall
		d.	Protect vegetation along edge of natural openings at all times.
		e	Site must be adequately stocked with trees 4 1/2 feet tall before a harvest area is considered a closed stand and not an opening

TABLE G-2

SUMMARY OF ALTERNATIVE MEANS CONSIDERED FOR IMPLEMENTING EACH MANAGEMENT REQUIREMENT

MANAGEMENT REQUIREMENTS	SUMMARY OF SPECIFICATIONS
1 Protect streams and streambanks	a. Set-aside streamside vegetation (no scheduled timber harvest).
	b. Selective harvest of streamside vegetation (scheduled timber harvest).
2. Provide for adequate habitat to maintain viable populations of existing native and desired non-native vertebrate species -Pileated woodpecker and pine marten	a Manage habitat sites on 240 year rotations.
	b. Dedicate habitat sites for no timber harvest.
3 Harvest dispersion	a. For all tree species, assume 10 years to grow to 4 1/2 feet in height to consider an opening "closed" or no longer an opening.
	b. For lodgepole pine, assume 10 years and for all other tree species, consider 15 years to grow to 4 1/2 feet in height to consider an opening "closed" or no longer an opening.

In analyzing the effects of the alternative means of meeting the MRs on Present Net Value and Allowable Sale Quantity, FORPLAN runs were made with and without constraints designed to simulate meeting the Management Requirement. The Present Net Value 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 Present Net Value) in managing Malheur National Forest resources. It also identifies the Allowable Sales Quantity 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. 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

4. Implementation Methods with High Opportunity Costs

Table G-3 displays the opportunity costs of the implementation measures selected for meeting Management Requirements on the Malheur National Forest Only those implementation measures with opportunity costs of two percent or larger are shown: water quality, mature conifer/old growth (for pileated woodpecker, pine marten) and dispersion of openings

TABLE G-3

OPPORTUNITY COST OF MEETING THE MANAGEMENT REQUIREMENTS WITH THE SELECTED IMPLEMENTATION METHODS

	FIRST DECADE ALLOWABLE SALE QUANTITY MMCF/YR [1] (MMBF/YR)[2]	CHANGE IN ALLOWABLE SALE QUANTITY[3]	PRESENT NET VALUE MM$ [4]	CHANGE IN PRESENT NET VALUE
PNV Benchmark with no protection measures	53 3 (304 9)	--	638 6	--
Opportunity Cost Approximate Change.				
Opportunity Cost of Selected Water Quality Implementation Methods	0 6 (3.5)	1%	14.5	2%
Opportunity Cost of Selected Old-Growth Implementation Methods (for pileated woodpecker, and pine marten)	2 6 (14 9)	5%	20 9	3%
Opportunity Cost of Selected Created Openings (Harvest Dispersion) Implementation Methods	2.5 (14.0)	5%	55 2	9%

1/MMCF/YR = Millions of cubic feet per year
2/MMBF/YR = Millions of board feet per year, assuming 5.72 MMBF per MMCF
3/Percent change calculated on cubic foot basis
4/MM$ = Millions of dollars

5. Implementation Methods With Low Opportunity Costs

Management Requirements for other wildlife habitat requirements for Threatened and Endangered Species, Sensitive Species, 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.

6. 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. 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 G for these Management Requirements.

C. WATER QUALITY MANAGEMENT REQUIREMENTS

1. Source of the Water Quality Management 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 6, 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 (BMPs) which the Forest Service then agrees to continue

2. Specifications For The Water Quality Management Requirements

State of Oregon water quality standards (Oregon Administrative Rules 340-41-602 through -615 and -802 through -815) provide specifications to be met by implementation methods selected by the Forest. They are summarized below

a. Dissolved oxygen concentration shall not be less than 75 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.

b No measurable increases shall be allowed when stream temperatures are 68 degrees F. or greater.. or more than 2 degrees F increase due to all sources combined when stream temperatures are 66 degrees F. or less..

c 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.

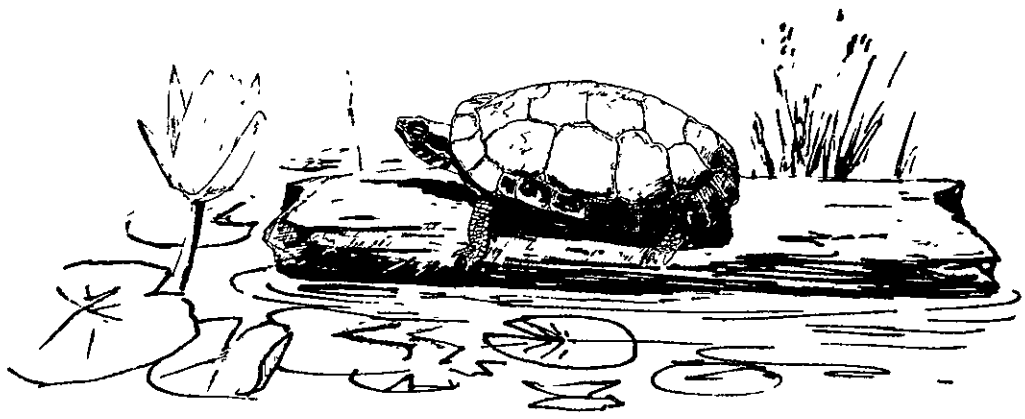
d. pH values shall not fall outside. 6 5 to 8 5 in the John Day basin and 7.0 to 9.0 in the Malheur basin

