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Six Rivers
National Forest

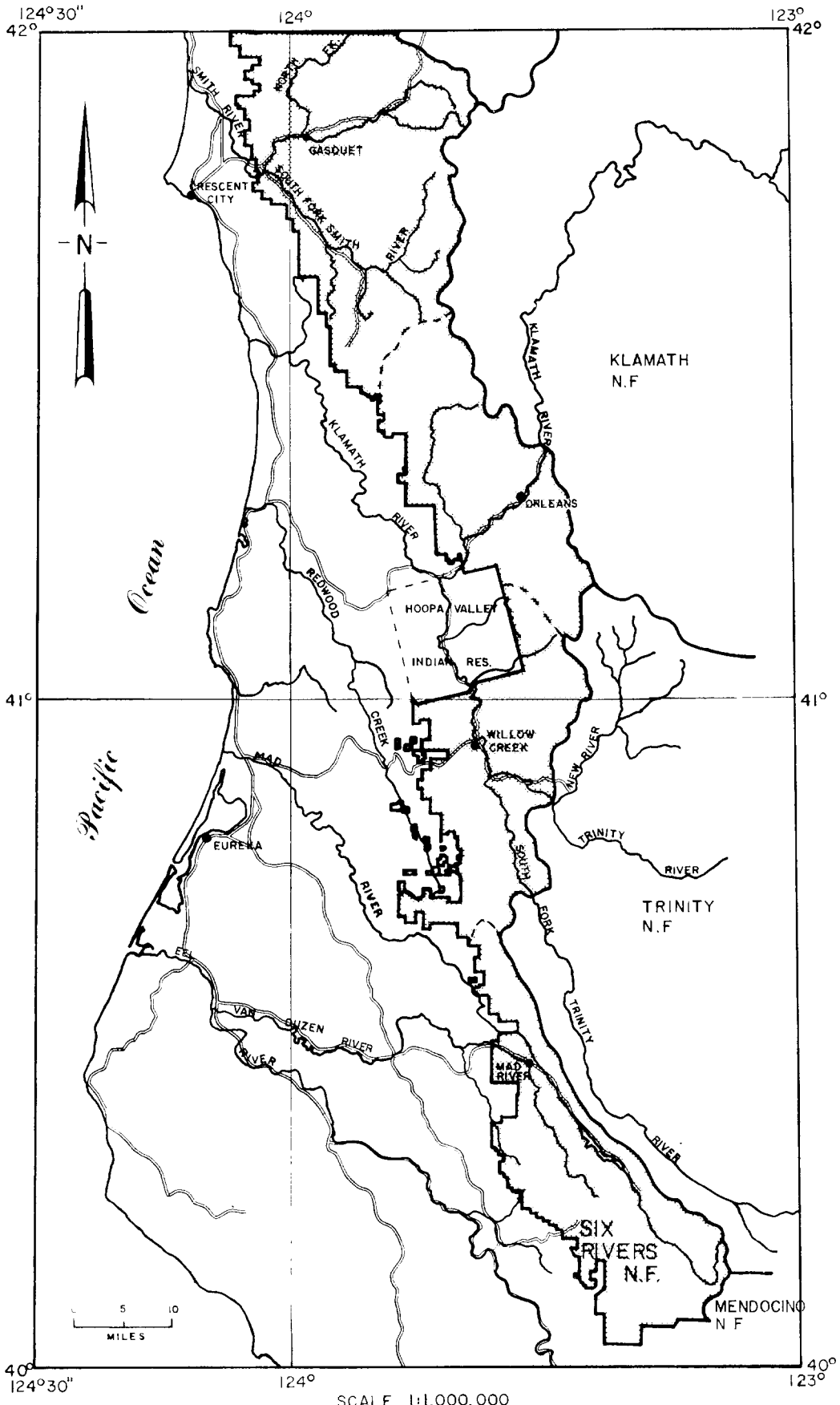


Final Environmental Impact Statement Appendices

Land and Resource Management Plan



VICINITY MAP



SCALE 1:1,000,000

SIX RIVERS NATIONAL FOREST

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ISSUES, CONCERNS, AND OPPORTUNITIES

INTRODUCTION

The Forest Service identifies public issues and internal management concerns through the scoping process. The scoping process for this plan has involved more than 7000 individuals, groups, companies, and agencies over a twelve year period. The narrative below details these interactions.

Initial scoping began on May 24, 1979 when the Notice of Intent to prepare the Six Rivers Forest Plan and Environmental Impact Statement (EIS) was published in the Federal Register. Public meetings were held on June 21, 1979 at each of the Ranger Districts and in Eureka. A list of preliminary issues identified through these meetings was published in the Forest's "Planning News" in December, 1979. The Forest Service continued to receive comments from both the public and employees through August, 1980.

The Six Rivers National Forest planning staff then synthesized the comments into groups of similar ideas and then evaluated them with respect to four criteria. The criteria were: ability of the Forest Service to resolve the issue, the scope and duration of the issue, and the intensity of feeling about the issue. Issues over which the Forest Service had jurisdiction, which had a large or long-term scope, and/or intense public sentiment, became part of the Final Issues Package. The ten issues are summarized below.

- 1. Timber Harvest:** The available land base, rotation age, sustained yield, community stability and jobs, hardwood utilization, size of clearcuts, the silvicultural 'wisdom' of clearcutting, the economics of clearcutting, and redwood management objectives.
- 2. Management of Blue Creek:** The desire to have the roadless area classified as wilderness, environmental consequences of harvest and road building, and desire for timber production.
- 3. Fisheries:** The declining populations of anadromous fish, reduction in habitat quality, and importance of resident fishery.
- 4. Herbicides:** The use of any herbicide or chemical and restriction of a forest management tool.
- 5. Indian Cultural Sites:** The disturbance of cultural sites and land allocations.
- 6. Recreation:** Off-road vehicle use, trail construction and maintenance, downhill skiing areas.
- 7. Relationship of Activities on Private Land:** The concern that the Forest will have to delay harvest to protect watersheds in areas of mixed ownership.
- 8. Soil Productivity:** Soil loss due to harvest and road construction, and effects of sustained logging (several rotations) on timber yield.
- 9. Water Quality:** The cumulative effects of repeated harvest activity in a drainage, disruption to beneficial uses, acceleration of geologic instability leading to water quality degradation.
- 10. Wildlife:** The retention of old-growth habitat, cumulative effects of repeated harvest activity in a drainage, and the protection of Sensitive, Threatened, and Endangered species.

The Regional Forester approved this package of ten issues for publication, and the Forest staff presented it to the public in the "Planning News" issue of September 26, 1980. In addition to the public issues, the Forest Service identified ten management concerns: range, fire, pest control, land adjustments, visual quality objectives, travel corridors, research natural areas, Sensitive plants, wildlife harvest species (deer), and marijuana gardens. An additional five issues were initially identified, but later screened out using the four criteria detailed above. The five issues removed from further analysis were: the G-O road, mining, plants, wilderness, and the Wild and Scenic status of the Smith River.

A Draft EIS and Forest Plan were made available for public comment in January 1987. In January 1988, the Forest Management Team reviewed the summarized responses to the Draft EIS and used a standardized flow chart to determine critical issues. The ten issues and recommendations for resolution were included in the revised issue package sent to the Regional Office in July, 1988. After the review by the Regional Office was received by Six Rivers in August, 1988, further analysis suggested that new criteria should be used to determine which issues were critical. Critical issues are now defined as those issues whose resolution forces compromises between resources and shapes the character of land allocations.

SELECTED ISSUES, CONCERNS, AND OPPORTUNITIES

Work toward the Final EIS was stopped in December 1990 when the Regional Forester withdrew the 1987 Draft EIS. The Notice to withdraw was published in the Federal Register and provided for a thirty day scoping period. Two major decisions prompted the withdrawal of the Draft EIS: (a) the signing of the Smith River National Recreation Area Act; and (b) the adoption of new habitat rules for the maintenance of the northern spotted owl. The Forest Service sent a letter in December, 1990 to over 6000 interested parties requesting verification of identified issues and disclosure of any newly-identified issues.

After the scoping process in December, 1990, the Forest planning staff decided that there were three issues whose resolution would force resource compromises and shape land allocation. They termed these critical issues and defined them as follows:

- (1) How will the Forest maintain biodiversity and viable populations of all native and desirable non-native plant and animal species?
- (2) What level of annual timber harvest will the Forest make available to help provide for the economic base of local communities?
- (3) How will the Forest manage riparian zones to help reverse the apparent decline in the yield of anadromous fisheries, and to maintain or restore the ecological processes and functions of riparian ecosystems?

In general, reserving the habitat believed to be required for the maintenance of the northern spotted owl,

anadromous fish stocks, and other threatened and endangered wildlife species is in conflict with the production of large volumes of timber.

There were also 35 issues whose resolution does not force substantial compromises in resource production or land allocation. Forest planning staff termed these non-critical issues. Information on these issues and how they affect alternatives may be found in Chapters 1, 3 and 4.

The interdisciplinary team identified opportunities from a variety of sources (scoping, consultation with other agencies, research, Indian Tribes, and Forest Staff); these opportunities are detailed in Chapter 3. The Forest planning staff then used these opportunities, along with issues and concerns, in the alternative development process.

Planning records and file issues of the "Planning News" are available for review in the Forest Supervisor's Office in Eureka. These files contain further details on the issues, concerns, and opportunities.

CONSULTATION WITH OTHERS

Consultation with other agencies, organizations, Indians and other key contacts began with a direct mailing on May 23, 1980, and was followed by personal contacts by Rangers and Staff. A summary of agency contacts is listed in Table A-1 at the end this appendix.

The northern California Forests and State of California agencies participated in a workshop on January 17, 1980. This workshop served to introduce the contacts who would be working together; to surface issues, concerns and opportunities; and to set the stage for further reviews and discussions. The following state departments were represented:

Department of Water Resources
Department of Boating and Waterways
Department of Fish and Game
California Energy Commission
Air Resources Board
Department of Conservation
Office of Planning and Research

Forest staff conducted coordination meetings with Indian Tribes (annex A of Six Rivers Public Involvement Plan) in March, 1980. They consulted with both Tribal organizations and key individuals of the Tolowa, Yurok, Hoopa, Karok, and Covelo tribes in a series of workshops arranged by the Northwest Indian Cemetery Protective Association.

OTHER CONSULTATIONS

Forest staff mailed an information packet to all major landowners within or adjacent to the Forest on October 10, 1980. This provided an opportunity for these landowners to coordinate any plans or objectives they had for their property with the Forest Plan. No landowners indicated that they had any formal plans or objectives.

Coordination with adjacent Forest Planners and Public Affairs Officers is a continuing process.

Periodically, the Six Rivers' "Planning News" is sent to a wide readership to keep interested and affected parties updated and to provide a feedback loop for public involvement.

Forest personnel have periodically conducted programs for service clubs, conservation clubs, and special interest groups since the scoping level of Forest planning began. Local agencies and elected officials are briefed periodically on the status of the DEIS and proposed Forest Plan. Issues continue to surface and be dealt with through these discussions as well as through the environmental assessment process used for individual projects.

Table A-1.

INTERAGENCY REVIEW

AGENCY	DATE OF INITIAL CONTACT	TOPICS SIGNIFICANT TO FOREST PLAN
1. Bureau of Indian Affairs (USDI)	6/11/80	None
2. Water & Power Resources Service (now U.S. Bureau of Reclamation)	8/15/80	Trinity River EIS done with Fish & Wildlife
3. California Department of Transportation (CalTrans)	7/31/80	No Major topics; Hwys. 199, 36, 299: slight modifications
4. California Air Resources Board	8/6/80	Possible reclassification of wilderness areas to Class I Air Quality Areas.
5. State Lands Commission	7/29/80	Adjacent state school lands
6. California Department of Parks and Recreation	8/14/80	Expansion of Jed. Smith State Park Joint VIS Plans
7. California Department of Water Resources	8/19/80	Possible reclassification of Eel River in 1985
8. Heritage Cons. and Recreation Service (USDI)	8/8/80	Wild and Scenic Rivers Inventory, Natural Biotic Landmarks
9. California Department of Forestry	8/8/80	Controlled burning, reforestation programs, harvest plans
10. California Department of Mines	8/12/80	None
11. Humboldt County Planning Dept.	7/31/80	Future zoning changes
12. Ruth Community Services District	8/12/80	Resident water project, future recreation facilities, summer home site expansion
13. California Office of Planning and Research	1/17/80	None
14. California State Resources Agency	1/17/80	None
15. Humboldt Bay Municipal Water District	8/14/80	Ruth Reservoir hydroelectric plans, Anderson Ford Dam proposal
16. Redwood National Park	8/21/80	Possible Bald Hills land acquisition, peregrine falcon habitat, Endangered plants, actions on Redwood Creek, drainage
17. Trinity County Planning Dept.	8/22/80	Ruth area development plans, inter-agency communication lines
18. Del Norte County Planning Department	8/27/80	Roads, Scenic designation of Hwy. 199, recreation, wildlife habitat, public transit, zoning
19. Bureau of Land Management (USDI)	8/28/80	Land trades, logging in contiguous areas
20. North Coast Water Quality Control Board	8/20/80	Water quality effects of logging, Best Management Practices
21. U.S. Fish and Wildlife Service	Continuing	T&E recovery plans
22. California Dept. of Fish and Game	Continuing	Indicator species, habitat diversity, deer herd study
23. California Energy Commission	8/29/80	Potential wind generation site, transmission lines, biomass energy

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THE MODELING AND ANALYSIS PROCESS

I. INTRODUCTION

The purpose of this appendix is to present a discussion of the analysis process and models used in developing the Forest Plan. Basic assumptions, model components and inputs, modeling rules and methods, and modeling constraints imposed as well as their rationale and impacts are described in this appendix. Information presented in this appendix supplements the broader and less technical descriptions that are included in the body of the Environmental Impact Statement (EIS). See Chapter 2 for a description of the overall process, the results of the benchmark analysis, and additional discussion of the alternatives.

A two step hierarchical modeling approach was used. Strategic, or forest level planning was done with the forest planning model FORPLAN¹. The Regional Ecosystem and Land Management Decision Support System (RELM) was then used to translate the Forest wide or zone solutions to watersheds of 2,000 to 11,000 acres at the tactical level of planning. The tactical level was used to test if the FORPLAN solution was feasible at the watershed level.

II THE PHYSICAL/BIOLOGICAL MODEL

OVERVIEW

The primary model use in developing the Forest Plan was FORPLAN. FORPLAN is a linear programming model developed by K. Norman Johnson. Linear programming is a standard mathematical technique for solving simultaneous linear equations subject to a certain set of constraints and a particular objective function. FORPLAN is a specialized matrix generator and report writer for a standard linear programming algorithm (C-WHIZ)². All of the

information needed for the FORPLAN analysis is entered into a data file. The FORPLAN matrix generator then creates the matrix of rows and columns that is then solved by the linear programming software (C-WHIZ). A report is then generated from the solution. Data in the summary reports are used to build tables and figures in the EIS and Plan. FORPLAN can be used to optimize any variable that can be expressed in a series of linear programming equations. In the various alternatives analyzed for this Plan, we used FORPLAN to maximize the amount of old growth, optimize seral stages distributions over time, maximize present net value, and maximize the timber harvest levels. Each of the solutions were subject to land allocations and standards and guidelines developed for each alternative.

Additional models were used to generate input data for use in FORPLAN and to interpret output data from FORPLAN. RAMPREP³ is the growth and harvest model used to make timber yield estimates for use in FORPLAN. The PROGNOSIS Growth and Yield Model was also used to determine effects of various stand treatments on stand growth and seral stage development. Wildlife Habitat Models were developed and used to estimate the effects of changes in Forest vegetation on effects on wildlife and fish populations. The Effective Alteration, 50-11-40, rule and Cumulative Watershed Effects modeling employed the use of a Spatial Disaggregation Model (RELM) to "test" the FORPLAN analyses on a watershed and/or compartment level. A more detailed description of some of these models is included in Part III of this Appendix.

FOREST DATA

A number of different data inputs went into developing the core physical/biological model. The Six Rivers Land and Resource Management Planning Base Data System is the current spatial data source

high-performance primal optimizer that solves large or difficult linear programming models.

³R-5 Inventory Process, July 1981, USDA-Forest Service, Pacific Southwest Region for a more detailed discussion of RAMPREP.

¹ Johnson, K. Norman; Daniel B. Jones, and Brian M. Kent: Forest Planning Model (FORPLAN) User's guide and Operations Manual, USDA Forest Service, May 1980.

²C-WHIZ is the linear programming code used with FORPLAN on an 486 type computer. C-WHIZ is a

MODELING AND ANALYSIS PROCESS

for forest level planning. The spatial line data is stored and manipulated in the Pacific Southwest Region (Region 5) interim Geographic Information System (GIS) called the "Distributed Wildland Resource Inventory System" (DWRIS 1987). DWRIS is a fully functional raster to vector GIS. This system is an evolution from the Region 5 Wildland Resource Inventory System (WRIS) which was developed by the Pacific Southwest Forest and Range Experiment Station.

The Land and Resource Management Planning Base Data System composite line layer was originally produced from existing inventories in 1980 (see Albert, 1985; Rohde, 1989)⁴. The composite layer's eight major line components (line determinates) consisted of the following:

1. Forest Boundary compiled from 1980 US Forest Service preliminary primary series 7.5' topographic quadrangles at 1:24,000 scale.
2. Private land boundary lines compiled from 1980 US Forest Service preliminary Primary Series 7.5' topographic quadrangles at 1:24,000 scale.
3. County and administrative boundaries compiled from 1980 US Forest Service preliminary Series 7.5' topographic quadrangles at 1:24,000 scale.
4. Valley Inner Gorge (Inner Gorge) and extreme landslide hazard areas were compiled from the Geologic Resource inventory (GRI) 1980 prepared for Six Rivers National Forest by Applied Earth Sciences, Inc.
5. Vegetation correction including timber harvest with an approved EA through June 1980 supplied by District personnel.
6. Original vegetation consisting of Timber type and Timber strata polygon from the original source 7.5' topographic maps used to create the first Six Rivers National Forest Timber type
7. Timber compartment lines were re-compiled from the original timber compartment maps (1979) from a scale 1:63,360 to the 1:24,000 base scale.
8. Eleven litigated Roadless Area Review and Evaluation (RARE II) roadless areas: North Forks Smith 707, Siskiyou A A701, Siskiyou B B701, Orleans Mtn. B B079, Orleans Mtn C C079, Underwood 237, Board Camp 308, Mt. Lassic 309, North Fork Eel 250, Big Butte Shinebone 145, and Yolla Bolly Extention 253, were re-compiled from a Forest Visitor's (Secondary Series) map at a scale of 1:126,720 corrected to 1978 to the 1:24,000 base scale.

This order of precedence was established based on the probably accuracy of the original data in combination with it's importance. The combining of the layer data was done by the cartographer with regard to the scanner tolerance of line approaches of no closer than 0.1".

Between 1980 and 1990 all other resource data inventories were coded to into existing polygon boundaries. A half in half out rule was applied. This meant that if 50% or more of the polygon was covered by the resource data, it was coded with that attribute, if less that 50% of the polygon was covered

⁴ Albert, George J. 1985. "The land and resource management planning base data system and map development." In Geographic Information Systems In Government. Opitz, Bruce K. eds. Vol. 2 p. 245-252. U.S.

Rohde, Robert. 1989. "A spatial timber inventory of Six Rivers National Forest." M.S. Thesis. California State University Humboldt, Arcata, CA.

by the resource data it was not coded into a 132 character long line polygon label linked data base.

In 1990 an update of the original composite line data was completed for the following:

1. Vegetation corrections for plantations, and other vegetation errors to cover the years 1980 to 1990. The primary source material was 1990 Spot orthophoto imagery at 1:24,000 scale on a 7.5' quadrant format. District personnel were instructed in the proper cartographic procedures to execute the manuscripting for this update.
2. The Forest boundary was corrected based on the Smith River National Recreation Area map of record at a scale of 1:63,360 scale (1990).
3. The Forest was divided into quarter townships.

The GIS update of the 1980 Land and Resource Management Planning Base Data System in 1990 was accomplished by Vestra Resources of Redding, CA for Six Rivers National Forest using ArcInfo GIS. They delivered the 60 updated quadrangles in a MOSS export format consistent with DWRIS. The 60 quadrangles were then processed through DWRIS.

At this time the original polygon attribute data base was migrated into Oracle. Since 1990 updated resource layers for planning are applied to the 1990 updated composite line Land and Resource Management Planning Base Data System using the DWRIS GIS. In this process a new or revised inventory is scanned or digitized and then processed in DWRIS and overlaid on the 1990 Composite line Land and Resource Management Planning Base Data System or "Newmap" quadrangle as the 60 individual 7.5' format maps are called.

The Forest Vegetation layer is the primary driver for the model. Ecological type mapping along with 2,600 ecosystem classification plots were used in determining historical range of variability and disturbance cycles. At the time of the analysis the only about half the Forest had ecological type map coverage (Smith NRA, Mad River RD and Portions of Orleans and Lower Trinity). Inventories or land designations used in developing the model are shown below in Table B-1.

Table B-1 Inventories used in Developing Forest Physical/Biological Model

1. Forest Vegetation type mapping developed in 1978 from 1970 aerial photos.
2. Plantation Records, updated in using 1990 SPOT images and stand records.
3. Forest stand exams (used in modeling growth & yield given various Prescriptions)
4. Ecological Unit Inventory (Grouse Creek, and Pilot Creek)
5. Series and seral stage mapping
6. Ecosystem classification plots (2600 throughout the Forest)
7. Geologic Resource Inventory (landslide hazard mapping and Inner George Mapping)
8. Soil Resource Inventory
9. Water Resource Inventory
10. T&E Plant inventory (ARABIS)
11. Native American Contemporary use areas (NACUAs)
12. Smith NRA Zones
13. Research Natural Areas
14. Botanical Areas
15. Fish inventories (in determining Key Watersheds and riparian widths)
16. Road Inventory & Road Densities
17. Variety Class
18. Visual Quality Objective mapping.
19. Roadless and RARE II areas
20. Recreation Opportunity Spectrum Maps (ROS)
21. Scenic highways and other corridors (travel, powerline etc.)
22. Political and administrative boundaries.
23. Watershed boundaries
24. Wild & Scenic river inventories
25. Wilderness
26. Wildlife Inventories and previous designations. eagle zones, falcon zones, goshawk territories, late-successional reserves & adaptive management areas, marbled murrelet habitat, Marten territories, HCAs and critical habitat

Economic data, such as activity costs and output valuations were included in the model. Activities (eg. tree planting watershed improvement, sale preparation) were based on past Forest programs (1988 through 1994) and staff projections of future trends. Output values were based on moneys received for the output 1988 through 1994. Where costs or values were not available the values were obtained from Appendix B of the 1990 Recommended RPA program (Resource Pricing and Valuation Procedures for the Recommended 1990

MODELING AND ANALYSIS PROCESS

RPA Program). All costs and outputs were converted to 1989 dollars. The state variables⁵ were not valued in dollar terms. Under the alternatives where the goal was to optimize or maximize some mix of habitat states, the model would be run to optimize or maximize the habitat. The resultant values would be set as a constraint and the model re-run to maximize PNV to determine the most cost efficient way to achieve the habitat objectives.

This information was analyzed in FORPLAN. In the FORPLAN matrix, the rows represent resource production functions, costs, and acreage or other types of constraints (for example, row 1 might represent acres of old growth; row 2 might represent timber harvest). The columns represent the different activities (prescriptions) which can occur over time on specific units of land called analysis areas. The numbers or coefficients at each row-column intersection are the outputs or costs associated with each prescription/analysis area combination.

For the Six Rivers National Forest, the FORPLAN matrix contained approximately 3,000 columns and 1,000 rows. Once the model was formulated, a number of test runs were made to check the model for reasonableness and to make additional calibrations. Activity and output schedules, costs, benefits, and present net value were developed by altering the objective function and constraint set to meet the theme of each alternative and benchmark and then running the model. For example, under the OGR alternative we ran the alternative to maximize timber, set the timber output level as a constraint, then maximized habitat quality, and then PNV. This would allow us to maximize the amount habitat quality given that timber was being maximized. Unique constraint sets were developed to represent minimum management requirements and minimum implementation requirements. An iterative process was used to formulate these constraint sets prior to making final FORPLAN runs for the alternatives and benchmarks (sections II-G, -H, and -I of this appendix).

FORPLAN was used to determine the most cost efficient mix of goods and services that could be produced from the Forest given the objectives and constraints of each alternative. The trade-offs made among alternatives were examined and the costs and

benefits associated with each objective or constraint set were measured. This analysis provided a way of indirectly evaluating the non-priced benefits by measuring the amount of present net value (PNV) foregone. The final criterion used to evaluate alternatives was net public benefits (NPB), which is the PNV plus consideration of non quantifiable Forest resource benefits.

The Forest used FORPLAN to analyze different management alternatives and optimize vegetative states and output scheduling over the planning horizon. The objective under the CUR and MKT alternatives were to maximize timber outputs given a set of land allocations and constraints based on standards and guidelines and management objectives. The timber harvest levels were then set as a constraint and the model was rerun or rolled over to Maximize Present net Value (PNV). In the OGR alternative, the objective was again to maximize timber outputs given a set of land allocations and constraints, but the model was rolled over to maximize old growth habitat and lastly PNV.

In the PRF alternative FORPLAN was used to model historic disturbance cycles and mimic historical seral stage distributions. The Forest was divided into three ecological unit subsections of the National Hierarchical Framework of Ecologic Units. Seral stage distributions were modeled over time based on past fire cycles for each subsection of the Forest (North Zone, Central Zone and South Zone). Timber yield was a by product of the disturbance cycles needed to achieve the Seral stage distributions. The solution was then rolled over to maximize PNV.

LAND UNITS

Capability areas are the smallest unit of land (or water) for which data is collected in Forest planning. They are classified according to physical (soil), biological (vegetation), and topographic factors as well as to administrative and political boundaries. All land within a capability area is alike in its ability to produce resource outputs and in its production limitations. The Six Rivers National Forest has 45,000 capability areas.

Capability areas were developed by overlaying existing map information. Capability area lines were drawn on maps with new areas created whenever a significant change in physical, biological or administrative features occurred. The ID team

⁵ State variables are a condition such as old growth habitat, amount of late seral habitat or vegetative states over time.

decided what information was needed for each capability area to assess resource opportunities and public issues and then collected information about each area.

Forty-eight different attributes were determined for each capability area and stored in computer files to form the Forest data base. The Forest used an Oracle Data Base Management System. Once entered into the system, information or capability areas could be retrieved, sorted, aggregated, and analyzed. The capability areas were also entered into DWRIS, a Geographical Information System. This system allows various spatial analysis and display the data.

Capability areas were aggregated or stratified into similar types (analysis areas) for purposes of analysis in FORPLAN. The characteristics that were used to define analysis areas were those which were thought to be most important for analyzing various management prescriptions. These characteristics used to stratify the Forest are called level identifiers in FORPLAN.

The level identifiers chosen to determine analysis areas were:

1. Key and non-Key watersheds.
2. Forest type.
3. Conifer size and stocking class.
4. Ecological Unit subsection
5. Timber suitability and regulation class.

Analysis areas resulting from this stratification which had less than 100 acres were combined with other similar analysis areas. There were 263 total land types defined as analysis areas in FORPLAN.

Key and non key watersheds were used to define analysis areas were as follows:

- KY** Key watersheds
- NK** Non key watersheds.

Vegetation types and size and stocking class used in identifying analysis areas were as follows:

- M1X** Mixed Conifer, plantations less than 15 years of age.
- MP2** Mixed Conifer, seedlings and saplings.
- MP3** Mixed Conifer, poles.
- M3P** Mixed Conifer, small sawtimber, poorly stocked.
- M3G** Mixed Conifer, small sawtimber, well stocked.

- M4P** Mixed Conifer, medium sawtimber, poorly stocked.
- M4G** Mixed Conifer, medium sawtimber, well stocked.
- MNS** Mixed Conifer, not currently stocked
- D1X** Douglas Fir, plantations less than 15 years of age.
- DP2** Douglas Fir, seedlings and saplings.
- DP3** Douglas Fir, poles.
- D3P** Douglas Fir, small sawtimber, poorly stocked.
- D3G** Douglas Fir, small sawtimber, well stocked.
- D4P** Douglas Fir, medium sawtimber, poorly stocked.
- D4G** Douglas Fir, medium sawtimber, well stocked.
- DNS** Douglas Fir, not currently stocked.
- HWD** Hardwood.

Sub-sections of the National Hierarchical framework of ecologic units use used to define analysis areas were:

- NO** Ecologic unit North of the Klamath River.
- MD** Middle zone North of Mad River Ranger District and South of the Klamath River.
- SO** Ecologic Unit Mad River Ranger District

In addition to the 72 land types, other analysis areas were created to deal with specific modeling needs. For example, existing and potential trail miles were defined as analysis areas for purposes of projecting recreation demands and costs.

