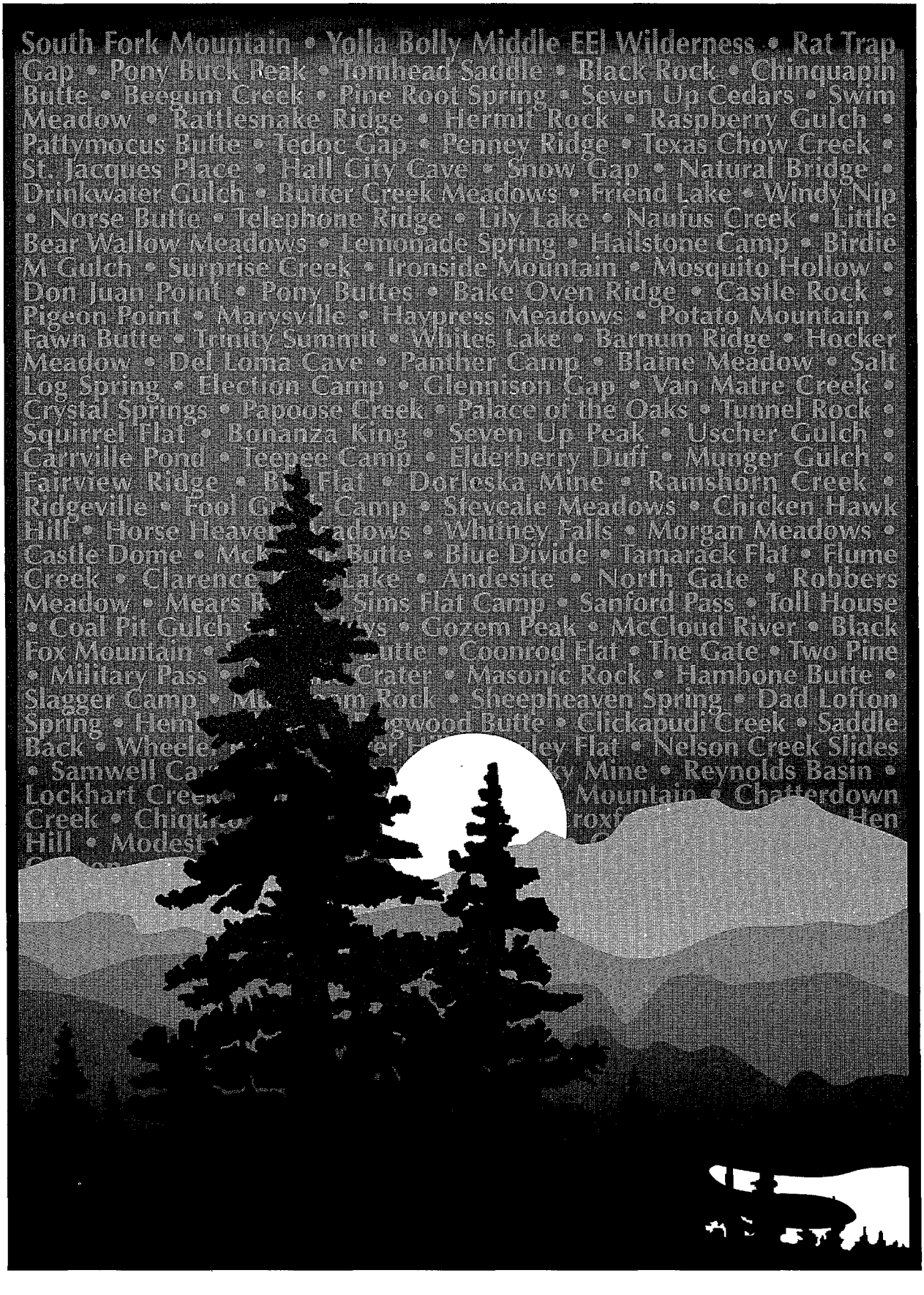
United States Department of Agriculture

Forest Service

Pacific Southwest Region

Shasta • Trinity National Forests

Land and Resource Management Plan



Forest Plan

Table of Contents

Chapters

Appendices

Forest Plan

Table of Contents
(continued)

Forest Plan

Table of Contents
(continued)

Forest Plan

Table of Contents
(continued)

Table of Contents
(continued)

Chapter 1

Introduction

Chapter Contents

Chapter I - Introduction

CHAPTER I
Introduction

Purpose of the Forest Plan

A

This National Forest Land and Resource Management Plan has been prepared to guide the management of the Shasta and Trinity National Forests. The primary goals of this Plan are to integrate a mix of management activities that allow use and protection of forest resources, meet the needs of guiding legislation, and address local, regional, and national issues. To accomplish these goals, the Forest Plan does the following:

1. establishes Forest-wide multiple use goals and objectives; objectives are short-term and long-range targets or projections;
2. establishes Forest-wide standards and guidelines to fulfill National Forest Management Act (NFMA) requirements relating to future management activities;
3. designates Management Areas and establishes direction which applies to future management activities;
4. designates land suitability for timber production;
5. establishes an allowable sale quantity;
6. makes non-wilderness multiple use allocations for those roadless areas released by the 1984 California Wilderness Act;
7. includes monitoring and evaluation requirements;
8. provides information for the development of program and budget proposals; and
9. provides a source of resource inventory data for Resource Planning Act (RPA) assessments.

The alternative presented in this document (Preferred Alternative) contains specific management actions for the next 10-15 years (the planning period) and compatible long-range Forest objectives for the next 50 years (the planning horizon).

The Forest and Rangeland Renewable Resources Planning Act (RPA), as amended by the NFMA, requires Forest Plans. Assessment of its environmental impacts is required by the National Environmental Policy Act (NEPA) and the implementing regulations of NFMA. This assessment of environmental impacts is contained in an accompanying document, the Final Environmental Impact Statement (Final EIS).

Relationship of the Forest Plan to Other Plans

B

The Forest Plan establishes integrated land management direction, including time frames for implementing, monitoring, and evaluating projects, activities, programs, and budgeting within the Shasta-Trinity National Forests. Therefore, the Forest Plan either supersedes existing plans or incorporates them by reference.

Existing plans that will be superseded by this Forest Plan include the following:

- Ranger District Multiple Use Plans;
- Timber Management Plans; and
- Unit Plans:
  - Medicine Lake
  - Upper Trinity

Goals, objectives, and standards and guidelines from existing plans, incorporated by reference, are described in Appendix A. These plans will be brought into conformance with the Forest Plan where necessary.

In addition to superseding or incorporating existing plans, resource/implementation plans will be developed during the planning period. These special area management plans and implementation plans, intended for specific resources or programs, will rely on the Forest Plan for a broad "umbrella" of direction. These plans will be in full compliance with and incorporated into the Forest Plan as completed.

In February 1989, the Pacific Southwest Region issued a Vegetation Management for Reforestation Final EIS and Record of Decision which selected the continued use of the full range of treatment methods, including herbicides. This Final EIS is hereby incorporated by reference.

Future project level environmental analyses would tier directly to this Plan and its accompanying Final EIS.

Plan Implementation Process

C

The Forest Plan will provide four levels of direction: (1) general Forest-wide management direction; (2) Land allocations and Standards and Guidelines from the ROD; (3) direction specific to each management prescription (or type of land allocation); and (4) specific (or supplemental) direction for each management area within the Forests.

The plan implementation process provides the framework for translating management direction into actual projects or activities which are consistent with the environmental and administrative objectives of the Forest Plan. After approval of the Plan, the Forest Supervisor will ensure that, subject to valid existing rights, all outstanding and future permits, contracts, cooperative agreements, and other instruments for occupancy and use of affected lands will conform to the Plan.

If a proposed project is determined to be incompatible with the direction in the Forest Plan, the action will be revised or not permitted. Recurring conflicts may result in review of the relevant plan direction and monitoring and evaluation process (Chapter 5) to determine whether a plan amendment or revision is needed to the Forest Plan.

The Forest Plan will be implemented on each of the seven Ranger Districts. Projects will continue to be planned and evaluated through the interdisciplinary process. District and Forest staffs will conduct environmental analyses for projects and document them in appropriate environmental documents which will be tiered to the Forest Plan.

Forest Plan Amendments and Revisions

D

In accordance with NFMA, the Forest Plan will normally be revised every 10 years (at least every 15). The Plan may also be revised whenever the Forest Supervisor determines that conditions or demands, including RPA policies, have changed enough to affect Plan implementation or when triggered by monitoring results (Chapter 5). For the above reasons, the Forest Supervisor is required to review conditions of the lands covered by this Plan at least every five years. Plan revisions require Regional Forester approval.

Plan amendments may occur whenever monitoring requirements indicate a need for change. The Forest Supervisor can approve amendments to the Plan if they are determined to be non-significant. Significant amendments require Regional Forester approval. Public notification and adherence to NEPA is required in any case.

Plan Organization

E

This Forest Plan has five chapters:

- **Chapter I - Introduction**;
- **Chapter 2 - Public Issues**. This chapter discusses the issues that were established at the start of the planning process and how they are resolved;
- **Chapter 3 - Summary of the Analysis of the Management Situation**. This chapter summarizes the Final EIS 'Affected Environment' (Chapter III). It describes the management situation, supply and demand, and resource uses and development opportunities;
- **Chapter 4 - Management Direction**. This chapter is the heart of the Plan. It contains the Forest goals and objectives, Forest standards and guidelines, management prescriptions to be applied to land areas, and management area direction. The management area maps in this chapter show where the prescriptions are applied;
- **Chapter 5 - Monitoring and Evaluation Requirements**. This chapter sets the requirements for monitoring and evaluating the implementation of the Forest Plan.

A map packet also accompanies the Forest Plan. Included in this packet are the following maps to supplement written direction.

- Off-highway Vehicle (OHV) Management Plan
- Recreation Opportunity Spectrum Classifications
- Wilderness and Released Roadless Areas
- Alternative Maps

The maps which accompany this Plan are primarily illustrative in nature and must be used in conjunction with the written direction contained in this Plan. While logical and readily identifiable boundaries (roads, ridges, etc.) are used wherever possible, the limitations of accuracy and precision inherent in the map scale must be recognized. For example, streamside protection zones or corridors which are only 200 feet wide do not appear on the Plan map. However, when these areas are identified in the field, standards and guidelines for Riparian Reserves, Prescription IX will apply.

Appeal Rights

F

An administrative appeal of his decision to approve the Plan and EIS can be filed according to Code of Federal Regulations (36 CFR Part 217).

Chapter 2

Public Issues

Chapter Contents

Chapter 2 - Public Issues

CHAPTER 2
Public Issues

Summary of Public Issues

A

The scoping process, conducted early in the planning process, identified important public issues. These issues represent important reasons for considering changes in the current management direction. They were also instrumental in formulating this Forest Plan and the alternatives considered in the Final Environmental Impact Statement (FEIS). More detailed information on the scoping process and public issues can be found in Chapter I and Appendix A of the FEIS.

Following are the 22 major public issues and how the Preferred Alternative (Forest Plan) deals with each:

Public Issues

B

Heritage Resources

Issue #1 How should the Forests effectively provide identification, protection, and interpretation of archaeological, historical, and religious sites?

Many traditional Indian religious sites/areas or practices, such as the gathering of religious materials, involve National Forest lands. In addition, there are numerous archaeological and historical values on these lands.

Disposition: The identification, management, and protection of archaeological, historical, and religious sites is addressed in Forest Standards and Guidelines and in Heritage Resource Management allocations (Prescription XI) where needed. Prescription XI has been assigned to approximately 300 of the best examples of heritage resource sites. These sites will receive added management emphasis such as interpretation, protection measures, adaptive reuse and research. Subject to available funding, these sites will be formally nominated to the National Register of Historic Places. Sites which are not eligible for Prescription XI will be protected by Forest Standards and Guidelines. Management plan direction will be evaluated periodically through a formalized monitoring plan. Implementation of this Plan maintains the rights of Native Americans to gather forest products and conduct religious ceremonies.

Biological Diversity

Issue #2 How should the Forests' vegetative resources be managed for ecosystem diversity?

Special consideration will be given to providing habitats that maintain or enhance populations of threatened and endangered (T&E) species and viable populations of sensitive species and/or management indicators.

There is public concern that a wide variety of ecosystems should be maintained on the Forests to specifically provide for the:

(1) maintenance and/or enhancement of habitats for Federally listed T&E species (plants and animals);

(2) maintenance and/or enhancement of habitats sufficient to provide for viable populations of all other native and desired non-native (plants and animals);

(3) maintenance and/or enhancement of the Forests' ecosystems and the biodiversity (plants and animals) associated with them; and

(4) maintenance and/or enhancement of special elements or components of these ecosystems (i.e., snags, down logs, cliffs, vegetative seral stages, etc.).

Disposition: The maintenance and/or improvement of wildlife habitats and their diversity is addressed in Forest Standards and Guidelines. These Standards and Guidelines include retaining a minimum of 5 percent of each vegetative/seral stage over time. They also provide for special habitat components of diversity: evenness, richness, and pattern. In addition, the management indicators will be managed to average moderate levels of habitat capability models (see Appendix G). Also, Prescriptions VI (Wildlife Habitat Management) and VII (Late-Successional Reserves and Threatened, Endangered, and Selected Sensitive Species) have been developed specifically for wildlife. To assess effects of management practices on diversity and associated components such as older over-mature habitat, snags, etc., an extensive monitoring program is proposed.

Issue #3 How much of the older vegetative seral stages existing on the Forests should be retained?

There is public concern that sufficient amounts of old growth habitats be retained and/or enhanced on the Forests to provide for the:

(1) viability of all species (plants and animals) requiring this type of habitat for all or part of their life cycle; and

(2) sufficient representation and retention of this ecosystem component for the sake of maintaining vegetative biodiversity.

Disposition: The importance of maintaining and managing older over-mature habitat is addressed in: (1) Forest and prescription-specific standards and guidelines; (2) the allocation of over 1,500,000 forested acres to prescriptions which have little or no timber harvest scheduled, including about 532,000 acres in Late-Successional Reserves, Prescription VII ; and (3) the use of older over-mature habitat associated species as indicators to be managed to average moderate levels of habitat capability models. To assess the effects of management practices on older over-mature habitat and associated components, an extensive monitoring program is proposed. It is predicted that there would be 368,000 acres of older over-mature habitat existing at the end of the fifth decade compared to 263,000 acres that exist today.

Facilities

Issue #4 How many miles of additional roads are needed and to what standard should they be constructed and maintained in order to meet future needs?

Roads create impacts directly on the landscape and indirectly on other resources by making access easier for users. At issue is the amount of additional roading needed and to what standard they should be maintained. Also of concern is whether or not the roads should remain open to public use.

Disposition: Road construction will average 3 miles a year in the first decade and increase to 5 miles a year by the fifth decade. Road reconstruction will remain relatively constant at about 20 miles per year. Proper management and maintenance of the Forest road system, to permit safe travel and minimize erosion, is addressed in Forest-Wide and Management Prescription Standards and Guidelines. Specific requirements for roads, as they relate to riparian values, are found in Riparian Reserves, Management Prescription IX . Roads will be constructed or reconstructed in such a manner that a stable road prism will be established. Each road will be assigned a specific maintenance level and all roads would be maintained to at least maintenance level 1. Surfacing on the Forests' arterial road system will be upgraded. First priorities for maintenance will be to protect natural resources and provide for user safety. Road closures will be used to protect resources and road surfaces, to provide safety, and for fire situations. A public information program will accompany any road closure program.

Fire and Fuels

Issue #5 To what extent should prescribed burning be used as a way to reduce fuel hazards, prepare sites for reforestation, and improve wildlife habitat?

Prescribed burning is the intentional burning of a predetermined area for planned objectives. At issue is the Forest Service's ability to balance beneficial uses of prescribed fire with the negative consequences of burning, such as smoke, energy waste, loss of soil protection, and modification of wildlife habitat.

Disposition: The use of prescribed fire for fire hazard reduction and other resource management (e.g., wildlife habitat improvement), as well as the means to mitigate its effects, is addressed in Forest-Wide Standards and Guidelines and Management Prescriptions. Fuels treatment will support the desired future condition of identifying the natural role of fire in the ecosystem. Fuel treatments will emphasize biomass utilization and firewood availability while maintaining enough woody material to meet wildlife needs and provide watershed protection. Prescribed fire will be used as appropriate to support the fuels/ecosystem management objectives. Prescribed burning would be initiated only on approved burn days as specified by the Air Pollution Control District.