On the Malheur National Forest, most of the activities which affect water quality are related to livestock grazing, timber harvesting, and erosion from roads These activities include removal of trees, road construction, burning of brush and organic debris, and grazing of riparian vegetation along stream banks (For more discussion, see FEIS Chapter IV, "Soil and Water" section)

The primary approach to maintaining water quality on Malheur National Forest lands is to maintain sufficient vegetation along stream banks which maintains stream temperatures within acceptable limits

This analysis discusses the approach to maintaining sufficient shade producing vegetation to meet water temperature requirements

In the FEIS, the specifications established by the Forest are called Standards The required watershed condition, and the Standards that indicate achievement of the water quality Management Requirement are described in the Forest Plan and in the EIS, Appendix D The following specifications are addressed in this appendix.



3. Alternative ways Of Meeting The Management Requirements For Water Quality

Alternative ways for 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 Present Net Value. (FORPLAN constraints are discussed in Draft EIS Appendix B, "Development of Management Requirements.") The following alternatives were considered:

a. Alternatives Considered in Detail

(1) Alternative 1

Set-aside Shade Producing Streamside vegetation (no scheduled timber harvest): This alternative is designed to minimize vegetation disturbance and does not allow timber harvest. No shade providing vegetation would be removed (no scheduled timber harvest) in riparian areas.

(2) Alternative 2

Selective Harvest of Shade Producing Streamside Vegetation (scheduled timber harvest): This alternative allows removal of shade producing vegetation from the riparian area Uneven-aged management is by single tree selection in the ponderosa pine type and group selection in the mixed conifer and lodgepole pine types. Even-aged management may also be featured in these types depending on the site-specific silvicultural prescription that meets the riparian management objectives.

Alternative 2 would result in less streamside shading than Alternative 1 simply because Alternative 2 allows removal of shade-producing vegetation. This approach is designed to maintain existing water temperatures in streams within a watershed 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 watershed as a whole and the expected results are viewed as a net change over time (zero)

4. Evaluations 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

a. Opportunity Costs

The opportunity costs of implementation methods for meeting water quality Management Requirements were estimated by comparing the differences in Present Net Value and Allowable Sale Quantity that occur in FORPLAN runs of the (PNV) Benchmark with and without the constraints that simulate the means for accomplishing the required condition.

Table G-4 compares the Present Net Value and Allowable Sale Quantity opportunity costs of the alternative implementation methods (means) for water quality protection.

TABLE G-4

OPPORTUNITY COSTS ASSOCIATED WITH ALTERNATIVE MEANS FOR MEETING THE WATER QUALITY MANAGEMENT REQUIREMENTS

	FIRST DECADE ALLOWABLE SALE QUANTITY MMCF/YR [1] (MMBF/YR) [2]	CHANGE IN ALLOWABLE SALE QUANTITY [3]	PRESENT NET VALUE MM$ [4]	CHANGE IN PRESENT NET VALUE
PNV Benchmark	53 3 (304 9)	--	638 6	--
Opportunity Cost Approximate Change.				
Opportunity Cost of Meeting Management Requirements With Alternative 1 (no vegetative removal)	2 1 (11.8)	4%	43 5	7%
Opportunity Cost of Meeting Management Requirements With Alternative 2 (selected vegetative removal)	0 6 (3 5)	1%	14 5	2%

1/MMCF/YR = Millions of cubic feet per year
2/MMBF/YR = Millions of board feet per year
3/Percent change calculated on cubic foot basis
4/MM$ = Millions of dollars

b. Consequences of Alternative Ways or Means of Meeting Water Quality

The opportunity costs of not removing any shade producing vegetation in riparian areas for watershed protection are four to five percent greater than the alternative that removed selected shade producing vegetation. This alternative would go beyond simply adhering to the requirement of meeting temperature specifications over time, as the temperature would be enhanced (lowered) as more shade would be provided. The no vegetative removal alternative would enhance fish habitat

c. 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 National Forest Management Act regulations Consequently, interpretations and processes for meeting these requirements are already established on the ground

Alternative 2 represents current practices that have been developed through interaction among soil scientists, hydrologists, foresters, biologists and other professionals. Compliance with these requirements is in large part a result of cooperation with the State of Oregon. Specialists from state and federal land management agencies agreed to the watershed Standards (specifications) that were written and included in the Malheur National Forest Draft EIS. Changing the methods for achieving the specifications may require new state certification processes

By implementing Alternative 2 the Forest would meet minimum state water quality Standards throughout the planning period while minimizing Present Net Value and Allowable Sale Quantity opportunity costs

d. Implications for Forest Plan Alternatives

Final Environmental Impact Statement Chapter II and Appendix B discuss the effects of this alternative way of meeting water quality requirements in Final EIS alternatives The analysis of opportunity costs of selected means of water quality protection shown in Table G-4 shows the maximum Present Net Value and Allowable Sale Quantity effects. Actual Plan alternatives will have somewhat less opportunity costs as overlaps from lands withdrawn for wildife, scenery, recreation or other nontimber objectives will help to provide shade producing vegetation

e Role of Monitoring and Research

The assumption that leaving shade producing vegetation on riparian areas is based on extensive research that describes the importance of water temperature for water quality and habitat that maintains viable populations of fish.