PRESCRIPTIONS

A prescription is the set of management practices and the schedule for their application on a specific area to achieve desired objectives. For a given analysis area, the range of prescriptions describe what could be done on that analysis area. FORPLAN is used to determine what should be done given the constraints and objective function for an alternative.

It is important to recognize the difference between management prescriptions and FORPLAN prescriptions. Management prescriptions provide direction for managing resources to produce goods and services and to meet specific goals and objectives. They outline management practices, schedules, and standards and guidelines for specific areas of the Forest. Management prescriptions and standards and guidelines meet the requirements outlined in 36 CFR 219.27. Management

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prescriptions are listed in Chapter 4 of the Forest Plan and are summarized in Chapter 2 of the EIS.

The prescriptions used in FORPLAN were derived from the Forest's management prescriptions. Members of the Forest's interdisciplinary (ID) team quantified the outputs, costs, and benefits that would result from the application of a management prescription to a given analysis area. This process provided the information needed to complete a set of yield and economic tables used to calculate the cost and benefit of each FORPLAN prescription/analysis area combination.

FORPLAN prescriptions were developed to consider a full range of management activities on the analysis areas. A minimum level prescription was developed for each analysis area to allow a choice between selecting the possible intensive practices or selecting no active management. Other prescriptions represented various levels of intensity, which provided maximum flexibility in modeling the management situation so that either intensive or non-intensive management practices could be allocated to any land unit. The range of prescriptions available for each analysis area was constrained only by technical feasibility or unalterable management requirements. No genetic manipulation or fertilization practices were included in any prescriptions.

FORPLAN prescriptions consist of two levels: management emphasis and management intensity. Many prescriptions can be represented by one management emphasis and several management intensities; for example, under the timber full emphasis, even-aged management produces high timber yields. Openings are the largest permitted under the timber dispersion constraint, and the landscape visual quality is modified. Tied to this management emphasis are management intensities which vary in silvicultural treatment and in the use and timing of commercial thinning.

The following descriptions summarize the FORPLAN management emphases:

- FOR-AO** (GA) Forest-wide background activities and outputs. These are fixed and apply to the Forest-wide analysis area.
- R1-FUL** (R1) Timber regulation class I: full yield objectives. This prescription

includes suitable timberlands where management objectives allow for even-aged and uneven-aged harvest methods with full timber yields. Average rotation varies from 70 to 120 years. Outputs from other resources may be generated on lands assigned to this prescription, but non-timber objectives do not constrain timber production. This management emphasis is further discussed under Section IV of this appendix in Silviculture Strategy 1.

R1--SS

(SS) Timber regulation class I: sanitation-salvage (mature timber only).

R2--PR

(R2) Timber regulation class II: reduced yield objectives. Includes suitable timberlands where management objectives allow for even-aged and uneven-aged systems, but not at full yields. The emphasis on other resources would result in reduced yield by leaving live trees, through longer rotations, and by increasing the competition in the young plantation. Under this management emphasis, the intensity of timber harvest would be reduced to about 50% to 80% of optimum yields to respond to other resource objectives (visual quality, wildlife, etc.). Average rotations varies from 110 to 150 years. This management emphasis is further discussed under Section IV of this appendix in Silviculture Strategy 2.

R2-180

(R2) Timber regulation class 2: 180 Yr. average Rotation. This reg class is the same as R2-PR except that the min. rotation age is set to 180 years..

R5-HRV

(R5) Timber regulation class 5: Historic Range of variability. Objectives of this prescription is to maintain ecosystem within the historical range of variability. Harvesting is based on historic disturbance events, but in a even flow context. To allow for habitat loss from natural disturbances such as

large wildfires harvest levels were set at a level to maintain late seral vegetation in the upper portion of their historic range. Timber harvest would emphasize the creation of the vertical and horizontal structural characteristics of old growth stands and regeneration units would mimic historical disturbance patterns. This management emphasis is further discussed under Section IV of this appendix in Silviculture Strategy 5.

R6-ECR

(R6) Timber regulation class 6: Objectives of this prescription is to maintain 55% old growth. Regeneration harvest would be limited to small highly fragmented stands, unless over 55% of the watershed was in mature and old growth. Timber yields would primarily result from salvage and thinning. There is a greater long-term retention of mature forest cover rotation ages averaging over 400 years)., Timber harvest would emphasize the creation of the vertical and horizontal structural characteristics of old growth stands and larger unfragmented habitat blocks..

R3-MRG

(R3) Timber regulation class III: marginal timber yield objectives. Includes suitable timberlands where management objectives demand minimal timber yields. This emphasis restricts harvest to 0.3% of the area each year. Timber outputs are regulated as separate, non-interchangeable components of the allowable sale quantity (ASQ). Stand maintenance and harvest on low-productivity sites are included in this prescription. Examples of management objectives in this category include scenic rivers, some wildlife management areas, and portions of the Smith River NRA.

TU-UNS

(TU) Timber regulations class IV: Unsuitable. This prescription applies to all lands for which no chargeable

timber harvest is scheduled. Management prescriptions either preclude timber production or are so restrictive that silvicultural objectives cannot be met. Examples are non-capable, non-available, and non-suitable lands; wilderness and research natural areas (RNAs); and threatened and endangered (T&E) species.

Within each of the timber management categories listed above, a variety of harvest methods and silvicultural activities were modeled. The mix of methods available varied by timber management category, by land type, and by alternative. In the MKT Alternative and the benchmarks, all even-aged methods were allowed R1-SS, R1-FUL, R2-PR, R3-MRG and TU-UNS . In OGR only R5-180 , TM-MRG & TU-UNS methods were allowed. . In PRF only R5-HRV , TM-MRG & TU-UNS methods were allowed. ECR allowed a limited amount of thinning and salvage of natural mortality R5-ECR.

Vegetative Succession

Forest landscapes are dynamic. Over time through succession, forest stands move from one vegetative state or seral stage into another in response to numerous environmental influences, fire being the major one. The Six Rivers model had several features to model succession. The modeling results were used extensively in the analysis and display of environmental consequences of alternatives and in developing standards and guidelines. In some alternatives the seral stage changes were primary a response to other management goals such as maximizing timber harvest subject to constraints. In some alternatives the seral stage distribution or amount of old growth was the primary goal and timber harvest rates were a by product of that goal.

Four major vegetation series were tracked in the analysis, tanoak, Douglas-fir, white fir, and red fir. FORPLAN was used to model seral stage changes for these series over the planning period. Because the Forest does not yet have complete coverage for series (as of this analysis about 1/2 the Forest), timber types were used in FORPLAN as a proxy for vegetation series in the analysis. The Douglas-fir type was used to represent the tanoak and Douglas-fir series; and the mixed conifer type was used to represent the white and red fir series. The timber type mapping overlapped these series fairly close in the areas where

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series mapping has been completed. It was assumed that the number of acres in each vegetation series would not change over time. Hardwood stands, non-coniferous species and non-capable acres were not included in the projections of seral stage.

The Forest was divided into three zones (North, Central and South) corresponding to sub-sections of the National Hierarchy of Ecological Units (1993). The North zone includes the area north of the Klamath river on the Forest. The Central zone includes the area north of the Mad River Ranger District to the Klamath River, and the South zone includes all of the Mad River Ranger District. These zones were divided base on their fire regime. Forest zone was a level identifier so that different succession rates could be applied to each zone as well as timber type.

Disturbance can increase succession depending on the type, intensity and duration of the disturbance. A wind storm may accelerate development of old growth by creating small openings where the stand can develop vertical and horizontal vegetation layers needed for old growth. These type of stand disturbance events were not directly modeled as a distinct event in FORPLAN, but were accounted for in the average succession path a series would follow. Thinning Prescriptions that would speed up the development of old growth were modeled in FORPLAN. The LP was allowed to choose these Prescriptions base on the objective of the of the alternative. The following is the seral stage paths modeled in FORPLAN.

Table B-2. Seral Stage Age Classes

Seral Stage	Stand Age Decades			
	North & Central Zone		South Zone	
	w/out Thinning	with Thinning	w/out Thinning	with Thinning
Shrub/Forb	1-3	1-3	1-3	1-3
Pole	4-7	4-6	4-6	4-5
Early Mature	8-11	7-9	7-10	6-9
Mid Mature	12-15	10-13	11-14	10-12
Late Mature	16-20	14-17	15-18	13-16
Old Growth	21+	18+	19+	17+

Historic Range of Vegetation Variability

Stand replacing events such as fire and timber harvest move stands back to early seral stages. Over the past 200 years fire has been the primary disturbance agent. To determine the stand replacing rate we divided the

Forest up the three zones, five vegetation series and six seral. This was done to stratify stand replacing disturbance rates on the Forest. Landscape position, lower, mid and upper slope and aspect, was not used to stratify fire cycle at this level of analysis.

The vegetation was mapped using 1990 aerial photos and ortho quads. The ecology data base for northwest California (Jimerson, 1993) was used to calculate the mean stand age for each seral stage, and divide old growth into 50 year age classes. The HRV was calculated for each vegetation series and Forest zone. Table B-3 and 4 is an example calculation for the combined tanoak/Douglas-Fir in the north zone. The box labeled 50 Yr. OG Distribution is the percentage breakdown of old growth by 50 year classes. This is used to determine the acres of each old growth class for the table just above. The current age class distribution for the combined Douglas-fir and tanoak series is shown in the second and third column of Table B-3.

The age class distribution without harvest was calculated assuming that 98% of all harvest in the tanoak/Douglas-fir series in the North zone occurred in old growth. This assumption did not apply in the south zone where only about 10% of harvest occurred in old growth. For the south zone the stand exam records were used to determine the seral stage before harvest.

To determine past age class distributions each stand was grown backward for five 50 year periods. Acres passing through shrub/forb were "returned" using the serial stage distribution percent of the existing stand prior to harvest. After two periods the return was based on an "idealized" stand distribution.

The historic range of variability for the tanoak/Douglas-fir series in the North zone is shown in Table B-4. The idealized seral stage distribution and fire cycle estimates were made using Van Wagner's (1978)⁶ holts fire cycle equation .

$$1 - e^{-px}$$

where:

p = probability of burning (1/(fire cycle))
x = age

⁶ Van Wagner, C.E 1978. Age-class distribution and the forest fire cycle. Canadian Journal of Forest Research. 8(2): 220-227.

Table B-3. Historic Range of Variation Analysis (HRV) Tanoak/Douglas-fir Strata North Zone

DF Strata	Current Age		Age Class Distribution ^{1/}									
	Class Distribution		w/out harvest									
	1990		1990		1940		1890		1840		1790	
	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent	Acres	Percent
return acres					6,443		49,716		67,518		51,810	
Shrub Forb	20,455	7.6%	4,343	1.6%	25,989	9.6%	52,285	19.3%	38,037	14.0%	42,115	15.6%
Pole	36,412	13.4%	4,899	1.8%	55,364	20.4%	35,543	13.1%	32,136	11.9%	42,603	15.7%
Early Mature	61,563	22.7%	61,563	22.7%	52,936	19.5%	22,840	8.4%	44,589	16.5%	38,721	14.3%
Mid Mature	67,083	24.8%	67,083	24.8%	6,232	2.3%	39,768	14.7%	34,634	12.8%	32,245	11.9%
Late Mature	5,795	2.1%	5,795	2.1%	34,314	12.7%	35,099	13.0%	34,020	12.6%	36,823	13.6%
OG 200-250	21,062	7.8%	34,176	12.6%	34,035	12.6%	27,223	10.1%	31,608	11.7%	18,888	7.0%
OG 251-300	21,011	7.8%	33,222	12.3%	20,948	7.7%	26,090	9.6%	14,653	5.4%	15,006	5.5%
OG 301-350	12,417	4.6%	20,158	7.4%	19,990	7.4%	10,173	3.8%	11,568	4.3%	9,892	3.7%
OG 351-400	12,796	4.7%	19,510	7.2%	6,472	2.4%	7,930	2.9%	7,101	2.6%	8,995	3.3%
OG > 400	12,180	4.5%	20,025	7.4%	14,494	5.4%	13,822	5.1%	22,428	8.3%	25,485	9.4%
OG Total	79,466	29.3%	127,091	46.9%	95,939	35.4%	85,239	31.5%	87,358	32.3%	78,267	28.9%
Total	270,774	100.0%	270,774	100.0%	270,774	100.0%	270,774	100.0%	270,774	100.0%	270,774	100.0%
Total Early Mature +	213,907	79.0%	261,532	96.6%	189,421	70.0%	182,946	67.6%	200,601	74.1%	186,056	68.7%
Total Mid Mature +	152,344	56.3%	199,969	73.9%	136,485	50.4%	160,106	59.1%	156,012	57.6%	147,336	54.4%
Total Late Mature +	85,261	31.5%	132,886	49.1%	130,253	48.1%	120,338	44.4%	121,378	44.8%	115,090	42.5%

50 Yr. OG Distribution	
Old Growth Class	OG %
OG 200-250	26.5%
OG 251-300	26.4%
OG 301-350	15.6%
OG 351-400	16.1%
OG > 400	15.3%
Total	100.0%
Old Growth %	46.9%

Return Cat.	Return Percentages				
	Percent	Percent	Percent	Percent	Percent
Shrub Forb	1.60%	1.60%	13.57%	13.57%	13.57%
Pole	1.81%	1.81%	11.73%	11.73%	11.73%
Early Mature	22.74%	22.74%	11.47%	11.47%	11.47%
Mid Mature	24.77%	24.77%	9.71%	9.71%	9.71%
Late Mature	2.14%	2.14%	10.07%	10.07%	10.07%
OG Total	46.94%	46.94%	43.46%	43.46%	43.46%
	100.00%	100.00%	100.00%	100.00%	100.00%

1/ Age class distribution assumes 98 % of harvested stands were in Old Growth prior to logging. In the south zone only about 10% of the plantations were originally Old Growth.

Table B-4 HRV & Fire Cycle Analysis Tanoak/Douglas-fir Strata North Zone

Seral Stage	Estimated			Existing		Fire ¹ Cycle	Stand Age	Idealized ² Seral Stage Distribution
	Historic Range of Variability %			without	Existing			
	Low	High	Mean	Harvest % - harvest	Condition %			
DF Strata								
Shrub/Forb	1.6%	19.3%	12.9%	1.6%	7.6%	240	35	13.6%
Pole	1.8%	20.4%	12.9%	1.8%	13.4%	240	70	11.7%
Early Mature	8.4%	22.7%	15.9%	22.7%	22.7%	240	110	11.5%
Mid Mature	2.3%	24.8%	13.3%	24.8%	24.8%	240	150	9.7%
Late Mature	2.1%	13.6%	10.5%	2.1%	2.1%	240	200	10.1%
OG 200-250				12.6%	7.8%	240	250	8.2%
OG 251-300				12.3%	7.8%	240	300	6.6%
OG 301-350				7.4%	4.6%	240	350	5.4%
OG 351-400				7.2%	4.7%	240	400	4.4%
OG > 400				7.4%	4.5%	240	400	18.9%
Old Growth	28.9%	46.9%	34.4%	46.9%	29.3%			43.46%
Total			100%	100.0%	100.0%			100.0%
Total Early Mature -	67.6%	96.6%	74.2%	96.6%	79.0%	240	110	74.7%
Total Mid Mature +	50.4%	73.9%	58.2%	73.9%	56.3%	240	150	63.2%
Total Late Mature +	40.8%	49.1%	45.0%	49.1%	31.5%	240	200	53.5%

1/ The number of years required to burn over an area equal to the whole are of the forest. This is a mea of stand replacing fires. Only about 65% of the area would be replaced in 240 yrs because of reburn.

2/ All estimates computed using Van Wagner's(1987) age-class distribution and fire cycle equations. Computed using e^{-px} where p is the probability of burning (1/240), and x is the stand age.

Table B-5 Historic Range of Variability (HRV), Existing Condition (EC), Recommended Management Range (RMR), and 1990 Pre-Logging (PR), by Zone, Vegetation Series, and Seral Stage

Series/ Seral Stage	Percent of Series											
	North Zone				Central Zone				South zone			
	HRV%	EC%	PR%	RMR%	HRV%	EC%	PR%	RMR%	HRV%	EC%	PR%	RMR%
Tanoak												
Mid Mature 2-23	23	23	10-20	11-19	19	18	12-17	8-36	36	36	22-32	
Late Mature 2-13	2	2	7-13	9-19	11	15	14-19	5-19	19	19	12-19	
Old Growth 29-48	25	48	38-48	22-50	19	50	36-50	21-29	18	29	24-29	
Douglas-fir												
Mid Mature 2-29	29	29	5-24	10-27	27	27	12-20	7-40	37	40	23-35	
Late Mature 2-16	2	2	9-16	9-14	11	12	12-14	2-14	14	14	9-14	
Old Growth 27-45	37	45	36-45	22-34	26	34	28-34	7-20	7	8	11-20	
White Fir												
Mid Mature 3-20	20	20	8-16	11-20	20	20	14-18	8-35	32	35	20-30	
Late Mature 1-12	1	1	6-12	8-16	15	15	12-16	4-13	13	13	9-13	
Old Growth 23-31	29	31	27-31	30-41	31	41	35-41	8-11	11	11	8-11	
Red Fir												
Mid Mature 3-26	26	26	7-20									
Late Mature 1-10	1	1	5-10									
Old Growth 14-18	17	17	14-18									

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The idealized seral stage distribution was made by plugging in a fire cycle that would match the old growth recommended management range (RMR) shown in Table B-5. In this case the RMR is 38 to 48 and the idealized seral stage distribution is 43.46%. The 240 year fire cycle was then modeled in FORPLAN

For non regulated areas on the Forest the fire cycles were adjusted by the ID team based on estimated effects of suppression and fuel treatment. These numbers are shown in Table B-6. The fire cycles were modeled in FORPLAN as a model 2 transition proportion due to mortality. 80% of the transfer volume in R5-HRV prescription analysis areas were counted to the regulated harvest. The unsuitable and LSR areas did not allow any of the transfer volume to be counted as regulated harvest.

Table B-6. Fire Cycle (Yrs) by Zone, Management Class and Veg Type

Zone	Matrix		LSR ⁷		Unsuitable ⁸	
	DF	MC	DF	MC	DF	MC
North	240	180	333	240	280	210
Middle	180	180	240	240	210	210
South	120	120	180	180	150	150

The historical and projected late seral and old growth distributions for Tanoak/Douglas-fir in the North zone each alternative is shown in Figure 1. These type of charts were developed for each Forest Zone and major. These charts were used to determine the historic range and to develop the recommended management range (RMR). The HRVs and RMR are shown in Table B-5.

Regeneration Failure

A regeneration failure rate of was modeled in the FORPLAN. It was developed based on stocking reports and replanting rates for existing plantations. These were modified based on based on the less intensive management practices being used currently.

TIME PERIODS

To facilitate modeling the schedule of outputs and activities on the Forest for the 50-year planning horizon, the basic reporting period chosen was 10 years. Consequently, outputs are modeled as totals or averages for 10 year periods, and constraints were

⁷ Fire cycle assumes fuel treatment and suppression activities

⁸ Cycle assumes only suppression activities

applied to outputs or activities on a 10 year basis. We used 15 time periods in FORPLAN. The first period is 1994-2004. For reporting purposes generally only five periods are displayed. Some test runs were made at 20 periods for alternatives with long rotations.

OUTPUTS

Each prescription/analysis area combination in the FORPLAN solution produces one or many outputs. From a modeling perspective, there are three ways an output may be generated:

Time-dependent relationship - The output level depends on the prescription that is applied to the analysis area and the point in time at which the prescription is applied relative to the beginning of the planning horizon.

Age-dependent relationship - The output level depends on the age of the vegetation associated with the analysis area to which the prescription is applied.

Sequence-dependent relationship - Sequence dependent outputs are secondary outputs that are produced as a function of a primary output generated through one of the relationships described above output descriptions

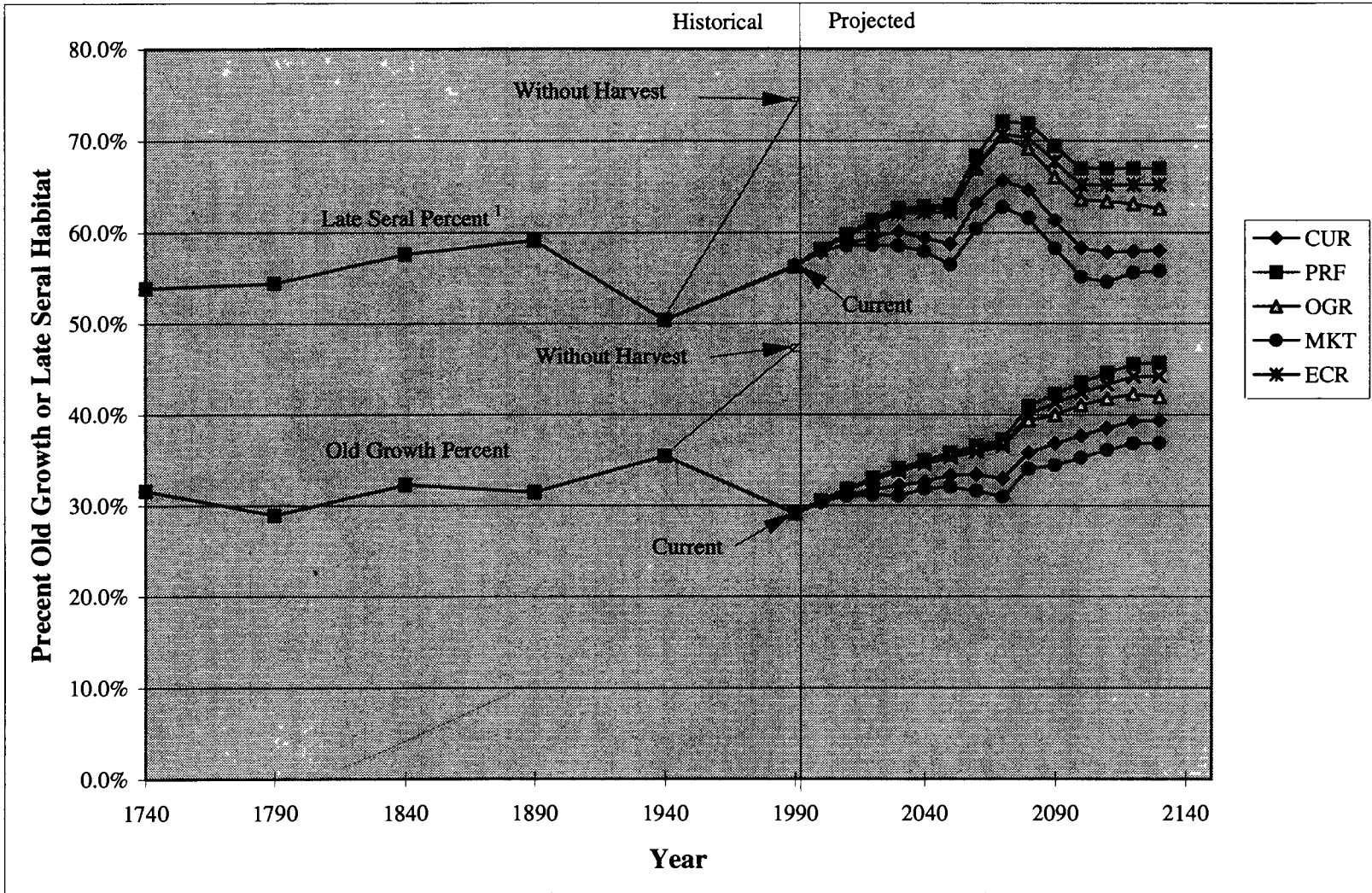
Outputs were also modeled using a model built in a spreadsheet. This allowed more complex relationships to be formulated. Outputs that were generated either by spreadsheet or FORPLAN are summarized below.

Sawtimber: Estimates of the volume of timber produced by the combination of a given analysis area and a prescription were developed from the 1978 timber inventory for existing stands. The inventory was used to develop the timber yield tables used in FORPLAN using the RAMPREP (Resource Allocation Method Preparation) model. RAMPREP calculates potential yields from a stand under various thinning and clear-cut harvest regimes for both existing and regenerated stands.

Road Construction: Estimates of the amount of road construction were based on average road densities needed to access stands. Rates of construction varied depending on acres of timber suitable timber land and objectives of the alternative related to roads. Under some alternatives more roads would be decommissioned than built. Average road densities

Figure B-1. Historical and Projected Late Seral and Old Growth Distributions by Alternative.

Douglas-Fir/Tanoak North Zone



1\ Late Seral includes Mid-Mature, Late-Mature and Old Growth.

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on timber suitable lands were 3.3 miles per sq. mile and 2.2 miles per sq. mile on the adjacent non-timber suitable areas.

Road Reconstruction: Road reconstruction miles are based on the total miles of road and the average road life. Forest roads are assumed to have a 20 year life. Reconstruction will take place every 20 years. Road reconstruction was divided between appropriated dollars and purchaser road credit. In areas not suitable for timber production many of the level 1 and 2 roads would be decommissioned.

Road Maintenance: Road maintenance miles are determined based on the miles of road currently on the Transportation Inventory, plus miles of new road construction, minus miles of decommissioned roads. Level 3, 4, and 5 roads are assumed to be maintained for general purpose use and recreation; 35 percent of level 2 roads are assumed to be timber-related maintenance, 65 percent for general purpose and recreation; and level 1 roads are assumed to be maintained for 100 percent timber use.

Road Decommissioning: Road decommissioning varied depending on the objectives of the alternative and the amount of land removed from timber management. Under the PRF alternative the objective is to reduce the amount of open roads on the Forest for wildlife, watershed protection and non-motorized recreation.

Developed Recreation Capacity: Recreation Visitor Days (RVDs) for each developed recreation site were based on :

- persons-at-one-time (PAOT) capacity.
- season of use.
- pattern of weekday/weekend use.
- average length of time in site.

The following formula is used to calculate RVDs:

$$\text{RVD} = \text{PAOT} \times (\text{Season Days}) \times (\text{Pattern of Use}) \times (\text{Length of time in site})$$

Demand for developed recreation was projected based on past use and population trends, with adjustments for the Smith River NRA and planned developments under each alternative. Any capacity above the projected demand level was assumed to be unused.

Dispersed Recreation/OHV Use: RVDs for dispersed recreation were based on the 1989 Recreation

Information Management (RIM) records, divided by the total Forest acreage. This coefficient was trended using factors from the RPA and was locally adjusted to three percent per decade to account for predicted population growth in Humboldt and Del Norte counties and the dedication of the Smith River National Recreation Area. Off Highway Vehicle RVDs are included in the total number of dispersed RVDs. The number of miles of trails suitable for OHV use varies by alternative with the number of miles of level 2 roads.

Wilderness Recreation: Wilderness recreation outputs were modeled using the same coefficients as described for dispersed recreation.

Wildlife and Fish User Days: One Wildlife and Fish User Day (WFUD) equals 12 hours of recreation activities associated with fishing, hunting, or wildlife enjoyment. The number of WFUDs generated by the Forest is correlated with the population of local communities, and the general trends associated with fish- and wildlife-related recreation. WFUDs are a subset of the total recreation that occurs on the Forest and they focus only on the consumptive and non-consumptive use of fish and wildlife. WFUD production coefficients were developed based on the RIM system and were trended according to the RPA.

Visual Quality Objectives: Visual quality objectives (VQOs) represent the suitability of various areas of the Forest to be managed for a range of visual quality. The five objectives used on the Forest are: preservation, retention, partial retention, modification, and maximum modification. Wilderness areas are always managed for a VQO of preservation, while other areas of the Forest are assigned objectives, based on management area, which vary by alternative.

Visual Alteration: This output (EFAL) is expressed in acres effectively altered by vegetation changes. Coefficients were developed to depict the number of regenerated harvest acres that could be treated in any one decade before violating visual resource objectives. These coefficients were derived from the EFFALT (effective alteration) concept, which is based on the assumption that what was once a visually homogeneous background will appear altered to the casual observer. After a timber harvest, the alteration remains until the trees grow to a certain height and color which blends in with the surrounding vegetation. A decay function reflects the decline in the severity of visual impacts over time.

For each VQO, a constraint is imposed in the FORPLAN model to limit the number of acres that would appear to be visually altered. The coefficients were derived from a perspective plot analysis conducted in Region 5, and are linked to the EFFALT decay function and the timber dispersion constraint. VQO and dispersion constraints apply to the total Forest regulated acres and inventory. FORPLAN results were used as input to the spatial disaggregation model to assure that visual quality objectives were met at the compartment level. See part III of this Appendix for more information regarding the EFFALT model and the VQO coefficients.

Livestock Forage: Livestock forage outputs measure the potential usable animal use months (AMs) per acre per decade for permanent range. Coefficients were based on the average AM/acre/year use for the last 5 years. Trends were applied to the coefficients based on information from the RPA.