Fisheries/Water

Issue #6 How should watersheds be managed to maintain or enhance water quality and fisheries?

The Shasta-Trinity National Forests contain the headwaters of two important watersheds in the State: the Sacramento and Trinity Rivers. These watersheds provide high quality water that has a broad variety of uses,

including that of supporting an important anadromous fishery (salmon and steelhead).

Disposition: Forest-Wide Standards and Guidelines, Management Prescriptions, Best Management Practices (BMPs), Riparian Reserves, Management Prescription IX Standards and Guidelines , special mitigation measures, and supplemental Management Area direction will protect the viability of the Forests' sensitive watercourses and their inhabitants. This direction prohibits harvest within Riparian Reserves. It also prohibits the use of chemical herbicides and broadcast burning within riparian areas and calls for protection of streambank vegetation. It calls for locating roads across stream-courses only in areas where water quality and fishery impacts will be minimized. Roads and trails will be located to avoid wetlands and wet meadows. In addition, existing stream crossings will be evaluated to assess their potential failure and the affects from a 100 year flood. If the affects are unacceptable, steps will be taken to upgrade the crossing. Riparian area conflicts will be resolved in favor of wildlife and fisheries. The effects of forest management practices on water quality and fisheries (and the need for any additional mitigation) will be assessed as described in the monitoring plan.

Human and Community Development

Issue #7 What activities and outputs should be provided to maintain community stability?

For most small communities stability is largely a matter of economics. Forest activities affect local economies in several ways: (1) jobs are created from Forest resources, primarily timber harvesting; and (2) payments of Forest Service shared receipts help build roads and support local schools.

Disposition: The need to promote community stability (to the extent that Forest personnel have an influence), is addressed through the integration of multiple resource standards and guidelines. Forest-Wide Standards and Guidelines, Management Prescriptions, and Management Area direction help provide for safe use and enjoyment of various resources and the production of goods and services. An estimated 3,600 jobs will be maintained or created through implementation of this Plan. This would be about a 40 percent reduction from recent levels. County receipts will be about 5.4 million dollars. This will be a 10 percent reduction from recent historical levels.

Minerals

Issue #8 How can mineral development and exploration be encouraged while minimizing adverse impacts to non-mineral surface resources?

Concern exists that minerals and energy development is not being recognized as a valid use of National Forest land.

Disposition: Minerals activities are recognized as a valid use of National Forest land. This is evidenced by the goal statement and standards and guidelines that are designed to minimize the impacts on mineral activities. Mineral activities are encouraged, consistent with other resource needs. Monitoring will be done to assure that minerals activities are carried out as required by the terms of operating plans.

Range

Issue #9 Is livestock grazing an appropriate use of wilderness? If so, how should conflicts be minimized between livestock use and recreationists?

There is concern that livestock grazing can degrade the attributes associated with primitive recreation within Wilderness.

Disposition: Established livestock grazing will be allowed to continue on allotments within Wildernesses. Minimizing conflicts between grazing and wilderness values is addressed in the Forest-Wide standards and guidelines.

Issue #10 How should livestock grazing be managed to minimize degradation of riparian areas?

There is concern that livestock grazing in riparian areas diminishes vegetation, breaks down stream banks, and adversely affects fish and wildlife habitat, as well as water quality.

Disposition: Resolving adverse resource conflicts in riparian areas within livestock grazing allotments is addressed in the Range Standards and Guidelines and in specific direction for Riparian Reserves (Management Prescription IX). The riparian standards explicitly require that necessary administrative measures be taken to assure that grazing within riparian areas is in accordance with riparian area goals. In addition standards and guidelines for forage utilization standards, range

suitability, and ecosystem condition have been established (Forest-Wide Range S&G's).

Recreation

Issue #11 How much of the Forests should be open, closed, or restricted to off-highway vehicle (OHV) use?

Concern exists that OHV use can cause damage to other resources such as soils and wildlife. The use of OHVs has increased while the lands open to this use have diminished. Conflicts can also occur between various OHV users and other recreationists.

Disposition: A wide range of OHV use is provided. Type, degree of control, and location of use varies by prescription. Each prescription has specific OHV direction. OHV use is restricted in areas rated highly erodible and where OHV use would conflict with other resource management objectives. In some areas use is restricted to roads or trails. About 239,175 acres are open to cross-country summertime use. About 810 miles of roads are closed to OHV summer use. An estimated 176,200 acres are available for wintertime use. About 815 miles of roads are closed to OHV winter use. About 500,000 acres will be closed to all types of OHV use. There are no roads open only to OHV use.

Issue #12 How should the Forests supply water-oriented recreation facilities and opportunities to meet increasing demand?

There is a statewide public need for additional water-oriented recreation activities. The Forests have the potential to supply most forms of water-oriented recreation. However, the current supply of support facilities will not meet estimated demand. Conflicts are occurring between different types of use.

Disposition: Areas with significant water-oriented recreation opportunities are maintained by prescriptions appropriate to the intended use. The prescriptions include extensive areas of Roaded Recreation (Prescription III) allocations associated primarily with both units of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). Designated and proposed wild, scenic, and recreation river values are maintained by assigning quarter mile corridors on both sides of the rivers to Unroaded Non-Motorized Recreation (Prescription I), Limited Roaded Motorized Recreation (Prescription II), or Roaded Recreation (Prescription III), depending on the proposed classification of the river segments. Other major streams, lakes, and reservoirs are maintained through assignment of areas bordering the water to Riparian Reserves (Prescription IX). There is a sufficient supply of water-oriented opportunities to meet anticipated demand; however, these opportunities cannot be realized until additional facilities are constructed.

Riparian Areas

Issue #13 How wide should riparian management zones (RMZs) be and what management activities should be allowed within them?

Forest management activities have the potential to affect water quality and the fisheries resource on the Forests. Timber harvesting, prescribed burning, and road construction near streamcourses are of particular concern to many people, because these activities have a high potential for degrading water quality and fisheries habitat.

Disposition: Streamcourse protection, riparian management zoning, watershed restoration, and cumulative impact assessment are addressed in Forest-Wide Standards and Guidelines. The Riparian Reserves, Prescription IX have been specifically developed to provide protection and management for all riparian areas on the Forests. This direction establishes RMZs along all streams. These RMZs are described in the Forest-Wide standards and guidelines under Riparian Reserves. The areas range from approximately 300 feet on both sides of perennial streams to 100 feet on both sides of intermittent streams. The widths can be adjusted only after the completion of an watershed analysis which may recommend a more or less restrictive reserve system. No timber harvest is allowed within Riparian Reserves until a watershed analysis is completed which recommends reserve modifications, either in width or standards, that will allow timber harvest.

Special Areas

Issue #14 What areas should be recommended for Research Natural Area (RNA) and Special Interest Area (SIA) establishment?

This issue relates to the number, size, and location of RNAs to be recommended for establishment on the Forests. RNAs are established: (1) to contribute to the preservation of examples of all significant natural ecosystems for purposes of research and ecological study; (2) to provide gene pools; and (3) where appropriate, to protect habitats of T&E and sensitive species of plants and animals.

This issue also relates to SIAs. The objectives of establishing SIAs are: (1) to protect, and where appropriate, foster public use and enjoyment of areas with scenic, historical, geological, botanical, zoological, palentological, or other special characteristics, and (2) to classify areas that possess unusual recreation and scientific values so that these special values are available for public study, use, or enjoyment.

Disposition: Identifying, managing, and preserving typical examples of important ecosystems addressed in the allocation of 23,260 (net) National Forest acres (in 8 areas) for RNAs. In addition to the RNAs, 19 SIAs are proposed for classification, and 22 other areas would be evaluated for possible classification as SIAs.

Timber

Issue #15 Should herbicides be used to control vegetation in order to meet timber management objectives?

There has been growing controversy regarding the use of chemicals, particularly herbicides, for the control of undesirable vegetation in forest plantations. At issue over the use of herbicides is: the effects of herbicides on human health, domestic animals, fish and wildlife; the cost and effectiveness of herbicides as compared to other vegetative control treatments; the need to maintain timber growth and water quality; and the registration of chemicals.

Disposition: The pesticide issue is Regional in scope and cannot be resolved in the Forest Plan. The full range of vegetation management practices, including pesticides, are available for timber stand establishment and growth in the Forest Plan. However, herbicides will be used only when essential to achieve assigned land management objectives and not at all within riparian areas. Essential, in this case, is defined as being biologically, physically, or economically impractical to achieve objectives using other methods. The actual methods selected will depend on relative effectiveness, environmental effects, and costs of feasible alternative methods, to be determined at the project level by site specific analysis. These site specific analyses would tier to the Regional Environmental Impact Statement on Vegetation Management for Reforestation.

The number of acres requiring some form of vegetation management (release) is estimated to be approximately 4,000 acres per year.

The consequences of not using herbicides, on yields and costs, are addressed in Chapter II of the Final EIS.

Issue #16 What should the timber harvest level or allowable sale quantity (ASQ) be?

Public opinion is sharply divided on the question of timber harvests. Many people feel that timber harvesting should be increased; others feel that the Forests are being overcut to the detriment of other resources.

Disposition: Of the approximately 1,077,800 acres of tentatively suitable timber land identified on the Forests, about 530,000 acres (or 49 percent) will be managed to varying intensities for timber production. On about 435,000 acres of the 530,000 acres, timber management will be relatively intensive, but will be subordinate to other resource objectives in some areas. On the remaining 95,000 acres, minimal timber management will be used where other resource objectives are the primary concern.

The corresponding allowable sale quantity (ASQ) is 82 million board feet (MMBF) per year. This ASQ will remove about 9 percent of the current timber inventory on suitable lands in the first decade this Plan is in effect. The ASQ of 82 MMBF per year is about 60 percent less than the actual average sell volume in recent years.

Issue #17 What silvicultural practices should be used to assure reasonably successful reforestation of harvested lands and to maintain tree species diversity?

There is concern over the success of the Forests' reforestation program, particularly on the areas that were previously clearcut. There is also concern that the conversion of some nontimber growing areas (i.e., brushfields) to forest plantations reduces deer habitat, resulting in lower deer populations. Public concern has also been expressed over reforesting plantations with a single species of trees.

Disposition: Regenerability was one of the major considerations in determining timber land suitability, as required by the National Forest Management Act. Approximately 54,500 acres of land were classified as unsuitable for timber production, because regenerability cannot be reasonably assured within five years after final harvest.

Approximately 3,500 acres are scheduled to be reforested under this Plan each year. The Forest monitoring plan requires evaluation of the reforestation program. Any significant reforestation failures could result in a reclassification of suitable lands.

On the other hand, lands currently classified as unsuitable due to regenerability could be reclassified as suitable if new technology or knowledge becomes available.

In either case, any significant change in the suitable timber land base could result in a revision of the Plan.

The current direction and practice of encouraging a mixture of native tree species in areas to be reforested will be continued. This is specified in a Forest Standard and Guideline.

Issue #18 What harvest methods, including clearcutting, should be used to meet management objectives?

Public concern over the practice of clearcutting has occurred mainly because of the appearance of the clearcut, the effects on water quality, and the possibility of herbicide use to reestablish new stands.

Disposition: Clearcutting is not planned but is allowed if it is the only ecologically acceptable silvicultural practice. Examples where it may be appropriate are after catastrophic wildfires or insect and/or disease events. Other forms of regeneration are planned such as green tree retention or group selection harvests.

Direction calls for leaving manageable, advanced reproduction and at least five square feet of basal area per acre of hardwoods within areas proposed for regeneration cutting. Several large, green conifer trees will also be retained in many harvest units.

In areas such as scenic highways, sensitive soils, etc., special cutting practices, such as green tree retention, shelterwood, and selection cutting, will normally be practiced. Actual silvicultural systems will be determined by site-specific prescriptions at the project level.

The Forests' monitoring plan requires evaluation of the various harvest methods to assure that all resource objectives are met.

Visual Quality

Issue #19 How and where should visual quality be protected and enhanced?

Visual effects of management practices have become more apparent in recent years. There is public concern that scenic quality has declined overall and that certain silvicultural practices and road building activities have contributed to this decline. There is also concern that visual quality does not receive adequate emphasis. This is most notable along sensitive travel corridors. Others feel that visual resource practices are too restrictive on management activities, particularly timber harvesting and mining.

Disposition: Identifying, protecting, and enhancing visual quality is addressed in specified adopted Visual Quality Objectives (VQOs) set for each Management Prescription. State scenic highways and National Recreation Areas will be managed to protect the scenery within foreground and middleground views. Several other roads and high use areas would be managed to protect the scenery within the foreground. The Wildernesses and distinctive landscape features are also protected. Visual quality will generally be enhanced where visual rehabilitation occurs. The allocation of over 500,000 acres to Late-Successional Reserves, Prescription VII with no scheduled harvest, will result in fewer acres being disturbed by timber management practices than has historically occurred. The result is less impact on visual quality.

Wild and Scenic Rivers

Issue #20 What river segments should be recommended for inclusion in the Federal Wild and Scenic Rivers system?

Portions of the New River, the North Fork and South Fork of the Trinity River, and the Trinity River were added to the National Wild and Scenic Rivers System in 1981. Several other major rivers and streams on the Forests have the potential for Wild and Scenic designation. This designation would maintain examples of pristine aquatic and riparian ecosystems and provide river-oriented recreational opportunities. There is concern that designation would restrict other management activities, such as timber harvesting, and adversely affect private inholdings.

For those rivers that have a high percentage of private lands there is concern by private landowners (especially along the McCloud River) that access and land use would be restricted.

Disposition: Approximately 106.4 miles of Wild and Scenic Rivers exist on the Forests. An additional 79.7 miles, including Hayfork Creek, the upper segments of the North and South Fork of the Trinity River, Beegum Creek, Canyon Creek, and Virgin Creek are to be recommended for Congressional designation and managed as Wild and Scenic Rivers. The Sacramento River is not recommended because of the large amount of private land and the concerns of private landowners along the river. In addition, State legislation is being proposed to prohibit dams along the River. In lieu of recommending Wild and Scenic River designation for the McCloud River system, including Squaw Valley Creek, the Forest Service has taken the lead in working with adjacent private landowners to develop a

Coordinated Resource Management Plan for the river corridor. A primary objective of the Plan is to retain the characteristics of the river which made it eligible for wild and scenic river consideration.

This is a preliminary administrative recommendation that would receive further review and possible modification by the Chief of the Forest Service, Secretary of Agriculture, and the President of the United States. Final decisions have been reserved by the Congress to designate rivers to the National Wild and Scenic Rivers System.

Wilderness and Roadless Areas

Issue #21 How should the Forests' roadless areas be managed, including the Mt. Eddy further planning area?

Approximately 498,776 acres, or 24 percent of the Shasta-Trinity National Forests, are designated in five Wildernesses. One roadless area, Mt. Eddy, was designated for further planning and is evaluated for wilderness classification as part of the Forests' planning process. The 1984 California Wilderness Act stated that those roadless areas, not designated as either wilderness or further planning, be managed for multiple-use purposes, and that they be reviewed again for wilderness option when the Forest Plan is revised in 10-15 years. At issue are management activities that would occur in some of the undesignated roadless areas between now and the next revision of the Forest Plan.

Disposition: Some 498,776 acres of National Forest lands are allocated to Wilderness Management (Congressional Reserve, Prescription V). While the Mt. Eddy area is not recommended for wilderness designation, wilderness attributes would be retained on about 90 percent of the area through allocations to Unroaded Non-motorized Recreation and Limited Roaded Motorized Recreation (Prescriptions I and II) and Special Area Management (Prescription X). All or major portions of the other roadless areas are retained in an undeveloped state. About 81 percent of the 29 released roadless area acreage would remain undeveloped.

Issue #22 To what extent should Mt. Shasta be allocated to prescriptions that would allow or encourage downhill skiing or other management activities that might conflict with the wilderness or cultural resource values in the area.