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

D. MANAGEMENT REQUIREMENTS FOR VIABLE POPULATIONS OF EXISTING NATIVE VERTEBRATE SPECIES

1. 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 nonnative 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 ensure continued existence in the planning area In order to ensure 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)

2. Description Of The Management Requirements

All vertebrate species in Region 6 were assessed with regard to population numbers and/or distribution that could result in either Forest or Regional extinction during the Plan period for 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 G-5 displays current Regional Management Requirement direction regarding limited habitats and wildlife species by sub-regional zones. The Malheur National Forest is in Zone IV, Blue Mountains

The pileated woodpecker and pine marten are the only species for which alternative ways of meeting Management Requirements are evaluated Management requirements were not established for three-toed woodpecker habitat because the timber management strategy for lodgepole pine habitat should provide a significant amount of old-growth type Forest-wide Furthermore, large acreages of old-growth lodgepole pine habitat have recently been attacked by mountain pine beetles, which precludes designation in many areas at the present time. Management Requirements for Threatened and Endangered Species, sensitive species, 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 G-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 & VI)	*Northern Spotted Owl Marten Pileated Woodpecker	*Northern Spotted Owl Marten Pileated Woodpecker	*Northern Spotted Owl Marten Pileated Woodpecker Three-toed Woodpecker	Pine Marten Pileated Woodpecker Three-toed Woodpecker
	*The Final Supplemental Environmental Impact Statement and subsequent Record of Decision will establish direction for management of spotted owl habitat in Region 6			
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 that there was not a need to address wildlife in addition to fish species as indicators for Management Requirements in riparian zones. Coordination of this process with adjacent Forests was necessary to determine consistency.			
Big-game		Mt. Goat	Mt. Goat (Wenatchee)	
T&E 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 bases 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 the Management Requirement context exactly, professional judgement was used to apply the information in estimating habitat needs. When information was not available, habitat needs were developed using professional judgement of a number of the more knowledgeable biologists on the subject. Information from existing research was used whenever possible.

Specific information on habitat needs, specifications for meeting habitat requirements, and alternative ways of meeting the Management Requirements for pine marten and pileated woodpecker 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 judgement (Guenther and Kucera 1978, Phillips et al., 1981.)

Dispersal Distance Between Habitats:
The guideline on distribution of habitat areas is intended to establish a network that allows individuals of a species to successfully disperse to adjacent habitat areas This provides interactions among individuals and prevents isolation of sub-populations This guideline is called the dispersal distance. Research information alone is generally not adequate to establish reasonable dispersal distances between habitats. As a result, dispersal distance is often determined on the basis of observations, experience, and professional judgement In establishing the network of habitat areas for each species, consideration is given to habitats in reserved areas and to habitat areas being established for other species.

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.

3. Specifications For Meeting Habitat Requirements For Pileated Woodpecker and Pine Marten

Approximately 35 wildlife species are known to depend on or prefer mature conifer habitat during some part of their life cycle on the Malheur National Forest. By providing a dispersion of mature/old-growth conifer habitat sites for the pileated woodpecker and pine marten, we are assuming that the other species preferring these types of habitats will have adequate habitat to maintain viable populations throughout the planning period Timber management strategies for lodgepole pine habitat will provide a substantial excess of old growth Forest-wide for indicator species such as the three-toed woodpecker.

Regional specifications for pileated woodpecker and pine marten are discussed in the following sections. The specifications are summarized from "A Report on Management Requirements for Forest Planning on the National Forests of the Pacific Northwest Region, 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. There is no data specific that would indicate that smaller habitat size or greater dispersal distances (biological requirements or specifications) would be appropriate minimum levels Therefore, alternatives which addressed changes to size or distribution were not considered in developing the Forest Plan for the Malheur National Forest

Habitat specifications for pileated woodpecker and pine marten are summarized in Tables G-6 and G-7

TABLE G-6

PILEATED WOODPECKER HABITAT REQUIREMENTS (ZONE IV, BLUE MOUNTAINS) 1/

Principal Habitats Used	Dispersal Distance Between Habitats	Size of Area to which Wildlife Prescriptions Apply	Habitat Requirements to be Used in Analyses
1 Reproducing		600 acres/pair	Within a 1,000 acre unit:
Seral Stages V and VI of Kuchler types K11, K12, K14, K15, and riparian.	One habitat area for every 12,000 acres		a. Maintain 300 acres of conifers in seral stages V and/or VI, per pair for reproducing
2 Feeding			
All seral stages of Kuchler types listed for reproducing habitat, provided snags are present			a. Maintain a minimum average of 2 hard snags per acre greater than or equal to 12 inches dbh, within the 300 acre reproductive area. Of these 600 snags, 42 should be greater than or equal to 20 inches dbh.
			b 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
			c Maintain a minimum average of 2 hard snags per acre greater than or equal to 10 inches dbh on an additional 300 acres for feeding.