Unregulated Harvest, Fuelwood, and Biomass: Outputs were calculated based on predicted demand and the amounts of wood products allocated and scheduled for regulated harvest by FORPLAN and past trends.

Optimal Long-Term Sustained Yield: The FORPLAN matrix generator calculates this coefficient by comparing all of the timing choices for all of the regenerated prescriptions available to each analysis area.

Ending Timber Inventory: The ending inventory is the merchantable volume of all standing timber that would exist at the end of the planning period. Coefficients for predicting timber growth and yields are in the FORPLAN yield tables.

Wildlife Habitat Seral Stages: Wildlife habitat seral stages were modeled to relate harvest patterns and seral stage distribution or habitat diversity. This provides a way for the LP optimize various habitats or seral stages over time. If timber harvest was the objective, it allows the tradeoffs to wildlife habitat to be displayed. Successional pathways for seral stages were determined using data collected from the ecological classification program currently underway and the PROGNOSIS growth and yield model. Wildlife habitat seral stages were modeled for both natural stands and stands modified using silvicultural

prescriptions. The wildlife habitat seral stages are described below:

- 1 Shrub/Forb Stage: Consists of annual and perennial grasses and forbs with or without scattered shrubs. May also be a conifer plantation in which the trees are less than 6" DBH. Stand age usually 0-35 yrs.
- 2 Poles Stage: Stands in the 6" to 10.9" DBH range. Stand age usually 36-70 yrs.
- 3A Early Mature: Stands in the 11" to 20.9" range with a crown closure less than 40 percent. Stands commonly support a substantial shrub layer. Stand age usually 70-110 yrs.
- 3BC Early Mature: Stands in the 11" to 20.9" range with a crown closure 40 percent or greater. Shrub layer density is variable. Stand age usually 70-110 yrs.
- 4A Mid Mature & Late Mature: Average DBH is between 21" and 29.9", with a crown closure less than 40 percent. Stands commonly support a substantial shrub layer. Stand age usually 111-200 yrs.
- 4BC Mid Mature & Late Mature: Average DBH between 21" and 29.9", with a crown closure 40 percent or greater. Shrub layer density is variable. Stand age usually 111-200 yrs.
- 5C Old Growth Stands: The component of the large tree stand that is older and the stand has multiple layers. Horizontal and vertical diversity is generally high. Stand age usually greater than 200 years.

Bald Eagle Habitat: There were no coefficients for this output. The amount of habitat was a fixed land allocation in the model and was delineated based on historic and active suitable habitat acreages in conjunction with Regional Recovery Plan targets.

Peregrine Falcon Habitat: There were no coefficients for this output. The amount of habitat allocated for falcon territories was a fixed acreage in the model and was based on observed falcon use during extensive field surveys as well as aerial photo interpretations. Habitat acreage were developed in accordance with Regional Recovery Plan targets.

Goshawk Habitat: There were no coefficients for this output. The forest developed a network of territories meeting Regional guidelines for moderate habitat. Also 200 acre territories were designated where active nest sites have been observed.

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Marten: There were no coefficients for this output. The amount of habitat allocated for marten territories was a fixed acreage in the model and was based on delineations performed in 1991 in accordance with the Regional Habitat Capability Model for the marten.

Pacific Fisher: There were no coefficients for this output. The amount of habitat allocated for fisher territories was a fixed acreage in the model and was based on delineations performed in 1991 in accordance with the Regional Habitat Capability Model for the pacific fisher.

Water Yield Meeting Water Quality Standards: The Forest water resource inventory determined approximately 3,800 acres were in need of improvement. We estimate 166 M Ac-ft (3.2 percent) does not meet water quality standards. As these acres are improved the amount of water meeting quality standards increase.

Acres of Improved Watershed Condition: Forest hydrologists reviewed the RPA estimate of acres needing watershed improvement and estimated the acres of watershed improvement for each alternative

Minerals: Mineral outputs were considered a part of general administration and did not vary..

Human Resources: There were no coefficients for this output. Numbers were estimated using historical data and expected budget levels, and were included in general administration.

Administrative Sites: There were no coefficients for this output. Estimates were based on existing budget levels and were included in general administration.

ECONOMICS

Economics is discussed in Chapter II of the EIS as part of the alternative development process and displayed in various tables; in Chapter III of the EIS in the economic environment section. The economic consequences are discussed in Chapter IV, and Appendix I, J and N of the Forest Plan. Most of the economic efficiency analysis was conducted with FORPLAN. The final calculations of costs and PNV were done in spreadsheets. Economic data and assumptions incorporated into the models are described below.

All dollar values are expressed in 1989 dollars. Dollar costs and values in past years were adjusted to 1989 dollars using the GNP implicit price deflator.

A four percent discount rate was used to determine the present net value of future benefits and costs. This rate approximates the long-term costs of capital in the private sector as measured by the return on AAA corporate bonds after adjustment for inflation.

Costs

Costs for the activities listed in Table B-7 were developed using information from past budgets and estimates by project managers. Costs varied by analysis area characteristics such as logging method, and by program levels, such and low and high standard recreation operation and administration. Approximately \$4.8 million of the program costs are fixed and are not allowed to vary by alternative. These fixed costs represent the costs associated with the minimum level of management.

Table B-7. Activity Costs

Activity Measure	Unit	Unit Costs
Recreation		
Dispersed	RVD	\$0.55
Developed	RVD	\$2.22
Wilderness	RVD	\$5.97
Range	AM	\$10.49
Timber Related Activities		
Fire	Acre	\$165.00
Sale Prep/Admin.	MBF	\$57.49
Brush Disp./Site Prep	Acre	\$455.00
Reforestation	Acre	\$427.92
Timber Release	Acre	\$321.51
Precom. Thins	Acre	\$354.00
Roads		
Road Construction		
Level 1&2	Mile	\$24,000
Level 3,4 & 5	Mile	\$108,300
Road Reconst.	Mile	\$31,500
Road Obliteration	Mile	\$15,000
Road Maintenance	Mile	\$583

1/ Note: Costs are divided between Fixed and variable costs. Values listed are the variable portion of the activity cost.

Benefits

The dollar values for outputs used to calculate PNV are based on actual cash receipts for items such as timber, mineral permits and special uses. They are based on FY 1988, 89 and 90 receipts. Non-cash outputs (i.e. hunting, hiking, range and fishing) were estimated using what consumers would be willing to pay, whether or not such prices are collected by the Federal Government. At present, it is national policy to provide most Forest outputs either at no charge to consumers or at a charge less than the willingness to pay.. Dollar values for outputs (Table B-8) were computed by multiplying the output by the estimated market price. Outputs above the estimated demand were not valued.

Table B-8. Output Benefit Values

Output	Unit of Measure	Ave Cash Receipt	Willingness to Pay
Recreation			
Dispersed	RVD	\$0.00	\$31.19
Developed	RVD	\$0.29	\$9.42
Wilderness	RVD	\$0.00	\$14.07
Hunting	RVD	\$0.00	\$33.16
Range	AM	\$1.26	\$4.91
Minerals	Tons	\$0.04	\$0.54
Timber	MBF	\$329.29	\$329.29
Output	Measure	Receipt	Pay
Wildlife & Fish			
Sport Fish	WFUDs	\$0	\$22.98
Special Uses	M\$/Yr	\$44.22	\$44.22

Timber: Timber values were estimated based on Forest sale records for the period of 1988-1990.

Grazing: Grazing values used are the average amount that permittees are willing to pay for grazing on the Forest. The value used in FORPLAN is \$4.91 per AM, which compares to the current charge for forage on the Six Rivers of \$1.87 per AM.

Water: A water value of zero is used because there are not adequate facilities to capture and store the increased runoff from that results from forest management. The bulk of the increased runoff occurs in the winter when flows greatly exceed the available capacity of storage and distribution systems. The

increased flows can not be utilized and therefore are valued at zero.

Recreation: Recreation values are based on estimates of willing to pay to participate in recreational activities. The values by type of recreational use were derived from the 1990 RPA values.

Trends

Trends were applied to benefit values as follows

Table B-9. Factors to Multiply Base Values

	Decade				
	1	2	3	4	5
Timber	1.14	1.29	1.47	1.68	1.91
Dispersed Recreation		1.02	1.04	1.06	1.08
	1.11				
Hunting	1.02	1.04	1.06	1.08	1.11
Wilderness Recreation	1.03	1.06	1.09	1.13	1.16
Developed Recreation	1.01	1.02	1.03	1.04	1.05
Range	1.04	1.08	1.13	1.17	1.22
Fish Improvements	1.02	1.04	1.06	1.08	1.11

The source of these trends is the 1990 RPA Assessment.

CONSTRAINTS

Each of the resources discussed in 36 CFR 219.13 through 219.26 must be addressed by standards and guidelines, management prescriptions, or other management direction in the Forest Plan. Regional resource direction which Forests are expected to follow is outlined in the Regional Planning Direction.

Some management requirements can be translated into modeling constraints and can be simulated or proxied in FORPLAN. Constraints are quantifiable limits placed on the linear program model to ensure that only reasonable amounts of resources are used, outputs are produced, and prescription allocations are made. In linear programming, constraints override the objective function. Thus where a predetermined level of output, minimum physical condition, or allocation is entered as a constraint, it is always achieved (or no feasible solution is found). Output levels and other desired effects entered as constraints are assumed to contribute more to public benefits than their cost of production plus the foregone public benefits of any outputs or other effects they replace in the solution. For this reason, the interdisciplinary team tried to formulate constraints that met objectives

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with the lowest cost and least effect on other outputs. In most cases this required the formulation and testing of several alternative sets of constraints to determine the most cost effective set (in terms of PNV) that would meet the objectives. Aside from those constraints used to specify total available acres, or to make the model work correctly, constraints can be divided generally into five categories, as discussed in the following section.

Technological Constraints

These are constraints that are needed to ensure technical implementability of the solution. They are applied to all benchmarks and alternatives. The Forest imposed the following technological constraints:

Limits on the types of logging systems available to certain areas (for example, no tractor logging on slopes averaging over 35 percent).

Existing recreation development sites are considered suitable for recreation purposes only.

Existing administrative and electronic sites are considered suitable only for facility development. The Redwood Experimental Forest is considered unsuited for regulated timber management.

Timber Policy Constraints (TPCs)

These are constraints which ensure that timber harvest levels meet sustained yield, culmination of mean annual increment (CMAI) and dispersion requirements.

Sustained Yield Requirements: These ensure a perpetual timber harvest level by the end of the planning horizon. This is accomplished through the use of the sustained yield link and the ending inventory constraint in FORPLAN. The sustained yield link ensures that the allowable sale quantity is at or below the long-term sustained yield of timber in the last decade of the planning horizon. The ending inventory constraint (or perpetual timber harvest constraint) ensures that the Forest contains as much timber volume inventory in the last period as it contains on the average.

Harvest Flow Requirements: A harvest flow constraint is included to maintain economic stability. It prevents wide fluctuations of timber outputs from

one decade to another. It is applied only in alternatives that depart from non declining, even-flow policy. Timber output after the first decade is not allowed to fluctuate more than 15 percent from the previous decade.

Dispersion: The intent of the dispersion rule is to prevent regeneration units which are still openings from being adjacent to each other. Dispersion also strives to leave logical harvest units between openings for future management. This analysis was performed on a compartment basis using the spatial disaggregation model. See Part III of this appendix for a more detailed discussion of the dispersion constraint and how it was modeled.

Rotation Length: Generally, all even-aged stands scheduled for harvest reach culmination of mean annual increment (CMAI) in utilized cubic feet of merchantable-size trees. Regenerated timber stands are regarded as generally culminated in growth at an age corresponding to 95 percent of the apparent culmination calculated from the managed yield projections used in FORPLAN. Minimum ages are established for merchantability, CMAI, and 95 percent of CMAI based on RAMPREP yield tables for the two commercial timber types. These ages are displayed below in Table B-10.

Table B-10. CMAI & Merchantability

Regenerated Strata Group	Age at merchantability	Age at CMAI	Age at 95% of CMAI
DF Thinning	40	80	60
DF No Thin	40	60	50
MC Thinning	40	80	60
MC No Thin	40	60	50

The OGR alternative has a rotation length constraint of 180 years. This was set to provide for late seral habitat in the forest matrix.

Minimum Management Requirements (MMRs)

MMRs are taken from 36 CFR 219.27 and generally represent requirements outside of Forest authority to change (that is, statutes and regulations in contrast to manual direction or agency policy). By definition, these requirements represent "absolute minimum" constraints and are needed for consistency of analysis between Forests. MMRs apply to all alternatives and

to all benchmarks except FLW. Examples of MMRs are: protecting threatened and endangered plant and animals species and their habitat; maintaining wildlife habitat diversity; and maintaining soil and water productivity. A discussion of the modeling rules for each MMR follows.

Timber Suitability: According to 36 CFR 219.24, lands were identified as tentatively suited for timber production if they met the following conditions:

1. The land is forested and is currently producing or is capable of producing crops of industrial wood.
2. The land has not been withdrawn from timber production by Congress, the Secretary of Agriculture or the Chief of the Forest Service.
3. Technology and knowledge exist and are available to ensure timber production without irreversible damage to soils, productivity, or watershed conditions.
4. Existing technology and knowledge, as reflected in current experience and research, provide reasonable assurance that adequate restocking can be attained within five years after final harvest.
5. Adequate information is available to project responses to timber management activities.

These tests constitute the NFMA "first cut" timber suitability criteria. Other lands were removed from the "first cut" tentatively suited land base during the development of alternatives as they became inappropriate for timber production. A detailed discussion of the timber suitability criteria is contained in the planning records. See also Figure II-1 in the EIS.

Threatened and Endangered Plant and Animal Species: Threatened and endangered species are below viable levels. Until recovery is achieved, habitat determined to be critical will be identified, and measures will be prescribed to prevent the destruction or adverse modification of such habitat. The Region assigned the Forest the following population levels for meeting the recovery of endangered animal species:

Bald Eagle:	4 breeding pairs and 2 winter roosts
Peregrine Falcon:	7 breeding pairs

Management prescriptions will be applied to provide capable habitat and to assist in the recovery of the

bald eagle and peregrine falcon. Habitat for these species is managed by the zone concept. These zones include the nest site protection, primary disturbance, feeding zones. The size of each zone varies depending on the species as well as site-specific conditions.

The northern spotted owl was listed as a threatened species on June 23, 1990. In the absence of a final recovery plan, the Forest is currently maintaining the proposed Habitat Conservation Areas (HCAs) and implementing the 50-11-40 rule, both of which were identified by the Interagency Scientific Committee's report "A Conservation Strategy for the Northern Spotted Owl." The 50-11-40 rule states that 50 percent of the land outside of HCAs would exhibit at least an 11 inch average diameter with a 40 percent canopy cover. In addition, the Forest is maintaining the critical habitat proposed by the USFWS on May 6, 1991. The Forest's total area in HCAs is 338,350 acres, with an additional 36,880 acres in critical habitat.

The PRF alternative establishes a series of Late Seral Reserves (LSRs) based on the FEIS on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. These reserves, in combination within the other allocations and standards and guidelines, is designed to maintain a functional, interactive, late-successional and old-growth related species including the northern spotted owl.

The marbled murrelet was listed as a threatened species in Washington, Oregon, and California on September 28, 1992. In the absence of designation of critical habitat by USFWS and a recovery plan the Forest would maintain 315,000 acres of potentially suitable murrelet habitat, of which over 90% is within 35 miles from the coast. The Forest in consultation with the USFWS would identify essential habitat and protection measures necessary to ensure the Forest contribution to the recovery of the murrelet.

McDonald's rock-cress (*Arabis macdonaldiana*), is the only Federally listed plant on the Forest. The taxonomy of the Del Norte population (the only Forest location) is being reviewed; until the results of the taxonomic study are published and accepted by the scientific community, all habitat occupied by McDonald's rock-cress will be removed from the suitable land base.

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Viable Populations: A viable population is regarded as one which has the estimated numbers and distribution of reproductive individuals to ensure its continued existence. A viable population is capable of maintaining itself over time despite natural and man-induced environmental changes. A description of the MMRs for viable populations is described below.

Marten and Pacific Fisher - Furbearer territories were delineated in 1991 according to the guidelines of the Regional Habitat Capability Model. Fisher territories range from 6,000 to 11,300 acres, and marten territories range from 1,400 acres to 2,500 acres, both depending on the capability of the habitat within the territory. There are presently 40 marten and 18 fisher territories on the Forest totaling 239,490 acres, of which 73,410 acres (34,800 suitable acres) are located outside HCAs and critical habitat. The minimum management level is to manage the territories in a manner which will maintain multi-storied mature and overmature stand characteristics.

Goshawks - Goshawk territories were delineated throughout their historical range to provide at least one territory per 18 square miles. Within the goshawk range, goshawk territories will be managed to provide a minimum of 50 acres of suitable goshawk habitat (200 acres of suitable habitat for known nest sites). The minimum management level of 56 goshawk pairs is adequate to support viable populations of goshawk on the Forest.

Snag-Dependent Species - Forest standards and guidelines call for each compartment to be managed to maintain varying amount of snags (depending on the alternative) per acre in various size and age class distributions. Timber yields are reduced in FORPLAN to accommodate snag requirements.

"Dead and Down"-Dependent Species - Forest standards and guidelines call for the retention of varying levels of unburned slash pile and cull logs per acre on tractor ground. These criteria will be accomplished on cable ground where feasible.

Fish Populations - Current populations of resident fish will be maintained through the implementation of Best Management Practices (BMPs) and the Riparian management strategy. Anadromous fish populations can be increased through an active habitat improvement program.

Riparian Protection Zones: The MMR riparian area acreage on the Forest was determined from a 10 percent survey of the Forest. Compartments were picked from all four districts and the riparian/streamside zones were surveyed. The width of the zones was determined based on slope, bank stability, and shade canopy needed for the protection of water quality and fisheries. Of the compartment sampled, 12.6 percent of the total acreage was along perennial streams, and 4.2 percent was located in intermittent streams. This riparian protection area included areas which are mapped as inner gorge (high or extreme landslide hazard areas adjacent to streams), which is unsuitable for timber management because of its instability. Subtracting the inner gorge portion of the riparian protection zone left 5.99 percent in the riparian protection zone outside inner gorge. This percentage was applied Forest-wide to determine the total acres in riparian protection zones (RPZs).

The MMR timber yield from RPZs was modeled in FORPLAN by scheduling 3 percent of the suitable timber volume for harvest each decade. This is approximately one fifth of the RPZ potential yield. In Alternatives B and C, riparian zones are not regulated for timber harvest. The zones follow the draft Riparian direction developed by the 4 Northern Forests.

Diversity: Diversity of plant and animal communities is to be achieved by providing a variety of vegetation types and seral stages found within the Forest. Where appropriate, and to the extent practicable, plant and animal communities will be managed such that diversity will be similar to that presently existing on the Forest.

The MMRs require the measurement of diversity at the Forest level (958,470 acres). The Six Rivers National Forest is monitoring diversity on a 5,000 to 15,000 acre watershed level. FORPLAN solutions are constrained to ensure that at least 5 percent of each seral stage in each vegetation type is present each decade. If a certain vegetation type/seral stage combination is below the long-term minimum level, the required 5 percent will be met within the planning horizon. Both suitable and unsuitable timber lands may be used to meet the diversity requirement as long as habitat characteristics for management indicator species are fully met.

Eight proposed research natural areas (RNAs) are unavailable for timber harvest in all alternatives to

protect the research and educational values of these ecosystems.

Soil and Water Productivity: This MMR was met using the Cumulative Watershed Effects method discussed below.

Cumulative Watershed Effects: The potential for cumulative impacts from management activities increases as more timber is harvested, roads are built, and less stable watersheds are entered. Other activities which can increase sediment or runoff, such as mining and grazing, also contribute to cumulative impacts. The potential for cumulative impacts also depends on stream stability, the ability of the stream to transport sediment, the beneficial uses of water, and the current condition of the watershed. In order to limit disturbance in individual watersheds, cumulative watershed thresholds were established, and an analysis was performed on a watershed level to ensure that management activities did not exceed allowable thresholds. See part III of this Appendix for a more detailed discussion of how cumulative watershed effects were modeled.

Minimum Implementation Requirements (MIR's)

These are constraints which are needed to ensure that alternatives are minimally acceptable and implementable on the ground and to provide consistent treatment of certain requirements that are common to all alternatives. Generally the requirements within this category are within agency control, but at the Forest level there is little discretionary control regarding the application of them on the ground. MIR's apply to alternatives only; they do not apply to benchmarks. These MIR's include:

Sensitive Plants: Forests will manage sensitive plants to ensure that species do not become threatened or endangered because of Forest Service actions. The small area of habitat occupied by sensitive plants on the Six Rivers has an insignificant effect on other resource programs. Therefore, sensitive plants are not modeled in FORPLAN.

Scenic Highways: Requirements were placed on lands viewed from officially designated State and County highways and routes on the 1970 State Scenic Highway Master Plan so that scenery was managed along heavily traveled scenic highways. These roads were State Highways 199, 299, 36, and 96. This constraint was achieved by assigning highway

foreground to a visual quality of retention, and middleground to a visual quality of partial retention .

Smith River National Recreation Area: All alternatives incorporate the direction contained in the Smith River National Recreation Area legislation. No changes to this legislation are proposed in any alternative. The legislation divides the NRA into seven management areas, of which three are not available for regulated timber harvest, two are managed for marginal timber yields, one is available for reduced timber yields, and one is available for reduced timber yields in existing plantations only.

Forest Constraints

These are constraints needed to ensure implementability at the local level. They are based on Forest rather than Regional conditions, and are in addition to MIRs. Of all Forest direction common to alternatives, only four items are constraining on the FORPLAN model, as discussed below.

Native American Contemporary Use Areas

(NACUAs): These areas were identified as part of the Blue Creek appeal decision by the Chief of the Forest Service for the purpose of accommodating Native American spiritual values. NACUAs will not be managed for regulated timber harvest. Of the 27 sections of land (approximately 15,400 acres) set aside as the "High Country" in the court decision for protection of Native American cultural values, 13,700 acres are now within the Siskiyou Wilderness. The total NACUA Management Area is 1,140 acres after overlap with more restrictive management areas is removed.

Vegetation Management: All alternatives are predicated on the continued use of a full range of alternative timber treatments including mechanical, prescribed fire, biological and chemical methods. The selection of any particular treatment is made at the project level and will be regulated by monitoring and implementation plans developed in project environmental analyses.

BENCHMARKS

Benchmarks display physical, biological, and technical capabilities. They are not limited by Forest Service policy or budget, discretionary constraints, spatial feasibility, or program and staffing requirements. They are physically and technically, but not necessarily operationally, implementable.

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Benchmarks are used as reference points for comparing alternatives, defining the decision space within which change can occur. Chapter 2 contains a complete discussion of benchmarks and results.

MLV: Minimum Level Management

Description and Purpose: The MLV benchmark estimates the background fixed costs and outputs which are common to all alternatives. It should be thought of as an accounting analysis to determine the outputs and fixed costs associated with maintaining the National Forest. It is used as a base to compare other alternatives and is not stewardship or custodial management. Because it is only an accounting analysis, the phase-in period that would be needed if minimum level were actually implemented should be ignored.

Modeling Specifications:

Objective	Minimize cost for the planning horizon.
Function:	
Technological Constraints:	All apply.
MMR Constraints:	Not used.
Timber Policy Constraints	Not used.
MIR Constraints:	Not used.
Output Constraints:	Only background/ incidental outputs allowed.

Other Assumptions:

1. Vegetation will follow natural succession.
2. Only maintain those facilities that are needed to support the basic ownership activities. Allow all other facilities to deteriorate.
3. State and county roads will remain open but most Forest roads will be closed.
4. Close all public and private sector recreation facilities on National Forest lands with no provisions for maintaining such assets.
5. The fire organization will be greatly reduced. The fire management budget is set at minimum level for this benchmark only.
6. Recreation use will consist of non-induced dispersed recreation and WFUDs that cannot be controlled or discouraged.
7. No developed RVD outputs or costs will be shown. Wilderness RVD outputs were included with dispersed recreation.

8. Only background water levels are produced as there is no timber harvest.

FLW: Unconstrained Maximized PNV with FLOW/LTSY Constraints

Description and Purpose: This benchmark displays the most economically efficient allocation of resources. FLW provides a basis for evaluating the MMRs. The purpose was to maximize PNV in the least constraining manner possible. Timber policy constraints, MMRs, and MIRs do not apply, nor do constraints common to all alternatives. A ± 15 percent departure from non-declining, even-flow timber harvest was allowed per period. This analysis was used to assess the appropriateness of imposing the flow constraint and to serve as a basis for determining the costs of imposing subsequent constraints in the development of alternatives. Between this maximally unconstrained run and the MMR run a number of timber policy constraints such as sustained yield and non-declining even flow, and legal considerations such as watershed protection and viable populations, are imposed to achieve an analysis that is minimally acceptable. If implemented, the FLW analysis would not be legal and would not be politically or socially acceptable.

Modeling Specifications:

Objective	MAX PNV for 12 periods.
Function	
Technological Constraints	All apply.
MMR Constraints:	All suitable timberlands are included. Other MMRs do not apply.
Timber Policy Constraints	Minimum rotation age is at culmination; sustained yield and harvest flow requirements are used; the dispersion constraint is not used.
MIR Constraints:	Not used.
Economic Assumptions	Use assigned values with trends from timber and demand cut-offs for RVDs and WFUDs.

MMR: MAX PNV with MMR-NDY-CMAI

Description and Purpose: The MMR benchmark defines and evaluates minimum management

requirements (MMRs) as specified by 36 CFR 219.27, National Forest Land Management Planning Direction. The Forest is managed in a manner which maximizes present net value for all scheduled outputs, subject to the minimum management requirements and timber policy constraints. These requirements and constraints are applied in order to produce a basis to which all other alternatives can be compared. The imposition of the MMRs makes the benchmark minimally legal.

Modeling Specifications:

Objective MAX PNV for 12 periods.
Function:
Technological All apply.
Constraints:
MMR All Apply.
Constraints:
Timber Policy Minimum rotation: Use the full set of rotation ages greater than or equal to 95 percent of culmination of mean annual increment (CMAI).
Constraints: non-declining yield and dispersion requirements apply.
Sustained yield, MIR They are not used.
Constraints:
Economic Use assigned values and price and cost trends for timber.
Assumptions:

MKV: MAX PNV - Market Values Only

Description and Purpose: This benchmark demonstrates the sensitivity of the solution to non-market values such as wildlife and dispersed recreation. Non-market outputs are valued after the solution is found and do not affect the allocation. The Forest is managed in a manner which maximizes net value using only those outputs that have established market prices. This analysis indicates the same effects as the MMR, except that only timber, developed recreation, anadromous fish values, and grazing receipts contribute to the PNV.

Modeling Specifications:

All specifications are the same as for the MMR run except that only actual receipts for timber, range, fisheries, and developed recreation are used.

TBR: Max Timber with MMR-NDY-CMAI and Economic Rollover

Description and Purpose: The theme of this benchmark is to define the maximum timber output

possible for the first decade under the constraints of non-declining yield, culmination of mean annual increment, and minimum management requirements. After determining the maximum yield under these constraints, the solution is used as a constraint in a second run which allocates resources to meet this goal and to maximize PNV (economic rollover).

Modeling Specifications:

Objective Maximize timber for the first decade. A max PNV rollover is performed to determine the most economically efficient allocation and schedule.
Function:
Technological All apply.
Constraints:
MMR All apply.
Constraints:
Timber Policies Minimum rotation: Use the full set of rotation ages greater than or equal to 95 percent of culmination of mean annual increment (CMAI).
Sustained yield, Non-declining yield and dispersion constraints apply.
Economic Use assigned values with output and cost trends for timber.
Assumptions:

TBD: Max Timber With One Year Departure

Description and Purpose: This benchmark is similar to the TBR benchmark, except that the non-declining yield constraint is relaxed in the first stage. The second stage uses the timber yield from the first stage and allocates resources to maximize PNV. This benchmark displays the opportunity cost of the non-declining yield constraint in terms of timber yield. The timber harvest is restricted to ± 15 percent of the previous decade's harvest level.

Modeling Specifications:

All specifications are the same as for the TBR benchmark except that the non-declining yield constraint is removed in the first run, and the timber harvest flow is restricted to ± 15 percent of the previous decade's harvest level.

ALTERNATIVES

Chapter 2 contains a complete discussion of all the alternatives and their results. This section lists only

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those constraints that were modeled in FORPLAN and describes how they were modeled.

Alternatives Not Carried Forward

These are the alternatives which were included in the 1987 Draft EIS but have been withdrawn from further consideration due to policy changes and the dedication of the Smith River National Recreation Area.

PRF - 1987 Preferred Alternative:

Description and Purpose: This alternative provides quality wilderness opportunities and a full range of dispersed recreation opportunities, improves the quality of anadromous fish habitat and produces moderate levels of timber, all of which are the outputs the Forest has historically emphasized. Moderate amounts of other goods and services would be produced.