Over the past 15 years, since the demise of the old Mt. Shasta Ski Area, many events have occurred that will effect the long term management of Mt. Shasta. Those events include the creation of the Mt. Shasta Wilderness area, and the recognition of the Cultural and Native American values of Mt. Shasta. At issue is what kinds of activities should be allowed in the Mt Shasta area and where can they occur.

Disposition: This plan allocates the Mt. Shasta area allocations that will allow the development of Mt. Shasta Ski area and will protect the heritage values of the area. The Ski area decision will be made in a separate EIS and that decision will be closely linked to the heritage values on Mt. Shasta. All activities that are planned within the Mt. Shasta area will address the cultural and religious values in the area prior to implementation.

Chapter 3

Summary of the Analysis of the Management Situation

Chapter Contents

Chapter 3 - Summary of the Analysis of the Management Situation

CHAPTER 3
Summary of the Analysis of the Management Situation

Introduction
A

The analysis of the management situation (AMS) is an assessment of the physical, biological, social, and economic environments of the Shasta-Trinity National Forests. From this assessment needed changes in management direction or emphasis can be identified.

Most of the AMS is presented in detail in the Final Environmental Impact Statement (Final EIS) Chapter III, The Affected Environment. This chapter is a summary, by resource, of that information.

This chapter also includes a brief description of the existing situation and supply and demand relationships for resource commodities and services. Production potentials, resource use, and development opportunities anticipated in the future, and proposed by this Plan, are also described.

Existing Situation
B

Location. The Shasta-Trinity National Forests are located in the center of Northern California. **Figure 3-I** illustrates the location of the Forests and their relationship to the surrounding region.

Within the Forests' boundaries are a diverse and complex array of vegetation types representing portions of at least four major physiographic provinces:

- the Cascade Mountains;
- the Klamath Mountains;
- the Coast Range; and
- the Sacramento Valley.

These two Forests, which have been combined into one administrative unit, possess a broad cross-section of resources and opportunities typical of those found within this part of the State. Oak and grass-covered foothills, ponderosa pine flats, and coastal type Douglas-fir stands grow in addition to the predominant mixed conifer forest. This diversity supports a wide variety of wildlife, domestic grazing, and recreation use.

Interstate 5 (the major north-south freeway on the West Coast) and State Highway 299 (the major east-west route across Northern California) enhances visitor access to an area with a large variety of recreation opportunities. Mt. Shasta, Shasta Lake, Clair Engle (Trinity) Lake, the Trinity Alps Wilderness, and the Yolla Bolly-Middle Eel Wilderness are the most popular recreation destinations on the Forests.

The Forests are located within four hours' driving time of the San Francisco and Sacramento population centers. The boundaries are only a few minutes drive from Redding, a city of over 70,000 people. Other population centers within the Forests' zone of influence include Anderson, Burney, McCloud, Mt. Shasta City, Dunsmuir, Weed, Hayfork, and Weaverville.

The Economic Environment
C

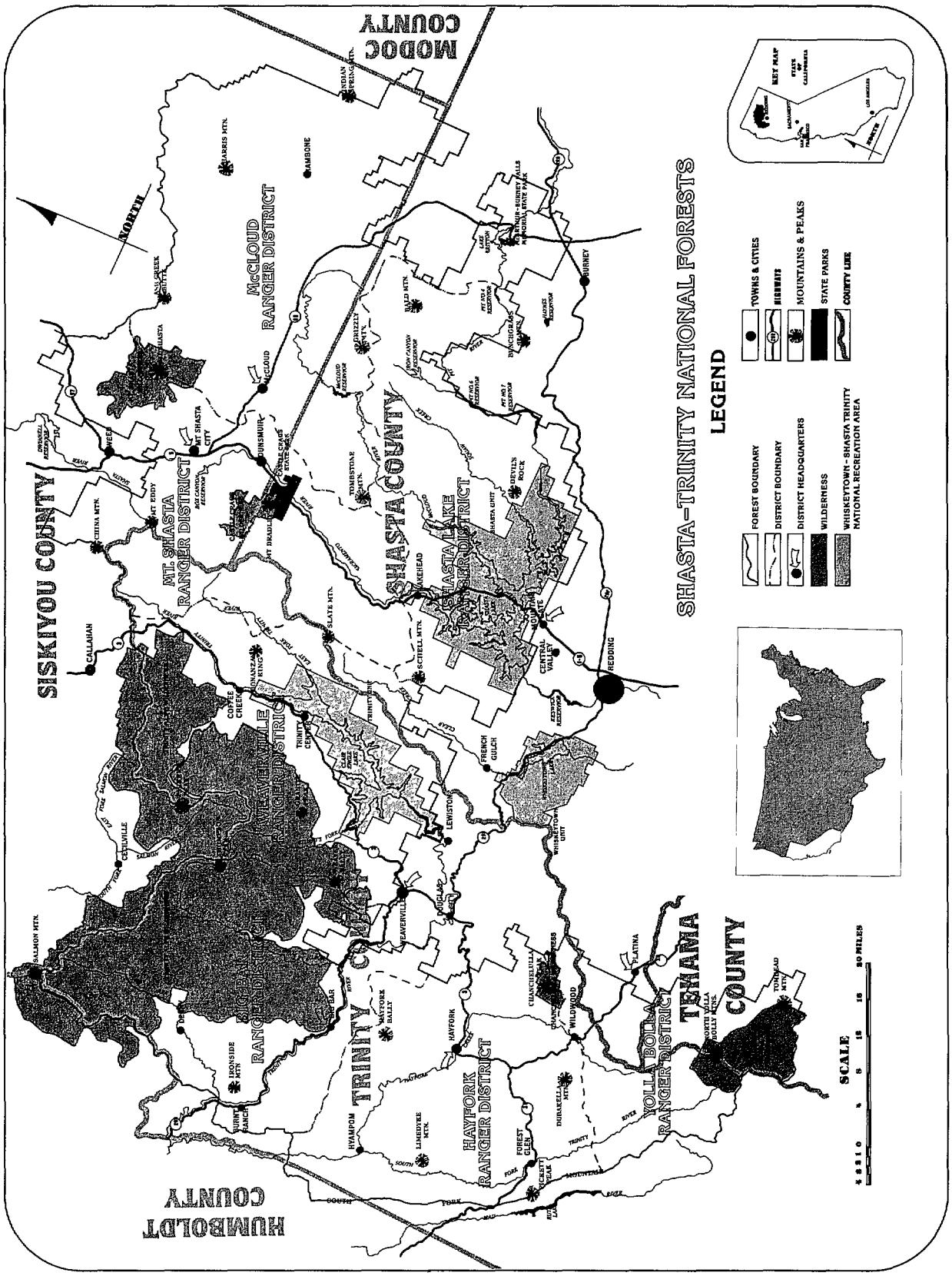
The economic impact area is defined as Shasta, Siskiyou, Tehama and Trinity Counties. Three counties--Shasta, Siskiyou, and Trinity--comprise the area of greatest influence. These counties contain 96 percent of the Forests' acreage; they also receive most of the measurable, direct and indirect economic effects of the Forests' activities. Tehama County makes up most of the remaining acreage.

A discussion of the following elements: (1) shared receipts with Counties; (2) employment patterns; (3) unemployment rates; (4) localized employment and income; and (5) impacts of budget levels is important to understanding the role of the Shasta-Trinity National Forests in the economic life of the area.

Shared Receipts With Counties. Returns are distributed back to the counties, in the amount of 25 percent, to help finance roads and school budgets. The majority of these payments comes from the value of harvested timber. Additional payments come from land use permits, grazing fees, recreation permits, and user fees. County receipts have averaged about 9 million dollars annually from 1988 to 1992.

For 1993, 1992 and 1991 payments to Counties were computed under a provision of the Interior and Related Agencies 1992 Appropriations Act and the 1991 Ap-

Figure 3-1
Location Map



propriations Act. For those National Forests affected by decisions on the northern spotted owl, the Act provides for payments to States of not less than 90 percent of a five-year average for Fiscal Year 1992 and a three-year average of payments for Fiscal Year 1991. Payments to the counties would be lower if based solely on actual receipts.

Employment Patterns. The four counties, as a group, display some striking employment differences from the state pattern, namely:

(1) Lumber manufacturing accounts for approximately 6 percent of the employment in these Counties, in marked contrast with less than one percent for the State.

(2) Government (State, Federal, and Local) employment is substantially more important in these Counties (ranging from 18 percent to 45 percent) than it is for the State (16 percent).

(3) Except for Shasta County, employment in services, finance, insurance and real estate is less important in these Counties than it is in the State.

Unemployment Rate. The unemployment rate in the impact area is generally twice the State (and National) average. In-migration has brought more job-seekers than the economy could absorb, and the seasonal nature of many timber, recreation, and tourism related jobs has also raised the unemployment rate.

Localized Employment and Income. The production of goods and services from the Forests affects the economy of the local area by generating income and employment. Timber harvest, recreation visitor days, total expenditures, and grazing animal months (AM) are the primary forest outputs that produce income and employment.

Budget Level. In the preceding section the impact of the Forest Service budget was related to local income and employment. This discussion of budget levels relates to the difference in identified budget needs versus actual historical levels. How this difference might affect resource programs and implementation of management activities in the Forest Plan is an important consideration.

The Shasta-Trinity National Forests' budget has averaged 37 million dollars (in 1989 dollars) from 1989-1993. The Forest Plan recommends a budget of approximately 49 million dollars (1989$). This increase occurs primarily in the wildlife, recreation operations and construction, and fire. Timber management and its related activities (multi-resource support, Knutson-Vandenberg Act [KV] reforestation, and brush disposal [BD] fuels treatment) decreased sharply in 1992 and 1993 because of regulations for northern spotted owl management.

Should the Forests be funded at a lower level than the Land and Resource Management Plan's recommended budget, resource outputs and facilities would be reduced accordingly. Regardless of the level of the annual budget, the Forests would implement minimum management requirements, monitoring, and Standards and Guidelines proposed in the Plan.

The Social Environment

D

The management and activities of the Shasta-Trinity National Forests influence individuals and groups of people living in the primary impact Counties and in the extended zone of influence. The primary Counties affected include: Shasta, Siskiyou, Tehama, and Trinity, which have a combined population of over 250,000.

Social Categories. Individuals and groups of individuals are affected differently by Forest management activities primarily because of different social linkages to the Forest. Social categories are used to describe the various linkages and effects of management activities.

Individuals within the primary social impact area have been grouped within several broad categories. These categories are not intended to represent specific social groups, but rather to serve as a means of describing social linkages and effects of Forest management activities. The Native American category, however, is an exception in that it can be considered descriptive of a social group. Social categories have been formed based on historical and projected trends of user groups, public hearings, informal interviews of Forest personnel and users, newspaper articles, other government studies and documents, use survey, and census data.

Individuals within these categories may hold similar or divergent personal values. Lifestyles exhibited may also be similar or divergent. A common bond which may be found in these categories is a general similarity in their feelings concerning the use of natural resources on National Forest lands. Individuals within the primary social impact area have been classified into a series of social categories.

Resource Utilization Emphasis Category. One broad classification is titled the Resource Utilization Emphasis

Category. These are individuals who are directly or indirectly associated with the utilization/marketing of the natural resources located in the impact area.

An example of the Resource Utilization Emphasis Category is those individuals whose occupations and/or political activities are associated with the wood products industry. The consolidation of these individuals within several local communities has given rise to what could be classified as timber dependent communities.

Timber dependent communities are those where the social and economic situation of the community is intertwined with and dependent on the timber industry. The towns of Weaverville and Hayfork in Trinity County and Weed in Siskiyou County are examples of timber dependent communities. While timber plays a major role in these communities, secondary occupations dealing with the recreation industry and government industries also make significant contributions.

It should be noted that not all Resource Utilization Emphasis individuals reside within timber dependent communities. Others who are also oriented towards a Resource Utilization Emphasis reside in other locations within and outside the primary social impact area.

Individuals sharing a resource utilization emphasis viewpoint may be long term residents within the social impact area (i.e., local residents for over 15 years, or relative newcomers to the area.) Many individuals within this category are retired workers.

As previously discussed, many residents of local settlements and small towns within the impact area have occupations which are dependent upon commodities produced from the National Forests. Often these individuals are from families who have been in the area for several generations. Loggers, millworkers, and community business people located in timber dependent communities are examples.

New residents have often immigrated from urban population centers. They have moved to this area for the rural environment including a lower cost of living, more recreational opportunities, and a slower pace of life. Some of these individuals hold professional occupations such as teachers, doctors and lawyers or are retirees and second homeowners. Others come in hopes of joining the local business communities but eventually leave the area due to limited opportunities.

Resource Amenity Emphasis Category. Another broad classification is titled the Resource Amenity Emphasis Category. These individuals typically value natural resources more for their amenity and symbolic values than their economic conversion values.

Natural resources within the area have a higher intrinsic value to these individuals than their potential conversion dollar values. For example, these individuals would prefer that local natural resource commodity items, such as timber, not be harvested but be retained for future generations. Concerns exhibited by this category of individuals often go beyond the actual production of specific commodities to include philosophies and strategies forming a potential policy basis for Federal land management.

These individuals may also be long term residents within the area or newly relocated residents from other areas. However, resource amenity emphasis individuals are generally not identified within occupational communities.

New residents who hold resource amenity emphasis viewpoints may be involved in a range of activities from local businesses to farming and/or mining. Some new residents can be considered as alternative lifestyle residents. These individuals are often seeking a simplified existence while practicing subsistence and/or commercial organic farming or mining.

Retirees and second homeowners are growing segments of the population in the study area. Some exhibit resource amenity emphasis values. Many of these individuals find that their economic stability is not tied to the use of natural resources as commodities. They value the Forests more for their recreation opportunities, particularly hunting, fishing, and boating.

These two categories of individuals, exhibiting Resource Utilization Emphasis and Resource Amenity Emphasis characteristics, view their lifestyle and quality of life as being interconnected with the natural resources.

Recreationists. The Forests are also important to another large, diverse group of people: visitors and recreationists who do not live in the primary area of influence. Many live in the San Francisco/Sacramento area and value the opportunity to escape the urban environment for a weekend or more in the Shasta-Trinity National Forests. Water-oriented and back-country recreation, as well as hunting and fishing, are more important to this group than timber-related industries.

Preservation of the Forests' amenity values is a major concern of this group. Many of these individuals have a sense of ownership as strong as that of area residents. They are often effective at lobbying for specific environmental issues.

Native Americans. Native Americans include American Indians, as well as those of Eskimo and Aleut ancestry. Native Americans indigenous to the area include the Hoopa, Yana, Wintu, Achuimawi, Shasta and Chirmariko. Many of these people still maintain traditional values and practices.

Native Americans commonly maintain a continuing interest in the Forests. In some cases, this interest is in the production of forest commodities to provide for continued employment opportunities. An example of these individuals are Native Americans who are also loggers. These individuals commonly hold a viewpoint similar to individuals exhibiting a resource utilization emphasis.

Other individuals are concerned with forest management practices as they may affect traditional commodities gained from the forest. The availability of these products for personal and/or spiritual use is of concern.

Native Americans, in some cases, are also concerned with National Forest outputs and management activities as they may impact traditional spiritual and/or religious activities.

Resource Environment

E

I. AIR QUALITY

The air quality standard on the Shasta-Trinity National Forests is very high. Forest activities which contribute to air quality degradation are: burning of forest vegetation, exhaust from vehicle and machinery use, and dust generation from logging equipment and other vehicular use of unpaved roads.

The majority of the Shasta National Forest lies within the Sacramento Valley Air Basin, while most of the Trinity National Forest is located within the North Coast Air Basin. There are no major heavy industrial areas in either of these air basins.

Logging is the primary industrial activity that takes place on National Forest and private lands. Logging, transportation vehicles, burning of logging slash, and burning for fuels reduction and wildlife habitat improvement account for a large percentage of the pollutants emitted into the air.

The Yolla Bolly-Middle Eel Wilderness has been designated as a Class I air quality area. Because of this, management of the air quality in this area requires identification of air quality related values (AQRVs) by measuring sensitive indicators of those values. The AQRVs are inventoried and monitored in cooperation with the Mendocino National Forest.