1/Malheur National Forest is in Zone IV, Blue Mountains. Principal habitats used vary by zone in the Region.

TABLE G-7

PINE MARTEN HABITAT REQUIREMENTS (ZONES III AND IV)[1/]

Principal Habitats Used	Dispersal Distance Between Habitats	Size of Area to Which Wildlife Prescriptions Apply	Habitat Requirements to be Used in Analyses
1. Reproducing			Maintain 160 contiguous acres of conifer in seral stages V or VI with a crown closure 50 percent or greater.
Seral stages V and VI of Kuchler types K4, K12, K13, K14, K15, and lodgepole climax.	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).	Within the 160 acre unit: Maintain an average of 2 hard snags per acre greater than or equal to 12 inches dbh Of these 320 snags, 24 should be greater than or equal to 20 inches dbh.
2. Feeding			
Seral stages III-VI of Kuchler types K4, K11, K12, K13, K14, K15, and lodgepole climax			Maintain a minimum average of 6 down logs per acre at least 12 inches dbh and 20 feet long.

1/ Malheur National Forest is in Zone IV, Blue Mountains. Principal habitats used vary by zone in the Region.

a. 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 et al. (1978), and Thomas (1979).

Dispersal Distance Between Habitats:
An initial five-mile maximum dispersal distance between habitats resulted from professional judgement documented in Phillips and Roberts (1985) In June of 1986, the distance between habitats was modified to one habitat for every 12,000 to 13,000 acres (about 5 miles apart) to allow greater flexibility in application. Irwin (1987) suggested that this distance could be greater, but also noted that dispersal distances of juvenile pileated woodpeckers are poorly known. He offered no concrete alternative to the five-mile distance.

Size of Habitat Areas

The size of areas used for nesting and roosting by pileated woodpeckers in Region 6 has been identified as a range of from 100 to over 810 acres The Region defined 300 acres of old growth or mature timber for nesting and roosting sites, plus 300 acres of feeding area as a Region-wide requirement to meet the needs of pileated woodpeckers both east and west of the Cascades. A nesting and roosting area of 300 acres appears to be an average for different habitats. As more data specific to westside and eastside habitats (eastside may be further subdivided) becomes available, the size of the nesting area may be adjusted (Bull and Meslow, 1977, Bull, 1975, Mannan, 1982, Mellen, 1987) Mellen (1987) has already suggested an increase in foraging and nesting habitat area in westside habitats based on results from radiotelemetry of pileated woodpeckers in the Oregon Coast Range 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 G-6 for summary of habitat specifications

b. Pine Marten Specifications

Principal Habitats Used

The pine marten uses seral stages IV-VI closed sapling-pole, large mature, and old growth (Thomas, 1979, Guenther and Kucera, 1978, Phillips et al , 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 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

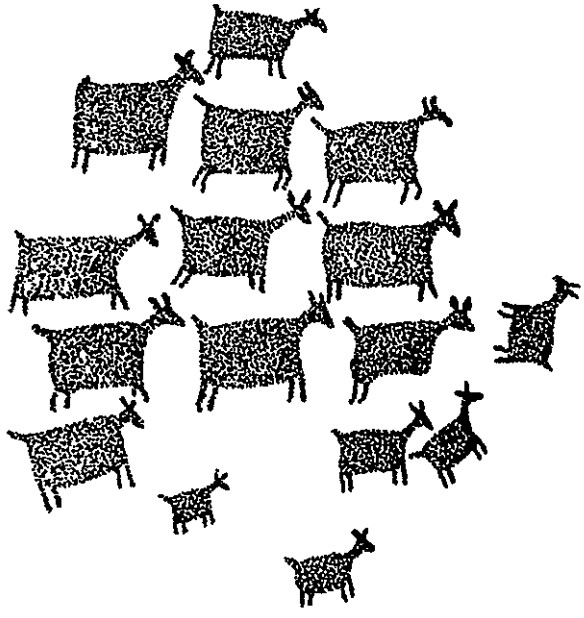
Juvenile marten dispersal up to 25 miles has been observed (Hawley and Newby, 1957 and Jonkel, 1959), and average juvenile dispersal distances greater than six miles were observed in these studies and in Burnett (1981) Based on this information, Irwin (1987) concluded that "the dispersal distance used in the MMR standards might be increased without reducing probabilities for interactions among adults or dispersing young". However, he did not provide a specific alternative, and concluded that there was little empirical insight into the probability of maintaining a viable marten population using the MR guidelines. As Burke (1982) noted, the distance covered by dispersing individuals is not an absolute guide to appropriate spacing between areas. The probability of dispersing individuals locating habitat areas and other individuals decreases rapidly as habitat areas are spaced further apart. Burke suggested that the observed range of population densities might be a better guide to spacing of habitat areas. He noted that the three mile spacing would result in a marten density 1/9 to 1/27 of normal densities in the literature.