Modeling Specifications:

Objective:	Maximize PNV subject to the constraints below.
Technological Constraints:	All apply.
MMR Constraints:	All apply.
Timber Policy Constraints:	The timber harvest level is set to 175 MMBF per year for the first 5 decades (vs. long term sustained yield of 194 MMBF). TPCs common to all alternatives apply.
MIR Constraints:	All apply.
Economic Assumptions:	Use assigned values with price and cost trends for timber.

Constraints Unique to Alternative:

1. Seven undeveloped roadless areas (UDRs) at 8,100 acres.
2. Three botanical areas at 5,580 acres.
3. Ten research natural areas (RNAs) at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to high road building needs vs. existing available suitable lands and timber volumes.
5. 18,160 acres set aside to meet retention VQO and 17,580 acres set aside to meet partial-retention VQO, in addition to constrained economic

efficiency which set aside 12,760 acres for retention and 24,540 acres for partial retention VQO.

CUR - "Current" Situation

Description and Purpose: The theme of this alternative is to manage the Forest based on the standards and guidelines, laws, policies and regulations and management plans as of 1992

Modeling Specifications:

Objective:	Maximize PNV subject to the constraints below.
Technological Constraints:	All apply.
MMR Constraints:	All apply.
Timber Policy Constraints:	TPCs common to all alternatives apply.
MIR Constraints:	All apply.
Economic Assumptions:	Use assigned values, with price and cost trends for timber.

Constraints Unique to Alternative:

- 1 Four UDRs at 1,140 acres.
- 2 Two botanical areas at 4,590 acres.
- 3 Ten RNAs at 8,790 acres.
- 4 North Fork Smith Roadless Area allocated to maintenance prescriptions.
- 5 18,160 acres set aside to meet retention VQO and 17,580 acres set aside to meet partial-retention VQO, in addition to constrained economic efficiency.

RPA - 1980 RPA Program

Description and Purpose: The purpose of this alternative is to best implement the Forest's share of the 1980 Resources Planning Act (RPA) program for the 50 year planning horizon, as assigned by the Region. This alternative emphasizes high output levels of both market and non-market resources.

Modeling Specifications:

Objective:	Approach the 1980 RPA targets as closely as possible while maximizing PNV.
Technological Constraints:	All apply.

MMR All apply.
Constraints:
Timber Policy TPCs common to all
Constraints: alternatives apply.
MIR All apply.
Constraints:
Economic Use assigned values with
Assumptions: price and cost trends for
 timber.

Constraints Unique to Alternative:

No acres are set aside for retention and partial retention VQOs in addition to the CEF analysis.

PFD - The (1987) Preferred Alternative with a Programmed Departure

Description and Purpose: This alternative is the same as the preferred alternative, but a programmed departure is scheduled to attempt to alleviate the anticipated decline in private timber outputs in the local area over the next 20 to 30 years.

Modeling Specifications:

Objective: Maximize PNV subject to the constraints below.
Technological All apply.
Constraints:
MMR all apply.
Constraints
Timber Policy TPCs common to all
Constraints: alternatives apply, except that the non-declining yield constraint is relaxed for the first three decades.
MIR All apply.
Constraints
Economic Use assigned values, with
Assumptions: price and cost trends for
 timber.

Constraints Unique to Alternative:

1. Seven UDRs at 8,100 acres.
2. Three botanical areas at 5,680 acres.
3. Ten RNAs at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to the high road-building needs vs. the existing available suitable lands and timber volumes.
5. allocates 18,160 acres set aside to meet retention VQO, and 17,580 acres set aside to meet partial-

retention VQO, in addition to constrained economic efficiency (CEF) analysis.

NMK - Amenities or Nonmarket Emphasis

Description and Purpose: The purpose of this alternative is to provide high levels of non-market goods, services and values. Marketable outputs will be produced on lands not otherwise constrained by this alternative, and will be emphasized when not in conflict with non-market values. A 150-year rotation is imposed to enhance visual and wildlife values, particularly those wildlife species requiring older successional stage habitat, to minimize potential risk to water quality, and to enhance overall vegetative diversity.

Modeling Specifications:

Objective: Maximize PNV subject to the constraints below.
Technological All apply.
Constraints:
MMR All apply.
Constraints
Timber Policy TPCs common to all
Constraints: alternatives apply. In addition, a 150-year rotation is imposed.
MIR All apply.
Constraints
Economic Use assigned values, with
Assumptions: price and cost trends for
 timber.

Constraints Unique to Alternative:

1. Twelve UDRs at 85,270 acres.
2. Three botanical areas at 5,560 acres.
3. Ten RNAs at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to the high road-building needs vs. the existing available suitable lands and timber volumes.
5. 17,360 acres set aside to meet retention VQO, and 6,040 acres set aside to meet partial-retention VQO, in addition to constrained economic efficiency (CEF) analysis.

WLF - Wildlife Emphasis

Description and Purpose: The theme of this alternative is to more closely reflect natural vegetative processes on the Forest, emphasize vegetative diversity, watershed stability, and the

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maintenance of healthy populations of all wildlife species. Other objectives are to improve the quality of anadromous fish habitat, and to produce modest outputs of goods and services. A 150 year rotation is imposed for reason similar to those discussed in NMK, and timber yield projections are reduced 15 percent to account for the maintenance of hardwood basal area within mixed hardwood/conifer stands.

Modeling Specifications:

Objective:	Maximize PNV subject to the constraints below.
Technological Constraints:	All apply.
MMR Constraints	All apply.
Timber Policy Constraints:	TPCs common to all alternatives apply. In addition, a 150-year rotation is imposed as described in NMK, and timber yield projections are reduced 15 percent as described above. Re-entry period for commercial thinning may not be less than 40 years.
MIR Constraints:	All apply.
Economic Assumptions:	Use assigned values, with price and cost trends for timber.

Constraints Unique to Alternative:

1. Seven UDRs at 8,100 acres.
2. Three botanical areas at 5,560 acres.
3. Ten RNAs at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to the high road-building needs vs. the existing available suitable lands and timber volumes.
5. 18,160 acres set aside to meet retention VQO, and 18,190 acres set aside to meet partial-retention VQO, in addition to constrained economic efficiency (CEF) analysis.

LOW - 25 percent Budget Reduction from Current

Description and Purpose: The purpose of this alternative is to manage the Forest in a manner similar to the (1987) current situation, but at a reduced cost per unit of resource output and a reduced overall budget (75 percent of the 1982

budget). Few new facilities and no capital investment projects would be constructed; existing facilities would be maintained. This alternative would emphasize timber production and dispersed recreation while maintaining other resources at or near current levels.

Modeling Specifications:

Objective:	Maximize PNV subject to the constraints below.
Technological Constraints:	All apply.
MMR Constraints	All apply.
Timber Policy Constraints:	TPCs common to all alternatives apply.
MIR Constraints	All apply.
Economic Assumptions:	Use assigned values, with price and cost trends for timber. For the first 50 years constrain the average annual budget to 75 percent of the 1982 budget.

Constraints Unique to Alternative:

1. Twenty-two UDRs at 147,190 acres.
2. Two botanical areas at 4,590 acres.
3. Ten RNAs at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to the high road-building needs vs. the existing available suitable lands and timber volumes.
5. 16,180 acres set aside to meet retention VQO, and 14,080 acres set aside to meet partial-retention VQO in addition to constrained economic efficiency (CEF) analysis.

DGF - California Department of Fish and Game

Description and Purpose: The purpose of this alternative is to provide more habitat allocation for fish and wildlife, and to give greater attention to the management of fish and wildlife resources. Timber will be produced at levels consistent with fish and wildlife objectives.

Modeling Specifications:

Objective:	Maximize PNV subject to the constraints below.
Technological Constraints:	All apply.

MMR Constraints All apply.
Timber Policy Constraints: TPCs common to all alternatives apply. In addition, an old growth management area will be provided consisting of 10 percent of the suitable lands managed at a 250-year rotation.
Timber yields Yields from full regulated lands will be reduced by 25 percent to provide for the maintenance of 75 percent hardwood basal area.
MIR Constraints All apply.
Economic Assumptions: Use assigned values, with price and cost trends for timber.

Constraints Unique to Alternative:

1. Nine UDRs at 45,420 acres.
2. Two botanical areas at 4,590 acres.
3. Ten RNAs at 8,790 acres.
4. North Fork Smith Roadless Area allocated to maintenance prescriptions due to the high road-building needs vs. the existing available suitable lands and timber volumes.
5. 17,670 acres set aside to meet retention VQO, and 5,050 acres set aside to meet partial-retention VQO in addition to constrained economic efficiency (CEF) analysis.
6. The Streamside Management Area will have no projected regulated timber yields.

Alternatives Considered in Detail

Alternative CUR - Current/RPA:

Description and Purpose: The purpose of this alternative is to provide adequate resource protection and to produce outputs and services generally based on current (1990) land use designations, budget levels, directions, policies and practices, projected into the future. This alternative balances timber growth and harvesting with the protection of anadromous fish, recreation, and wildlife values. Timber management areas would be maintained according to "modification" visual quality objectives.

Modeling Specifications:

Objective: Maximize timber rolled over to Max PNV subject to the constraints below.

Technological Constraints: All apply.
MMR Constraints: All apply.
Timber Policy Constraints: TPCs common to all alternatives apply.
MIR Constraints: All apply.
Economic Assumptions: Use assigned values, with price and cost trends for timber, recreation, and range.

Constraints Unique to Alternative:

1. Six Special Interest Areas and eight RNAs w/ no regulated timber yields.
2. Riparian protection zone 16.6% of Forest. No harvest in inner gorge areas, Remaining 5.99% of Forest in zone managed for marginal yields.
3. Marten (40) and fisher (18) territories managed for marginal timber yields.
4. No regulated timber harvest in the nest protection zone (NPZ) of active bald eagle and peregrine falcon territories.
5. No regulated timber harvest in spotted owl Habitat Conservation, Critical Habitat Units at marginal yields.
6. Marginal timber yields only in goshawk nest protection zones. There are 19 known 200 acre nest protection zones and 37 designated 50 acre nest protection zones.
7. Difficult-to-plant sites will be managed for marginal timber yields; harsh sites will not be managed for regulated timber harvest.
8. Green tree retention of 6 trees live trees per acre greater than quadratic mean diameter.
9. 120 year minimum rotation.

Alternative PRF - Preferred

Description and Purpose: The theme of the alternative is to use an ecosystem management approach to maintaining healthy forest ecosystems. Biodiversity would be maintained by establishing a large system of reserved areas (91% of the Forest) managing the matrix outside reserved areas to mimic natural patterns and levels of stand replacement. Timber stand replacement through harvesting and natural disturbances occur at a rate determined by analyzing past rates of natural stand replacement. Regeneration units which reflect natural landscape level forest openings could occur. The amount of openings created in this manner would not exceed the historical replacement rate. By creating a landscape reflective

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of natural diversity at some point in the future, there would be no need for the zoning of wildlife and other management areas. Instead, these areas would be managed through standards and guidelines.

Modeling Specifications:

Objective:	Model historic disturbance cycles, with late seral vegetation targeted for the upper portion of their historic range. Do this in the most cost efficient manner.
Technological Constraints:	All apply.
MMR Constraints	All apply.
Timber Policy Constraints:	TPCs common to all alternatives apply.
MIR Constraints	All apply.
Economic Assumptions:	Use assigned values, with price and cost trends for timber, recreation and range.

Constraints Unique to Alternative:

1. Six Special Interest Areas and 8 RNAs w/ no regulated timber yields.
2. Riparian protection zone 42.7% of Forest. No regulated timber harvest on Riparian reserves.
3. No additional set asides for fisher (protected by LSRs and R5-HRV Prescription). Three Marten territories managed for marginal yields, rest protected through LSRs and R5-HRV prescription
4. No regulated timber harvest in the NPZ of active peregrine and bald eagle nesting areas and six suspected peregrine falcon nest protection zones.
5. No regulated timber harvest in LSRs. Critical habitat Units would be managed at R5-HRV.
6. Goshawk habitat maintained through LSRs and R5-HRV prescription.
7. Difficult-to-plant and; harsh sites will not be managed for regulated timber harvest.
8. Green tree retention or 15% of the area in the larger trees.
9. Model to meet recommended management ranges(RMRs) for late seral habitat. RMRs targeted for upper portion of their historic range.
10. Travel and ecological corridors not modeled. Met through riparian reserves, 100 ac owl reserves and LSRs..

11. 667,700 acres designated as key watersheds for protection of anadromous fish (70% of Forest).

Alternative OGR - Old Growth Reserve

Description and Purpose: This alternative emphasizes the production of non commodity resources and utilizes "old growth reserves" in addition to HCAs to maintain viable populations of spotted owls and other old growth-dependent species. This emphasizes the selection-based harvest system to create a multi-story residual stand designed to have the vertical and horizontal structural characteristics of old growth stands.

Modeling Specifications:

Objective:	Maximize timber rolled over to max habitat and PNV subject to the constraints below.
Technological Constraints:	All apply.
MMR Constraints	All apply.
Timber Policy Constraints:	TPCs common to all alternatives apply.
MIR Constraints	All apply.
Economic Assumptions:	Use assigned values, with price and cost trends for timber, recreation and range.

Constraints Unique to Alternative:

1. Six Special Interest Areas at R3-MRG and eight RNAs w/ no regulated timber yields..
2. Riparian protection zone 16.6% of Forest. No regulated harvest this zone..
3. 18 fisher territories managed for functional mature and old growth stand structure, no regulated timber harvest in the 40 marten territories.
4. No regulated timber harvest in the NPZ of active peregrine and bald eagle nesting areas and 6 suspected peregrine falcon nest protection zones.
5. There will be no regulated timber harvest in "old growth reserves".
6. No regulated timber harvest in the 19 known 200-acre nest protection zones and 37 designated 50-acre nest protection zones.
7. Difficult-to-plant sites and harsh sites will not be managed for regulated timber harvest.

8. Green tree retention of 6 trees live trees per acre greater than quadratic mean diameter.
9. 180 year minimum rotation.
10. 667,700 acres designated as key watersheds for protection of anadromous fish.

8. There are no restrictions on clearcutting.
9. 70 year minimum rotation.

Alternative ECR - Ecological Rotation

Description and Purpose: The theme of the alternative is to maintain 55% old growth by watershed. Timber management would occur on most of the Forest, but harvest rates would be at near natural disturbance levels. Clearcuts which reflect natural landscape level forest openings could occur, although their position in the landscape would be designed to maintain large continuous patch sizes in late seral stages and to reduce fragmentation. The amount of openings created in this manner would not exceed the replacement rate of three percent per decade. By creating a landscape reflective of natural diversity at some point in the future, there would be no need for the zoning of wildlife and other management areas. Instead, these areas would be managed through standards and guidelines. This alternative would require a transition period before it could be put into effect, as all of the Forest's watersheds presently do not meet the 55% old growth requirement.

Modeling Specifications:

Objective: Maximize PNV subject to the constraints below.

Technological Constraints: All apply.

MMR Constraints All apply.

Timber Policy Constraints: TPCs common to all alternatives apply. In addition, only 3 percent of the volume in timber regulated lands could be harvested each decade. No salvage would be allowed on unsuitable timber lands. No type conversions permitted.

MIR Constraints All apply.

Economic Assumptions: Use assigned values, with price and cost trends for timber, recreation and range.

Constraints Unique to Alternative: After the initial transition period there would be no landbase allocated to management areas in this alternative, except for MMRs and MIRs. Endangered species would be managed according to approved recovery plans; resource management would eventually be regulated

Alternative MKT - Market

Description and Purpose: The purpose of this alternative is to produce high levels of marketable outputs.. Timber outputs are increased relative to the other alternatives by making more lands available for timber production and by not requiring green tree retention or longer rotations.

Modeling Specifications:

Objective: Maximize timber rolled over to max PNV subject to the constraints below.

Technological Constraints: All apply.

MMR Constraints All apply.

Timber Policy Constraints: TPCs common to all alternatives apply.

MIR Constraints All apply.

Economic Assumptions: Use assigned values, with price and cost trends for timber, recreation, and range.

Constraints Unique to Alternative:

1. Six Special Interest Areas. 4 in the NRA reserved, two outside the NRA at marginal yields.
2. Riparian protection zone 16.6% of Forest. No harvest in inner gorge areas, Remaining 5.99% of Forest in zone managed for marginal yields.
3. Marten and fisher territories managed for marginal timber yields.
4. No regulated timber harvest in the active bald eagle and peregrine falcon nest protection zones.
5. No regulated timber harvest in spotted owl Habitat Conservation, Critical Habitat areas regulated at marginal yields.
6. Marginal timber yields in goshawk nest protection zones. There are 19 known 200 acre nest protection zones and 37 designated 50 acre nest protection zones.
7. Difficult-to-plant sites will be managed for timber reduced yields with an assumed 30 percent failure rate for replanting; harsh sites will be managed for marginal timber yields.

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through standards and guidelines rather than zoned protection areas.

A summary of constraints for each alternative are displayed in table B-11.

III. OTHER MODELS

This section provides a brief description of the other models used to generate input data for use in FORPLAN and to verify and interpret output data from FORPLAN.

RAMPREP

RAMPREP is a PSW Regional Timber Management Model that is used to develop timber yield tables. RAMPREP timber yield tables are based on the 1978 Forest inventory data; it summarizes the potential yields of the Forest based on the inventory data. For a detailed discussion of how RAMPREP calculates potential yields, see [The Region Five Timber Inventory Process](#), July 1981.

PROGNOSIS

Prognosis is timber growth and yield model. It uses a series of regressions developed from regional and local data to model stand growth and yield. We used prognosis to determine the effects of various treatments on stand development. We modeled ingrowth and outgrowth of seral stages under different treatments. This was critical for determining the amounts and types of various wildlife habitat types that would occur over time. Prognosis was also used to model the effects of leaving live trees on growth and volume removals.

SPREADSHEET MODELING

All alternatives were modeled in FORPLAN and by models developed in a series of linked spreadsheets. In the spreadsheets the harvest was modeled through an area/volume method. A percentage of the volume would be harvested each decade, factoring in items such as green tree retention, and stand mortality. Depending on the objective of the alternative certain strata would be targeted for harvest in order to maintain various habitat types which were limiting for wildlife. The spreadsheets modeled acres by seral stage over time, economic outputs and other resource outputs and costs. The spreadsheets allowed us to vary the harvest level and immediately see the effects on habitat over time charted in a graph. Harvest levels

could be set based on the amount of certain habitat types the ID team wanted to produce over time as well as other economic factors.

Outputs and costs modeled in the spreadsheets are the generally same as discussed above section II the Forst Planning Model. There were some cases, such as roading, the spreadsheet program allowed a more accurate model to be developed. In modeling timber outputs and finding optimal solutions, FORPLAN is much more sophisticated. FORPLAN is a linear optimization model which can optimize chosen outputs. Spreadsheets can not optimize or maximize an output. Timber outputs and PNVs modeled in the spreadsheets were usually within one or two percent of the FORPLAN model. Some exceptions are alternatives where constraints in the model were a minimum. such as the MKT alternative. In those cases FORPLAN harvest yields exceeded the spreadsheet model.

We used the FORPLAN report for each alternative and linked the spreadsheets to various portions of the report. Timber yields, acres treated by harvest type and seral stage outputs over time were taken from the FORPLAN report. Other outputs were modeled in the spreadsheets generally using the same formulas used in the FORPLAN model.

A major advantage of linking spreadsheets to the FORPLAN Report was the ability to produce the tables and figures for the FEIS and plan. This allowed the tables and figures to be directly linked to the model and updated automatically whenever the model was changed.

THE SPATIAL DISAGGREGATION MODEL (RELM)

The spatial disaggregation model was used to disaggregate timber related activities and effects to the compartment level. This allowed us to test the feasibility of implementing the FORPLAN solution factoring in spatial constraints. At the compartment level we modeled cumulative watershed effects, the 50-11-40 rule and visual effective alteration. The model was run for six decades. When a compartment reached a "threshold of concern" in any of the three areas, no more disturbance would be allowed until the compartment recovered. Activities were programmed according to a equilibrium risk method where compartments with the lowest threshold would receive higher percentage of the harvest.

To model the effects of timber management to the compartment level over time required some assumptions be made about the future state. We assumed that private lands were recently cut over and fully roaded in all time periods and that all compartments were fully roaded. These are not necessarily true but because we have no way of knowing when a piece of private land may be harvested, we assumed the worse case.

The analysis was run for each alternative. All alternatives stayed within thresholds limits. The third decade was the most critical as far a approaching threshold limits.

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Table B-11. Management Prescriptions by Alternative

Mgt. Area/ Issue	Alternative Rx				
	CUR	PRF	OGR	MKT	ECR
Objective	Max. Timber rolled over to Max. PNV	Model natural disturbance cycles, late seral veg targeted for the upper portion of historic range.	Max. Timber rolled over to Max. habitat then Max. PNV	Max. Timber rolled over to Max. PNV	Max old growth; Old growth targeted for more than 55% of the area
Matrix	R2-PR w/ 50-11-40	R5-HRV	R2-180 w/ 50-11-40	R1-FUL w/ 50-11-40	R6-ECR
Rotation	120 Yr min. Rotation	HRV See Table B-2	180 Yr Min Rotation	80 Yr min. Rotation	330 Yr. Average Rotation
Green Tree Retention	6 TPA > QMD ; 20 % of volume	15% of acreage ; 20 % of volume	6 TPA > QMD ; 20 % of volume	none	8-12 TPA > 30 DBH ; 45% of Volume
Type Conversions	allowed	none	none	allowed	none
Partial Retention	R2-PR	R5-HRV	R2-180 w/ 50-11-40	R2-PR	R6-ECR
SIA	6 total TU-UNS	6 total TU-UNS	6 total TU-UNS	6 total R3-MRG	6 total R6-ECR
RNA	8 total TU-UNS	8 total TU-UNS	8 total TU-UNS	8 total TU-UNS	8 total TU-UNS
Wild, Scenic & Rec Rivers	1/4 mile each side, 80,749 Total Acres	Boundary includes riparian, view areas & avoids Pvt. Property, 77,830 total Acres	Boundary includes riparian, view areas & avoids Pvt. Property, 77,830 total Acres	300 ft. or riparian which ever is greatest, 73,110 total Acres	300 ft. or riparian which is greatest, 73,110 total Acres
Scenic Rivers	R3-MRG	R3-MRG	R3-MRG	R2-PR	R3-MRG
Riparian Protection Zone					
Amt. of Forest	16.60%	42.73%	16.60%	16.60%	16.60%
Inner Gorge	TU-UNS	TU-UNS	TU-UNS	TU-UNS	TU-UNS
Zone Outside Inner Gorge	R3-MRG	TU-UNS	TU-UNS	R3-MRG	R3-MRG

Table B-11. Management Prescriptions by Alternative

Mgt. Area/ Issue	Alternative Rx				
	CUR	PRF	OGR	MKT	ECR
Harsh-2	R3-MRG	TU-UNS	TU-UNS	R2-PR	R6-ECR
Harsh-3	TU-UNS	TU-UNS	TU-UNS	R3-MRG	R6-ECR
Goshawk	56 Total	R5-HRV	56 Total	56 Total	R6-ECR
Known occupied sites	NST ¹ & NPZ ² R3-MRG Rest R2-PR	none; habitat maintained through LSRs & R5- HRV (see S&Gs)	NST ¹ & NPZ ² TU-UNS Rest R2-180	NST & NPZ R3-MRG Rest R2-PR	R6-ECR
Network Territories	NST R3-MRG Rest R2-PR	R5-HRV	NST R3-MRG Rest R2-PR	NST R3-MRG Rest R2-PR	R6-ECR
Fisher	R3-MRG (18 Territories)	R5-HRV (habitat maintained through LSRs and R5-HRV Rx)	R2-180 w/ 50-11-40 (18 Territories)	R1-FUL (no additional territories)	R6-ECR (no additional territories)
Pine Marten	R3-MRG (40 Territories)	R3-MRG (3 territories, rest of habitat maintained in LSRs and R5- HRV Rx)	TU-UNS (40 Territories)	R1-FUL	R6-ECR
Bald Eagle	NST, NPZ & Winter Roost TU-UNS Rest R2-PR	NST, NPZ & Winter Roost TU-UNS Rest R5-HRV	NST, NPZ & Winter Roost TU-UNS Rest R2-180	NST, NPZ & Winter Roost TU-UNS Rest R2-PR	NST, NPZ & Winter Roost TU-UNS Rest R6-ECR
Peregrine Falcon	8 Sites NPZ TU-UNS Rest R2-PR	14 Sites NPZ TU-UNS Rest R5-HRV	14 Sites NPZ TU-UNS Rest R2-PR	8 Sites NPZ TU-UNS Rest R2-PR	8 Sites NPZ R3-MRG Rest R6-ECR
Owls					
Territories	HCA TU-UNS	LSR TU-UNS	HCA TU-UNS	HCA TU-UNS	HCA R6-ECR
CHUs (outside LSRs)	R3-MRG	R5-HRV	R3-MRG	R3-MRG	R6-ECR
Activity Centers (Matrix)	91 Territories 80 Acres min. TU-UNS	93 Territories 100 Acres min. TU-UNS	91 Territories 80 Acres min. TU-UNS	91 Territories 80 Acres min. TU-UNS	none R6-ECR

Table B-11. Management Prescriptions by Alternative

Mgt. Area/ Issue	Alternative Rx				
	CUR	PRF	OGR	MKT	ECR
Murrelet	none	Nest Sites and Critical Habitat TU/UNS	none	none	none
Retention	R3-MRG	R3-MRG	R3-MRG	R3-MRG	R6-ECR
Travel Corridors	600 Ft. travel R2-FR No Ecological	Riparian Reserve and 100 Ac. owl Territories	180 Yr rotation 600 Ft. Travel & 1200 Ft. Ecological	None	180 Yr rotation 600 Ft. Travel & 1200 Ft. Ecological
NRA	See NRA Zones Appendix A Plan	See NRA Zones Appendix A Plan	See NRA Zones Appendix A Plan	See NRA Zones Appendix A Plan	See NRA Zones Appendix A Plan

1\ NST = Nest site

2\ NPZ = Nest site protection zone

IV SILVICULTURAL STRATEGIES

OVERVIEW

The following section presents the concept of how the forest stands would be managed to meet various resource objectives. These strategies are general in nature. They provide a framework in which site-specific prescriptions would be developed. Site specific prescriptions would vary because of differences in site characteristics and vegetation, as well as the need to provide a diverse range of late seral habitat types and other habitat types depending on how the area fits in the landscape or larger ecosystem. The silvicultural strategies described below are for the Douglas-fir and mixed conifer timber types. These two timber types differ in their management strategies.

The Douglas-fir timber type contains the conifer species Douglas-fir and sugar pine along with the hardwood species tanoak, madrone and occasionally canyon live oak. Tanoak and madrone, due to their sprouting capabilities and rapid early growth can often prevent successful regeneration of conifers by competing with them for light, moisture, and nutrients. To successfully regenerate these stands the hardwood component must be significantly reduced and the forest canopy must be opened to allow sufficient light to reach the young trees. These stands should be managed on an even aged basis.

The mixed conifer timber type occurs on the Southern portion of the Forest and at higher elevations in the North. It differs from the Douglas-fir timber type in its reduced hardwood component. The stands are dominated by conifers, including Douglas-fir, white fir, sugar pine, Port-Orford cedar, and incense cedar with the hardwood species chinquapin and canyon live oak in certain plant associations. In this timber type the conifers often regenerate naturally when the forest canopy is opened enough to allow some light penetration. Where the hardwood component is absent these stands may be managed on an uneven aged basis.

Both vegetation types would generally require site preparation and planting after treatment. Site preparation could include hand or machine piling of slash (with and without burning), broadcast burning, mechanical scarification, or hand application of herbicides. The method chosen would depend on a

site specific analysis. Species planted would approximate those found naturally on the site. Depending on stand objectives, precommercial and commercial thinning may be used. Thinning (from above or below or for old-growth structure) would depend on the prescription objectives.

Strategy six refers to the maintenance of the old-growth legacies described in Table B-12. These legacies were developed from the old-growth definitions described in Chapter 3 in the Biological Diversity section. The legacy consists of live trees, snags, and dead and down logs in various stages of decay. The legacy provides structural components characteristic of late seral stands, which provide habitat for wildlife, nutrient sources for vegetation growth, water storage sites, seed beds for germinating trees, slope stability and long-term sources of organic material for vegetation growth and soil development. They are similar to what is left in forest stands following natural disturbance, such as fire.

The strategies are described below by number. They are applied to each alternative as follows;

<i>Alternative</i>	<i>Strategy</i>
CUR	1, 2, 3, 4
PRF	3, 4, 5
OGR	2, 3, 4
MKT	1, 2, 3, 4
ECR	4,6

SILVICULTURAL STRATEGY 1

Objective: Maximize timber growth and yield.