The Forests are in compliance with all national ambient air quality standards. However, like most air basins in the State, those within the Forests exceed the California ambient air quality standard for PM-10 (particulates less than 10 microns in size). Primary sources for PM-10 are burning and dust generating activities. Less prescribed burning would be emphasized in the future in order to maintain soil quality and habitat diversity. There would be more emphasis on better utilization of excess slash for biomass and firewood. Therefore, emissions would be reduced and air quality would be better. Since no major industries are planned, other dominant pollutants would not be a problem.

2. BIOLOGICAL DIVERSITY

Biological diversity is a broad ecological concept that can be described in many ways. Generally, it describes the relative degree of abundance of wildlife species, plant species, plant and animal communities, habitats, or habitat features per unit of area.

The main components of diversity include: richness (number and type of different species); evenness (amount of various components); and pattern (structure and location of components).

There are several broad ecosystems on the Shasta-Trinity National Forests: conifer forests, hardwoods, and chaparrals. All of the vegetation types, their successional stages, and their localized, special components such as caves, talus slopes, rock outcrops, snags, downed logs, etc. provide habitat for a diverse array of fish and wildlife species.

Conifer Forests. Four major coniferous forest types grow on the Shasta-Trinity National Forests: mixed conifer, Douglas-fir, ponderosa pine/Jeffrey pine, and red fir/white fir. They comprise roughly 79 percent of the Forests' land base.

An estimated 13 percent of the vegetation on the Forests is in early seral stages, 45 percent is in mid seral stages, and 34 percent is in late seral stages. Another 8 percent is in pure or mixed hardwood stands.

There is much public debate over the management of "old-growth" coniferous forests. Most concerns seem to focus on large, old conifer stands that have a high level of decadence. For tracking purposes in this Plan, "old-growth" is labeled "4C-older" and is described as older over-mature habitat or late-successional. These older stands make up about 10 percent (210,000 acres) of the vegetation on the Shasta-Trinity National Forests.

Hardwoods. Hardwoods, including black oak (*Quercus kelloggi*), canyon live oak (*Quercus chrysolepis*), madrone (*Arbutus menziesii*), tanbark oak (*Lithocarpus densiflora*), and big leaf maple (*Acer macrophyllum*) grow in pure stands and also as components of some conifer stands.

Chaparral. About 149,300 acres of chaparral grow on the Shasta-Trinity National Forests. In addition, another 60,000 acres of chaparral are found under a sparse canopy of tree species. An estimated 21,600 acres of this chaparral are on lands classified as suitable for timber production.

A wide variety of chaparral species combinations grow in the understory which is composed predominantly of evergreen (sclerophyllic) shrubs and scrub tree species. Chaparral stands basically originate in one of two ways: (1) as the successional stage of vegetation allowed by local environmental conditions, and (2) from past natural or human-induced processes such as fire and timber management.

The benefits derived from chaparral are varied. Wildlife (foraging, nesting, thermal and escape cover), range (foraging and thermal cover), and watershed (soil stabilization), represent the major beneficial resource outputs. Negative impacts can also occur primarily in the form of unavailable or impenetrable vegetation with high evapotranspiration rates.

In addition, adverse fire situations can develop in old, decadent, and dense stands. Most of the chaparral brushfields on the Forests are over-mature and decadent. The location and extent of chaparral types offer very limited opportunities to reduce wildfire hazard.

Shasta-Trinity National Forests personnel have historically had prescribed burning programs to enhance brushfields on deer winter ranges. This burning has been in cooperation with the California Department of Fish and Game (DFG).

Riparian Woodland. The riparian woodland grows where water runs intermittently or year-round. The most common species are alders (*Alnus* ssp.), cottonwoods (*Populus* ssp.), and willow (*Salix* ssp.). An estimated 85,500 acres of riparian habitat are scattered throughout all vegetation types across the Forests.

Natural Grasslands. About 11,000 acres of grasslands are scattered throughout the Forests.

In addition to the vegetated lands, there are about 110,100 acres of non-vegetated lands comprised of rock or water.

The size and location of the Forests' broad ecosystems will not change over time. Even the size and location of vegetation types will not change significantly. Wildfire and people, primarily through prescribed burning and timber management activities, can alter the amount and pattern of structural diversity. This alteration of habitat is important to wildlife by providing a continuous rejuvenation of forest vegetation.

3. BIOMASS

Biomass is of increasing interest on the Shasta-Trinity National Forests. Once a discarded by-product of logging, biomass now has growing value as fuel for home heating and for generating electricity. There is a recognized need to encourage the orderly removal and use of biomass, while considering other resource values. Increased utilization of biomass would reduce the amount of prescribed burning on the Forests.

In the recent past the available biomass material was generated from logging debris. Recent inventories of logging debris indicate that there is in excess of 50 tons per acre of suitable biomass material on many harvest units after logging.

Additional biomass comes from precommercial thinning activities and brushfields. In addition, significant amounts of biomass are located on non-commercial land where no timber management activities are planned.

Biomass is distributed throughout the Forests, but its availability for use is limited by factors such as slope, accessibility, and competing demands.

The existing demand for biomass is in the form of hardwoods for firewood. Relatively little of the available biomass on the Forests is being used to generate electricity in wood-burning power plants. However, this use is expected to increase.

Nine wood fiber power plants are operating in the area. No new plants are planned in the near future. The existing plants need about 1,640,000 bone-dried tons of fuel per year. Most of these plants are connected to lumber mills and rely heavily on fuel from mill waste rather than forest residues (biomass). Less than 20 percent of the material required by these plants is being supplied from forest residues. This is expected to increase to over 50 percent within the next few years.

The demand for biomass will be met by the Shasta-Trinity National Forests, other National Forests in the area, and private lands. Currently the demand for wood fuel for power plants is greater than supply.

The opportunity exists to increase biomass supplies for electricity without impairing the availability of firewood. The removal and use of excess biomass can produce related benefits including reduced loss from wildfires, improved air quality, improved land productivity, increased wildlife and range browse, and added employment. The ecological role of biomass in the forest environment must be considered in conjunction with its removal and use.

4. BOTANY

Threatened/Endangered

No plants on the Shasta-Trinity National Forests are Federally listed as threatened or endangered.

Sensitive

Forty-two plant species native to the Shasta-Trinity National Forests are on the Pacific Southwest Region's (Region 5) sensitive species list. One third of these are endemic to the Forests. The majority of these endemics are restricted to serpentine soils.

The Forests' sensitive plants include two State-listed species: Brandegee's eriastrum (*Eriastrum brandegeae*), listed as rare, and Trinity buckwheat (*Eriogonum alpinum*), listed as endangered.

Rare plants can be affected positively or negatively by natural or human-caused disturbances. Examples include road building and maintenance, excavation of rock sources, grazing, logging, changes in hydrology, wildfire, fire suppression activities, introduction of non-native, competitive weed species, natural succession, climatic conditions, and plant collecting. However, some sensitive plants rely on wildfires or other disturbances for maintenance of their habitat.

Management and protection of sensitive plants is accomplished through identification and inventory of suitable habitat, surveys of project areas for potentially affected populations, protection of habitat, and population monitoring. It may also include manipulation of habitat to increase or stabilize populations. Species Management Guides have been developed to address the individual needs of each species.

Endemics

Four non-sensitive plants are endemic to the Shasta-Trinity National Forests. These are: Dubakella Mountain buckwheat (*Eriogonum libertini*), serpentine haplopappus (*Haplopappus ophitidis*), Shasta eupatory (*Eupatorium shastense*), and veiny arnica (*Arnica venosa*).

Endemics are surveyed for, mapped, and avoided where possible. In addition, habitat management plans are being developed for them.

5. FACILITIES

There are over 6,800 miles of inventoried roads and about 500 miles of uninventoried roads on the Shasta-Trinity National Forests. Following is mileage of roads and their respective maintenance levels. (See the glossary in the Final EIS for a definition of each maintenance level).

	Miles
Level 1	941
Level 2	4,241
Level 3	1,309
Level 4	262
Level 5	66

The number of miles of roads that are maintained may vary from year to year. Some 1,500 miles of the Forests' road system are jointly owned or cost-shared with private landowners, and 110 miles are under County jurisdiction. Another 370 miles of Forest highways are under the jurisdiction of the Forest Service and State or County agencies. The Shasta-Trinity National Forests' transportation system represents an investment of approximately $300 million.

About 15 percent of the Forests' inventoried road system is closed seasonally by gates, and as much as 30 percent

more is closed by snow during normal winters. An additional 10-12 percent of the road system is closed following completion of management activities such as timber harvesting. These roads are kept closed, providing there is adequate public access into the area, until future management activities necessitate re-opening.

Officially recognized as recreation facilities, but commonly thought of as part of the transportation system, are three categories or classifications of trails. They include the Pacific Crest Trail (154 miles), National Recreation Trails (26 miles), and other Forest trails (1,139 miles). The majority of the users are backpackers, equestrian groups, hunters, and anglers.

Other facilities include over 460 recreation buildings and about 300 non-recreation buildings. Many of the recreation buildings are in need of maintenance and/or replacement; this will be accomplished as funds become available. Some of the administrative facilities at Hyampom, Harrison Gulch, Big Bar, Weaverville, Lakeshore, Turntable, and the Northern California Service Center are in need of major reconstruction or replacement. A significant capital investment program will be pursued to accomplish this needed improvement. Many of the fire lookouts on the Forests are old and in need of replacement. This will be accomplished on a priority basis while protecting significant historical values. Additional lookouts may be abandoned as new detection systems are implemented.

A decision has been made to eliminate all administrative site facility leases.

6. FIRE AND FUELS

The Shasta-Trinity National Forests provide wildland fire protection for approximately 2.4 million acres. Of this area, 364,081 acres are private or State-owned lands protected for the State of California by cooperative agreement. The State has wildfire protection responsibilities on 200,000 acres of National Forest land within the boundary of the Shasta-Trinity National Forests.

By the end of 1987, seven years of the 1981-1990 planning period had elapsed resulting in an average of 126 lightning and 103 person-caused fires burning an annual average of 13,880 acres. The fire season of 1987 was extremely bad, and nearly 90,000 acres were burned on the Forests. During the ten-year period between 1971-1980, an average of 120 lightning and 144 man-caused fires burned annually. These fires averaged 8,470 acres within the total protection area.

The configuration and size of the present protection organization resulted from base fire plans prepared in 1972 for the 1971-1980 period. The size of the fire organization is a function of the budget which has declined significantly since 1980.

A Fire Protection Agreement is in effect with the California Department of Forestry and Fire Protection (CDF) that provides for the sharing of fire protection resources, thus augmenting the fire suppression capabilities of each agency.

The wildland fire protection problem is becoming more acute as values-at-risk increase. Wildland fuels management presents an opportunity for long-range mitigation of the increasing demand and escalating costs of fire protection.

Fuels management activities have consisted of construction and maintenance of fuelbreaks, burning of timber sale slash, and broadcast burning in timber and brush fuels. Fuel treatment has been accomplished on about 11,000 acres per year. The majority of the prescribed burning is done to prepare brushfields for reforestation. The remainder of the burning is done to benefit wildlife and reduce natural fuels. In the future fuels treatments will support ecosystem goals that encourage returning the landscape to conditions that pre-existed the exclusion of fire.

An increasing demand for logging residue, for the generation of electricity, is emerging. This demand has the potential for removing significant amounts of debris that is being burned through prescribed fire.

7. FISHERIES

Environmental Setting. Fishing, the Nation's second most popular outdoor sport, after swimming, is in abundance on the Shasta-Trinity National Forests. Of the 5,500 miles of rivers and streams within the Forests, 1,900 miles are fishable. In addition, there are more than 50,000 acres of lakes and reservoirs.

Outstanding coldwater fisheries are found in the McCloud and Pit Rivers. Eight miles of the McCloud River (below McCloud Reservoir) are classified as a Wild Trout Stream and offer a blue-ribbon fishing experience of National acclaim.

The headwater areas of the Trinity River (above Clair Engle [Trinity] Lake); the North and South Forks of the

Trinity River and their tributaries; Squaw Creek; and Squaw Valley Creek also support fisheries of regional interest.

The fish in Shasta, Trinity, Lewiston, McCloud, and Iron Canyon Reservoirs, as well as in over 80 alpine lakes, are also of major recreational interest.

The Sacramento and Trinity River Basins once sustained several of the largest populations of important anadromous fish (salmon and steelhead) in California. However, factors such as dam construction, catastrophic floods, natural landslides, over harvest of fish, human activities on the landscape, and domestic livestock grazing have contributed to reduced habitat quality and population levels.

Two types of habitat problems can impose long-term impacts to anadromous or inland coldwater fish stocks -- those that are human-induced and those that are naturally inherent to a system, (i.e. unstable soils or geological formations.) Human-induced activities are further delineated by those that are under Forest Service administrative control and those that are outside the purview of Forest Service authority. Only those Forest Service activities that have a potential to impact either anadromous or inland coldwater fish habitat will be discussed here. Forest Service land management activities are not expected to impact inland warmwater fish habitat.

Instream habitat improvement and watershed rehabilitation projects, coupled with biological (fish stock) enhancement opportunities, are helping bring about the recovery of salmon and steelhead populations in the Trinity River Basin.

Forest Service involvement with plans to initiate recovery of anadromous fish in the Sacramento River Basin has been limited because of the small amount of National Forest land involved (Beegum Creek).

Fisheries Program Planning. National and Regional attention has focused on the need to provide direction to the National Forests to develop and implement viable fisheries programs.

National emphasis has focused on the "Rise to the Future" program (March, 1987). This action plan further integrates fish habitat management into the overall multiple use goals of the Forest Service.

The Pacific Southwest Region's (Region 5) "Rise to the Future" program (October, 1987) reiterates integration of the fisheries program with other resource programs. This document also acknowledges the state-approved "Partners in Fish" program (May, 1987) which asks the Forest Service to take a strong leadership role in protecting, restoring, and improving fish habitats within the National Forests.

In addition, Forest personnel have assisted in the preparation of fisheries plans with other agencies, including the California Department of Fish and Game (DFG). Each of these plans sets goals for achieving the long-term stability of selected fish species or bodies of water.

Threatened/Endangered/Sensitive Fish Species

There are no Federally designated threatened or endangered fish species on the Shasta-Trinity National Forests.

The sensitive fish species include the spring-run (summer) steelhead, bull trout, rough sculpin, and the redband trout.

Anadromous Fish Concerns

The primary area of concern is the South Fork Trinity River. Even though this basin is gradually recovering from the catastrophic impacts of the 1964 flood event, populations of fall and spring-runs of chinook salmon, like the summer steelhead, have not responded. Their numbers remain relatively low.

Because of its geological nature, this river system is vulnerable to disturbances both natural and human-caused. Although both causes are potential sediment producers, forest management activities can be sensitive to watershed and fisheries needs in order to maintain populations of fall and spring-runs of chinook salmon in this drainage.

Within Canyon Creek, New River, and the North Fork Trinity River spring-run chinook adults, like summer steelhead, are vulnerable to poaching during the summer since they are extremely visible in clear canyon pools. The DFG recognizes poaching as one of the most immediate threats to these fish. These latter tributaries to the mainstem Trinity River have not been identified as major sediment producers accelerated by human-induced activities, although areas of natural instability do exist within their systems.

Anadromous Fish Opportunities

The Forest Service plays an important role in the enhancement of anadromous fish within the Trinity River Basin. Major investments have been made by the agency and the Trinity River Restoration Program (TRRP) to facilitate the improvement of adult returns of winter-run steelhead and increase the survival of rearing juveniles within the South Fork Trinity River basin. This effort is expected to continue throughout the next two decades.

Although the spring-run (summer) steelhead stocks within the New River and North Fork Trinity River basin are stable, they are not stable in the South Fork Trinity River. Adult returns of spring-run chinook are very low within these three basins as well as Canyon Creek and throughout the Klamath-Trinity River Basin. Cooperative efforts are on-going with DFG and other concerned agencies as to the most appropriate methods that can be applied to protect and enhance these stocks.

Concerted efforts have been undertaken by the TRRP agencies to implement a 10-year program to restore fish and wildlife resources within the Trinity River Basin to pre-Central Valley Project levels. The Forest Service continues to be a supportive and active member of this restoration effort.

Inland Coldwater Fish Concerns

Because of budget constraints, little effort is being concentrated on the wild trout populations of the Forests. Insufficient funds prohibit development of a significant inventory and improvement program in inland coldwater and warmwater fisheries.