Size of Habitat Areas·

In the professional judgement 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 50 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. A minimum down material requirement of 6 down logs/acre was selected (Burke, 1982). The number and size of snags required were selected to ensure that the amount of down material was achieved. The specifications for pine marten habitat are summarized in Table G-7.

Irwin (1987) noted that the MR guidelines contained an implied hypothesis that 160-acre areas would meet reproductive and winter range needs, and that marten would use broader areas containing a mix of less suitable habitat types at other times. He concluded that monitoring and research could provide appropriate tests of this hypothesis



4. Alternative Ways of Meeting the Management Requirement for Pileated Woodpecker and Pine Marten

On the Malheur National Forest, mature conifer habitat is defined as a stand of conifers which are predominantly over 160 years old.

Habitat areas for pileated woodpeckers and pine marten were identified 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 However, there is no MR for the three-toed woodpecker indicator species at this time. A mountain pine beetle epidemic has effectively eliminated much of the old growth lodgepole pine component on the Forest for the next three decades, at minimum (USDA - Malheur National Forest, 1986).

Whenever possible, sites were placed within Wilderness, other no-harvest areas, and in areas of reduced harvest levels, wherever these met habitat quality and distribution requirements

Table G-8 summarizes the number of mature conifer sites for pileated woodpecker and pine marten located on unsuitable and suitable land

TABLE G-8
MATURE CONIFER HABITAT SITES

SPECIES	DISTRIBUTION REQUIREMENTS	UNSUITABLE TIMBER LAND	SUITABLE TIMBER LAND
Pine Marten	Every 4-5,000 ac.	17 sites	69 sites
Pileated Woodpecker	Every 12-13,000 ac.	7 sites	125 sites

Once the minimum number of habitat sites was determined using Regional spacing and habitat suitability specifications, the Forest considered two options or ways to provide mature conifer habitat. One way 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 at least five decades. The second way was to manage timber stands on a larger area in order to harvest timber and produce replacement stands over time

a. Alternative 1: Managed Sites

Sites occurring on lands suitable for timber production are managed on a 240-year rotation. This means that for every acre of suitable habitat, two acres would be managed as replacement stands when the original acre is harvested. A rotation length of 240 years was selected over other rotation lengths because it maximized the allowable sale quantity while meeting habitat requirements. Information on this analysis is found in the Final Environmental Impact Statement Appendix B, section VI.B.

There were 29 pileated woodpecker and pine marten sites which overlapped with areas that were unsuitable or not appropriate for timber production. The remaining 103 pileated woodpecker sites and 57 pine marten sites were modeled by estimating an assignment to those analysis areas (or portions thereof) that would receive the mature conifer prescription, which harvests timber on a 240-year rotation. Managed habitat areas for the pileated woodpecker average 1260 acres in size, of which at least 300 acres must be mature at any point in time Managed habitat areas for the pine marten will average 800 acres in size, of which at least 160 acres will be mature at any point in time

Using the three-tiered replacement strategy, the Forest would be constrained to provide mature conifer on at least 48,720 acres of suitable timber land at any one time This required approximately 146,460 acres to be harvested on 240-year rotations, rather than at some earlier rotation age such as 80-100 years.

Managing for mature conifer sites on long rotations 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 (i e , large diameter snags and down material) as predicted, mature conifer habitat would either be lost for a period of time or a further delay in harvesting the existing mature conifer stands would occur.

b. Alternative 2: 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

c Analysis of Opportunity Costs·

Table G-9 displays the opportunity costs associated with the two ways of meeting the Management Requirement for the pine marten and pileated woodpecker. Allowable Sale Quantity and Present Net Value are slightly different when mature conifer habitat sites are managed on a long rotation compared to dedicating areas. Similar conditions may not exist on other Forests. Table G-10 (displayed later in this appendix) compares the first decade changes in Present Net Value and Allowable Sale Quantity associated with each of these alternatives when applied to the PNV Benchmark.

TABLE G-9

OPPORTUNITY COST OF ALTERNATIVE WAYS OF MEETING THE MATURE CONIFER MANAGEMENT REQUIREMENT FOR PILEATED WOODPECKER AND PINE MARTEN

	FIRST DECADE ALLOWABLE SALE QUANTITY MMCF/YR [1] (MMBF/YR) [2]	CHANGE IN ALLOWABLE SALE QUANTITY [3]	PRESENT NET VALUE MM$ [4]	CHANGE IN PRESENT NET VALUE
PNV Benchmark	53.3 (304.9)	--	638.6	--
Opportunity Cost Approximate Change·				
Opportunity Cost of Meeting Mature Conifer Management Requirements with Long Rotations	2.0 (11 2)	4%	15.7	2%
Opportunity Cost of Meeting Mature Conifer Management Requirements with Dedicated Habitat	2 6 (14 9)	5%	20 9	3%

1/MMCF/YR = Millions of cubic feet per year
2/MMBF/YR = Millions of board feet per year
3/Percent change calculated on cubic foot basis
4/MM$ = Millions of dollars

d 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 habitat alternative. Both would maintain the same amount and distribution of habitat. There are, however, differences in the opportunity costs (see Table G-10).