This is the standard short rotation, even-aged management system currently used on general forest land. Clearcutting is the predominant silvicultural system, with seed tree and shelterwood systems prescribed in the difficult to regenerate areas. Rotation age varies with site productivity and would range from 70 to 120 years. Rotation is based on 95% of the stand reaching the culmination of mean annual increment.

Site preparation would be accomplished with mechanical or hand piling, hand application of herbicides, and/or prescribed fire. Most regeneration units are planted with mixtures of species that approximate the natural species composition. Seedling protection, vegetation control and precommercial thinning activities would occur with the objective of improving conifer vigor and growth

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to meet the proposed yield projections. At least one commercial thin would occur before final harvest

Table B-12. Requirements for Old-Growth Legacies for the Douglas-fir and Mixed Conifer Timber Types Strategy 6

Veg-Type	Live Trees				Snags/Acre (>20" dbh & 15' tall)	Logs/Acre \1 (Decay Classes 1-2) (>20" dbh & 10' long)
	Conifer		Hardwoods			
	Trees/Acre	Min dbh	Trees/Acre	Min dbh		
D4G	6 to 12	30	4	18	3	4
D4P, D3G & D3P	6 to 12	21	4	18	3	4
M4G	6 to 12	30	-	-	6	6
M4P, M3G & M3P	6 to 12	21	-	-	6	6

\1 Decay classes 3 to 5 would be left on site and not be utilized.

SILVICULTURAL STRATEGY 2

Objective: Maximize growth and yield while considering other resource objectives.

This strategy includes suitable timberlands where management objectives allow for even aged systems, but not at full yields. Under this management objective, the intensity of timber harvest would be reduced to about 50% to 80% of optimum yields to respond to other resource objectives (visual quality, wildlife, etc.) The site specific prescription may require longer rotations, leaving live trees on the site, and/or changing the shape and size of the openings.

Site preparation would be accomplished with mechanical or hand piling, hand application of herbicides, and/or prescribed fire. As in strategy 1, planting would occur on all regeneration units, and aggressive seedling protection, vegetation control, and precommercial thinning activities would be implemented. At least one commercial thinning would occur before final harvest.

SILVICULTURAL STRATEGY 3

Objective: Meet other resource objectives, while allowing limited timber harvest.

This strategy is primarily driven by other resource needs with timber yields being incidental. The strategy could range from individual tree selection to group selections. The timber yields over the whole rotation would be small. This strategy was modeled using an extended rotation (300 years). The actual ground prescription would vary greatly depending on the resource needs.

SILVICULTURAL STRATEGY 4

Objective: No regulated harvest, timber removal is allowed only to meet other resource objectives.

Timber harvest would be an incidental benefit of achieving other resource objectives, including ensuring public safety in areas such as campgrounds and along roads, or wildlife habitat improvement projects. Individual trees would be selected for removal. Site preparation and regeneration activities would occur only to meet other resource objectives.

SILVICULTURAL STRATEGY 5

Objective: Develop a range of stands conditions to provide functional habitat for mature and old growth related wildlife species. Site specific prescriptions would vary because of differences in site characteristics and vegetation, as well as the need to provide a diverse range of late seral habitat types and other habitat types depending on how the area fits in the landscape or larger ecosystem. Regeneration harvest would mimic natural disturbance rates and conditions.

Regeneration Treatment

The acreage to be regenerated annually is fixed at a level that achieves the desired age distribution and connectivity of late seral stage habitats. At least 15 percent of the acreage associated with each regeneration unit will be retained to meet green tree retention requirements. Also snag and downed log levels will be left at to provide 80 to 100% of the average densities shown in Table B-8.

Table B-13. Mean Snag & Log Densities

Vegetation Series & Seral Stage	Snags/ Acre	Logs/ Acre
Tanoak		
Early Mature	3.2	8.2
Mid Mature	3.6	4.7
Late Mature	1.3	1.8
Old Growth	4.3	9.2
White Fir		
Early Mature	1.7	7.0
Mid Mature	5.2	5.3
Late Mature	7.6	11.0
Old Growth	5.9	13.5
Red Fir		
Early Mature	4.6	6.3
Mid Mature	6.5	7.7
Late Mature	7.2	9.7
Old Growth	8.2	11.4
Douglas-fir		
Early Mature	3.7	16.0
Mid Mature	1.2	5.4
Late Mature	0.9	6.3
Old Growth	3.9	8.7

development of a mult-storied stand condition. At 120-140 years, the stand would look like figure 2 Time period IV.

Pre-Commercial Treatment in Shrub/Forb and Pole Stands

Pre-commercial treatments would occur in sapling/shrub/forb and pole stands when necessary to meet stand structure and growth objectives. In Douglas-fir plantations, both conifers and hardwoods would be managed to meet the desired conditions. Hardwoods sprout clumps would be thinned to increase their growth and size. These would be managed along with the conifers throughout the pre-commercial and intermediate treatments applied to this vegetation type. Conifers and hardwoods selected for removal would accelerate the development of vertical and horizontal diversity and the attainment of old-growth structure sooner than would occur naturally.

Figure B-2, Time I shows the condition of a Douglas-fir/hardwood stand that would be a priority for regeneration. Hardwoods are beginning to dominate the stand with the potential loss of the conifer component. The stand would be regenerated, retaining a legacy of large trees, snags, logs, and hardwoods (Table B-13 & Figure B-2, Time II). The legacy could be clumped, or spread evenly throughout the unit depending on the other resource and stand needs. When Douglas-fir/hardwood stands are regenerated, harvest units should vary from 5-30 acres in size and would not exceed 60 acres in the Douglas-fir type and 40 acres in the mixed conifer type. On some sites, to attain successful regeneration of conifers, hardwood control, using hand application of herbicides, would be required. Time II depicts what the stand would look like 20 years following regeneration harvest.

Approximately 60-80 years after initial treatment the stands are projected to look like Time III. At this time, approximately 40% of the basal area could be removed, with the objective of beginning

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FIGURE. B-2. TIME SEQUENCE OF STAND STRUCTURE FOR DOUGLAS-FIR STAND BEFORE AND AFTER REGENERATION USING SILVICULTURE STRATEGY 5

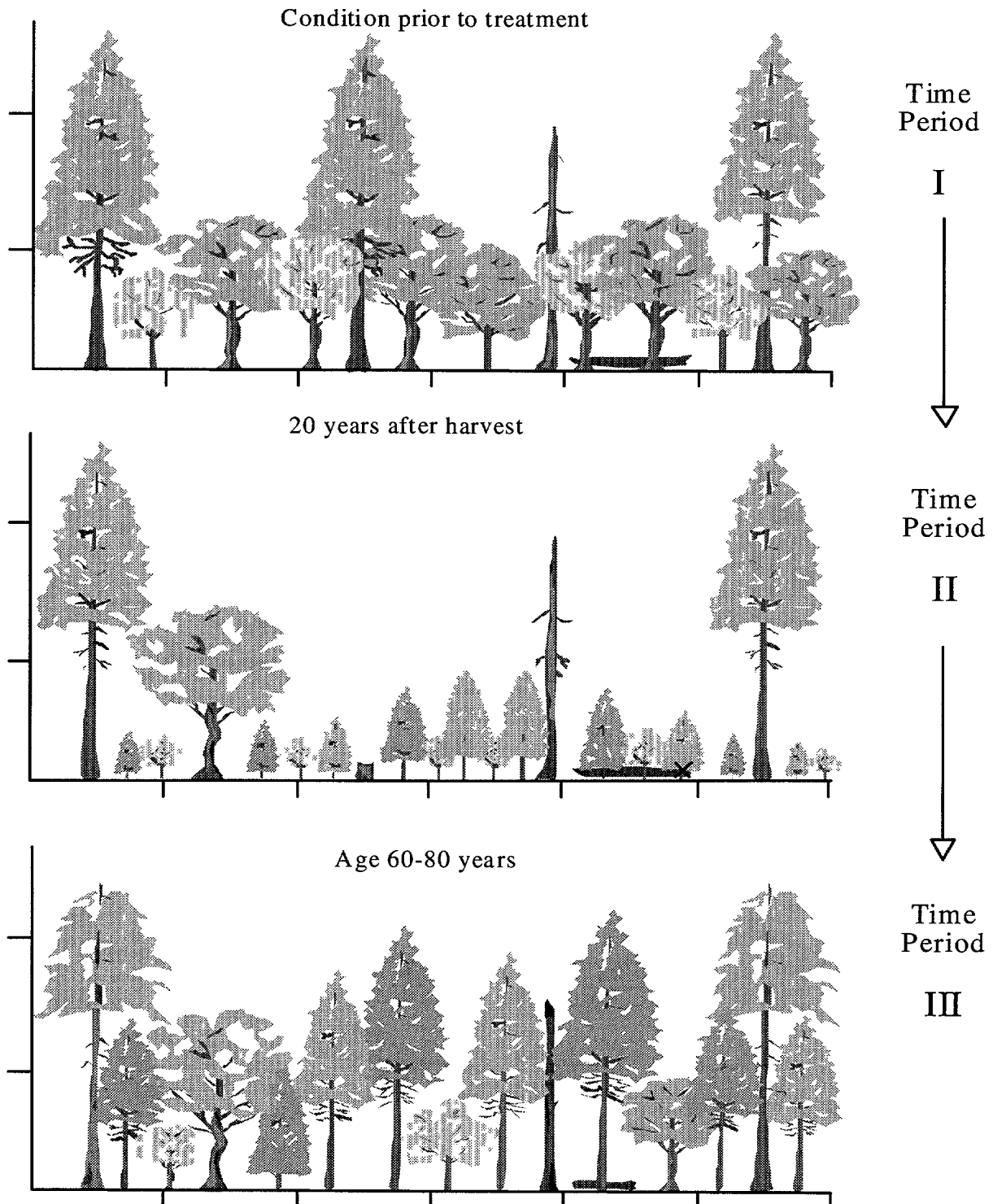
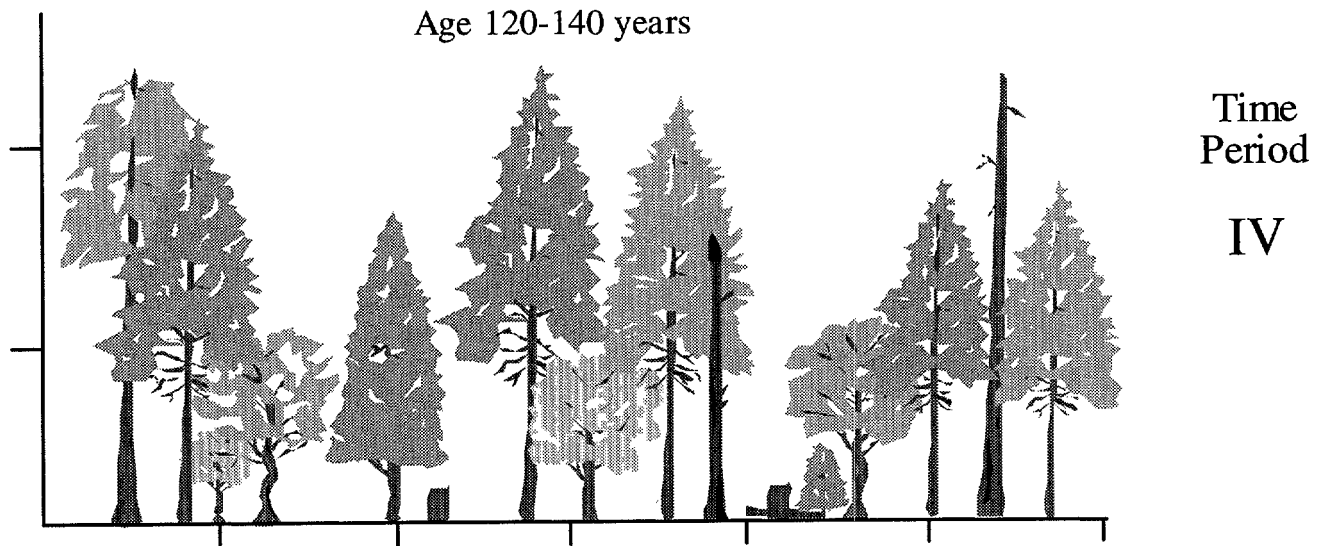


FIGURE B-2. TIME SEQUENCE OF STAND STRUCTURE FOR DOUGLAS-FIR STAND BEFORE AND AFTER REGENERATION USING SILVICULTURE STRATEGY 5



Intermediate Treatment In Mature Stands

In Douglas-fir stands where the existing condition is a 60-120 year old mature stand, such as the one shown in Figure B-3, Time I, individual tree selection or small group selection would be used to meet the objectives of this alternative. Up to 40% of the basal area would be removed to accelerate stand development. The projected conditions 60-80 years after treatment are shown in Figure B-3, Time II. The proposed future condition of these stands are shown in Figure B-3, Time III.

Many of the mixed conifer type would be managed on an uneven-aged basis, since many of these stands lack the hardwood component that severely limits regeneration of conifers (Figure B-4). To bring natural mixed conifer stands under uneven-age management, individual stand and watershed prescriptions would need to be developed, whether the individual tree or group selection systems are used. At each entry, all diameter classes from saplings to large trees would be managed to maintain stocking, desired crown cover, and growth to produce the desired stand condition. Removal of trees is based on the number of trees per acre desired in each diameter class and the target maximum tree size.

A possible example of one of these prescriptions is shown in Figure B-4. Individual tree selection or small (1/2 acre) group selection could be used to remove 20% of the basal area in an effort to introduce or accelerate the development of vertical and horizontal stand diversity (Figure B4). An additional limited entry may occur at 120-180 years, where 10-15% of the basal area could be removed. This would only occur in situations where it was deemed necessary to maintain old-growth characteristics (Figure B-5, Time III).

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Fig. B3. Time Sequence of Stand Structure for Intermediate Harvest of Douglas-fir Stands under Strategy 5.

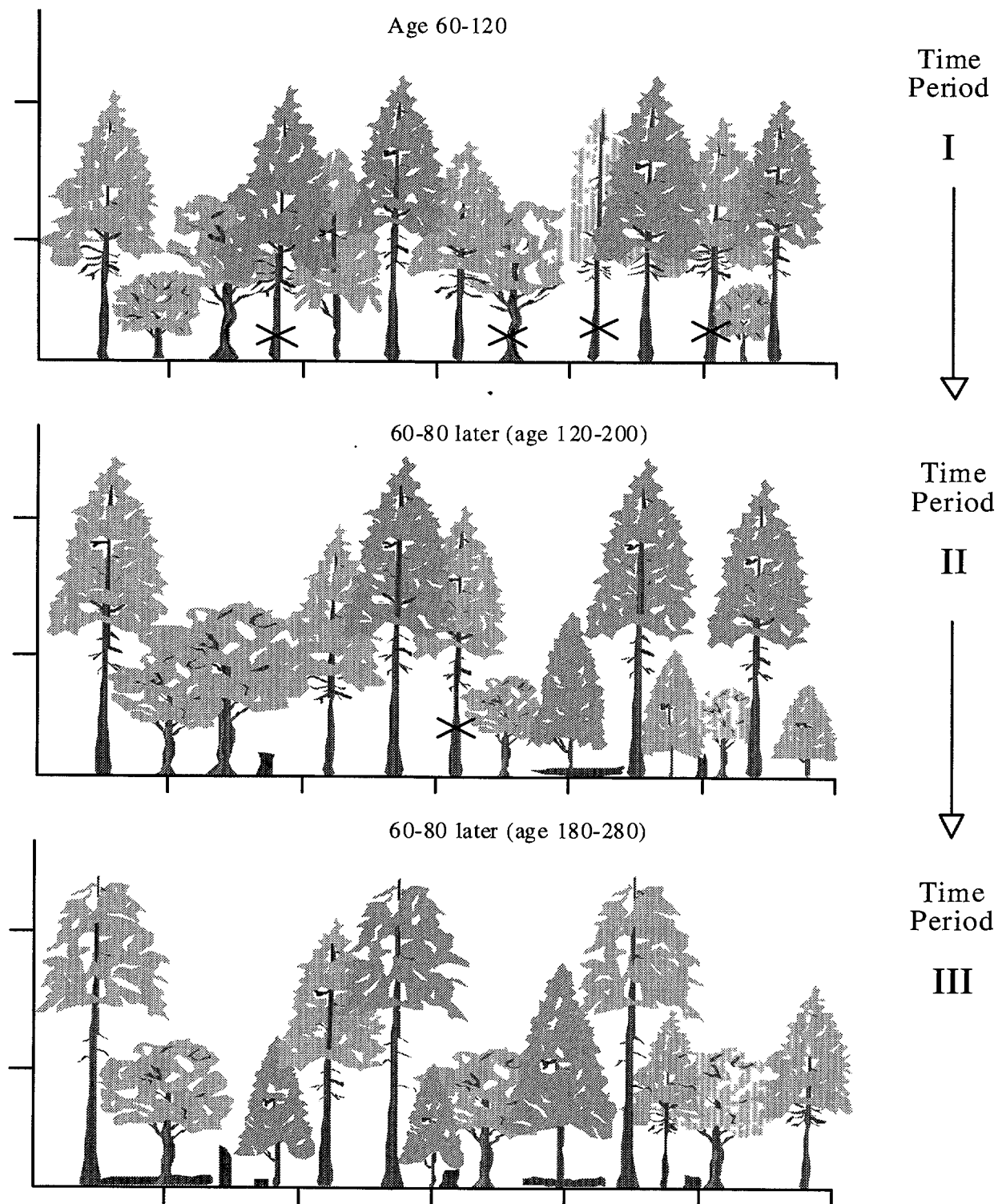
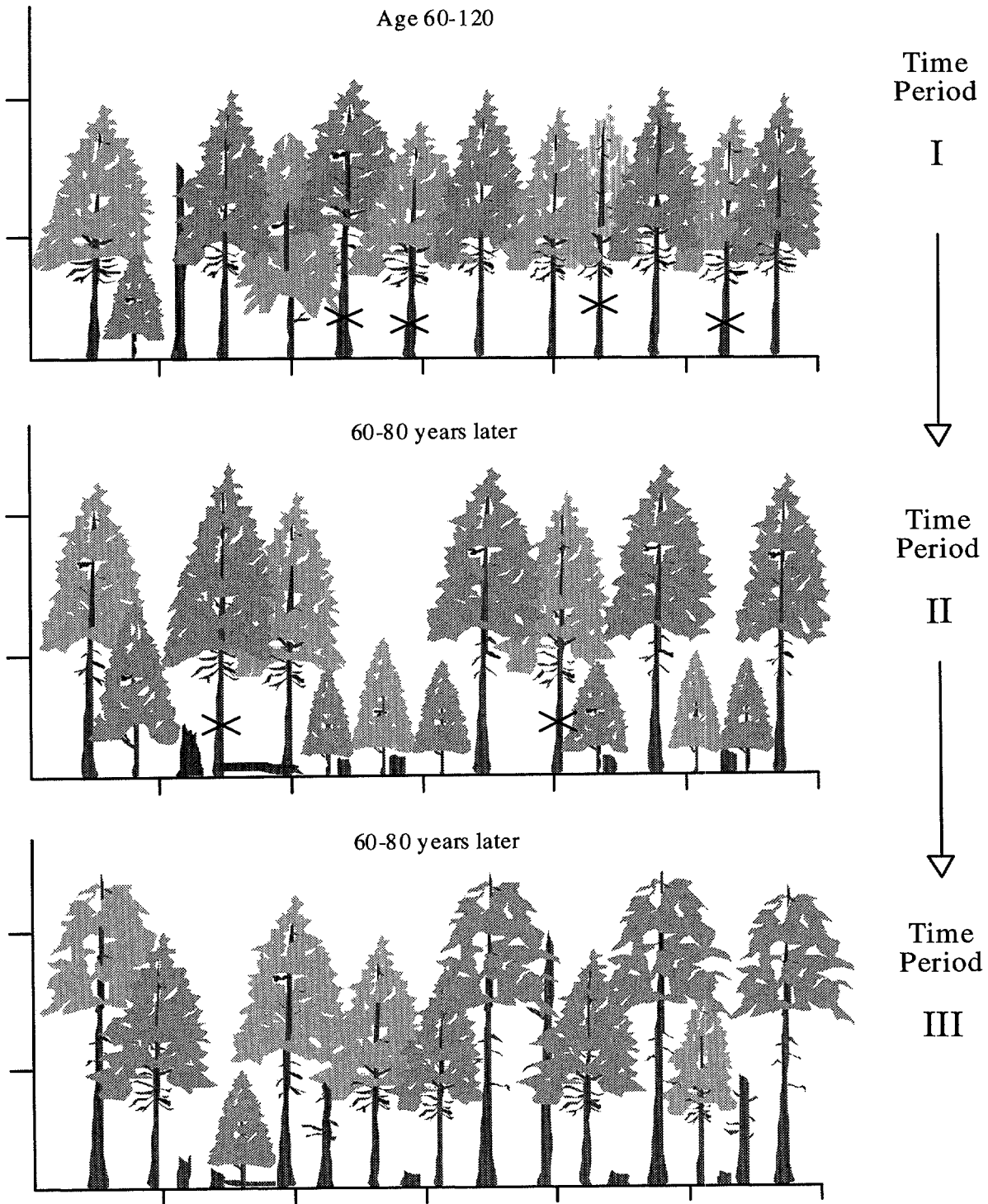


Fig. B-4. Time Sequence of Stand Structure for Uneven Age Management of Mixed Conifer Stands Under Strategy 5.



SILVICULTURAL STRATEGY 6

Objective: Mimic the natural succession rates and provide a natural distribution of vegetation types, seral stages, and patch sizes. The desired future condition is displayed in Table B-14. To ensure vegetation diversity is maintained over the landscape, this seral stage distribution should be met on the forested land within each watershed.

Table B-14. Desired future condition of seral stages by forest watershed.

Seral Stage	Percent of Landscape
shrub/forb	7.5
pole	7.5
mature	30
old-growth	55

Regeneration Treatment

Regeneration harvests (clearcuts, shelterwoods, group selection) of variable patch size can be used in old-growth stands (as defined in Chapter 3, Biological Diversity) where a watershed level analysis determines that the desired future condition for these seral stages are exceeded. Regeneration may occur at no more than 3% per decade, Forest wide, as explained earlier in the description of alternatives. Regeneration harvest would be designed to limit fragmentation and leave legacies of large old trees, snags and logs as shown in Table 13 and Figure B-5, Time I. These stands can be treated approximately 80 years later to accelerate the development of old-growth stand structure. During this treatment 20-30% of the basal area could be removed to achieve vertical and horizontal diversity (old-growth structure) earlier than would occur naturally (Figure B-5, Times II). An additional limited entry may occur at approximately 120 years, where 10-15% of the basal area could be removed. This would only occur in situations where it was deemed necessary to maintain old-growth characteristics (Figure B-5, Time III).

Pre-Commercial Treatment

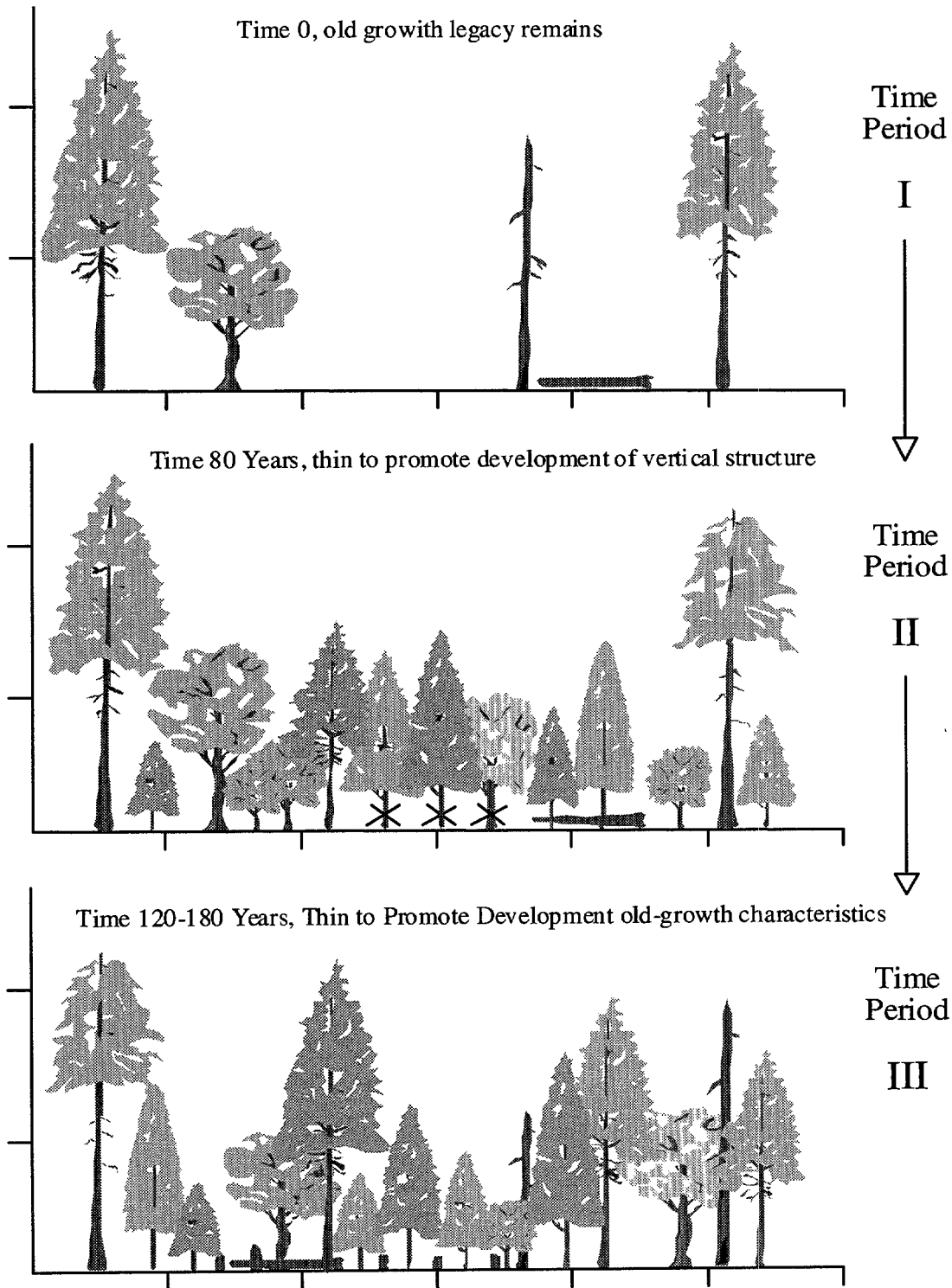
Pre-commercial treatments of shrub/forb and pole stands would occur when necessary to meet the objectives of this alternative. In Douglas-fir plantations both conifers and hardwoods would be managed to meet the desired future condition. Clumps of dominant hardwoods (10-20/acre) would be selected for sprout thinning (select the 3-5

dominant sprouts per clump). These would be managed along with the conifers throughout the pre-commercial and intermediate treatments applied to this vegetation type. Conifers and hardwoods selected for removal would accelerate the development of vertical and horizontal diversity and the attainment of old-growth structure sooner than would occur naturally.

Intermediate Treatment in Mature Stands

In areas where insufficient old-growth acres exist, the mature seral stage could be treated in an effort to accelerate the development of old-growth stand structure characteristics. Strategies similar to those in Strategy 5 would be used (Figures B-2 B-3 & B4). Individual tree selection or small (1/2 acre) group selection could be used to remove 20% of the basal area in an effort to introduce or accelerate the development of vertical and horizontal stand diversity (Figure B4). An additional limited entry may occur at 120-180 years, where 10-15% of the basal area could be removed. This would only occur in situations where it was deemed necessary to maintain old-growth characteristics (Figure B-5, Time III). Unlike the PRF alternative no further entry into these stands would take place until the desired future conditions described in Table B-14 are met.

Fig. B-5 Time Sequence of Stand Structure for Douglas-fir With Regeneration Harvest Under Strategy 6.