After several years of drought conditions, major concerns have been expressed over the viability of the small tributary streams to support wild trout populations, especially redband trout.

The greatest concerns for the redband trout streams center on cattle grazing/disturbance, high point source recreational use, and water drafting for dust abatement.

The Upper Sacramento River (above Shasta Lake) supported a unique wild trout fishery until the summer of 1991. Unfortunately, the prized trout populations from a 45-mile stretch of this river were temporarily lost as a result of a chemical (Metam Sodium) spill in July, 1991. Currently that section of the river is recovering from the effects of the spill.

Inland Coldwater Fish Opportunities

DFG has recommended that special management protection be provided for all redband trout waters on the Shasta-Trinity National Forests.

In an effort to improve the informational database on inland fish streams, habitat typing began in 1990. Surveys have been completed on Raccoon Creek, Squaw Creek, Squaw Valley Creek and the Upper McCloud River. In addition, three redband trout streams (Moosehead Creek, Sheepheaven Creek and Trout Creek) have been habitat typed.

Further assessments of the alpine lake resources need to be made to identify ways of emphasizing the diversified recreational sportfishing opportunities offered by these waters. The Upper Trinity River, tributary to Trinity Lake, needs to be evaluated to determine watershed rehabilitation and fish habitat restoration needs and establish its candidacy as a State wild trout stream.

Inland Warmwater Fish Concerns

Impacts from land management activities on warmwater fish habitat and associated recreational sportfishing is minimal within the Whiskeytown-Shasta-Trinity National Recreation Area (NRA).

Two concerns exist with respect to the maintenance of reservoir levels and the continued perpetuation of black bass populations at Shasta and Trinity lakes. First, prevailing drought conditions in California have reduced water storage capacities to critical levels. Secondly, the Bureau of Reclamation adjusts its Central Valley Project operating plan annually to meet water rights for downstream water users.

The first action has decreased bass access to traditional spawning and rearing areas and has left numerous fish habitat improvement structures unusable. Secondly, water releases, which may benefit downstream fish species like the winter-run chinook salmon, Delta smelt (candidate species for listing), and native nongame fish species within the Sacramento River, need to be regulated to meet the lifecycle needs of black bass at Shasta Lake.

Inland Warmwater Fish Opportunities

Opportunities to improve shoreline rearing habitat at Shasta and Trinity Lakes are being pursued jointly by the Forest Service and the DFG. Habitat typing preceded the

development of habitat improvement plans at each lake. This was conducted in order to locate the most suitable sites for planting willows and button bush as well as locating areas for structural habitat improvements.

Establishing sound partnerships will be important in accomplishing future habitat improvement efforts, especially in the warmwater fisheries program.

Selection of Fish Assemblages. Fish species have been grouped into specific assemblages or groups to simplify tracking the effects of Forest Service management activities on fish habitats. Three assemblages have been established. These are: (1) Fish Habitat - Anadromous Assemblage, (2) Fish Habitat - Inland Coldwater Assemblage, and (3) Fish Habitat - Inland Warmwater Assemblage. The species associated with these assemblages are listed in Appendix G of this document.

Winter-run steelhead, spring-run chinook and summer steelhead were selected as management indicators for the anadromous fish assemblage. The rainbow trout was selected for the inland coldwater fish assemblage, and the largemouth bass was selected for the inland warmwater fish assemblage.

Selection of Management Indicators. The Forest Service manages fish habitats to maintain viable populations of wild, native fish (rainbow trout, salmon, and steelhead) or to enhance fish populations of wild or introduced (largemouth and smallmouth bass) species. To ensure that viable populations are maintained, these management indicators are selected to act as "barometers" for aquatic communities. These indicators can then be used in determining the needs of a species and for predicting habitat capability responses to management activities. Simply put, these management indicators are used to guide and monitor forest management activities in a manner that will maintain biological diversity in addition to producing enough fish to meet recreational and commercial needs.

Management indicators are selected from species with similar habitat requirements. Management of these species will ensure that viable population levels of other species represented by the indicator species are also maintained.

8. FOREST PESTS

Plants, animals, insects, fungi, and other organisms in the natural forest environment that interfere with the attainment of Forest goals and objectives are referred to as forest pests. These forest pests exploit certain ecological niches or conditions which occur at times during a forest's development.

Mortality of mature conifers usually involves a complex of forest pests and predisposing site and stand conditions. Bark beetles are usually the immediate cause of conifer mortality. Stresses caused by dwarf mistletoe infestations, root diseases, overstocking, and drought increase the susceptibility of a tree to bark beetle attack. When these trees have commercial value, the mortality may be recovered by salvage logging. Over the last few years, about one-half of the mortality was salvage logged on suitable lands. Annual mortality has ranged from 15-20 million board feet (MMBF) during periods of relatively normal precipitation, to as high as 80 MMBF following several years of drought.

Forest pests also account for significant losses to young tree seedlings. Competing vegetation, deer, and gophers are the major pests which contribute to plantation failures and/or the need for replanting.

In addition to losses to the timber resource, pests can have significant effects on other resources as well. Loss of vegetation in campgrounds can affect their management and use. Small openings and dead trees may provide habitat for wildlife. High levels of mortality along streams may affect streambank stability and on hillsides visual quality may be impaired.

The overall approach to preventing or controlling forest pests is called Integrated Pest Management (IPM). IPM recognizes the interrelationships of the entire pest-host system and, rather than just attacking the pest, treats one or more of the components in an integrated manner.

IPM combines various strategies into a decision-making process. The process includes one or more of the following steps: prevention, surveillance, detection, evaluation, suppression, and monitoring. The goal is to prevent and/or reduce unacceptable resource losses. This approach includes pest-related information in the development and implementation of silvicultural prescriptions. In selecting appropriate techniques to minimize pest-caused losses, a range of options is considered on a case-by-case basis, including chemical, biological, manual, and cultural methods.

Maintaining acceptable levels of pest effects is usually related to the level of vegetation management that can be implemented. Most pest management measures occur as a result of silvicultural manipulations, not from direct control of the offending organism. For analysis purposes, the

intensity of pest management practiced is partially dependent on the level of vegetation management that can be applied.

9. GEOLOGY

Two active volcanoes are located in the northeastern portion of the Shasta Forest: Mt. Shasta and Medicine Lake Volcano. The U.S. Geological Survey has identified an area of 1,200 square miles around Mt. Shasta as having a significant hazard from ash fall, mudflows, pyroclastic flows, and lava flows. The hazards associated with the Medicine Lake Volcano are still being assessed.

The extent of seismic hazards within the Forests is unknown. Earthquakes of Richter magnitude 4.5 and 3.7 were recorded in 1978 and 1981. Both occurred near Stephens Pass in the northern portion of the McCloud District and resulted in localized surface rupture.

Nearly all of the Shasta-Trinity National Forests have been inventoried for landslide hazards. Significant landslide hazards are present within the Trinity National Forest and in portions of the Shasta National Forest, especially in canyon lands adjacent to the Sacramento, McCloud, and Pit Rivers.

Avalanche hazards are extensive in steep, high elevation, alpine areas. These areas are generally above treeline or in sparsely vegetated areas. Major avalanche areas on the Forests include the Trinity Alps, the Trinity Divide, and Mt. Shasta. Other than Mt. Shasta, winter access is limited and use within these areas is light.

There are over 80 groundwater wells, with an annual output of nearly 657 acre-feet/year of water, on the Forests. The majority of the well water is used at recreation and administrative sites. Additional uses include dust abatement, wildlife habitat, and fire suppression.

10. HERITAGE RESOURCES

Several professional anthropologists and archaeologists were contracted to prepare overviews concerning local history, Native American religious places, prehistoric Indian sites, and Native American place-names. These contracts were awarded to: Bauman, 1981; Martin and Hodder, 1981; Theodoratus Cultural Research, 1981; and Theodoratus Cultural Research, 1984.

Additionally, a workshop was held to solicit information from local historical societies, academic institutions, the Native American community, and the State Historic Preservation Office. A review of the California Inventory of Historic Resources (State Plan, 1976) indicated that of the nine themes identified, all are represented by recorded sites in the Forests.

As of 1990, several hundred thousand acres in the Forests had been inventoried for cultural resources, with about 1,050 historic and 1,600 prehistoric sites being recorded. Since most of the inventories were done in support of other resource activities (e.g., timber sales), most of the recorded properties occur in areas managed for multiple use.

Wildernesses, the Whiskeytown-Shasta-Trinity National Recreation Area, and non-commercial timber land have either been lightly sampled or not surveyed at all. Some level of inventory is needed on other areas to be sure that a representative sample of the Forests' cultural resources are documented for study and management. Also, as of 1990, about 1,100 of the recorded cultural resources had been evaluated against criteria for the National Register of Historic Places, and approximately 500 have been determined eligible.

The inventory and evaluation of cultural resources has been guided by two research orientations that have been termed "cultural ecology" and "the direct historical approach." The former is concerned with how societies, through time and space, have used culture to adapt to changing or static environments. The latter involves studying the history of a particular ethnographic group, such as the Wintu of the Redding area, by using the written historical record to interpret archaeological remains. Both approaches seem particularly appropriate to the Shasta-Trinity National Forests, since there is a diverse and well documented ethnographic record and multiplicity of environments that must have fostered variable adaptive responses. The two-fold research orientation revolves around the subject of land-uses and requires detailed chronological and environmental data, as well as a thorough understanding of prehistoric technologies.

The historic overview prepared for the Forests identified a number of themes which highlight events of the last 150 years. The earliest theme identified was exploration, beginning in the 1830s. The first explorers were fur trappers. During the 1840s, several military expeditions, such as that of John C. Fremont, passed through the Forests. Beginning in 1848, with the discovery of gold by P.B. Reading, Shasta and Trinity Counties witnessed the first significant population influx.

Trails, stage routes, and wagon roads were established throughout much of the Forests by the 1870s. These early endeavors culminated in 1887 with the completion of the Central Pacific Railroad linking Oregon with California. The completion of the railroad and other transportation routes set the stage for several other historic themes that characterized the next few decades: lumbering, recreation, and mining.

Early recreational use in the Forests was associated predominately with resorts, typified by those along the Upper Sacramento River. Mining activities continued off and on during the last decade of the 19th century. They reached a peak between 1895 and 1920 with the development of copper mines and smelters in the vicinity of present-day Shasta Lake. When the Shasta and Trinity National Forests were created (in 1905 and 1907, respectively), the present era of Forest Service multiple-use management began.

Within the general area of the Forests are several California Indian groups including the Wintu, Chimariko, Achumawi, Yana, Hoopa, and several Shastan peoples. Interest in local Native American culture has continued unabated for over a century. Archaeological field work at prehistoric Indian sites began in the first decade of this century, with studies of caves around Shasta Lake (i.e., Samwel and Potter Caves). Reservoir projects were the primary impetus for archaeological work between the early 1940s and the late 1960s.

In the 1970s, several programs were established that significantly increased the scope of archaeological work within the Forests' zone of influence. Projects begun by the Forest Service and the U.S. Bureau of Land Management (BLM) included inventory, evaluation, research, and interpretation of cultural resources.

During the past several years, there has been an increased use of cultural resources and associated records by outside parties. Archaeological excavations have been carried out on National Forest lands by various organizations including academic institutions and private consulting firms. These types of activities and passage of the Archaeological Resources Protection Act of 1979 (Public Law 96-95), the Native American Graves Protection and Repatriation Act of 1990 (Public Law 101-601), and recent amendments (1992) to the National Historic Preservation Act of 1966 will require increased consultations with Native Americans.

Public and agency concerns indicate the major problems with cultural resource management include difficulty in evaluating the significance of cultural resources, safely protecting sites during project activities, and adequately considering Native American concerns. New direction in the Forest Plan should mitigate these concerns.

Personnel of the Shasta-Trinity National Forests will pursue opportunities to cooperate with local organizations and institutions (for example, Shasta College, California State University, Chico, and Local Indians for Education, Inc.) to do further research and interpret important cultural resources.

Mt. Shasta was determined to be eligible for historic designation under section 106 of the National Historic Preservation Act. This eligibility means that all activities will be coordinated with Native Americans to determine if they would adversely affect the religious significance of sites within the designated area.

II. LANDS

There are a variety of complex land ownership patterns within the boundaries of the Shasta-Trinity National Forests. This diversity of ownership results from disposal of land under a variety of public land and mining laws enacted before and after the Forests were established. Homestead laws, general mining laws, grants to schools, and railroad land grants are a few examples.

This complex landownership pattern can diminish the effectiveness and benefits that can be derived from Forest resources. The intermingled ownership results in increased costs for boundary line establishment and maintenance, the need for right-of-way acquisition, complexity of fire protection and general administration, occupancy trespass, a demand for special uses, and increases in complexity of other basic realty management and protection responsibilities.

Conversely, the need to consolidate in areas where the intermingled lands are large tracts of single private owners may not be needed when there are advantages to the public of retaining the mixed ownership pattern, and there is an opportunity to promote better land use through coordinated efforts.

Land exchange is the principal method for accomplishing landownership adjustments. The Forests' land adjustment program is the vehicle to develop and implement a coordinated program of adjusting ownership patterns to optimize public benefits and administrative effectiveness consistent with private landowners needs.

The Resources Planning Act (RPA) requires that all property boundary lines between Forest and private lands be surveyed by the year 2020. About 1,900 miles of boundary line remain to be located and posted.

Hydroelectric power is the major energy resource associated with the Forests. The Bureau of Reclamation operations at Shasta and Trinity Dams, along with PG&E operations in the Pit River, yield a maximum potential capacity of 1,352 megawatts. Several small hydro projects have been developed and a few are in various stages of planning. Numerous opportunities exist for small hydro but development has been curtailed because of economical considerations.

12. LAW ENFORCEMENT

Shasta-Trinity National Forests' personnel administer their responsibilities for regulating use and protecting National Forest lands under Title 36 of the Code of Federal Regulations (CFRs) and appropriate sections of Titles 16, 18 and 21 of the United States Code.

According to the U.S. Constitution, the authority and responsibility to protect citizens and their property and the general police power is reserved to the States. Except in specific areas, the States have delegated their general police powers to city police departments or local county sheriffs.

While the Forest Service does not assume the sheriff's responsibilities in these matters, it is essential that the agency continue to provide and enforce 36 CFRs which govern public behavior. Specific examples relate to the rights, safety, and enjoyment of other users. The Forest Service enforces the CFRs in full partnership with local law enforcement agencies. State, local, Forest Service, and other Federal law enforcement authorities, each with somewhat different responsibilities and authorities, share in the law enforcement role on National Forest lands.

Although only a small percentage of visitors and users on the Shasta-Trinity National Forests commit violations, the number of law enforcement incidents is rising steadily due to an increase in the following:

a. visitors and users;
b. conflicts between users;
c. enclaves of lawlessness on National Forest and adjacent lands;
d. users involved in illegal activities; and
e. the trend toward increased criminal activity in areas suffering from economic depression or uncertainty.

These increased violations of the law, with their complexity and diversity, require professional law enforcement support. Staffing of appropriately trained and equipped personnel commensurate with the volume of violations will continue. The philosophy that all Forest Service employees have law enforcement responsibilities will continue and will be strengthened.

13. MINERALS

Forest Service policy is to encourage mineral exploration and development. The Forest Service integrates the development and use of mineral resources to the fullest extent possible under the laws governing mineral removal.

Noteworthy minerals in the Forests, based on past and present mining or exploration interests, are gold, limestone, copper, zinc, iron, manganese, chromite, barite, sodium, geothermal energy, oil and gas, and rock aggregate.

The removal of locatable minerals is administered under 36 CFR 228, Subpart A through a Plan of Operations or Notice of Intent. Removal of mineral materials of common variety (non-locatable) is administered under 36 CFR 228, Subpart C through a Mineral Materials Permit.

There is no interest in oil and gas exploration on the Forests.

The Geothermal Steam Act of 1970 (P.L. 91-581) authorizes the Secretary of the Interior to issue leases for exploration, development and utilization of geothermal resources on National Forest lands. There is interest in the geothermal resource on the Shasta Forest, particularly a portion of the Glass Mountain Known Geothermal Resource Area (KGRA) located on the eastern edge of the Forest. The majority of this KGRA is on the Modoc National Forest.