e. Rationale for the Selected Method

In the Final Environmental Impact Statement, the Malheur National Forest chose to provide mature conifer habitat by dedicating sites occurring on suitable timberland, rather than managing this habitat on a 240-year rotation This alternative achieves the desired habitat with roughly similar effect on timber outputs and Present Net Value. Although it is slightly more costly to manage dedicated habitat, it is believed to be an economically efficient way of meeting the Management Requirement considering the potential for long rotation management to affect three times the land area *If future old growth habitat needs are* identified that have an influence on rotation length requirements, the stability of the dedicated habitat alternative may become more desirable.

f. Implications for Forest Plan Alternatives

Plan alternatives were designed to address public issues As a result, most alternatives, including the preferred alternative, incorporate objectives for retention of mature and old-growth timber for wildlife, scenery, and recreational purposes. Pine marten and pileated woodpecker areas will be overlapped with areas selected for other purposes, such as unroaded recreation areas and special interest areas, wherever these meet habitat suitability and distribution requirements. Methods resulting in the opportunity cost shown in Table G-10 would benefit other resource uses as well

g. Role of Monitoring and Research

The Forest Monitoring Plan (Forest Plan, Chapter V) calls for monitoring populations and habitats of pileated woodpecker and pine marten. At scheduled plan reviews, these data will be considered in determining the suitability and effectiveness of the selected way for meeting the Management Requirement for viable populations. This is important in testing the appropriateness of the selected modeling assumptions.

Information needs include.

Dispersal distances for pileated woodpeckers and pine marten:
- How far can juveniles successfully disperse?
- As habitat becomes increasingly fragmented, what is the ability of dispersing individuals to locate habitat islands?
- What effect does the size of habitat sites have on the ability of dispersing individuals to locate these sites?

Size of the mature/old growth conifer habitat sites:
- Utilization of habitat sites, particularly as the sites become more isolated.
- Reproductive success within habitat sites.
- Home range size in fragmented forests.

Utilization and reproductive success of pileated woodpeckers and pine marten in mature/old growth conifer sites managed on a 240-year rotation (i.e., are managed sites meeting habitat needs as compared to natural stands)?

Population density, home range size and distribution of pine marten in eastern Oregon.

E. SPECIFICATIONS FOR MEETING REQUIREMENTS FOR DISPERSAL OF CREATED OPENINGS

1. Source of the Management Requirement

Direction for harvest dispersion comes from several sources. The National Forest Management Act [Section 6(g)(3)(F)] sets broad direction that the Forest Service is to, among other things, identify maximum sizes for openings created by harvest activities (created openings). This is further defined in the National Forest Management Act implementing regulations [36 CFR 219.27(d)] and in the Regional Guide for the Pacific Northwest Region (pages 3-7 and 3-8).

2. Description of the Management Requirement

The specifications or standards for achievement of the harvest dispersion Management Requirement are:

a A harvested area of commercial forest land will no longer be considered a created opening, for silvicultural purposes, when stocking surveys, carried out in accordance with Regional instructions, indicate prescribed tree stocking that is at least 4 1/2 feet high and free to grow

b. The maximum size limit of harvest openings on the Malheur National Forest is 40 acres Some exceptions are permitted in specific situations

c Harvest openings will be separated by blocks of land that generally are adequately stocked with trees that are at least 4 1/2 feet high and that contain one or more logical harvest units of similar size.

d Harvest openings which touch each other are not precluded, but will be considered a single opening in determining compliance with harvest area maximum size limits

e Harvest openings contiguous to 30-acre or larger natural openings are subject to the 40-acre maximum size limit, but normally should not exceed one-third the size of the natural opening and not occupy more than one-third of the natural opening perimeter.

f Harvest openings should not be created adjacent to any natural openings (regardless of size) unless adequate vegetation along the edge of the natural opening can be developed or retained in sufficient density to protect wildlife and meet visual management objectives

3. Alternative ways of Meeting the Management Requirement for Dispersion

The selected modeling assumption is that 4-1/2 foot trees will generally be achieved within 10 years of a regeneration harvest. Achieving a 4-1/2 foot tree height in 10 years requires rapid reforestation and good growth on the newly-established stand Prompt reforestation of lodgepole pine sites has occurred consistently on the Forest even though natural regeneration is by far the dominant means of stand establishment Rapid establishment of mixed conifer and ponderosa pine/Douglas-fir sites has been less reliable across the Forest For this reason an alternative set of modeling assumptions was evaluated Under these alternative modeling assumptions, it was assumed that the average time required to reach a 4-1/2 foot tree height in a lodgepole pine stand would be 10 years, and that for regeneration in other timber types the average time required would be 15 years This results in a dispersion constraint of 25 percent on all timber types

Two other alternative modeling assumptions were considered, but were not developed in detail The alternative of constraining the rate of regeneration harvest in all timber working groups to 25 percent was considered This would be the maximum rate at which regeneration could occur, without corners touching, if a checkerboard harvesting model were assumed This alternative was not considered in detail because it was obvious that opportunity costs would be greater than with the selected assumption

Also considered was the assumption that up to 50 percent of an analysis area could be harvested per decade. This could occur under a checkerboard modeling assumption, but only if corners of units were permitted to touch and such adjacent openings were not considered one opening This was not considered in detail since it would not meet the Management Requirement specifications established by the Regional Guide (i.e., that openings which touch or corner must be considered a single opening with regard to the maximum opening size standard).