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V HABITAT CAPABILITY MODELS

Table B-15. bald eagle habitat capability model

Haliaeetus leucocephalus

Species Status-Federal Endangered

SEASON Spring & summer	HIGH (Preferred)**	MODERATE (Required)*	LOW (Marginal)
HABITAT VARIABLE		Seral Stages	
Vegetation type:			
Nesting and roosting			
Mixed evergreen w/ chinquapin or rhododendron	4A,5A	4B,4C,5B,5C	2,3A,3B,3C
Feeding perches (year round)			
Mixed evergreen w/ 4A,5A chinquapin or rhododendron		3A,3B,4B,4C,5B,5C	2
Nest tree	Dominant Ponderosa pine, Douglas-fir; >38" DBH; large limbs, open crown	Dominant Ponderosa pine, Douglas fir; 28-38" DBH; large limbs, open crown	Other tree species; DBH <28"; or trees w/small limbs or closed crown
Pilot (roost) trees	>5 snags or spike topped trees/acre w/in 1/4 mi. of nest; snags >24" DBH	2-5 snags or spike topped trees /acre w/in 1/4 mi. of nest; snags 16-24" DBH	<2 snags or spike topped trees/acre w/in 1/4 mi. of nest snags > 16" DBH (at least 50' tall?)
Distance from nest to food supply	<1/2 mi.	1/2-1 mi.	>1 mi.
Disturbance (Action item 133)	Disturbance not allowed w/in 1/2 mi. of nest from Jan. 1 to Aug. 31	Disturbance not allowed w/in 1/4 mi. of nest and regulated w/in 1/2 mi. of nest Jan. 1 to Aug. 31	Disturbance not allowed w/in 1/4 mi. of nest and not regu- lated w/in 1/2 of nest from Jan. 1 to Aug. 31

Note: Protect occupied or unoccupied nest trees and trees that provide windbreaks to nest trees (action item 1.3211)

Note: Disturbances include vehicle and boat traffic, picnicking, camping, blasting, fire arms use, timber harvest, low level aircraft operations, and construction of facilities. Restrict recreation on rivers or reservoirs adjacent to feeding areas or nest sites where necessary (action items 1.311, 1.331, 1.332, and 1.334).

Assumption: It may not be practicable to control all activities in areas of concern. Some short duration, low intensity activities may occur and are not expected to significantly affect breeding birds.

TABLE B-15. BALD EAGLE HABITAT CAPABILITY MODEL (CONTINUED)

	HIGH	MODERATE (Preferred)**	LOW (Required)*	(Marginal)
Maintenance of suitable habitat:				
Nest protection zone:				
Area	A contiguous area out to at least 1/4 mi. Size and shape of the zone will depend on local conditions such as topography, kind and location of disturbance sources, and visibility of disturbance sources from nest.			
Snags	Maintain all snags within 1650 ft. of nests or roosts (Action item 1.325)			
Timber Mgt.		Reg. Class III	Reg. Class III	Reg. Class I, II
Rotation age		240-300 yr.	200-240 yr.	<200 yr.
	Maintain and develop nesting and roosting habitat for future use by eagles (Action item 1.322)			
Primary disturbance zone:				
Area	A contiguous area out to at least 1/2 mi. Size and shape of the zone will depend on local conditions such as topography, kind and location of disturbance sources from nest, and observed patterns of habitat use			
Timber mgt.	Same rotation ages as for nest site protection zone. It is expected that portions of this area would contribute replacement habitat for nest sites (Action item 1.322).			
Feeding zone:				
Area	Size and shape of area will depend on observed patterns of habitat use, location and extent of primary feeding areas.			
Snags	Protect all snags used as foraging perches within nesting territories (Action item 1.322)			
Timber Mgt.	Maintain and develop replacement habitat near currently used habitat for foraging (Action item 1.322)			
Limiting factors:	Disturbance, abundance and seasonal availability of food supply, loss of suitable habitat (roosting, nesting, perching).			
Vegetation Type:		Seral Stages		
Mixed evergreen w/ chinquapin or rhododendron		4B,4C,5B,5C	4A,5A	2,3A,3B,3C
Roost trees	Roost are trees higher than canopy or on edge of forest opening; flight path to tree is not restricted.	Roost trees are higher than canopy or on edge of forest opening; flight path to tree is moderately restricted.	Roost trees are same height as canopy or not on edge of forest opening; flight is high-restricted	
Note: Protect known roost trees (Action item 1.25). Dominant trees (live or snags) with an open crown and stout limbs are essential where the main food supply is fish.				
Acreage		Note: Protect food resources (Action item 1.25), and maintain and improve the quality, quantity, and availability of food supplies (Action item 1.31).		
Food supply				
Distance from roost to food supply	<10 mi.	10-12 mi.	>12 mi.	

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TABLE B-15. BALD EAGLE HABITAT CAPABILITY MODEL (CONTINUED)

SEASON: Spring & Summer HABITAT VARIABLE	HIGH (Preferred)**	MODERATE (Required)*	LOW (Marginal)
Disturbance (Action item 1.33)	Disturbance not allowed within 1/2 mi. of nest or roost from Nov. 15 to March 15.	Disturbance not allowed within 1/4 mi. of nests or roosts and regulated within 1/2 mi. of nest or roosts from Nov. 15 to March 15.	Disturbance not allowed within 1/4 mi. of nest or roosts and not regulated within 1/2 mi. of roosts from Nov. 15 to March 15.

Note: Disturbances include boat and vehicle traffic, picnicking, blasting, firearms use, timber harvest low-level aircraft operations, and construction facilities. Restrict recreation on rivers or reservoirs adjacent to feeding areas or nest sites where necessary (Action items 1.311, 1.331, 1.332, 1.334)

Note: Control of licensed trapping may be necessary to eliminate accidental mortality.

Note: No building construction within 1/4 mi. of a roost, and campgrounds in vicinity of roost closed Nov. 15 to March 15 (Action item 1.333).

Timber management Maintain and improve forested habitat in the wintering range (Action item 1.32).

* Values of moderate or high habitat capability are needed for long term viability. Values of low habitat capability do not represent acceptable reproductive habitat.

** Since bald eagles are listed as endangered species, management will be the preferred level when possible.
Note: Action items from the Bald Eagle Recovery Plan are referenced throughout the capability model.

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- (4) Shimamoto, K., and T. Newman. 1982. Bald Eagle (breeding season) habitat capability model. Pages 96-98 in K. Shimamoto and D. Airola, eds. Fish and Wildlife habitat capability models and special habitat criteria for the northeast zone national forests. USDA. For. Serv. Modoc Natl. For., Alturas, Calif.
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- (6) U.S. Fish and Wildlife Service. 1986. Pacific bald eagle recovery plan. USDI. Fish and Wildlife Service, Portland, Oregon. 163 pp.
- (7) U.S. Forest Service. 1986. Proposed forest land and resource management plan: Shasta-Trinity National Forests. Appendix G. USDA. Forest Service. Shasta-Trinity National Forest, Redding, Calif.

Table B-16. Peregrine Falcon Habitat Capability Model

Species Status - Falco peregrinus Federal Endangered

SEASON	year round		
HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)	LOW (Marginal)*
Vegetation Type	Occurs in all types and seral stages when within range of suitable nesting cliffs as described below.		
Distance from nest site to riparian habitat supporting prey	<0.5 mi.	0.5 1 mi.	1 2 mi.
Distance to other habitat supporting prey base	<2 mi.	2 4 mi.	4 10 mi.
Characteristics of cliff:			
Elevation	<3500 ft.	3500 4500 ft.	>4500 ft.
Height	150+ ft.	75 150 ft.	<75 ft.
Ledges	Ledges are abundant and at least 10 sq.ft., providing a commanding view; cliff is vertical.	Fewer ledges provide at least 10 sq. ft. or a commanding view; portions of cliff are not vertical.	Few or no ledges provide at least 10 sq. ft. or a commanding view; most of cliff is not vertical..
	Note: enhance ledge size when this is a limiting factor (Action item 242).		
Aspect at elevations >4000 ft.	SE SW	NE SE, SW NW	NW NE
	Note: at elevations <4000 ft. all aspects may be used.		
Disturbance (action items 115 and 221)	Disturbance not allowed within 2mi. of nest from Jan. 1 to July 31.	Disturbance not allowed within 1 mi. of nest and regulated out to 2 mi. from nest from Jan. 1 to July 31.	Disturbance not allowed within 1 mi. of nest and not regulated out to 2 mi. from nest from Jan. 1

Note: Monitor disturbance and provide surveillance or law enforcement as needed. Disturbances include visits to sites by humans, low level aircraft use, road construction, shooting, blasting, logging, and other noise generating activities.

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Table B-16. Peregrine Falcon Habitat Capability Model *Continued*

SEASON	year round		
HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)	LOW (Marginal)*
Maintenance of suitable habitat			
Nest protection zone:			
Area	A contiguous area out to at least 1 mi. from nest. Size and shape of the zone will depend on local conditions such as topography, kind and location of disturbance sources, and visibility of disturbance sources from the nest.		
Snag retention	>3 snags/acre >36in DBH	2-3 snags/acre >36in DBH	<2 snags/acre >36in DBH
Cliff	Maintain suitability of cliff face for nesting.		
Primary disturbance zone:			
Area	A contiguous area out to at least 2 mi. from nest. Size and shape of zone will depend on local conditions such as topography, kind and location of disturbance sources, visibility of disturbance sources from nest, and observed patterns of hab use.		
Snag retention	3-5 snags/acre >20in DBH	2-3 snags/acre >20in DBH	<2 snags/acre >20in DBH
Cliff	Maintain vegetative screening for nest site.		
Feeding zone	(essential habitat) (Action item 112):		
Area	Size and shape of area will depend on observed patterns of habitat use, and locati and extent of primary feeding areas.		
Seral stage diversity	>75% of area in greater than pole tree stage	>50% of area in greater than pole tree stage	<50% of area in greater than pole tree stage
Snag retention	3-5 snags/acre >20in DBH	2-3 snags/acre >20in DBH	1.5 snags/acre >20in DBH
Hardwoods	Maintain >5 mature (>16in DBH) hardwoods per acre within partial cut harvest or the largest diameter available. Maintain hardwood forest vegetation types at ex levels. (Note: Sizes of nest and primary disturbance zones may vary due to site specific topographic features and locations of disturbance areas. Size of the feeding zone be determined by observed patterns of habitat use, prey species used, composition		

Table B-16. Peregrine Falcon Habitat Capability Model *Continued*

SEASON	year round	HIGH (Preferred)	MODERATE (Required)	LOW (Marginal)*
HABITAT VARIABLE				
Timber management:				
Rotation age	An objective of the recovery plan is to provide a diverse array of prey species, especially avifauna. Rotation ages within primary disturbance and feeding zones include areas under longer (>120 years) rotation ages. to provide a balance and diversity of all seral stages and an abundance and diversity of habitat component (e.g. snags and mature hardwoods) used by prey species. No scheduled timber ha is expected in the nest site protection zone.			
Limiting factors	Presence of DDT in food chain; disturbance; availability of suitable nest sites.			

*Management at low habitat capability levels is not expected to contribute to the recovery of the species. Action items of the recovery plan for the Peregrine falcon are referenced throughout the capability model.

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MODELING AND ANALYSIS PROCESS

TABLE B-17. NORTHERN GOSHAWK HABITAT CAPABILITY MODEL

Accipiter gentilis		Species Status-Sensitive		
SEASON: Year Round	HIGH	MODERATE	LOW	
HABITAT VARIABLE	(Optimum)	(Sub-optimum)	(Marginal)	
VEGETATION TYPE				
California WHR	Douglas-fir Montane Hardwood	Klamath Mixed Conifer White fir (5) Conifer (3,5)	Red fir Coastal Oak Woodland (5)	
Kuchler type	Mixed Evergreen	Klamath Montane	Oregon Oak Woodlands Coast Range Montane	
Habitat Type		Seral stage:		
Nest/Roost	4B,4C (5)	3B*,3C*,4A**(5)	3A (5)	
Forage	1,3A,4A,5A (5)	3B,4B,4C,5B,5C (5)	2,3C (5)	
Nest stand structure	single-layered (3,8)	single-layered (3,8)	multiple-layered (3,8)	
Area requirements:				
Nest stand	200-300 ac. (1,2,3,8)	150-200 ac (1,2,3,8)	50 ac. (1,2,3,8)	
Home range	8,000 ac (2)	6250-8000 ac. (2)	1250-6250 ac (2)	
Spatial Distribution				
Territories	> 1.0 mi. (2)	1.0 to 3.5 mi. (2)	>3.5 mi. (2)	
Distance from nest to riparian area	<.25 Miles (3)	25-1 Miles (3)	1-3 Miles (3)	
Special habitat	Provide small snags and downed logs upslope and within 250 components ft. of known nest sites, to serve as prey plucking sites.(2)			
Disturbance	Establish disturbance zones out to at least one-third mile and eliminate human entry and loud noise-generating activities to reduce the potential for abandonment or nest failure from March 1 to Aug. 31. The size of disturbance zones will vary depending on site specific conditions such as topography, extent and location of disturbance sources, etc.			
Characteristics of nest sites				
Canopy closure	70% or greater (3,8)	40-70% (3,8)	0-40% (3,8)	
Aspect	north to east (3)	south to southeast (3)	southeast to northwest (3)	
Percent slope	0-40% (2,3)	40-60% (2,3)	>60% (2,3)	
Openings in canopy	2 openings ≥0.1 ac.	1 opening > 0.1 a c.	No openings	

TABLE B-17. NORTHERN GOSHAWK HABITAT CAPABILITY MODEL (CONTINUED)

SEASON: Year Round HABITAT VARIABLE	HIGH (Optimum)	MODERATE (Sub-optimum)	LOW (Marginal)
Characteristics of nest sites			
Canopy closure	70% or greater (3,8)	40-70% (3,8)	0-40% (3,8)
Aspect	N to E (3)	S to SE (3)	SE to NW (3)
Percent slope	0-40% (2,3)	40-60% (2,3)	>60% (2,3)
Openings in canopy	2 openings ≥0.1 ac.	1 opening > 0.1 a c.	No openings
Spatial distribution of alternate nest sites w/in a territory	>600M (8)	600 to 2800M (8)	>2800M (8)
Characteristics of nest trees			
DBH	27" to 36" (live tree)(3)	27" to 21" (live tree)(3)	less than 21" (live tree)(3)
Snag density	>4/ac 27-36" DBH	2-4/ac 27-21" DBH	<2/ac <21" DBH
Dead and Down (hard logs)	4+logs ≥27" DBH 10' long/acre within 1/4 mi.	3-4 logs ≥20" DBH 10' long/acre within 1/4-1 mi.	3 logs >10" 10' long/acre within 1-3 mi.

* Seral stages 3B and 3C were considered moderate not high due to the Diameter class, not canopy closure.

** Seral stage 4A was considered moderate not low due to the contribution of the understory.

Management at low habitat capability levels is not expected to contribute to the long-term viability of the species.

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MODELING AND ANALYSIS PROCESS

TABLE B-18. HABITAT PARAMETERS FOR FISHER
(*Martes pennanti*) Species Status-Sensitive

SEASON: Year-round			
HABITAT PARAMETER	HIGH [1]	MODERATE	LOW
1.Home range [2]	6000a. 8 mile linear limit (Buck 1989)	9800a. >8 miles:actual limit undefined	11,300a. >8 miles:actual limit undefined
2.Seral Stage:			
a.Denning/Resting	5 (old growth) 4(mature)	5,4	5,4
b.Foraging	5,4,3 (mid succession)	5,4,3	5,4,3
3.Minimum Stand Size (3) Size [3]	>120ac. adj mature timber	80-119ac. adj. mature timber	60-79ac. adj.ma mature timber
	>500a. adj. open canopy areas	200-499a. adj. open canopy areas	120-199a. adj. open canopy area
4 .Denning/Resting Canopy Closure[4,18] [Verner & Boss WHR]	>80% WHR CLASS C	61-80% WHR CLASS B	40-60% WHR CLASS B
5. Home Range Stand Structure [5,17,18]	70-80% mature closed conifer (≥4C)If unavail. hardwoods(≥4B) If unavailable 15-20% ≥4B or 3C 10-15% ≥3C or 3B	60-70% mature closed conifer (≥4C)If unavail. hardwoods(≥4B) If unavailable 10-15%≥4B or 3C 10-15%≥3C or 3B	50-60% mature closed conifer (≥4C)If unavail. hardwoods(≥4B) If unavailable 15-20%≥4B or 3C 15-20%≥3C or 3B
	5% hardwood/other (≥4A HW/≥3A-4A for other)	5-10% hardwood/ other(≥4A HW/ ≥3A-4A other)	10-20% hardwood/ other (≥4A HW/ ≥3A-4A other)
6. Riparian/wet meadow proximity to denning resting habitat [6]	<1/4-1/2 mile	1/2-1 mile	1-2 miles
7. Vertical Diversity Denning, Resting, Foraging Areas [16]	3-4 layers plus shrubs	2-3 layers plus shrubs	2 layers plus shrubs
8 .Openings [12] without Cover	<1a. each	1-2a. each	2-3a. each

TABLE B-18. HABITAT PARAMETERS FOR FISHER (CONTINUED)

SEASON: Year-round HABITAT PARAMETER	HIGH [1]	MODERATE	LOW
9. Minimum Snag Densities [8]:			
a. Resting/Denning[9] ≥2/acre (4-5C stands)(size)	1-2/acre 44" dbh	0.5-1/acre ≥30-43" dbh	≥24-29" dbh
b. Other Snags/(No (foraging use)	4-5/acre >20" dbh	2-3/acre >20" dbh	1/2-1/acre >15" dbh
10. a. Live Tree Snag (for dens)			
	>6/a. >44" dbh	3-6/a. 30-43" dbh	1.5-3/a. 24-29" dbh
b. Replacements (foraging)	12-15/a. >20" dbh	9-18/a. >20" dbh	4.5-9/a. >15" dbh
11. Downed logs[10] (hunting use)			
	>4/acre >30" x 15'	2-3/acre >20" x 15'	1-2/acre >20" x 15'
12. Road Density[11]			
	0-<1/2mi/mi ²	1/2-2mi/mi ²	2-3 mi/mi ²
13. Travel Corridor Width [13]			
	≥600ft within mature stands	300-599ft within mature stands	100-299ft within mature stands
	≥1200ft adj. to clearcuts	600-1199ft adj. to clearcuts	300-599ft adj. to clearcuts
14. Travel Corridor Canopy Closure [5,6,7]			
	>60%	50-60%	40-50%
15. Habitat Spacing Distance [14]			
	≤ 3 miles	3-8 miles	>8-12 miles

Footnotes in brackets [1-19] refer to the attached list of assumptions.

A. HABITAT CHARACTERISTICS FOR FISHER (*Martes pennanti*)

SUMMARY: In California, fisher most often occur at somewhat lower elevations than marten, between 2000-5000 feet in the N Coast region and 4000-8000 feet in the southern Sierra Nevada (Grinnell et al. 1937, Ingles 1965, Orr 1949).

Preferred habitat is characterized by dense (60-100% canopy) multi-storied, multi-species late seral stage coniferous forests with a number of large (> 30 inch dbh) snags and downed logs. These areas also include close proximity to dense riparian corridors and sac between major drainages or other landscape linkage patterns used as adult and juvenile dispersal corridors, and an interspersions of (<2a.) openings with good ground cover used for foraging. Numerous and heavily travelled roads are not desirable to avoid ha disruption and/or animal mortality. Occasional one and two lane forest roads with moderate levels of traffic should not limit marten fisher movements.

The stand structure mix in the following table appears to be skewed towards a mature/old growth component, especially when comp to the data from Canada, the midwest, Maine, and other locations. Other studies indicated that fisher apparently use greater percent of mid-early seral stages for foraging in summer months although they still appear to need and utilize the mature/old growth stand denning, especially in areas with high snowfall.

MODELING AND ANALYSIS PROCESS

Preferred WHR habitat types include Montane hardwood-conifer, mixed conifer, Douglas-fir, redwood, montane riparian, Jeffrey pine, ponderosa pine, lodgepole pine, subalpine conifer, aspen, eastside pine and possibly red fir. Predominant use is of the Douglas-fir mixed conifer in the north coast and mixed conifer in the southern Sierra Nevada.

NOTES: used: Freel, M. 1992. A literature review for management of the Marten and Fisher in National Forests in California. USDA/PSW Region.

TABLE B-19. HABITAT PARAMETERS FOR MARTEN
(*Martes americana*) Species Status-Sensitive

SEASON: Year-round HABITAT PARAMETER	HIGH [1]	MODERATE	LOW
1.Home range [2]	1400a.	2100a.	2500a.
2.Seral Stage:			
a.Denning/Resting	5 (old growth) 4 (mature)	5,4	5,4 5,4
b.Foraging	5,4,3 (midsuccession)	5,4,3	4,3
3.Minimum Stand Size [3]	>120a. adj. mature stands	80-119a. adj. mature stands	60-79a. adj. mature stands
	>500a. adj. open canopy areas	200-499a. adj. open canopy areas	120-199a. adj. open canopy areas
4.Denning, Resting			
Canopy Closure[4,18] (*Verner&Boss WHR)	>70% WHR Class C	41-70% WHR Class B,C	30-40% WHR Class A,B
5. a. Stand Structure [5,17]	50% mature (≥4C)	35% mature(≥4C)	25% mature(≥4C)
	if unavailable: 35% ≥4C and 15% ≥4B	if unavailable: 20% ≥4C and 15% ≥4B	if unavailable: 15% ≥4C and 10% ≥4B
	30% ≥4B if unavailable: 15% ≥4B or 3B 15% ≥3C or 3B	45% ≥4B if unavailable: 25% ≥4B and 20% ≥3C or 3B	55% ≥4B if unavailable: 30% ≥4B and 25% ≥3C or 3B
	20% ≥4A/other	20% ≥4A/other	20% ≥4A/other
b.Basal Area [15]	≥350 ft	176-350 ft	75 ft
6.Riparian/wet meadows: proximity to closed canopy stands [6]	<1/4 mile	1/4-1/2 mile	1/2-1 mile
7.Vertical Diversity	No pertinent information available		
8.Openings [12]	<1a. each	1-2a. each	2-3a. each

MODELING AND ANALYSIS PROCESS

TABLE B-19. HABITAT PARAMETERS FOR MARTEN CONTINUED

SEASON: Year-round			
HABITAT PARAMETER	HIGH [1]	MODERATE	LOW
9. Minimum Snag Densities [8]:			
a. Resting/Denning [9] (>24" dbh)	≥3/acre (24" dbh)	2-3/acre (20-23" dbh)	1-2/acre
b. Foraging (>15" dbh)	>3/acre (>15" dbh)	3/acre (>15" dbh)	2/acre
10 .a Live Tree Snag (dens)			
b. Replacements(forage)	>9/a. (>24" dbh)	6-9/a. (>24" dbh)	3-6/a. (>24")
	>9/a. (>15" dbh)	9/a. (>15" dbh)	6/a. (>15" dbh)
11. Dead and Downed Logs			
	≥20/a. (≥15" x 15")	10-19/a. (≥15" x 15')	5-9/a. (≥15" x 15')
12. Road Densities[11]			
Paved	<1 mi/mi ²	1-2 mi/mi ²	2-3 mi/mi ²
13. Travel Corridor			
a. Canopy Closure[5,6,7]	>60%	50-60%	40-50%
b. Width [6,7,13]	>300ft w/in mature stands	150-299ft w/in mature stands	100-149ft w/in mature stands
	>600ft adj. open/no canopy	300-599ft adj. open/no canopy	200-299ft adj. open/no canopy
14. Habitat Spacing [14]			
	≤2 miles	>2-3 miles	>3-6 miles

Numbers in brackets [1-19] refer to the attached list of assumptions.

B. HABITAT CHARACTERISTICS FOR MARTEN (*Martes americana*)

SUMMARY: In California, marten most often occur at somewhat higher elevations than fisher, although the Humboldt subspecies occur from 200 feet above sea level to 9000 feet with the average at 4700 feet (Schempf and White 1977). The elevational record: the northern Sierra Nevada ranged from 3,400 feet up to 10,400 feet averaging 6,600 feet. For the southern Sierra Nevada the range from 4,000 feet to 13,100 feet averaging 8,300 feet elevation.

Preferred habitat is characterized by dense (60-100% canopy), multi-storied, multi-species late seral coniferous forests with a number of large (> 24 inch dbh) snags and down logs. These areas also include close proximity to dense riparian corridors use travelways, and an interspersed of small (<1 a.) openings with good ground cover used for foraging. Numerous and heavily traveled roads are not desirable to avoid habitat disruption and/or animal mortality. Occasional one and two lane forest roads with moderate levels of traffic should not limit marten and fisher movements.

Preferred WHR habitat types include mature mesic forests of red fir, red fir/white fir mix, lodgepole pine, Sierran mixed conifer Klamath mixed conifer.

DOCUMENTATION OF ASSUMPTIONS AND REFERENCES USED

**FOR DEVELOPMENT OF
REGION 5 FURBEARER INFORMATION****ASSUMPTION 1: HABITAT DEFINITIONS**

High capability habitat is defined as habitat which supports a stable population of fisher and/or marten where home ranges occur at relatively high densities suggesting abundant availability of preferred habitat characteristics and high prey densities.

Moderate capability habitat is defined as habitat which supports a stable population of fisher and/or marten where home ranges occur spaced at lower densities than in 'high' capability habitat, with lesser availability of preferred habitat characteristics and lower prey densities.

Low capability habitat is defined as habitat which cannot independently support a stable population of fisher and/or marten. Home ranges include low capability habitat but generally also include moderate and high quality habitat. Preferred habitat characteristics occur in limited quantities and limited prey is available. Areas of low capability habitat may occur as inclusions among high and moderate capability portions of a habitat management area. Complete habitat management areas of low potential should not occur unless the options for the location of these habitat management area(s) and linkage corridors are limited by site potential, and the area is significant in the desired spatial array of habitat management areas for a viability strategy.

Unsuitable habitat is defined as habitat which cannot independently support a stable population of fisher and/or marten. Preferred habitat characteristics generally do not occur and limited prey is available. Some animals may occasionally disperse through or be temporarily present in these areas but reproductive populations of marten/fisher are not expected to occur.

Habitat capability relates to the ability of an area to provide adequate abundance and distribution of prey, cover, reproductive and resting sites and dispersal corridors.

ASSUMPTION 2: HOME RANGE SIZES

Recommendations for home range sizes and distributions for each species incorporate interpretations of habitat quality parameters plus the recognition that the home ranges of fisher and marten males are larger and spaced further apart than the home ranges of fisher and marten females. Reproductive potential varies depending on habitat quality.

An average of 3 young per female were produced in high and moderate areas (Leonard 1986, Strickland et al. 1982, Wright and Coulter 1967); in less suitable habitat the rate was less than 2 young per female (Hamilton 1958; Coulter 1966; Strickland et al. 1982). An estimated 50% survival rate was assumed for young produced (Arthur et al. 1989). It was assumed that there is little to no overlap in territories of adult males, however, that female/male ranges can significantly overlap especially during the breeding season (Buck et al. 1983, Powell 1982, Johnson 1984, Simon-Jackson 1989). For California fisher the mean overlap of adult male and females was 40% (Buck et al. 1983). Since California studies tended to have smaller home ranges than other studies, it was assumed that the habitat quality described represents high quality habitat. The moderate and low quality categories utilize mean home range from a cross section of studies as they are thought to represent the variation of home range sizes better than the few California data points.

MODELING AND ANALYSIS PROCESS

TABLE B-20. FISHER HOME RANGE DATA:

Source	Date	Location	Male Home Range	Female Home Range
Kelly, G.M.	1977	New Hampshire	M= 8.0sq.mi.= 5120a.:	F= 6.0sq.mi.= 3840a.
Buck, et al 1983		California	M= 7.2 = 4608a.: (n=13)	F= 2.2 = 1408a. (n=7)
Powell, R.A	.1982	Michigan	M= 13.5 = 8640a.:	F= 6.0 = 3840a.
Johnson,S.A.	1984	Wisconsin	M= 15.0 = 9600a.:	F= 3.0 = 1920a.
Douglas and Strickland	1987	Misc. Loc.	M= 10.9 = 6944a.:	F= no data given
de Vos, A.	1952	Canada	M= 10.0 = 6400a.:	F= no data given
Allen, A.W.	1983 (n=7)	U.S.	M= 8.9 = 5664a.:	F= no data given
Arthur,	1989 (n=6)	Maine *	M= 11.9 = 7635a.:	F= 6.3sq.mi.= 4028a.

Mean home range for male fisher = 6826 acres.

Mean home range for female fisher = 3007 acres.