14. RANGE

Historically, livestock grazing on public land reached its peak during the late 1800s and declined over the next 50 years. The decline in stock permitted on public land was largely a result of a reduction in livestock numbers to achieve proper stocking rates. In addition, more reliance

on family-owned ranching operations lead to decreased demand.

The Forests' permit and administer 7,028 animal months (*AM) of grazing for 2,350 cattle, 2,120 sheep, and 45 horses on 26 term and temporary allotments. These allotments include 245,834 acres of suitable range land. Twenty-nine permittees are dependent upon the Forests' range resource to maintain part of their ranching operations.

*An AM is one month's use and occupancy of the range by one animal.

I5. RECREATION

The Shasta-Trinity National Forests are recognized nationally for the wide variety of outstanding recreation opportunities they provide. A large share of the Pacific Southwest Region's (Region 5) recreation activities is offered on the Forests. Other Federal agencies, State and local governments, and the private sector also share in the type of recreation activities offered.

Recreation on the Forests can be best described in terms of supply and demand. Supply is the quantity of recreation facilities or settings available for visitor use. In the case of developed sites, supply is expressed in terms of capacity. This is determined by the number of camping units or parking spaces available. For dispersed recreation, supply is expressed as a mixture of settings that are conducive to various activities. The recreation opportunity spectrum (ROS) is used to describe recreation settings offered; they range from primitive to rural. The recreation setting supply is measured in acres within each ROS class.

Demand for recreation is more difficult to determine than supply. Demand varies according to numerous factors associated with the preferences of recreationists and the settings offered. One indication of probable demand, which is easily measured, is recreation use. Current and projected use levels give an estimate of the recreation settings that may be needed in the future.

Recreation Supply

Recreation Opportunity Spectrum (ROS). ROS is a system that inventories National Forest lands for a variety of existing and potential recreation opportunities based on the size, distance from roads, and degree of development of a given area. The ROS classes pertinent to the Shasta-Trinity National Forests are: Primitive (P), Semi-primitive non-motorized (SPNM), Semi-primitive motorized (SPM), Roaded Natural (RN), and Rural (R). These terms are defined in the Glossary (Final EIS, Chapter VIII).

Inventoried SPNM and SPM categories include the majority of about 306,000 acres (within 29 areas) that were released for non-wilderness resource management under the 1984 California Wilderness Act. (Refer to the "Wilderness and Roadless Areas" Section in this Chapter and to the "Recreation" Section in Chapter IV).

Developed Recreation Facilities. Developed sites include campgrounds and picnic areas, observation and interpretive sites, fishing areas, boating and swimming sites, trailheads, recreation residences, marinas and resorts. The ROS settings include the semi-primitive (motorized and non-motorized) and roaded settings (roaded natural and rural).

Approximately 1,300 acres are allocated to developed recreation areas on the Forests. These include 81 campgrounds with 1,355 camping units; 20 picnic areas with 127 units; 14 parking areas for boaters; 3 day use swim areas; and 20 resorts and marinas. The total capacity of developed recreation facilities, estimated by the number of people-at-one-time (PAOT) multiplied by the season of use (days), is 1,147,500 PAOT-days.

Developed recreation use (1.5 million recreation visitor days [RVDs]) is at 65 percent of the theoretical maximum capacity for developed facilities (2.3 million RVDs). Regional standards state that if a Forest's developed facilities are reporting use greater than 40 percent of the theoretical maximum capacity, demand is exceeding supply.

Some developed sites on the Forests are overcrowded and in poor condition. Many campgrounds are frequently filled to capacity. Most of the Forests' campgrounds were designed and constructed 30-50 years ago and are not suited to today's recreational pursuits. Recreation budgets have not kept pace with facilities maintenance and reconstruction needs. It is estimated that 90 percent of the developed recreation facilities on the Forests are operated below standard.

Downhill ski facilities were in operation in the ski bowl on Mt. Shasta between 1957 and 1978. Studies for possible redevelopment were delayed pending final wilderness allocation of the California Wilderness Act of 1984. An environmental statement was completed in 1988. The Record of Decision selected an alternative involving development of downhill skiing on 1,950 acres of National

Forest land on Mt. Shasta, with the potential to serve 4,800 skiers-at-one-time (SAOT).

A decision on subsequent appeals required the Forest Service to complete a supplemental environmental analysis. Following completion of this document in 1990, several lawsuits were filed objecting to redevelopment of downhill skiing. A decision by the U.S. District Court on the first issue addressed in court proceedings has directed the 1990 Record of Decision to be subject to administrative review (appeals). A thorough review of the historic significance of Mt. Shasta was completed by the Forest Service during 1993. With the concurrence of the State Historic Preservation Office (SHPO), the Shasta-Trinity Forests forwarded an eligibility recommendation for a portion of the Mountain (over 19,000 acres) to the Keeper of the National Register of Historic Places. In March 1994, the Keeper issued a decision finding the entire Mountain (approximately 150,000 acres) eligible, based on its Native American traditional cultural values. As a result of considerable public interest concerning the content and process of the Keeper's decision, an additional public comment period has been announced in the Federal Register. New information and comments are being sought by the Keeper's office during a 60-day period. Upon completion of the comment notice and disposition process the keeper could issue a revised or reaffirmed decision.

Following completion of the Keepers review and decision, and a Forest Service review and evaluation of impacts of the proposed ski area on the historical property, a new Record of Decision may be issued announcing the start of the administrative review period. Following completion of the appeal process the original lawsuits may or may not be refiled in the U.S. District Court.

Mt. Shasta Ski Park, located on a lower elevation section of private land, became operational for the 1985/86 ski season. It has an estimated capacity of 2,000 SAOT.

Dispersed Recreation Settings. Dispersed recreation settings include forest roads and highways, backcountry areas, rivers, lakes, streams, and wildernesses. The ROS settings include the primitive, semi-primitive (motorized and non-motorized), and roaded settings.

Roaded settings include scenic byways, highways, wild and scenic rivers, lands adjacent to timber harvest areas, and many lakes within the Whiskeytown-Shasta-Trinity National Recreation Area (NRA). Developed recreation sites are generally located within the roaded settings. In addition to the developed sites, there are opportunities for many kinds of dispersed recreation. Because roaded settings are located on relatively gentle terrain with abundant access, most of the acreage within the setting is usable.

Semi-primitive settings include wild and scenic rivers, large lakes, and backcountry areas. These settings provide remoteness, challenge, and solitude. Some of these areas are managed for motorized travel by boat or off-highway vehicle (OHV) travel. Other areas are managed for non-motorized travel by foot, horseback or mountain bike. Location, access, and attractions affect the semi-primitive areas' level of use. As with developed sites, some semi-primitive areas are lightly used. Other areas attract enough use so that crowding and user conflicts occur. In these settings, terrain and trail access could limit the usable area. Although total acreage may be high, recreation use is usually concentrated along a trail or shoreline.

Many semi-primitive areas on the Forests offer desirable attractions, but use is limited. These areas generally lack an identity, adequate signing, or published information. Therefore, many potential visitors turn toward more publicized, Congressionally designated areas like NRAs and Wildernesses.

The largest and most remote backcountry areas are classified as primitive. All of the primitive ROS settings on the Forests are within Congressionally designated Wildernesses. There are five Wildernesses on the Shasta-Trinity National Forests: Castle Crags, Chanchelulla, Mt. Shasta, Trinity Alps, and Yolla Bolly-Middle Eel.

The Forests' OHV Plan designates 239,175 acres to cross-country travel. An additional 1,383,596 acres restrict OHV use to existing roads and trails because of highly erodible soils, steep terrain, critical wildlife habitat, or other resource conflicts. About 500,000 acres on the Forests are closed to OHVs, primarily because of wilderness designation.

A Draft Statewide OHV Motor Vehicle Recreational Trails Plan has been developed for the State of California Department of Parks and Recreation. This plan presents the concept of a statewide OHV trail system that connects use areas to provide opportunities for long distance trail touring. Although the State Plan identifies specific route locations, it recognizes that the actual route may vary. Existing OHV trails and low-standard roads can serve as part of the statewide system and provide long distance touring opportunities. There are 4,300 miles of road on the Forests that are ideal for OHV travel. Lands designated as semi-primitive motorized would be managed to provide a primitive recreation experience, while maintaining motorized access.

Recreation Demand: Current and Projected Use

Recreation use on the Shasta-Trinity National Forests is extremely high when compared to other National Forests in the United States. It ranks among the top ten in the Nation. An estimated 4.1 million RVDs occurred in 1989; this figure does not include 0.7 million RVDs related to hunting and fishing. This use is the result of the unique and abundant recreation opportunities which are easily accessible from Interstate 5, the primary north/south transportation corridor for the West Coast. I-5 passes directly through the Shasta Unit of the NRA and in close proximity to the Castle Crags Wilderness and the Mt. Shasta Wilderness and Recreation Area. Between Shasta Lake and Mt. Shasta the Interstate parallels the upper Sacramento River. From I-5, State Highway 299 west provides access to the Trinity Scenic Byway, the Trinity Unit of the NRA, the Trinity Alps Wilderness, and the Trinity Heritage Scenic Byway.

The current (1989) recreation use of 4.1 million RVDs is distributed as follows:

Developed Recreation (Public)--15 Percent. This includes campgrounds, group campgrounds, and picnic areas.

Developed Recreation (Private)--10 Percent. This includes facilities under special use permit, such as resorts, campgrounds, and recreation residences.

Dispersed Recreation--70 Percent. This includes boating, hiking, car camping, backpacking, pleasure driving, horseback riding, cross-country skiing, snow play, river rafting, mountain biking, and OHV use.

Wilderness--5 Percent. This includes hiking, backpacking, horseback riding, camping, mountaineering, and rock climbing.

The 1989 RPA document, "An Analysis of the Outdoor Recreation and Wilderness Situation in the United States: 1989-2040", lists 11 activities that are expected to exhibit the greatest growth in the number of recreational trips away from home. In order from greatest to least are: pleasure walking, pleasure driving, picnicking, stream/lake/ocean swimming, family gatherings, pool swimming, wildlife observation and photography and other outdoor photography, motorboating, bicycle riding, and day hiking.

Of particular interest is the projected growth in demand for the following water and snow activities: 27 percent increase for motorboating and 233 percent increase for downhill skiing. The Shasta-Trinity National Forests will play a major role in meeting these increasing recreational demands.

Additional private sector demand is expected in the areas of downhill skiing, outfitter guide services, and resorts. This increased demand is addressed in various NRA Plans, wilderness plans, and other environmental documents.

16. RIPARIAN AREAS

There are about 2,000 miles of perennial streams, 3,500 miles of intermittent streams, and 53,000 acres of lakes and reservoirs within the Forests.

Some of the most productive, sensitive, and diverse sites on the Shasta-Trinity National Forests are within riparian areas. These areas are adjacent to streams or other bodies of water. For fish-bearing streams riparian areas generally comprise the area within 300 feet of the high water mark. For nonfish-bearing perennial streams riparian areas generally comprise the area within 150 feet of the high water mark. For constructed ponds, reservoirs, and wetlands greater than 1 acre riparian areas generally comprise the area within 150 feet of the high water mark. For lakes and natural ponds riparian areas generally comprise 300 feet of the high water mark. For seasonally flowing or intermittent streams, wetlands less than 1 acre, and unstable and potentially unstable areas riparian areas generally comprise the area within 100 feet of the high water mark. Using these standard widths the estimated extent of riparian areas on the Forests is approximately 274,308 acres. Actual acreage will be mapped during future inventory work and at the project level to ensure full protection. These inventories will include information not only on the extent of the riparian area, but also on the conditions within the area. This information will be used in planning management activities within riparian areas to benefit the riparian-dependent resources.

Riparian areas provide important habitat for fish and other aquatic life-forms, as well as a variety of wildlife species, including the willow fly catcher, fisher, and bald eagle. Riparian areas have high wildlife values because of the close proximity of water and structural diversity of the vegetation. Riparian areas are the focus of water-related recreation uses; other uses are for livestock foraging and watering, water developments, and protection of wood products. This wide array of uses often results in conflicts between uses and the way riparian areas should be managed.

The condition of the Forests' riparian areas varies from areas that have never been disturbed to areas which have recovered or are in the process of recovering from disturbance. Other areas are in need of restoration efforts to help them recover more quickly. Riparian area damage can occur from natural causes, such as floods, as well as from livestock grazing, and other human-caused disturbances.

Past land management activities have been inconsistent in the application of riparian area management. Current management objectives within riparian areas are directed toward maintenance/improvement of the riparian ecosystem and protection of water quality and streamcourses. Ecosystem management programs including wildlife and fisheries are emphasized while forest management activities that emphasis commercial product development and extraction, and other non-dependent resource practices are not emphasized.

Forest personnel use Best Management Practices (BMPs) for the protection of water quality as described in "Water Quality Management for National Forest System Lands in California." These BMPs provide for watershed and riparian area improvement and the conduct of land-disturbing activities in a manner that will not result in the pollution of water from nonpoint sources. The use of BMPs will also minimize future conflicts and provide protection or enhancement of riparian areas. Riparian reserve areas along perennial, intermittent, and major ephemeral streams add additional protection to the riparian areas and the streams.

17. SOILS

A Soils Resource Inventory (SRI) has been completed for the Shasta-Trinity National Forests. This SRI is an Order 3 (reconnaissance) level survey which is suitable for broad land management planning. Soil/Water Resource Specialists provide the project level information. In addition, an Ecological Unit Inventory (EUI) is in progress. This EUI will provide integrated soil/geology/vegetation data for project level ecosystem management planning.

The SRI has identified 105 different soil types on the Forests. The productivity of these soils range from unsuitable to high. The greatest threat to the maintenance of soil productivity is erosion--both sheet and gully. Almost any soil is subject to erosion if a sufficient amount of surface water flow is present. Some soils have a higher propensity to erode than others. Examples of highly erodible soils are: Howtow, Chawanankee, Chaix, and Oval; they have developed from coarse-grained granitic bedrock.

Approximately 195,000 acres of National Forest land have a high to very high erodibility factor. Several management tools can be used to prevent unacceptable soil loss resulting from management activities. These tools include: (1) an Interagency Erosion Hazard Rating system for identifying soil erosion hazards; (2) management guidelines for granitic soils for controlling the management activities; and (3) Soil Quality Standards (SQS) which require the amount and kind of ground cover to be retained for soil protection.

The SQS are being implemented to provide better long term protection for the soil. These SQS are threshold values that are being established to protect soil productivity from significant change or impairment of the soil's productivity capacity through land management practices. Long term impairment or change of the soils can occur in several ways: through compaction, loss of organic matter, loss of large, woody material and erosion.

Shasta-Trinity National Forest personnel have completed a soil moisture/seedling survival study and a soil fertility study on a variety of plots in Northern and Central California. The results of this study will be used to identify opportunities for increasing productivity. In addition, there is a program in place to monitor the implementation and effectiveness of the SQS.

18. SPECIAL AREAS

Research Natural Areas (RNAs)

One RNA, the Shasta Mud Flow RNA, is established on the Shasta-Trinity National Forests. Approximately 3,703 acres (3,115 acres, net) were designated as the Shasta Mud Flow RNA by the Chief of the Forest Service in 1971. This RNA represents young growth Pacific ponderosa pine for the Cascade Physiographic Province and the scientific geologic values of a volcanic mud flow.

Fourteen areas have been screened and found to be viable candidates for RNA status. Nine of these are recommended for establishment. See **Table 3-I**.

The Pacific Southwest Region's RNA Committee recently identified several gaps in the array of natural habitat types currently represented in the California RNA system. In addition, new target types were added in 1990 as a result of refinement in the classification of non-forested ecosystems.

On the Shasta-Trinity National Forests 87 elements (ecosystems) are targeted by the Pacific Southwest Region for investigation, screening, and possible inclusion into the RNA system. These elements include: 19 meadow and wetland types, 11 riparian and bottomland types, 8 scrub and chaparral types, 1 grassland type, 9 woodland types, 36 forest types, 2 alpine types, and 1 limestone type.

A list of RNA targets and their correlation with RNA candidates on the Shasta-Trinity National Forests is shown in Appendix F of the Final EIS, along with descriptions of the RNA candidates.