The ways of meeting the Management Requirement for harvest dispersion were modeled in FORPLAN by constraining the rate of regeneration harvest For example, using 4-1/2 feet in 10 years and given a continuous stand of mature timber, it is not possible to harvest more than one-third of the area per decade (on the average) and still meet the requirements from the National Forest Management Act regulations and the Regional Guide This was determined as follows:

In a theoretical, homogeneous timber stand, made up of numerous smaller stands (represented by the smaller squares making up the large square in the figure below) it is possible to harvest 1/3 of the area in the first decade (those squares labeled "1"), 1/3 in the second decade ("2"), and 1/3 in the third decade ("3"), without corners of created openings touching To do this assumes that an area which is harvested in decade 1 will no longer be a created opening in decade 2 and one created in decade 2 will no longer be a created opening in decade 3. Hence, in the FORPLAN model a constraint was applied which limited the rate of regeneration harvest, for any analysis area, to 33 percent of the area per decade. This represents the maximum rate at which an analysis area can be scheduled for harvest.

This relationship can also be depicted by the following equation·

D = 1/H x P/C x 100 Where,

D = the dispersion constraint in percent,
H = the number of harvest entries needed to access the entire analysis area without having openings adjacent to each other or having corners touching,
P = the FORPLAN period in years (this is always 10), and
C = the number of years for a created opening to close (the length of time required for a new stand to reach 4-1/2 feet in height).

In the case of the above example, and assuming that a 4-1/2 foot tree height can be reached in 10 years, the equation is as follows·

D = 1/H x P/C x 100

= 1/3 x 10/10 x 100 = 33%

4. Evaluation of Implementation Methods to Meet Harvest Dispersion Management Requirements

Either of the alternative means or implementation methods noted above would meet Management Requirements

a. Opportunity Costs

Table G-10 displays the opportunity costs associated with the two sets of alternative analysis assumptions considered in detail for meeting the timber harvest dispersion Management Requirement

The reduction in Present Net Value per unit loss of Allowable Sale Quantity in meeting the harvest dispersion Management Requirement is disproportionately high as compared to the effects of the other Management Requirements on Present Net Value. This occurs because the lower ASQ is not accompanied by a corresponding reduction in management costs In fact, some management costs may actually increase with implementation of harvest dispersion requirements For example, to meet the harvest dispersion Management Requirement it may be necessary to accelerate development of roadless areas (resulting in additional road development costs), delay harvest of high-value timber on some lands, or use faster (and more expensive) reforestation methods to reduce the length of time that an area is considered a created opening