Mean home range needed in low capability habitat (one male plus three females with approximately 50% overlap of each female home range with the male home range) = 6826a. per male + 1504a. per each female = 11,300a. = **11,300a.**

Mean home range needed in moderate capability habitat (one male plus two females with approximately 50% overlap of each female home range with the male home range) = 6826a. per male + 1504a. per each female = 9,834a. = **9,800a.**

Mean home range needed in high capability habitat (as defined by California data-one male plus 2 females) = 4,608a. per male + 704 a. per each female = 6,016 a. = **6,000 a.**

TABLE B-21. MARTEN HOME RANGE DATA:

Source	Date	Location	Male Home Range	Female Home Range
Hawley and Newby	1957	Montana	(n=6) M=0.9 sq mi= 595a.	(n=5) F=0.3 sq mi= 173a.
Francis and Stephenson	1972	Ontario	(n=4) M=1.4 sq mi= 896a.	(n=4) F=0.4 sq mi= 269a.
Mech and Rogers	1977	Minnesota	(n=3) M=6.1 sq mi=3706a.	(n=1) F=1.7 sq mi=1062a.
Clark and Campbell	1977	Wyoming	(n=2) M=0.8 sq mi=544a.	(n=1) F=0.3 sq mi=198a.
Simon	1980	California	(n=5) M=1.1 sq mi=692a.	(n=3) F= sq mi=768a.
Spencer	1981	(n=1) California	(n=3) M=1.89 sq mi=1210a.	F=1.13 sq mi=724a.
Martin	1987	(n=6) California	(n=4) M=0.66 sq mi=422a.	F=0.39 sq mi=247a.
Soutier	1979	Maine	(n=81) M=1.74 sq mi=1088a.	(n=42) F=0.9 sq mi=576a.
Archibald and Jessup	1984	Yukon	M=2.4 sq mi=1536a.	(n=4) F=1.8 sq mi=1152a.
Davis M=no data		1978		Wisconsin F=3.0 sq mi=1920a. F=3.2 sq mi=2048a.
Wynne and Sherbourne	1984	Maine	(n=3) M=2.2 sq mi=1408a.	(n=2) F=1.1 sq mi=704a.
Steventon and Major	1982	Maine	(n=3) M=3.2 sq mi=2048a.	(n=1) F=0.9 sq mi=576a.
Buskirk	1983	Alaska	(n=9) M=2.5 sq mi=1600a.	(n=3) F=1.4 sq mi=896a.

Mean home range for male marten = 1312 acres.

Mean home range for female marten = 808 acres.

Mean home range needed in low capability habitat (one male and two females with approximately 50% overlap of each female home range with the male home range) = 1312a. per male and 404 a. per female = 2524a. = **2500 acres.**

Mean home range needed in moderate capability habitat (one male and two females with approximately 50% overlap of each female home range with the male home range) = 1312a. per male and 404a. per female = 2120a. = **2,100a.**

Mean home range needed in high capability habitat (as defined by California data) equals 775a. per male and 290a. per each female = **1,400 a.**

MODELING AND ANALYSIS PROCESS

ASSUMPTION 3: MINIMUM STAND SIZE

The minimum stand sizes were derived from literature relating to the effects of fragmentation in forest ecosystems and specifically relates to "effective habitat island size". The major reference was Harris (1984:108-112), which summarizes a number of other authors on the subject. Also, Rosenberg and Raphael (1986), and Raphael (1982); Raphael (1989) identified minimum stand size for furbearers as 25ha (60a.). This was for presence/absence only and did not identify if these areas were used for breeding, foraging or travel.

ASSUMPTION 4: CANOPY CLOSURE

These figures come from published literature and theses (Kelly 1977, Coulter 1966, Powell 1982, Buck et al. 1979, Simon 1980, Spencer 1981, Martin 1987), and from the interagency workgroup assembled for the Duncan Canyon EIS in June 1989.

ASSUMPTION 5: STAND STRUCTURE

These figures come from the literature cited below and as developed by the Duncan Canyon workgroup. In all cases, the highest number of acres of the highest habitat capability are used, keeping habitat areas as contiguous as possible. Current information from Maine and Canada suggests that fisher may utilize second growth more than indicated in this table. As more local data becomes available the percentages of old/mature to second growth may change although the need for good (>40%) canopy closure still applies equally for all seral stages.

ASSUMPTION 6: IMPORTANCE OF RIPARIAN CORRIDORS

This information was derived from the literature and with the Duncan workgroup. It is based on field observations and radiotracking information from several researchers. These riparian corridors are especially important when containing meadow-forest edges which are highly utilized for foraging/hunting areas and as travelways. (See also Harris 1984, de Vos 1951, 1952, Kelly 1977, Buck et al. 1983).

ASSUMPTION 7: TRAVEL CORRIDOR LOCATIONS

Again, as with the riparian information this conclusion is based on field observations and recommendations of field researchers. These corridors are oriented along creeks and through saddles over ridgetops (Powell 1982, Buck et al. 1983, Duncan Workgroup 1989). Where there are established roads within riparian areas, the riparian corridors can still serve as movement corridors or for foraging or even denning, if the road density, plant community disturbance and level of human activity will be low enough in these areas so that the animals are not deterred from using the corridors.

ASSUMPTION 8: SNAG REQUIREMENTS

research data in California on marten and fisher (Buck et al. 1979, 1983; Simon 1981; Martin 1987). Snags of all species and decomposition states are included and well distributed throughout the habitat areas. Replacement live culls are managed for also in like numbers as presented in the model.

ASSUMPTION 9: RESTING/DENNING SNAGS

Snags greater than 24" dbh were preferred for denning by martens (Simon personal communication 1989), and snags greater than 44" dbh are preferred for denning by fisher (Buck personal communication 1989). In general, the largest snags available in a stand should be retained and managed for resting and denning use.

ASSUMPTION 10: DOWNED LOG REQUIREMENTS

Again, use of downed logs is well documented and recommendations were derived from research data from California studies cited above. In all cases, the largest logs available are retained. Ground surface covered by downfall ranging from 20-50% is assumed optimal (Allen 1982). Logs in all decay classes should be provided.

ASSUMPTION 11: ROAD DENSITIES

This information has not been directly documented in the field for the marten or fisher, however it is based on research conducted relating to disturbance for deer and elk (Lyon 1984; Perry and Overly 1977) and for wolf and wolverine (Solis personal communication 1989). Buck (1989), emphasized minimizing the presence of roads by obliterating all old un-needed roads and the need for locating any new roads away from ridges, saddles and riparian zones. Arthur, et al. (1989), found only limited crossing of dirt roads even when forested on both sides; also that home ranges were in relatively contiguous blocks with roads at the perimeters.

In contrast, recent radiotelemetry studies indicate that marten and fisher readily cross forest roads, however, animal mortality can be expected to increase with increases in vehicle trips (M. Raphael, Pers. Commun.). Roads are apparently not a barrier to animal movement, however, they are undesirable as a general feature of a habitat management area because of the disturbances associated with them. Where there are established roads within habitat management areas, the areas adjacent to the roads may still be used if the road density, plant community disturbance and level of human activity is low enough in these areas so that the animals are not deterred from using the peripheral areas.

ASSUMPTION 12: OPENINGS

The information relating to the appropriate size of openings is based on professional judgments and field observations of the California researchers cited above. They were derived by consensus by the Duncan Canyon interagency workgroup (1989). In addition, Koehler and Hornocker (1977), Hargis (1981), and Spencer (1981), all reported that marten rarely venture over 150 feet from cover therefore optimum openings should not exceed 300 feet in width for marten use.

Powell (1982), Buck et al. (1983), Arthur et al. (1989), and other fisher literature emphasizes the avoidance of openings by fishers. They may use previously cut areas, especially during summer, if good ground canopy or other low closed canopy (>30%) is present to provide cover. An appropriate amount of downed logs and standing trees, either single or in small groups need to be left in openings to provide needed cover.

ASSUMPTION 13: CORRIDOR WIDTH

These figures are based on literature (Harris 1984) and the professional judgment of Jones (1989), Buck (1989), and Solis (1989). Powell (1989), also emphasized that the greater the length of a corridor the wider it should be, and the percent of canopy closure should increase as distance increases.

MODELING AND ANALYSIS PROCESS

ASSUMPTION 14: HABITAT SPACING DISTANCE

These figures apply to the distance between habitat management units, not the spacing of components within a home range. (It is recommended that stands within a home range not be over 1/2 mile apart and connected by suitable dispersal linkages).

Powell (1989) stated that he considered optimal habitat to contain contiguous home range areas not separated by any distances, and anything greater than 8 miles apart as unavailable. For marten, information from Burk (1982) recommends 2 miles, and from Region 6, Forest Service, which has adopted a standard of 3 miles spacing when there is more than one adjacent habitat area available (Region 6 MMR letter of April 16, 1984). Fisher distances are based on data from Buck (1983), Jones (1989) and Powell (1989).

ASSUMPTION 15: BASAL AREA

These figures come from Simon-Jackson (personal communication 1989) as derived from her research data.

ASSUMPTION 16: VERTICAL DIVERSITY

Due to the variability in stand structure potential among the various habitat types some geographic areas may only have the potential for 3 layers while others may have 4 potential layers. Management, therefore, should be to create the maximum number of vertical layers possible under natural conditions as determined by the vegetation type and geographic location of the site (Buck 1989, Solis 1989).

ASSUMPTION 17: FORAGING CANOPY COVER

Class 3A-4A canopy closure equals $\geq 30\%$ canopy cover. Areas with less than 30% cover are considered unsuitable.

ASSUMPTION 18: DEFINITIONS OF STAND CLASSES

The definition of stand classes relies on the measured inches dbh and percentage canopy closure, not on any classification scheme. Do not substitute seral classes or timber closure classes for the actual numeric measurements. In the following table note that stage 5 includes multi-dominant large trees.

SERAL STAGES:	HEIGHT RANGE (feet)	DBH RANGE (inches)
1 = grass/forb	0.2	<1
2 = seedling/sapling	<20	1-6
3 = pole/medium	20-50	6-24
4 = large tree	>50	>24
5 = multi-layer large tree	>50	>24

CANOPY CLOSURE CLASSES:

<u>TIMBER CLASS</u>	<u>WHR CLASS</u>	<u>PERCENT CLOSURE</u>
S	A	<20%
P	A	20-39%
N	B	40-69%
G	C	70+%

The following chart shows a comparison of the Region 5 Timber Typing and Wildlife Habitat Relationships classification schemes:

SERAL STAGES

<u>Mean Tree Diameter</u>	<u>Region 5 TM HANDBOOK</u>	<u>California WHR System</u>	<u>Verner & Boss 1980</u>
-	1 Seed/Sap	1 Seedling 2 Sapling	1 Grass/Forb
< 12"	2 Pole	3 Pole	2 Seed/Sap
12-24	3 Sm.Tree	4 Sm.Tree	3 Pole/Med.
24-40"	4 Md.Tree	5 Md.Tree	4 Large Tree
> 40"	5 Lg.Tree	5 Lg.Tree	4 Large Tree
> 1 Story	6 Mlt.Layer	6 Mlt.layer	4 Large Tree

CANOPY CLOSURE CLASSES

<u>Canopy Closure</u>	<u>Region 5 TM HANDBOOK</u>	<u>California WHR System</u>	<u>Verner & Boss 1980</u>
10 - 19 10 - 24%	S - Sparse	S - Sparse	A - Open
20 - 39 25 - 39%	P - Light	P - Open	A - Open
40 - 59 40 - 69	M - Mod.	N - Medium	B - Mod.
> 60% > 70%	D - Dense	G - Heavy	C - Dense
>2 Stories	6 Mlt.Layer	6 Mlt.layer	C - Dense

Note: For fisher and marten management purposes, cover less than 30% is considered unsuitable for use. Therefore, even though tables indicate Sparse or Class A cover is acceptable for travelway purposes this is only true down to 30%. Actual areas in the field with less than 30% canopy cover would be considered unsuitable and lumped as part of the opening category.

ASSUMPTION 19: LIVE TREE REPLACEMENT NEED

Due to the natural loss of snags due to decay, fire, blowdown, etc. it is necessary to retain and manage a number of live trees as replacement snag trees.

The exact number required varies from species to species and from size class to size class. Raphael (1989) indicated that a general rule is to retain at least 3 times the number of live trees as you wish to manage for as snags. Formulas to calculate these specific needs can be found in Morrison (1987).

MODELING AND ANALYSIS PROCESS

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TABLE B-22-PILEATED WOODPECKER HABITAT CAPABILITY MODEL
***Dryocopus pileatus*, Species Status-Special Interest**

SEASON: Year Round	HIGH	MODERATE (Preferred)	LOW (Required)*	(Marginal)
HABITAT VARIABLE				
Vegetation Type:				
Seral Stages				
Mixed evergreen w/ chinquapin or rhododendron (4)		4B,4C,5B,5C (8)		
Klamath montane w/ Douglas fir (4)		4B,4C,5B,5C, (8)	3B,3C,4A,5A (8)	
Coast Range montane w/ Douglas fir (4)		4B,4C,5B,5C (8)	3B,3C,4A,5A (8)	
Redwood (4)				1,2,3A (8)
Riparian:		<.25 mi. to water(1,5)	25-.5 mi. to water (1,5)	>0.5 mi to water (1,5)
Habitat (nest territory) size requirements:				
Area		300 ac.(2,8)	300-600 ac.(2,8)	>600 ac.(2,8)
Note: The amount of habitat is found within .5 mi. from nest or center of activity				
Block size		125 ac. (8)	60 ac.(8)	
Note: Habitat is comprised of no more than two habitat blocks.				
Nest type and/or characteristics:		Cull tree or snag >70 ft. high and 36" DBH (1,2)	Cull tree or snag 40-70 ft. high and 24- 36" DBH (1,2)	Cull tree or snag <40 ft. high and <24" DBH (1,2)
Snag Densities in vicinity of nest tree:		(>5) >10 snags/ac. >20" DBH >70 ft. high (1,2,7,9)	(2-5) 5 to 10 snags/ac. 10 to 20 " DBH 40 to 70 ft. high (1,2,7,9)	(1-2) <5 snags/ac. <10" DBH <40 ft. high (1,2,7,9)

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TABLE B-22. PILEATED WOODPECKER HABITAT CAPABILITY MODEL (CONTINUED)

Dryocopus pileatus Species Status-Special Interest

SEASON: Year Round HIGH	MODERATE	LOW	
HABITAT VARIABLE	(Preferred)	(Required)*	(Marginal)
Snag Density throughout territory:	>.14 snags/ac. >30" DBH >39 ft. high (2,4,9)	.10 to .14 snags/ac. 20" to 30" DBH 25 to 39 ft. high (2,4,9)	<.10 snags/ac. <20" DBH <25 ft. high (2,4,9)
Dead and Down (hard)	>10 logs/ac. >10" dia. (4)	5 to 10 logs/ac. 5" to 10" dia. (4)	<5 logs/ac. <5" dia. (4)
Spatial Distribution	1 pair/5 sq.mi. (4)	1 pair/>5 sq.mi. (4)	

* Values of moderate or high habitat capability are needed for long-term viability. Values of low habitat capability do not represent acceptable reproductive habitat.

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TABLE B-23. BLACK-TAILED DEER HABITAT CAPABILITY MODEL

***Odocoileus hemionus columbianus* Species Status-Harvest**

SEASON : Year Round HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)*	LOW (Marginal)
Vegetation Type: (2)	Seral Stages (1,2,3) (A1)		
Redwood forest			
Cover	2BC,3BC,4BC,5	3A,4A	1,2
Forage	1,2,3A	3B,4A	3BC,4BC
Mixed evergreen w/ chinquapin or rhododendron			
Cover	2BC,3BC,4BC,5	3A,4A	1,2
Forage	1,2,3A	3B,4A	3BC,4BC
Klamath montane w/ Douglas fir			
Cover	2BC,3BC,4BC,5	3A,4A	1,2
Forage	1,2,3A	3B,4A	3BC,4BC
Coast Range montane w/ Douglas fir			
Cover	2BC,3BC,4BC,5	3A,4A	1,2
Forage	1,2,3A	3B,4A	3BC,4BC
Oregon oak			
Cover	2BC,3BC,4BC,5	3A,4A	1,2
Forage	1,2,3A	3B,4A	3BC,4BC
Riparian	Key habitat for fawning/thermal cover		
Minimum width	300 ft.	100 ft.	<100 ft.
Forage area distance (center) to cover w/young	<300 yds.(3) <150 yds.(2,4)	300-500 yds.(3) 150-250 yds.(2,4)	>500 yds.(3) >250 yds.(2,4) _
Forage Patch Size			
winter	>160 ac.(2)	100-160 ac.(2)	<100 ac.(2)
summer	1-4 ac.(1,2)	4-10 ac.(1,2)	.10 ac.(1,2)
Cover Stand Size (1,2,4)	20-60 ac.	60-100 ac.	<20 ac. >100 ac.

TABLE B-23. BLACK-TAILED DEER HABITAT CAPABILITY MODEL (CONTINUED)
Odocoileus hemionus columbianus Species Status-Harvest

SEASON: Year Round HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)	LOW (Marginal)
Cover Canopy Density	60-80% (4,5)	40-60% 80-100% (4,5)	<40% (4,5)
Forage Cover Density (Herb,Shrub)	20-40% (4)	10-20% 40-60% (4)	<10% >60% (4)
Road Density	<1.5 mi./sec (4,5)	1.5-3.0 mi./sec (4,5)	>3.0 mi./sec (4,5)
Distance to Water	<.5 mi. (1,4)	.5-1.0 mi (1,4)	>1.0 mi. (1,4)
Slope	0-15% (1,4)	16-60% (1,4)	61-100% (1,4)

* Values of moderate or high capability are needed for long-term viability. Values of low habitat capability do not represent acceptable reproductive habitat.

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TABLE B-24. CAVITY NESTING AND DECADENCE WILDLIFE ASSEMBLAGE (Snags)

Management Indicator Species: Douglas squirrel, Brown creeper, Red-breasted sapsucker, White-headed woodpecker, Hairy woodpecker, Downy woodpecker, Screech owl, Flammulated owl, Western bluebird, Vaux's swift

SEASON: Year Round HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)*	LOW (Marginal)
Vegetation Type (1)			
Klamath montane w/ Douglas fir	X	X	
Mixed evergreen w/ chinquapin or rhododendron	X	X	
Snag Density (5)			
Future (cull) Replacement Densities (2) (18-28" DBH)	>1.92/acre	0.77-1.92/acre	<0.77/acre
Snag Characteristics (5) Height DBH	>5.76/acre	2.31-5.76/acre	<2.31/acre
Dispersion and spatial distribution (snags >9"DBH) (3)	>31 feet >20 inches	6-31 feet 10-20 inches	<6 feet <10 inches
Hard : Soft Ratio (3)	One group per 5 acres or less with 15 snags	One group per 5-15 acres, with 5-15 snags	Even dispersion
Snag Species (7)	>3:1	2:1 - 3:1	<2:1
Snag Location (3)	Sugar pine Douglas fir	Port Orford cedar Incence cedar Hardwoods	White fir Red fir Western white pine
Madrone Component (4)	Edges of meadows, brushfields, and riparian areas.	Throughout wooded stands. barren areas.	Rocky, open slopes,
	>1.5 stems/ac >12" DBH	<1.5 stems/ac <12" DBH	

* Values of moderate or high capability are needed for long-term viability. Values of low habitat capability do not represent acceptable reproductive habitat.

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**TABLE B-24. CAVITY NESTING AND DECADENCE WILDLIFE ASSEMBLAGE (CONTINUED)
(DOWNED-WOODY MATERIAL)**

Management Indicator Species: Arboreal salamander, Clouded salamander, Western fence lizard, Dusky-footed woodrat, Blue grouse

SEASON: Year Round HABITAT VARIABLE	HIGH (Preferred)	MODERATE (Required)*	LOW (Marginal)
Logs/Acre (6)	>3 uncharred Class 1 or 2 logs. All Class 3, 4, 5 logs. > 30" X 20'	2 uncharred Class 1 or 2 logs. Some Class 3, 4, 5 logs. > 12" X 10'	<2 Class 1 or 2 logs. Some charring. <12" X 10'

** These values are required in Wildlife Emphasis areas.

* These values or higher are required for long-term viability.

ASSUMPTION 1: MINIMUM HABITAT AREA AND OTHER HABITAT COMPONENTS NOT ADDRESSED

This model does not list a minimum habitat area requirement. It deals only with those habitat components related to snags and downed woody material which are important to members of the assemblage. Cover ratios (for blue grouse) and other species specific variables are not addressed.

ASSUMPTION 2: SNAG DENSITY

HIGH value represents density of snags required to maintain 100 percent, and the MODERATE value represents the density required to support between 40 and 100 percent of maximum populations of Red-breasted sapsucker, White-headed Woodpecker, and Hairy woodpeckers.

ASSUMPTION 3: SNAG SPECIES PREFERENCES

Tree species were rated on the basis of use by excavators and longevity. Other species such as incense cedar are of high value for wintertime foraging (Jimerson, pers. comm.).

ASSUMPTION 4: HARD TO SOFT SNAG RATIOS:

Due to the frequent blowdown of hard snags, three hard snags are required to produce one soft snag. However, the studies which produced these ratios were in burned stands in the Sierra Nevada.

ASSUMPTION 5: TONS/AC OF DOWNED WOODY MATERIAL

These values represent only the larger size classes of downed-woody material. Some smaller material is needed for woodrat nests.

ASSUMPTION 6: SNAG RECRUITMENT

Using Cline's (1980) estimate of 35-50 years for douglas-fir snag longevity, the number of cull trees needed to maintain snags over a 100 year rotation was estimated to be three times the values listed under Snag Density.

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ROADLESS AREA DESCRIPTIONS AND EVALUATIONS

The purpose of this appendix is to provide a description of the roadless and released RARE II areas as a result of the 1984 California Wilderness Act.

The 1984 California Wilderness Act allowed for non-wilderness multiple-use management of roadless areas. These roadless areas originally totalled 190,000 acres of National Forest Land, but now total approximately 124,000 acres due to past management activities. The remaining roadless areas would be subject to varying degrees of resource development activities depending upon the themes and management area allocations of the alternatives considered in detail in this FEIS. The following is a description of each of the individual roadless areas.

BIG BUTTE-SHINBONE (05145)

DESCRIPTION

The Big Butte-Shinbone area is composed of 12,340 acres on the Mad River Ranger District and 21,100 acres on the Mendocino National Forest. Only the portion on the Six Rivers National Forest is described here. Of the original 12,340-acre roadless area on the Six Rivers, 11,380 acres are now part of the Yolla Bolly-Middle Eel Wilderness.

The Big-Butte Shinbone area is bordered on the north by Hayden Roughts and Jones Ridge, from which it drops off steeply into the arid, rugged ridges to the south. This part of the wilderness is contained within the Red Mountain Creek watershed, a tributary of the North Fork of the Eel River. Red Mountain stands in the center of this area; this mountain and about 800 acres nearby were burned many years ago and have since been invaded by manzanita and other chapparal plants.

The minerals potential for the area is rated as high on 5,600 acres, medium on 3,700 acres, and unknown on 2,080 acres. The potential locatable minerals are gold, mercury, copper, manganese, chromite, nickel and cobalt. There are two historic mines located within the wilderness boundary, the Bluejay and Grubstake mines. The Bluejay mine was an open pit operation and produced manganese (the mine ceased production in 1956). The total resource includes about 2,400 tons of inferred subeconomic ore, averaging 9.5 percent manganese. The Grubstake mine was also an open pit operation. The total resource of this mine includes about 40 tons of inferred subeconomic chromite (averaging 2.5 percent chromium) and 9,700 tons of other subeconomic resources (averaging 2.5 percent chromite, .45 percent nickel, and .03 percent cobalt). Several small jade occurrences also lie in the wilderness; however, prospecting for this mineral appears to have been unsuccessful.

The area supports 4,220 acres of mature and old-growth habitat, including 1,200 acres of spotted owl habitat. It is also very productive deer summer and winter range. The grasslands of this area also provide forage for cattle.

Several trails cross the area. There are several historical points of interest in the area, including the Bluejay mine. The scenic Little Red Mountain creek area is also accessed. However, due to the remote nature of the Big Butte-Shinbone area, recreational use has been low (about 500 RVDs per year), in the form of non-motorized and motorized recreation and big game hunting (motorized use has not been allowed since the area was designated wilderness). Deer hunting in the fall is the primary recreation use. The area also provides a unique primitive hunting experience with trophy bucks often being taken.

CAPABILITY

The naturalness of this area is moderately compromised by the presence of nearby roads, disturbances created by past mining activity, grazing, and the large fire scar. In addition, a few non-indigenous plant species are invading the meadows and glades. The opportunities for solitude and for primitive recreation is moderate. Even though the area is large and there is good vegetative and topographic screening of surrounding areas, the Jones Ridge mainline road is readily apparent from most of the area.

Although there are some areas of significant scenery in the area, it generally reflects the features common to the surrounding landscape and other parts of the Yolla Bolly-Middle Eel Wilderness, which receives relatively little use.

BLUE CREEK

DESCRIPTION

The original Blue Creek roadless area was 31,050 acres in size; 19,850 acres became part of the Siskiyou Wilderness, and 11,200 acres remain as a roadless area. The area is located about 20 miles inland from the Pacific Ocean and 18 miles northwest of the town of Orleans. The area is bordered on the east and north by the Eye-see (Gasquet-Orleans) road, and adjacent to the west lies the Siskiyou Wilderness.

The area consists of the drainages of the East Fork of Blue Creek. The terrain for the most part is very steep (60-70 percent slopes) and rugged, especially in the inner gorges of the watersheds. Most of the ridgetops are a combination of rocky faces and steep, brushy slopes. The elevation ranges from 1,000 feet to 4,800 feet. The Blue Creek roadless area supports a complex mosaic of plant communities. One species of sensitive plant is known to occur here as well as rare plants. Douglas-fir is the predominant commercial timber species; ponderosa pine, sugar pine, and Port-Orford-cedar also grow here.

Blue Creek and its tributaries produce chinook salmon, steelhead, and resident and rainbow trout. The fish habitat was severely altered by the 1964 flood but has recovered considerably. Spawning gravels are infrequent for salmon, but juvenile rearing habitat for steelhead and trout is good to excellent. The area has fisher, pine marten, spotted owl, marbled murrelet, and peregrine falcon habitat. The principal public use of the area is for deer hunting; current recreation use is low.

CAPABILITY

The naturalness of the Blue Creek roadless area has been modified very little. The natural integrity of the area remains intact. The opportunity for solitude is moderate; the Eye-see road along the east and north border impacts solitude in the immediate area of the road. The opportunities for solitude are enhanced throughout the rest of the area due to the adjacency of the Siskiyou Wilderness to the west. Use is somewhat restricted by the vegetation and terrain, concentrating use to a limited number of areas. This vegetation and terrain offers considerable challenge to the traveler and provides a good opportunity for primitive recreation. The opportunities for challenge and primitive recreation are further enhanced by the presence of the adjacent Siskiyou Wilderness.

BOARD CAMP (05308)

DESCRIPTION

Board Camp on the Lower Trinity Ranger District is a peninsula of National Forest land originally 4,580 acres in size; it is presently 3,020 acres in size due to roading and is bordered on three sides by private land. Board Camp is within the Mad River watershed; Bug Creek is the principal drainage.

There are several high, rocky buttes in the headwaters of Bug Creek and on the divide south of Boulder Creek. Of these, Bug Creek Butte is the most conspicuous; it is surrounded by smaller buttes, hogback ridges, and rock outcrops. The vegetation in and adjacent to these buttes is composed of a diverse mosaic of brush, Brewer's oak, glades, and meadows, intermingled with patches of Douglas-fir and white fir. There is one sensitive plant species found here.

The variety of physical features and vegetation patterns in Board Camp combine to provide excellent wildlife habitat, especially for blacktail deer. There are several areas here that have been identified as key summer range for these deer. There is fisher, pine marten, spotted owl, and falcon habitat in this area. The potential for mineral development for this entire area is rated as probably low. The principal public uses of this area have been deer hunting, hiking, cattle grazing, and some OHV use. The area's remoteness and poor access have contributed to its overall low public use.

CAPABILITY

The naturalness of this area has been somewhat affected by some roading, livestock grazing and by vegetative manipulation for deer habitat improvement. Generally the area appears natural. The opportunity for solitude and primitive recreation is low, due to the small size of the area. Opportunities for primitive recreation would be low. Most trails are on ridges, which have little vegetative screening and allow views to adjacent private cutover land.

COW CREEK (05222)

DESCRIPTION

The Cow Creek Roadless area consists of 23,150 acres, most of which are on the Shasta Trinity National Forest. The Six Rivers National Forests' portion was 1,310 acres, and is presently 860 acres in size due to past roading. Only the Six Rivers' portion is described here. Cow Creek is bounded on the south and west by the Trinity River and Highway 299, on the north by the Denny County Road, and joins the Shasta-Trinity portion to the east.

The entire area is very steep; the southern two-thirds are composed of rock outcrops, rock slides, and bluffs with very little soil. The landform is that of southwest facing slopes of which the Trinity River lies at the foot. Vegetation is sparse; the northern portion is covered with stands of mixed conifers and hardwoods. There is peregrine falcon territory in this area. Mineral development potential for the area is rated as high and very high on most of the area, the locatable mineral being gold.

CAPABILITY

There is evidence of an old plantation in the northern portion of the unit. A harvest unit and small portion of road extends into the unit along the northeastern boundary of the unit. Generally most of the area appears natural. The predominantly steep sloped landform with rock bluffs and talus slopes provides few opportunities for use. Opportunities for solitude are also limited in this portion due to the presence of Highway 299. The area only has potential opportunities for solitude or primitive recreation when combined with the larger portion on the Shasta-Trinity.