Special Interest Areas (SIAs)

There are no established SIAs on the Shasta-Trinity National Forests. However, 19 areas are recommended for SIA designation. Special features of these SIAs include limestone caves, waterfalls, volcanic craters, fossil localities, and serpentine plant communities. Twenty-two other candidates will be evaluated for their suitability as SIAs during the Plan period.

Table III-14 (Final EIS) lists the 19 areas recommended for designation as SIAs and the candidates to be evaluated for SIA suitability. Each is described briefly in Chapter III of the Final EIS.

19. TIMBER

Forest Land Description. Of the 2,121,547 acres of National Forest lands on the Shasta-Trinity National Forests about 76 percent, or 1,623,000 acres, is forested with commercial conifers. Of that amount, about 1,077,775 acres are classified as tentatively suitable and available for timber production.

Tentatively suitable timber lands occur in four major commercial forest types: mixed conifer, Douglas-fir, ponderosa pine, and red fir. Lodgepole pine, knobcone pine, and hardwoods are also found, but they are in limited supply with minor timber yields. Six percent of the tentatively suitable timber land base is occupied by brush and other non-commercial species and is devoid of commercial trees.

The predominant conifer species on the Forests are Douglas-fir, ponderosa pine, red and white fir, sugar pine, and incense-cedar. The predominant hardwood species are black oak and live oak.

The size and age class distribution of the Forests' commercial conifer timber is not in an even or regulated condition. There is a large amount of land in the small sawtimber class and less in the smaller and larger size classes.

Table 3-I
Candidates for Research Natural Areas

	Area Name	Acres	Ranger District
1.	Bald Mountain Creek	800	McCloud
2.	Bear Creek	4,500	Hayfork
3.	Cascade	2,000	Mt. Shasta
4. *	Cedar Basin	1,160	Mt. Shasta
5. *	Devils Rock-Hosselkus	5,550	Shasta Lake
6. *	Manzanita Creek	7,250	Big Bar
7.	Murphy Glade	1,260	Yolla Bolla
8. *	Mt. Eddy	890	Mt. Shasta
9. *	Preacher Meadows	1,850	Weaverville
10 *	Red Butte-Red Fir Ridge	1,640	McCloud
11. *	Rough Gulch	3,960	Hayfork/Yolla Bolla
12. *	Smoky Creek	960	Yolla Bolla
13.	South Fork Mountain	1,180	Yolla Bolla
14. *	Stuart Fork	1,500	Weaverville
	TOTAL	**34,500**	

*Recommended for RNA establishment.

Nearly one-third of the tentatively suitable land is understocked. In fact, many stands are understocked and/or over-mature and are not fully utilizing the growth potential of the site. In addition, most of the existing stands on the Forests have culminated in mean annual increment of cubic foot growth.

Refer to Appendix D for additional timber related data.

Timber Management Direction. The latest timber management direction was established in the May 8, 1975, Shasta-Trinity National Forest Timber Management Plan and Final Environmental Impact Statement (Final EIS). Among other things, this Plan set an annual potential timber yield for the Forests based on timber inventory conditions that occurred in the 1960's.

Several of the assumptions on which these potential yield calculations were based have changed or have proven incorrect. Recent changes in multiple-use direction for timber producing lands, such as for spotted owls, as well as reductions in the amount of land suitable and available for timber production, such as for new wildernesses and land exchanges, have changed the Forests' timber base significantly.

Suitable Timber Land Base. The National Forest Management Act (NFMA) of 1976 required Forest personnel to do an assessment of lands which are capable, available, and tentatively suitable for timber production. Based on this assessment, completed in 1990, 622,870 acres on the Shasta Forest and 454,905 on the Trinity Forest, for a total of 1,077,775 acres, have been identified as tentatively suitable for timber production. Of this amount, 924,230 acres are suitable for all silvicultural systems (including clearcutting); 37,945 acres are suitable for all systems except clearcutting (primarily high elevation red fir); and 115,600 acres are suitable for stand maintenance or salvage only (due to site limitations such as low soil productivity, high rock content, and soils with poor water-holding capacity.)

Herbicides/Timber Stand Improvement. Timber stand improvement (TSI) consists of suppressing competing vegetation (release) and thinning young stands. Over the previous five years, an average of about 8,000 plantation acres per year were released on the Forests, and about 1,600 were precommercially thinned.

The Annual TSI Needs Report identifies the amount of acreage that has been inventoried and requires TSI treatments. The most recent Needs Report (October 1993) shows about 23,000 acres in need of release; an additional 22,000 acres need thinning. An unknown number of acres in need of TSI treatments has not yet been inventoried.

Precommercial thinning is normally done manually by chainsaw, but some thinning is done mechanically on flat ground. Until 1984, release of plantations on the Forests was normally accomplished by chemical methods, using herbicides. Since 1984, release treatments have been done either by manual or mechanical methods due to a moratorium on the use of herbicides. This moratorium has been lifted, and herbicides are available for use once again.

Harvest Level. The annual programmed harvest level under the 1975 Timber Management Plan was about 242 million board feet (MMBF) after adjustments were made for the California Wilderness Act. This harvest level was based on a suitable timber land base of about 1,074,000 acres.

The actual volume sold between 1975 and 1992 averaged about 200 MMBF per year (95 MMBF on the Shasta side and 105 MMBF on the Trinity). The actual sell volume was less than the programmed harvest level due primarily to budget limitations, poor timber markets during the early 1980's, and restrictions on the timber land base (such as herbicides and roadless areas.)

The listing of the northern spotted owl and subsequent implementation of the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl have further reduced the Forests' timber sale program. The actual volume sold between 1990 and 1992 averaged about 90 MMBF per year and for 1993 the volume sold was 55 MMBF.

Reforestation. Artificial regeneration by planting is the most commonly used method to assure adequate and prompt regeneration. Over 130,000 acres of plantations have been artificially regenerated. Many of these plantations are less than 20-25 years of age. Over the previous decade an average of about 9,500 acres was regenerated by planting annually.

The seedling survival rate after one growing season has consistently been about 85-90 percent for the pines and 70-75 percent for Douglas-fir. The success of planted seedlings, along with the natural regeneration that occurs, has resulted in a high percentage (95 percent +) of the Forests plantations meeting minimum stocking standards within five years after harvest.

Natural regeneration is not normally relied on due primarily to the unreliability of natural seed sources. Past experience with natural regeneration in shelterwood and selection cuttings has resulted in failures.

Clearcutting/Silvicultural Systems. The 1975 Timber Management Plan and Final EIS selected even-aged management as the preferred method for the Plan period (1975 to present). Clearcutting has been the primary method used to regenerate stands under this Plan. During the period from 1984 through 1990, about 49 percent of the acres harvested on the Forests were clearcut, or an average of about 8,700 acres per year. The average size of clearcut openings has been between 10 and 12 acres in recent years.

Even-aged management is the preferred silvicultural system for the commercial forest types, particularly when timber growth and yield are a primary management objective. Uneven-aged management may be appropriate where resources other than timber are emphasized and a continuous forest cover is desired.

Timber Supply. According to inventories completed for the Shasta and Trinity Forests in 1980, and updated in 1989, there are about 19.0 billion board feet of standing timber on lands classified as tentatively suitable for timber production.

The average volume harvested from the Forests between 1975 and 1992 was about 97 MMBF per year on the Shasta Forest and 115 MMBF on the Trinity Forest. This volume is expected to remain lower than average outputs of the past decade because of the listing of the northern spotted owl, and concerns for retention of "old growth" and riparian ecosystems.

As of September 30, 1993, the volume under contract on existing timber sales was about 48 MMBF. The volume under contract has been steadily declining in recent years.

Timber Demand. About 20 local mills get their timber supply from the Shasta-Trinity National Forests. Nearly all of the Forests' timber is processed in the local impact counties of Shasta (40 percent), Trinity (26 percent), Tehama (16 percent), and Siskiyou (12 percent). The annual capacity of the local mills is estimated at 700-800 MMBF.

The demand for timber is high because mill capacity is about four times the Forests' annual sell volume. This demand leads to highly competitive bidding on most sales. The mills in the smaller local communities rely heavily on Shasta-Trinity timber; as much as one-half of the processed timber comes from the Forests. Timber harvest levels have a significant impact on those communities most dependent on the wood products industry.

In recent years, due to high demand, all of the timber offered for sale on the Forests has been sold. Sales typically sell for several times more than the advertised rates.

Real timber prices have steadily increased over the years, as reflected in the average prices paid for timber sales. These long term price trends reflect the increasing scarcity of timber in relation to demand.

Demand for the major conifer species on the Forests can be reflected in their relative stumpage values. Sugar pine and ponderosa pine are high value species; Douglas-fir and incense cedar are moderate value species; and the true firs, red and white fir, are low value species.

The demand for hardwoods for home heating has risen dramatically since the cost of electricity has increased. However, there are large quantities of hardwoods available on the Forests.

20. VISUAL QUALITY

About 373 miles of roads on the Forests are managed so that adjacent beauty and attractiveness can be maintained or enhanced.

The Shasta and Trinity Units of the Whiskeytown-Shasta-Trinity National Recreation Area (NRA) were designated by Congress "for the public outdoor recreation use...and the conservation of scenic, scientific, historic, and other values..." (Public Law 89-336). The NRA is managed accordingly.

The Mt. Shasta Recreation Area possesses "much scenic beauty which should be conserved and developed for use and enjoyment by the general public for purposes of outdoor recreation..." This area, located on the upper slopes of Mt. Shasta, is also managed for scenic quality.

Views from State and Federal highways, identified as being eligible for designation as Scenic Highways, are managed to protect scenic quality. In addition, developed recreation sites and Wildernesses are managed to protect scenic values.

Over time, the landscape has undergone significant change. The existing visual condition of the Forests varies from an unaltered appearance to areas which have been physically altered on a large scale. About 75 percent of the Forests are natural or near natural in appearance. Inventories indicate there is a historic trend toward more change to a less natural appearing landscape. This trend has been accelerating during the past 35 years, principally in the areas seldom visited by recreationists.

In order to estimate the level of visual quality which would be acceptable to most people, recommended standards for managing the visual resource have been established. These inventoried visual quality objectives (VQOs) were based upon estimates of public concern for scenic quality (sensitivity levels), the quality of the landscape (variety class), and distance of the landscape from the viewing area. VQOs identify how much a management activity can contrast visually with the character of the landscape.

Management activities are being monitored to determine the trend of visual quality throughout the Forests.

21. WATER

Water Yield

Of the 5.45 million acre-feet of water yielded from the Shasta-Trinity National Forests' watersheds annually, almost all is used for human benefit in some manner. The water temporarily stored in Shasta and Clair Engle (Trinity) Lakes is used extensively for consumptive and nonconsumptive uses. The Water Quality Control Plans for the North Coast and Central Valley Regions list beneficial uses for the waters of the major tributaries on the Forests. The Plans list potential as well as existing uses. Aquatic habitat, lake-oriented recreation, production of hydroelectric power, and downstream agricultural irrigation are the primary water uses. Lake storage and releases also affect wildlife habitats and provide flood control.

Nine communities within the Forests have organized water supply agencies that obtain community water from surface sources. They are: Big Bar, Castella, Covington Mill, Craigview, Del Loma, Hayfork, Lakeshore Heights, Trinity Center, and Weaverville. Shasta and Trinity Lakes also provide domestic water to several communities and/or resorts: Jones Valley, Silverthorn Resort, Bridge Bay Resort, Mountain Gate, Shasta Dam Public Utilities District, and Fairview Marina. There is no formal agreement with these users regarding watershed management; however, water quality for these domestic uses meets State objectives.

In addition to community water systems, many domestic water systems are scattered throughout the Forests. Management direction is to protect water quality for domestic uses while maintaining State objectives.

The current water yield is sufficient to meet existing and future local needs. However, it is anticipated that there may be a water shortage in Southern California for irrigation and domestic uses. A portion of the water produced from the Shasta-Trinity National Forests is transported to Southern California.

Water Quality

Generally, water quality meets standards for beneficial uses. There are some areas where, because of past management activities, the quality of water does not meet standards during storm runoff periods. Cumulative impacts of successive activities, such as road construction and timber harvesting on private and National Forest lands, also contribute to the degradation of water quality.

Sixty-one watersheds have been identified within the Forests; they range from 11 to 410 square miles in size. An inventory of the existing condition of these watersheds indicates that seven have high disturbance levels due to past management activities or the 1987 fires. These watersheds are the East Fork of the South Fork Trinity River, Rattlesnake Creek, Hyampom, Gulch, Butter Creek, Plummer Creek, and Upper Hayfork Creek. Cumulative impacts have occurred within subwatersheds of these watersheds, and there is a significant risk of initiating additional cumulative impacts within the main channels draining these watersheds.

22. WILD AND SCENIC RIVERS

In 1968, Congress established the National Wild and Scenic Rivers System and encouraged States and local governments to participate in the program. In 1972, a California System was established under the California Wild and Scenic Rivers Act (Behr Bill). In 1976, the Forest Service and the California Department of Fish and Game (DFG) entered into a Memorandum of Understanding on cooperative relationships in handling Wild and Scenic River matters for both the National and State systems. This agreement included cooperation in carrying out studies and in preparing management plans.

In July, 1980, the Governor of California petitioned the Secretary of Interior to include certain segments of the previously designated California Wild and Scenic Rivers System as part of the National System. In January, 1981, approximately 106 miles of the Trinity River system, on National Forest lands, were designated as part of the Wild and Scenic Rivers System.

Public demand for existing Wild and Scenic Rivers, as measured through recreation use, is low to moderate. Projected demand for free-flowing rivers, as measured through growing public interest, is expected to increase significantly in the next five decades. As more dams and diversions are constructed in the western states, the availability of wild and scenic rivers will decrease. Therefore, it is likely that additional river designations will continue as long as the related concerns of water quality maintenance, fishing habitat protection, and scenic protection remain in the forefront.

In 1982, the Department of Interior completed an inventory and screening of potential rivers and river segments. A total of 134.6 miles of additional rivers within the Forests' planning area were identified under the National Rivers Inventory. Public comments on the Shasta-Trinity National Forests' Draft Environmental Impact Statement (Draft EIS), issued in August 1986, recommended that Squaw Valley Creek also be considered as a potential wild river. Field analysis indicates that 10.5 miles of Squaw Valley Creek are eligible for designation. Segments of the public also recommended Canyon Creek and Hayfork Creek for designation. While these streams were not listed on the Nationwide Rivers Inventory, they total about 21.5 miles and 14.0 miles, respectively, and have been determined to be eligible for designation. The public also requested evaluation of Beegum Creek and the Sacramento River (above Box Canyon Dam) for eligibility.

Through this document Forest personnel have made a preliminary administrative recommendation for National Wild and Scenic River designations. This recommendation is subject to further review and modification by the Chief of the Forest Service, Secretary of Agriculture, and the President of the United States. The Congress reserves the right to designate rivers to the National Wild and Scenic Rivers System.

A Coordinated Resource Management Plan (CRMP) has been adopted for long term management of the Lower and Upper McCloud River and Squaw Valley Creek. This agreement is between private landowners, the Forest Service, Pacific Gas & Electric, Nature Conservancy, Cal-Trout, and the DFG. This plan will effectively maintain the outstandingly remarkable values of this potential wild and scenic river. If, for any reason, the terms of the CRMP are not followed and the wild and scenic river eligibility is threatened, the Forest Service will recommend these segments for Federal Wild and Scenic designation.

A Wild and Scenic River Management Plan has been completed for the 53-mile section of the South Fork Trinity River (lower portion). Plans are needed for the New River, North Fork Trinity River (lower section), and the Trinity River (mainstem).

23. WILDERNESS AND ROADLESS AREAS

Wilderness

About 498,776 acres of the Shasta-Trinity National Forests are in five designated Wildernesses. The net acreage of these Wildernesses represents about 24 percent of the Forests. This figure includes a portion, 36,805 acres, of the Yolla Bolly-Middle Eel Wilderness. In addition, there are 405,128 acres in the Forests' portion of the Trinity Alps Wilderness. The Castle Crags Wilderness totals 10,483 acres; the Chanchelulla Wilderness encompasses 7,800 acres; and the Mt. Shasta Wilderness includes 38,560 acres.