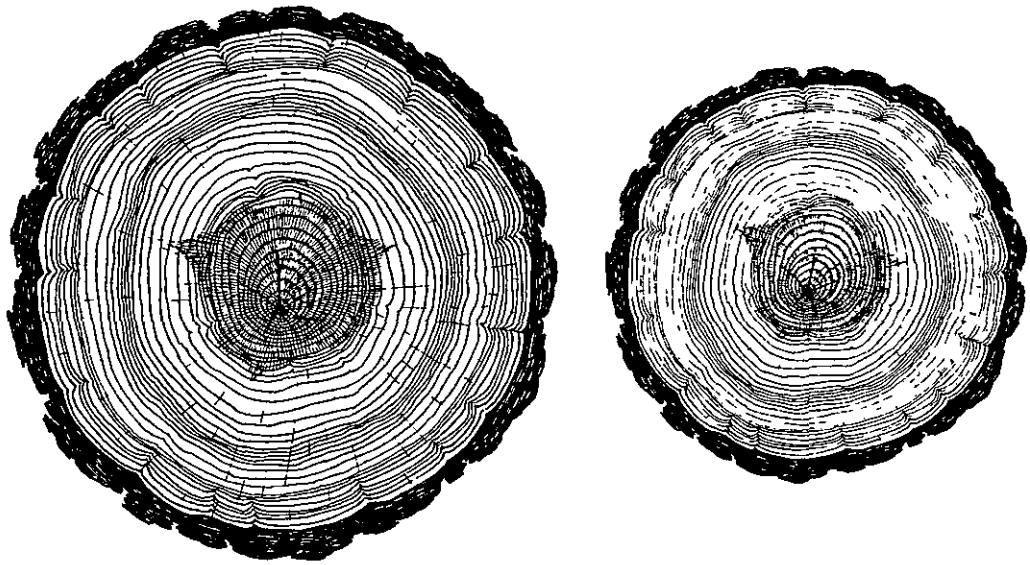


TABLE G-10

APPROXIMATE CHANGE (OPPORTUNITY COST) ASSOCIATED WITH MEETING THE HARVEST DISPERSION MANAGEMENT REQUIREMENT

VALUE	FIRST DECADE ALLOWABLE SALE QUANTITY MMCF/YR [1/] (MMBF/YR)[2/]	CHANGE IN ALLOWABLE SALE QUANTITY[3/]	PRESENT NET VALUE MM$ [4/]	CHANGE IN PRESENT NET VALUE
Maximum PNV Benchmark as Displayed in the Final EIS	53.9 (304.9)	---	638.6	---
Opportunity Cost Approximate Change.				
Opportunity Cost of the Selected Way for Meeting the Harvest Dispersion Management Requirement (10 yrs for all species)	2.5 (14.0)	5%	55 2	9%
Opportunity Cost of Meeting the Harvest Dispersion Management Requirement Using a Modeling Assumption of 10 years for lodgepole pine and 15 years for Other Working Groups [5/]	4.0 (22.9)	9%	88.3	14%

1/MMCF/YR = Millions of cubic feet per year
2/MMBF/YR = Millions of board feet per year
3/Percent change calculated on cubic foot basis
4/MM$ = Millions of dollars
5/Estimate, based on analysis outside of FORPLAN

b. Consequences of the Different Ways of Meeting the Management Requirement

The 10-year assumption alternative provides a higher timber harvest and Present Net Value than the 10- to 15-year alternative assumption, although reforestation costs in the former will be higher. Assuming a 10-year period for lodgepole pine types and a 15-year period for other types would result in reduced PNV due to first-decade harvest reductions as shown in Table G-10

The 10-year assumptions would result in a slightly more rapid rate of old-growth reduction, loss of big-game thermal cover, and risk of adverse soil and water effects These differences from the 10- to 15-year assumptions however, are not large enough to be considered significant.

The analysis shows that the 10- to 15-year assumption Allowable Sale Quantity opportunity cost is not quite twice that of the 10-year alternative assumption The Present Net Value opportunity cost for the 10-15 year assumption is 44 percent higher than for the 10-year assumption

c Rationale for the Selected Method

The selected set of modeling assumptions was chosen because existing data indicate that achieving a 4-1/2 foot tree height in 10 years on all forest types is probably feasible This alternative also provides a higher Allowable Sale Quantity and Present Net Value. Effects on other resources are negligible With increased reforestation efforts for mixed conifer, ponderosa pine/Douglas-fir sites, it is reasonable to expect that this alternative can be implemented successfully The additional expense which may be necessary to assure rapid reforestation is justified by the increased timber availability and Present Net Value which will result Implementation monitoring will provide the basis for tracking regeneration success Should intensified reforestation fall short, future plan amendment would be an appropriate remedy

d. Implications for Forest Plan Alternatives

Considering opportunity costs, Forest Plan alternatives with the harvest dispersion constraints have less Present Net Value and associated Allowable Sale Quantity than those same alternatives without dispersion constraints

e. Role of Monitoring and Research

Monitoring of harvest dispersion will occur during the life of the Plan with several objectives. Monitoring will be used to determine whether or not actual outputs are consistent with those projected by the FORPLAN model using the modeling assumptions applied. Also, the actual time required, on the average, for new stands to reach 4-1/2 feet in height will be monitored This is important in testing the appropriateness of the selected modeling assumptions Also see Forest Monitoring Plan (Forest Plan, Chapter V)

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Appendix H

INDIAN RIGHTS AND TREATIES

APPENDIX H FEDERAL ACTIONS ASSOCIATED WITH INDIAN RIGHTS AND TREATIES

INTRODUCTION

The following treaties, court decisions, and laws are those pertinent to the Malheur National Forest and its relationships with Native American tribes.

A. TREATIES

Action: Treaty with the Walla Walla, Cayuse, and Umatilla Tribes, June 9, 1855
Treaty with the Tribes of Middle Oregon, June 25, 1855

Both treaties contain this provision "That the exclusive right of taking fish in the streams running through and bordering said reservation is hereby secured to said indians, and at all other usual and accustomed stations, in common with citizens of the United States, and of Erecting Suitable House for curing the same, also the privilege of hunting, gathering roots and berries, and pasturing their stock on unclaimed lands, in common with citizens, is secured to them." The John Day River System contains many usual and accustomed fishing sites of these two confederations

B. COURT DECISIONS

The Federal court has confirmed the intent of treaty reserved rights In 1980, the court held that a treaty right to fish is meaningless if most of the fish are destroyed by a hostile environment such as dewatering and others have the obligation to refrain from degrading habitat to the extent that tribes would be deprived of moderate living needs The court further held that environmental conditions essential to anadromous fish runs include access and an adequate supply of good quality water (United State v. Washington, Phase II, 506 F Supp 187, W D. Wash 1980).

C. LAWS

Civil Rights Act of 1964, Title VII

Title VII prohibits discrimination in hiring, promotion, discharge, pay, fringe benefits, and other aspects of employment on the basis of race, color, religion, sex, or national origin

American Indian Religious Freedom Act of 1978

This act requires Federal agencies to evaluate their policies and procedures in consultation with native traditional religious leaders in order to determine appropriate changes necessary to protect and preserve Native American religious cultural rights and privileges

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