There are scattered parcels of private land within the Wildernesses. Because of potential conflicting resource management objectives, it is desirable to acquire these inholdings. There are also conflicts between recreationists and cattle grazing primarily related to adverse effects on drinking water sources. Trail maintenance has been deferred for many years; therefore, many trails require extensive rehabilitation. A number of trails, some built during intensive gold mining days and others located for early grazing use, should be closed and/or relocated to reduce safety and erosion problems.

Public demand for the existing wildernesses, as measured through recreation use, is low to moderate. Projected demand for wilderness and roadless recreation opportunities is expected to increase significantly in the next five decades. The 1989 RPA document "An Analysis of the Outdoor Recreation and Wilderness Situation in the United States 1989-2040" projects increases in wilderness demand, based on projected future demand for activities commonly occurring in Wildernesses. Day hiking is projected to increase 193 percent; backpacking 155 percent; general outdoor photography 105 percent; and wildlife observation and photography 74 percent.

Further Planning Areas

The Mt. Eddy Roadless Area, containing 7,720 acres, is the only area in this category. Areas in the further planning category are to be considered for wilderness and non-wilderness options. Potential uses include dispersed recreation, downhill ski development, wilderness, wildlife management, research natural area, and a limited amount of timber management.

Released Roadless Areas

The 1984 California Wilderness Bill released 29 inventoried RARE II roadless areas, totalling 306,060 acres, to be managed for multiple-uses other than wilderness. Wilderness designation cannot be considered for these areas until the Forest Plan is revised in 10-15 years.

Sixteen of these released roadless areas, containing 167,076 acres, are highly controversial as to the type of activities to be allowed. Some segments of the public urge intensive management, including road building and timber harvest, while others support proposals for non-development, such as semi-primitive non-motorized recreation activities or research natural area designation. A listing of these 16 areas is contained in **Table 3-2.**

Table 3-2
Released Roadless Areas
of High Public Interest

Name	Total Acres
Castle Crags(B)	1,732
Chanchelulla	3,865
Chinquapin*	21,520
Devils Rock	13,896
East Beegum	7,963
East Fork*	5,195
East Girard (Nature Conservancy portion)	226
Fisher Gulch	4,472
Little French Creek	11,227
Mt. Shasta(B)	2,958
Pattison*	28,326
Penney Ridge	4,844
South Fork*	17,261
Underwood	3,219
West Beegum	5,480
West Girard*	34,892
TOTAL	**167,076**

* Five top priority areas of particular concern to the public.

24. WILDLIFE (General)

The Forests' diversity of habitats helps provide for the needs of about 370 wildlife species either seasonally or on a year-round basis. These wildlife are made up of 240 species of birds, 85 species of mammals, and 45 species of reptiles and amphibians.

Because the success of species management is dependent on habitat and population management, close coordination is required between the Forest Service, the U.S. Fish and Wildlife Service (USFWS), and the California Department of Fish and Game (DFG), as well as partnerships with conservation and sports groups. These include: the Mule Deer Foundation, Defenders of Wildlife, National Wildlife Federation, Rocky Mountain Elk Foundation, the National Audubon Society, and more.

The public enjoys wildlife for photography, viewing, nature study, hunting, etc. Most of the wildlife are non-consumptive species. Some of the consumptive species are: black bear, elk, mule deer, wild pig, gray squirrel, rabbits, pigeon, dove, grouse, quail, bobcat, and grey fox.

Management Indicators

The management indicator approach is used to reduce the complexity of discussing all the wildlife species on the Forests. Assemblages or groups of wildlife associated with vegetative communities or key habitat components have been selected as management indicators. Management of these assemblages will be directed under the standards and guidelines. However, not all of the assemblages are used as management indicators for every project.

Assemblages of Management Indicators include *:

1. Late Seral Stage Wildlife Assemblage;
2. Openings and Early Seral Stage Wildlife Assemblage;
3. Multi-habitat Wildlife Assemblage;
4. Snag and Down Log Wildlife Assemblage;
5. Riparian Wildlife Assemblage;
6. Aquatic Wildlife Assemblage;
7. Hardwood Wildlife Assemblage;
8. Chaparral Wildlife Assemblage; and
9. Cliffs, Caves, Talus, and Rock Outcrops Wildlife Assemblage.

* See the Wildlife Section in Chapter III of the Final EIS for a more detailed discussion of these assemblages.

1. Late Seral Stage Wildlife Assemblage

The late seral stages are important to wildlife for cover, thermal cover, large trees for nesting, large snags and down logs, vertical diversity, older over-mature habitat, etc. Some species represented in this assemblage are: northern spotted owl, goshawk, fisher, marten, Trowbridge shrew, and northern flying squirrel.

2. Openings and Early Seral Stage Wildlife Assemblage

Meadows, shrublands, and early forest seral stages provide diversity within the forest landscape. The openings provide forage areas for some big game species and habitat for small birds and mammals. Some species represented with this assemblage are: the racer, western meadowlark, California quail, song sparrow, western harvest mouse, brush mouse, brush rabbit, California vole, and deer.

3. Multi-Habitat Wildlife Assemblage

Some wildlife species depend upon a variety of vegetated habitats, seral stages, and special habitat components. Their needs may vary from winter to summer, from night to day or during breeding season. Some harvest species are represented in this multi-habitat assemblage: black bear, mule deer, elk, and turkey.

4. Snag and Down Log Wildlife Assemblage

Snags and down logs, components of decadence, are requirements for many wildlife species. Some species represented by this assemblage are: long-toed salamander, pileated woodpecker, black bear, western screech owl, pygmy owl, sawwhet owl, and tree swallow.

5. Riparian Wildlife Assemblage

The riparian assemblage represents species which use the terrestrial vegetation of the riparian zone. Riparian vegetation is dependent on a high water table. Riparian areas have a high diversity of plant and wildlife species. Many wildlife species are dependent on this habitat type and adjacent vegetation. With the dense canopy providing cover, shade and cooler temperatures, riparian forests provide corridors, connective habitat, and migration routes. Some species represented by this wildlife assemblage are: California red legged frog, black salamander, yellow warbler, willow flycatcher, and fisher.

6. Aquatic Wildlife Assemblage

There are several large reservoirs, lakes, rivers, and streams within the Forests. Along with fish, many wildlife species are dependent on water for their living or fish for their diet. The use of Best Management Practices (BMPs) helps provide for water quality protection. Aquatic systems are also managed through fishery and riparian management.

Aquatic dependent wildlife need good water quality, adequate water quantity, riparian and forested cover, fish or aquatic insects, and large woody debris. Some species represented by this assemblage are: tailed frog, western pond turtle, bald eagle, river otter and water shrew.

7. Hardwood Wildlife Assemblage

Hardwoods are found throughout the Forests either in pure stands or as individual trees in conifer forest types. Hardwoods have a high value to wildlife. Wildlife use hardwoods for forage, nesting, and shelter. Acorn production from the oaks is especially important as a food source. Some species represented by this assemblage are: acorn woodpecker, scrub jay, evening grosbeak, white breasted nuthatch and Hutton's vireo.

8. Chaparral Wildlife Assemblage

Chaparral is the general name given to a diverse combination of shrubs that provide habitat for many wildlife species. Chaparral is maintained as a shrubland through time. It is also included within the early seral stage category. Many rodents inhabit chaparral, and deer and other herbivores find forage here. Chaparral can vary in elevation, and can provide winter range, summer range, escape cover and fawning areas for deer. The shrubs provide flowers, seeds, and leaves for birds in addition to providing cover and nest sites. Some species represented by this assemblage are: bushtit, green-tailed towhee, wrentit, and mountain lion.

9. Cliffs, Caves, Talus, and Rock Outcrops Wildlife Assemblage

Cliffs, caves, talus, and rock outcrops are geologic features that provide unique habitat for wildlife. These features provide nesting, denning, and shelter. Because of rough, broken terrain and less vegetation, these features are normally protected from change. For example, cliffs and talus are protected because they are avoided by construc-

tion activities. Some species represented by this assemblage are: Shasta salamander, canyon wren, peregrine falcon, and Townsend's big eared bat.

Management Opportunities

Wildlife habitats are managed through project design, habitat improvements, protection, and mitigation. Wildlife habitats are also managed through application of standards and guidelines for riparian areas, snags, down logs, hardwoods, and seral stages.

There is an opportunity to increase the viewing and hunting possibilities for the hunted species: deer, bear, elk and turkey. Water, as a drinking source, has a low availability and poor distribution, especially during a drought cycle. Guzzler installation, spring development, riparian improvements and closures can help meet drinking water needs. Prey and vegetative forage needs to be maintained or increased in chaparral, hardwood and conifer forest communities. Prescribed fire or crushing of decadent browse, orchard pruning, oak thinning, etc. will improve food availability, abundance, variety, and nutritional value.

Two emerging programs, for mostly non-consumptive species, are the Watchable Wildlife and Neotropical Migrant Bird Program. The Watchable Wildlife Program emphasizes increasing the access, interpretation, and education for public enjoyment of viewing, nature study, and photography of wildlife. The goal of the Neotropical Migrant Bird Program is to maintain, enhance, and restore declining populations of these birds. The need and opportunity exists to determine the status and possible causes of population changes of these migrant birds. Mapping habitat changes, bird banding, and breeding bird surveys will help determine the status and changes.

There is also an opportunity to market the species, habitat, and program for Watchable Wildlife and Neotropical Migrant Birds. Creation of view sites, viewing pamphlets and brochures, news releases, magazine articles, local presentations, etc. can be used to promote the enjoyment of wildlife viewing and nature study opportunities. There is an opportunity to increase partnerships with civic, recreation, and conservation groups interested in these species.

Several funding sources are available for habitat management: program management funds, challenge cost share funds, partnership contributions, and Knutsen-Vandenberg (KV) funds.

WILDLIFE (Threatened, Endangered, and Sensitive Species)

Nationwide, there has been a reduction in certain fish and wildlife species due, in part, to past usage of environmentally persistent insecticides such as DDT, but primarily due to the reduction in the quality and quantity of habitat. This reduction has resulted in placing certain species on Federal and/or State lists of threatened and endangered (T&E) species.

Policy direction for the Forest Service is to manage "habitats for all existing native and desired non-native plants, fish, and wildlife species in order to maintain viable populations of such species". The Forest Service has management authority only over those elements related to habitat alteration on National Forest lands. Forest Service activities and programs are intended to assist in the recovery of T&E species and to avoid actions that may cause a species to become threatened or endangered.

State/Federal Lists. Various species lists are maintained by the U.S. Fish and Wildlife Service (USFWS), the U.S. Forest Service, and the State of California. In addition to State and Federal T&E species lists, the Pacific Southwest Region (Region 5) maintains a "sensitive" species list. The Regional Forester's "sensitive" species list for the Shasta-Trinity National Forests includes 42 plants, 2 birds, 2 mammals and 1 fish.

Species requiring special management considerations due to low population numbers and/or the potential for their habitats to be degraded are included. State listed threatened, endangered, and rare species may also be listed.

Eight of the Forests' T&E and sensitive wildlife species are discussed in this section. They are: the northern spotted owl, marbled murrelet, bald eagle, peregrine falcon, goshawk, marten, Pacific fisher, and willow flycatcher. For a complete listing of T&E and sensitive species refer to Appendix G of the Final EIS.

Threatened

Northern Spotted Owl. The northern spotted owl (NSO)(*Strix occidentalis caurina*) has been listed by the USFWS as a threatened species and, therefore, is protected under the provisions of the Federal Endangered Species Act of 1973.

To provide for a viable population of spotted owls throughout their historic range a network of late-successional reserves (LSRs) has been designated by the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl (ROD) issued on April 13, 1994.

In addition to the LSR network, the strategy for dispersal of the species includes the establishment of a system of corridors along riparian areas and green tree retention requirements within matrix areas.

Marbled Murrelet. On September 28, 1992, the North American subspecies of the marbled murrelet (*Brachy ramphus marmoratus marmoratus*) was listed as a threatened species by the USFWS.

The marbled murrelet is a small sea bird of the Alcidae family. Its normal range extends from British Columbia, south through Washington, Oregon, and Central California.

Marbled murrelets feed primarily on fish and invertebrates in or near shore marine waters and the majority are found within or adjacent to the marine environment.

While they spend the majority of their lives on the ocean, they come inland to nest in larger older trees. Some have been observed nesting inland up to 50 miles in Washington and up to 30 miles in Northern California.

Portions of the Trinity National Forest fall within 35-50 miles from the coast and have the potential to provide suitable nesting habitat. As of November 1, 1992, there had been no verified sightings and/or nests on the Forests.

Endangered

Bald Eagle and Peregrine Falcon. The bald eagle (*Haliaeetus leucocephalus*) and peregrine falcon (*Falco peregrinus*) have been listed by the USFWS as endangered and, therefore, are protected under the provision of the Federal Endangered Species Act of 1973. Management direction is identified in individual nesting territory management plans. These plans, which are in compliance with official species recovery plans, call for managing approximately 25 pairs of bald eagles and 6 pairs of peregrine falcons on the Shasta-Trinity National Forests.

Sensitive

Goshawks. The goshawk can be found throughout the Forests in late successional stages of most conifer timber types. The Forests have sufficient habitat to support about 200+ nesting pairs. Current management direction is to protect each known nest site during planning and implementation. Besides protection individual goshawk nests, additional habitat can be found in reserved areas (ie. wilderness) and other places managed for older over-mature habitats.

Marten. The marten is a Region 5 sensitive species. It is a close relative of the fisher and both belong to the mustelid family. The marten prefers stands of coniferous forest, primarily the true fir types at higher elevations. Current management direction is similar to that for the fisher.

Pacific Fisher. The fisher is a Region 5 sensitive species that frequents riparian areas as well as dense, deciduous stands of many forest types. Current management direction is to provide a network of suitable habitat to include linkage in the form of dispersal habitat. This direction is being fulfilled with the implementation of the LSR and riparian reserve systems. In addition wildernesses, roadless areas, and wild and scenic rivers help provide habitat and maintain viability of the species.

Willow Flycatcher. The willow flycatcher is a Region 5 sensitive species and a State listed threatened species. This species is associated with riparian woodland vegetation, primarily willow and alder, but is known to use upland shrub-type vegetation. Current management direction is to provide for population viability through the protection of habitat in the form of riparian habitat such as riparian management reserves and wet meadows.

Extirpated

Several wildlife species no longer exist on the Shasta-Trinity National Forests. These include the California grizzly bear (*ursus chelan*), bighorn sheep (*Ovis canadensis*), and wolf (*Canis lupis*). The State Fish and Game Commission has no plans to reintroduce these species.

Management Opportunities

Future management goals for TE&S species will be directed towards (1) reaching viable populations in the

case of T&E species; and (2) maintaining or, if possible, increasing existing viable populations of sensitive species.

Forest personnel will continue to survey for additional populations and habitats of TE&S species. Comprehensive surveys have begun for bald eagles, peregrine falcons, and NSOs. These surveys will intensify as management activities continue on the Forests. Additional inventory and/or surveys will be necessary to determine location, distribution, and habitat requisites of additional species and populations.

T&E species will continue to be managed under existing recovery goals identified in individual species recovery plans.

Production Potential

F

The Shasta-Trinity National Forests contain a wide range of production potential associated with various resources and activities. Production potential is defined as the opportunity to capture 100 percent of a resource's given biological production capacity. Production potentials are established for single resources, but also include minimum multiple-resource and legal and administrative constraints. Therefore, the constrained maximum quantity-quality available for any given resource or element is expressed as production potential. Refer to Chapter II and Appendix B of the Final EIS for a complete discussion of the various "benchmarks" used in the analysis process which determined the production potentials for each resource.

Resource Uses and Development

G Opportunities

Although production potentials for individual resources are important considerations in the analysis process, the Shasta-Trinity National Forests are mandated by legislative acts and administrative regulations to implement multiple-use management techniques rather than manage the Forests for any single resource emphasis. The allocations associated with this Plan reflect not only the capability and suitability of the land for various uses, but also respond to the public issues and development opportunities identified during the planning process. Refer to Chapter 2 for specific descriptions of how this Plan responds to various issues.

Because of the multiple-use mandates, ecosystem management goals, public issues, and competition among resources for the same land areas, individual resource production potentials are not usually attainable, nor desirable, when developing implementable alternatives.