KELLY (05247)

DESCRIPTION

The Kelly area was 5,390 acres; some of the area has been roaded, and the area is now 5,100 acres in size. The area extends from east of French Hill Road to State Highway 199 and the Middle Fork of the Smith River on the north, to Kelly Peak on the east. The area consists primarily of north-facing slopes, with Kelly Creek and many other small unnamed drainages flowing north to the Middle Fork.

Vegetation at higher elevations is limited to knobcone pine, lodgepole pine, western white pine, Jeffrey pine, and incense cedar because of the poorer peridotite, serpentine, and diorite soils. The lower elevations of the canyon support scattered pockets of mature/old-growth Douglas-fir, Port-Orford-cedar, and sugar pine. The area has one sensitive plant species. The area provides winter deer habitat and contains fisher habitat. The mineral development potential for the area is rated as low because the Smith River National Recreation Area (NRA) Act prohibits location of new mining claims and development of existing claims, subject to valid existing rights.

Recreation opportunities are limited to fishing in the Middle Fork along U.S. Highway 199. Existing recreation use is low. There are no trails in this area, and cross-country travel is difficult and challenging because of the rocky nature of the surface and heavy brush.

CAPABILITY

The area appears to have retained its natural integrity. The apparent naturalness is high; the area appears to have been affected primarily by the forces of nature. There is one small harvest unit that intrudes into the area along the southern boundary. Highway 199 can be seen and heard from the area; consequently, opportunities for solitude are low. Opportunities for primitive recreation are limited. Most of this area (97 percent) is within the Middle Fork-Highway 199 management area (management area 3) of the Smith River NRA.

MONKEY (05248)

DESCRIPTION

The Monkey roadless area originally consisted of 9,500 acres. About 1,250 acres of the area have been developed because of the Shelly Ridge and Collier timber sales. There are also three other areas totalling 3,17 acres that each contain cutover units and access roads. This area contains the Monkey Creek drainage and a portion of the Shelly Creek and Griffin Creek drainages. The remaining roadless area has been split into two separate areas as a result; each of these areas is between 2,000 and 3,000 acres.

The vegetation consists of dense stands of mature/old-growth Douglas-fir, Port-Orford-cedar, and sugar pine (4,000 acres). The slopes of Monkey Ridge contain large areas of knobcone pine, western white pine, Jeffrey pine, and incense cedar. The area contains occupied spotted owl habitat, habitat for the marbled murrelet, fisher and northern goshawk, and deer winter range. One sensitive plant species is located in the area.

The mineral development potential of this entire area is rated as low due to enactment of the Smith River NRA.

Recreation opportunities are limited to road hunting and fishing in Monkey Creek because of the lack of trails in the majority of the area and the steep, brushy terrain. Current use is low.

CAPABILITY

The naturalness of this area has been modified by timber sales and associated roads. The area's shape limits the opportunities in the area as it is bisected by a road that extends from the north into the central portion of the unit. There is little opportunity for solitude or primitive recreation experience because of the shape, roads, and cut blocks within the area. The area is no longer roadless. The area is within the Smith River NRA. Approximately 85 percent lies within the Middle Fork-Highway 199 Management Area, and 15 percent is within the Prescribed Timber Management Area of the Smith River NRA.

MT. LASSIC (05309)

DESCRIPTION

The Mt. Lassic area on the Mad River Ranger District was 6,150 acres; part of the area has been roaded, and the remaining area is 5,550 acres in size. It includes the Red Lassic and Mt. Lassic peak. Elevations range from 1800 to 5900 feet. These prominent landmarks are almost 6,000 feet tall and provide outstanding views to Mt. Shasta, Trinity Alps, and the Pacific Ocean. Vegetation of the Lassic consists of mostly slow growing Jeffrey pine and specially adapted plants. Other portions of this area are timbered with Douglas-fir, ponderosa pine, and incense cedar. Approximately 1,000 acres of the proposed Lassics Botanical Area occurs within this area. The unique soils and geology have produced a unique botanical community with many sensitive plants occurring here. There are six sensitive plant species and species endemic to the Lassics occurring here. There are also a number of rare plant species that occur. The area contains fisher, pine marten, and spotted owl habitat. The mineral development potential is high on 36 per cent of the area and moderate on the remainder. The area has moderate dispersed recreation use due to its unique features. The area has a number of old jeep routes that receive OHV use.

CAPABILITY

The apparent naturalness of the area has been affected by past vegetation management, visible roads, and grazed areas. There is a small area of approximately 2,000 acres that would appear to have been unaltered. The natural integrity of the area has been changed by past management. The opportunities for solitude and primitive recreation are limited. The area has unique geologic and botanical features that influences recreation use. Harvest units on adjacent lands to the east and the west are readily apparent. The area is readily accessible by road along its southeastern boundaries.

NORTH FORK SMITH (05707)

DESCRIPTION

The North Fork Smith area was 39,400 acres in size (including 900 acres on the Siskiyou National Forest) and it includes the majority of the drainage of the North Fork of the Smith River. Approximately 30,330 acres of the area remains roadless; the western portion has been altered by roads and mining activities. The area is characterized by steep, rocky gorges below rolling plateaus of red laterite soil. The river canyons have many active and historic slides.

The serpentine, diorite, and peridotite rock in this area accounts for the very sparse and stunted vegetation of Jeffrey and knobcone pine. Because of the unusual soils, many unique plants are found in this area. A proposed botanical area occurs in this area. There are numerous sensitive species and one endangered plant species. The unusual soils produce many unique plant communities, particularly in transition zones (ecotones) where different communities come together. The area has spotted owl, marbled murrelet, and peregrine falcon habitat; the area also contains winter deer range.

This area offers recreation opportunities in the form of rafting and kayaking on the North Fork of the Smith River. The fishing on this river is very good, especially for cutthroat trout, although the access is very limited. Fishing and camping opportunities are also available along Diamond Creek. There is a maintained trail along Elk Camp Ridge that offers the hikers a view of the Pacific Coast, Siskiyou crest, and the Stony Creek and Smith River canyons. Recreation use of the area is moderate.

The mineral development potential for the area is rated as low due to the inclusion of the area in the Smith River NRA. Much of the past mining in the area was for defense minerals in domestic markets stimulated greatly by World Wars I and II.

CAPABILITY

The naturalness of the plateaus and smaller benches has been substantially modified by mining activity; there are several historic mine sites in the general area. There are also areas showing the effects of more recent mineral exploration by Cal-Nickel in the early 1980s. The areas of most intensive recent exploration and associated road building are within and adjacent to the northwestern and western portion of the roadless area. Evidence of both

old and new exploration is visible from higher ridges and from the air. Peripheral powerlines on the south side can be seen from Elk Camp Ridge Trail. Several of the historic mine sites and abandoned roads can be seen from certain vantage points within the roadless area.

Although the large size of the area generally allows for good opportunity for primitive recreation and solitude, the road penetrating to the center of the area and the shorter roads extending into the area from the sides tend to detract from this opportunity. These roads create narrow necks of land, some no wider than 1/4 to 1/2 mile. The opportunity for primitive recreation is best in the river canyons, which screen most human activity. Overland travel through the sparse vegetation is possible, though difficult, allowing solitude. The area is within the Smith River NRA. Approximately 95 percent of the area is within the North Fork Management Area of the Smith River NRA.

ORLEANS MOUNTAIN "B" (B5079)

DESCRIPTION

Orleans Mountain "B" is a 17,140 acre roadless area that occurs in three separate parcels. The area is located approximately 6 miles southeast of the community of Orleans. The northernmost parcel takes in the majority of the Pearch Creek drainage, most of which burned in 1959. The creek is the source of drinking water for most of the town of Orleans. The middle parcel contains the Boise Creek drainage, and the southernmost parcel contains the Middle Fork of Red Cap Creek, an important anadromous fisheries stream. This parcel is contiguous to the Trinity Alps Wilderness.

The mineral development potential for the area is rated as high on 1,200 acres, medium on 9,840 acres and potentially low on the rest. The majority of the terrain is very steep and rugged. Portions of Whiteys Peak, Orleans Mountain, and Soms Mountain are within this unit and are three of the highest peaks in the area. Elevations range from 800 feet to 6,180 feet. Douglas-fir is the predominant conifer species in this area; some portions contain dense old-growth trees, while other portions contain sparse stands of old and younger trees. Hardwoods also occur in the area. There is one known sensitive species of plant occurring in the area. The area contains fisher, pine marten, peregrine falcon, eagle, spotted owl, and goshawk habitat. Use of the area is for hiking, backpacking, and deer hunting. A portion of the Salmon Summit National Recreation Trail occurs in the area. Recreation use of the area is light.

CAPABILITY

The natural integrity of the northern parcel has been altered by the effects of a wildfire. The other two portions remain natural appearing. A feeling of naturalness is diminished by the readily noticeable adjacent lands to the west that have been managed for timber. Harvest units of these adjacent lands are particularly noticeable from within these roadless areas due to the westward orientation of the landforms. The separation of this area into three noncontiguous areas because of roads reduces the degree of solitude available. The southern parcel has the most opportunities for solitude due to it being contiguous to the Trinity Alps Wilderness. Opportunities for challenge and primitive recreation do occur due to the ruggedness of the terrain. Such opportunities are limited by the separation of the area with the exception of the southern portion that is contiguous with the Trinity Alps Wilderness.

ORLEANS MOUNTAIN "C" (N5079)

DESCRIPTION

The Orleans Mountain "C" was a 27,060 acre Rare II area. 11,650 acres were designated as part of the Trinity Alps Wilderness by the 1984 California Wilderness Act. The remaining 15,710 acres are in two separate parcels. The larger area is approximately 12,330 acres and is adjacent to the southeastern boundary of the Trinity Alps Wilderness. This portion consists primarily of the upper drainages of the East Fork of Horse Linto Creek, Tish Tang Creek drainages, and Tish Tang point landform. The other portion is a small area adjacent to the western boundary of the Trinity Alps Wilderness. Elevations vary from 1,600 to 5,200 feet. Terrain generally consists of steep sided drainages covered with Douglas-fir and mixed conifers. Sensitive plant habitat occurs within the area. The area is part of three different range allotments. Mineral development potential is medium, low and probably low. Recreation use is low; primary use is for hiking, horseback riding, and hunting. There are noticeable short spur roads and harvest units within the area along the southern border on Lone Pine Ridge impacting approximately 800 acres in this portion.

CAPABILITY

The natural integrity generally has been maintained. There are some noticeable changes due to access trails and range improvements. Along the southern portion of the unit the naturalness has been modified by short spur roads and harvest units. There are opportunities for solitude and primitive recreation in the areas. These opportunities are also influenced by the presence of the adjacent Trinity Alps Wilderness. From some locations within the area outside influences such as adjacent harvest units and roads are visible; generally, vegetative and topographic screening within the area minimizes the noticeability of these impacts.

PACKSADDLE (05703)

DESCRIPTION

The Packsaddle roadless area is 13,325 acres in size and is primarily on the Siskiyou National Forest in Oregon. The California portion (all within the Six Rivers National Forest) is about 3,880 acres. Of this, approximately 1,380 acres have had past activity or have been roaded, and 2,510 acres remain roadless. This description will discuss the California portion only. Terrain is characterized by steep sloped drainages. Vegetation varies from mixed conifer and Jeffrey pine to hardwoods and low brush. There are two species of sensitive plants found here. The area contains spotted owl and peregrine falcon habitat. Recreation use is light.

CAPABILITY

Most of the area has been altered by roads, mining exploratory routes and excavations, and harvest units. The area has been evidently modified; there is no real contiguous natural appearing area of any size to offer opportunities for solitude or primitive recreation.

PILOT CREEK (05310)

DESCRIPTION

The original Pilot Creek area contained approximately 10,210 acres. The southern portion has been heavily modified by roads, timber harvest, fire salvage harvest, and the effects of an 1800 acre wildfire. There presently are approximately 4,610 acres of roadless area left in the northern portion of Pilot Creek. This description will focus on that remaining roadless portion. The area has a portion of the Pilot Creek watershed, characterized by steep side slopes of the drainages. Elevation ranges from 3,200 to 5,800 feet. The area is fairly evenly forested with Douglas-fir, mixed conifers, and hardwoods. The area is readily accessed by Forest Route 1 that borders the area on the north, northwest, and east. There is one known species of sensitive plant that occurs in the area. There are fisher, pine marten, goshawk, and spotted owl habitats in the area. The mineral development potential is rated at medium and low. The area receives light dispersed recreation use, primarily hiking, hunting, and OHV use. There are approximately four miles of old routes within the area; some of these are occasionally used as OHV routes.

CAPABILITY

The apparent naturalness of the area has been altered very little. The natural integrity of the area has been altered by two different portions of the unit totaling approximately 240 acres that were cut over about 20-30 years ago. Within the immediate area of the old routes the apparent naturalness is also affected. Generally, throughout most of the unit, the apparent naturalness remains due to regrowth of the cutover units and vegetative screening of the old roads. The size and shape of the area limit the opportunities for solitude or primitive recreation. The shape and terrain of the area provide a relatively small potential use area in the northern portion. The area is bordered on the north, east, and northwest by a main Forest road which impacts the remoteness and solitude.

SALT CREEK (05252)

DESCRIPTION

The Salt Creek area encompasses 9,420 acres on the Mad River District. It generally encompasses the eastern side of Haman Ridge and the western side of Long Ridge and includes much of the Salt Creek watershed. Elevations range from 2,000 to 3,600 feet. The area has a variety of vegetative types, the predominant being grasslands, oak woodland, and coniferous forests. The area contains recent harvest units, and the western and central portion is roaded. The area has been utilized as a range allotment with 200 AMs (animal months) of available forage. Range improvements such as fences and water developments occur. There is fisher, spotted owl, peregrine falcon, and goshawk habitat in the area. Mineral development potential is low. Recreation use is low. There are old routes in the area used as OHV routes. The area has been utilized for timber harvest, and there are scattered harvest units and access roads in the area.

CAPABILITY

The natural integrity and apparent naturalness have been altered. Harvest units and access roads are scattered through the area. There are apparent changes to the area resulting from grazing and range management. Opportunities for solitude and primitive recreation are little to none. Timber harvest units on adjacent lands are readily visible from locations within the area. The area is well accessed by roads and is no longer roadless. Private property occurs adjacent to the west and south. The North Fork Wilderness is within a half-mile to the northeast, separated by a Forest Road.

SHIP MOUNTAIN

DESCRIPTION

The Ship Mountain roadless area contains 12,280 acres, bounded by Ship Mountain Road (FS 16N02) on the south and east and the Fox Ridge to Hurdygurdy Butte Road (FS 16N03) on the north and west. The steep topography is covered with red peridotite rocks and boulders, which account for the red appearance of this range rather than the green vegetation of the surrounding country.

The higher elevations of Ship (5,252 feet) and Table Mountains (4,717 feet) have very sparse and stunted vegetation of knobcone pine, lodgepole pine, western white pine, and Douglas-fir. The lower elevations (along tributaries of Jones Creek and Muzzleloader Creek) support stands of mature/old-growth Douglas-fir, Port-Orford-cedar, and sugar pine (4,000 acres). There are fisher, spotted owl, peregrine falcon, and pine marten habitats in the area. Portions of the area are key deer winter range. There are two sensitive plant species and rare plants in the area. The mineral development potential for the area is rated as low due to the inclusion of the area in the Smith River NRA.

Current recreation use consists of hunting along roads and small-stream fishing. There are no maintained trails within this area, and cross-country travel is difficult. The view from Ship Mountain includes the Siskiyou Crest, Pacific Ocean, and Mount Shasta, on a clear day.

CAPABILITY

The natural integrity of this area is intact. The area remains natural appearing. Vegetation and topography restrict movement through the area; this area offers good opportunity for solitude and primitive recreation. All of the unit occurs within the Prescribed Timber Management Area of the Smith River National Recreation Area.

SISKIYOU "B" (B5701)

DESCRIPTION

The original entire Siskiyou B roadless area was 110,120 acres in size, on three National Forests: 38,270 acres on the Six Rivers, 66,900 acres on the Klamath and 4,950 acres on the Siskiyou. Of the 38,270 acres originally on the Six Rivers, 20,040 acres became part of the designated Siskiyou Wilderness, and 1,730 acres have

been dropped due to roading. The remaining 16,500 acres will be described here.

The Six Rivers' portion of Siskiyou "B" consists of approximately six separate parcels that are adjacent and contiguous to the Siskiyou Wilderness. The northern parcel extends from Broken Rib Mountain and Wounded Knee Mountain. Another portion has the drainages of the South Siskiyou Fork and the Siskiyou Fork of the Smith River. Another portion consists primarily of the east slopes of the South Fork of the Smith River, the east slopes of Buck Mountain, Buck Creek, and Muslatt Mountain. Elevation ranges from 1,400 feet to 5,800 feet. The terrain is characteristically rugged and steep sided. The vegetation consists of dense stands of old-growth Douglas-fir, Port-Orford-cedar, and sugar pine at lower elevations, and knobcone pine, western white pine, Jeffrey pine, incense-cedar, and true firs at the higher elevations. Hardwoods occur in the lower drainages such as the South Fork of the Smith. The area around Bear Basin contains 15 different species of conifers and has been proposed as a botanical area.

The area has fisher, pine marten, spotted owl, and goshawk habitats. Recreational opportunities include hunting, hiking, and fishing; use is low. The area contains outstanding scenery, allowing a view of a large part of the Siskiyou Crest.

The area lies within the Smith River National Recreation Area. Approximately 50 percent of the area is within the Upper Middle Fork Management Area, 45 percent of the area is within the Upper South Fork Management Area, and the remaining 5 percent is within the Prescribed Timber Management Area of the NRA.

CAPABILITY

One portion of Siskiyou "B" has been noticeably altered by roads and timber harvests; this is a small 230 acre northern portion adjacent to Wounded Knee Mountain and adjacent to the Siskiyou wilderness. The naturalness of the remaining Siskiyou "B" area has been modified very little. Only minor impacts result from the presence of old trails. The opportunity for solitude and primitive recreation are high due to the area being adjacent to the Siskiyou Wilderness and good vegetative and topographic screening. In some locations access roads are very close to the outer boundaries of these units, but use is very light on these roads. There is a diversity of recreation opportunity in a very challenging setting. However, the rugged nature of the area tends to concentrate use into a few areas.

SLIDE CREEK

DESCRIPTION

The Slide Creek area on the Orleans Ranger District is approximately 11,760 acres in size and is located about 15 miles inland from the Pacific Ocean and 18 miles northwest of the town of Orleans. Slide Creek drainage and portions of Nickowitz Creek drainage are the two major watersheds in the area. The area is bordered on three sides (south, west, and north) by cutover lands. On the east is Bluff Creek Road (13N01).

The terrain of the area is generally very steep (60-70 percent) and rugged, with steep stream inner gorges. The elevation ranges from 4,351 feet at Barren Butte to 650 feet where Slide Creek leaves the Forest boundary and goes into private cutover land.

The mineral development potential for the area is rated as high on 7,800 acres and low or probably low on 3,960 acres. The potential locatable mineral is chromite.

The area supports a complex mosaic of plant communities; there is one sensitive plant species present. Slide Creek has fisher, pine marten, and spotted owl habitats. Approximately 4,000 acres are key deer winter range. Douglas-fir is the predominant commercial timber species. Some ponderosa pine, sugar pine, and Port-Orford-cedar are found in the area. Stands of oak and madrone are present as well.

Slide Creek has a fair resident trout population while Nickowitz Creek has a relatively good resident trout population. Both Slide Creek and Nickowitz creeks have potential for anadromous fish species in their lower sections. Some prehistoric and historic use of the area probably occurred. There are no Forest-maintained trails in the area. The principal public use of the Slide Creek area is deer hunting. Current recreational use of the area is low.

CAPABILITY

The opportunities for solitude and primitive recreation are moderate because of the size and the amount of obvious disturbance around the area. However, within the Slide Creek area the environment is natural and reflects little or no influence of human activities.

SOLDIER (05251)

DESCRIPTION

The Soldier roadless area on the Mad River District was originally 14,940 acres in size. The area has been modified by timber harvests and roads. Its northern edge borders private lands in Hetten Valley while the southern boundary is close to the North Fork Wilderness. The area consists of the drainages of the North Fork of the Eel River and its tributaries of Salt Creek, West Fork of the Eel River, East Fork of North Fork, and Soldier and Bluff creeks. The terrain varies from rolling gladelands vegetated with annual grasses or oak woodland to steep-sided canyons and areas forested with coniferous forest. Elevations range from 1,800 to 4,600 feet. Hettenshaw Peak, at 4660 feet, occurs in the northern portion of the area. The area is under a range allotment and is currently vacant. There is one species of sensitive plants that exist in the area. There are fisher, spotted owl, and peregrine falcon habitats in the area. The area has been managed for timber production and has numerous cut blocks and access roads. The mineral development potential is rated as moderate on two per cent of the area and low and or probably low on the remainder. Recreation use of the area is low; there are trails that receive hiking and OHV use.

CAPABILITY

The apparent naturalness and natural integrity have been noticeably altered. There are numerous roads and harvest units within the area. Fences, range trails, and water developments are noticeable within the area. Most of the area has noticeable recent alterations. There is a relatively small contiguous area that has a natural appearance. The opportunities for solitude and primitive recreation are limited. A small portion of the southern border of the area lies next to the South Fork Wilderness, separated by private property and a road.

SOUTH KALMIOPSIS (05709)

DESCRIPTION

The South Kalmiopsis roadless area contains 108,200 acres, the majority of which is on the Siskiyou National Forest in Oregon. The Six Rivers' portion contains about 290 acres in the Fall Creek and Wimer Creek drainages. This small area has two distinctly different soil types and their associated vegetative cover. The Fall Creek area drains north into Oregon and is primarily a Galice soil formation. This formation supports dense hardwoods and brush with mature Douglas-fir, Port-Orford-cedar and sugar pine along the drainages.

The Wimer Creek area drains south into Diamond Creek through infertile ultramafic soils that will only support sparse stands of Jeffrey pine and Douglas-fir and a ground cover of grass and low brush.

The mineral development potential for the area is rated as low due to the inclusion of the area in the Smith River NRA.

Populations of the endangered plant McDonald's rock-creep (*Arabis macdonaldiana*) and the sensitive plant Oregon bleeding-heart (*Dicentra formosa* ssp. *oregona*) have been recorded in this area.

Recreation use in the California portion is low to none; however, it is part of a much larger area that is accessed through Oregon.

CAPABILITY

The area retains its natural integrity and generally appears natural. The area is bisected by a road that enters from the south. This is a very small area that has few opportunities for solitude or primitive recreation in itself and must be evaluated in conjunction with the majority of the unit that occurs on the Siskiyou National Forest. Refer to the discussion of the opportunities for solitude and primitive recreation in the Siskiyou National Forest EIS. The area within the Six Rivers occurs within the North Fork Management Area of the Smith River National Recreation Area.

UNDERWOOD (05237)

DESCRIPTION

The Underwood area originally totaled 9,930 acres with about 6,530 acres within the Six Rivers National Forest and 3,400 acres within the Shasta Trinity National Forest. Approximately 5,040 acres in the southwest portion within the Six Rivers have been roaded and altered by timber harvest, and 1,490 acres remain roadless.

The area contains a section of the South Fork of the Trinity River and includes extremely steep canyon slopes on both sides of the river. The area is characterized by numerous rock outcrops, talus slides, rocky ridges, and steep drainages. The river itself is the primary attraction of the area, this segment is a designated wild river. Elevations range from 800 to 3,700 feet. The vegetation is characterized by brush, live oak, and scattered conifers. The higher elevations tend to contain more dense areas of conifer trees with little brush or hardwood understory. The area contains occupied peregrine falcon habitat. There is spotted owl, fisher, pine marten, and goshawk habitats in the area. Public use of the area is very low and occurs primarily around its perimeter and along and on the river.

CAPABILITY

There is large portion of the area that has been modified and no longer appears natural. The remaining area generally appears natural. There is very little evidence of humans; what does occur is primarily from mining and grazing activities. Surrounding roads and harvest units are occasionally visible from locations within the area. The opportunity for solitude is high along the Trinity River within the steep inner gorge as the landform tends to isolate this area. The area is somewhat divided by Forest road 5N07 that extends from the north and almost bisects the unit in the center; this tends to reduce the potential for solitude and isolation in this portion. This road is lightly used. There are opportunities for primitive recreation along the river; the very rugged terrain tends to limit other opportunities.

YOLLA BOLLY EXTENSION (05253)

DESCRIPTION

The Yolla Bolly Extension was that small strip of land between the existing Yolla Bolly-Middle Eel Wilderness and Road 27N01 on the Mad River Ranger District. The strip begins in the area of Four Corners Rock, ends near Little Doe Camp, and contains about 200 acres. The entire area is now part of the Yolla Bolly-Middle Eel Wilderness.

The minerals potential of the area is low.

The area is generally in a natural state, except areas directly adjacent to Road 27N01 where evidence of road construction exists in the form of cut and fill areas. There is also an old jeep trail that follows the ridgetop for the length of the area. The area provides deer summer range.

This area provides two trailheads to the Yolla Bolly-Middle Eel Wilderness: Little Doe and Four Corners. Current recreation use is about 200 RVDs per year.

There are about 80 acres of mature and old-growth habitat occurring in this area. A portion of the area (180 acres) is considered as deer summer range.

Table C-1 Management Area Allocation of Areas that do not Meet Roadless Criteria by Alternative.

Roadless Area	NFS Acres	Alternative					
		CUR	PRF	OGR	MKT	ECR	
Big Butte Shinbone Outside Wilderness Total	12,100	General Forest	80	530	60	90	880
		Managed Habitat Area	790	0	790	780	0
		Special Regeneration	20	20	0	20	0
		Riparian	80	420	70	80	80
		Special Habitat Area Wilderness	10 11,130	0 11,130	40 11,130	10 11,130	10 11,130
Board Camp Mtn Outside Wilderness Total	4,530	General Forest	2,570	1,000	0	3,130	3,280
		Managed Habitat Area	560	0	790	0	0
		Special Regeneration	150	20	20	150	0
		Riparian	870	900	710	870	870
		Special Habitat Area	380	2,600	3,010	380	380
Cow Creek Outside Wilderness Total	320	General Forest	0	0	0	0	240
		Partial Retention	90	50	0	90	0
		Retention	160	100	0	160	0
		Riparian	60	150	40	60	60
		Special Habitat Area	10	10	260	10	10
Kelly	60	Smith River NRA Dedicated	60	60	60	60	60
Lassics Outside Wilderness Total	6,650	General Forest	0	0	0	10	10
		Managed Habitat Area	10	0	0	0	0
		Riparian	790	0	790	790	790
		Special Habitat Area	5,850	6,650	5,860	5,850	5,850
Monkey Outside Wilderness Total	9,020	Managed Habitat Area	330	0	0	0	0
		Riparian	300	20	220	300	300
		Special Habitat Area	0	1,510	1,300	0	0
		Smith River NRA Dedicated	7,480	7,480	7,480	7,480	7,480
		Smith River NRA Managed	910	10	20	1,240	1,240
NF Smith Outside Wilderness Total	7,680	Riparian	10	10	10	10	10
		Smith River NRA Dedicated	7,120	7,120	7,120	7,120	7,120
		Research Natural Area	220	220	220	220	220
		Wild River	330	330	330	330	330
North Fk. Eel	10	General Forest	10	10	0	10	10
Orleans Mtn C Outside Wilderness Total	3,010	General Forest	0	0	0	0	80
		Managed Habitat Area	80	0	0	80	0
		Riparian	260	0	260	260	260
		Special Habitat Area	2,450	2,790	2,540	2,450	2,450
		Wilderness	220	220	220	220	220

Table C-1 Management Area Allocation of Areas that do not Meet Roadless Criteria by Alternative.

Roadless Area	NFS Acres		Alternative				
			CUR	PRF	OGR	MKT	ECR
Packsaddle		Managed Habitat Area	0	0	0	0	0
Outside Wilderness	3,620	Riparian	550	120	540	550	550
Total	3,620	Special Habitat Area	1,250	1,960	1,360	1,250	1,250
		Smith River NRA Dedicated	1,460	1,460	1,460	1,460	1,460
		Smith River NRA Managed	360	80	250	360	360
		Wild River	250	250	250	250	250
Pilot Creek		General Forest	2,160	1,880	280	6,380	8,020
Outside Wilderness	9,370	Partial Retention	450	490	160	1,200	0
Total	9,370	Managed Habitat Area	5,290	2,310	0	320	0
		Special Regeneration	120	130	0	120	0
		Riparian	1,200	4,190	730	1,210	1,210
		Special Habitat Area	140	370	8,200	140	140
Red Cap Creek		Riparian	20	0	20	20	20
Outside Wilderness	14,370	Special Habitat Area	50	70	50	50	50
Total	14,370	Wilderness	14,300	14,300	14,300	14,300	14,300
Salt Creek		General Forest	1,520	4,100	10	1,710	7,910
Outside Wilderness	9,390	Managed Habitat Area	5,370	0	6,670	5,180	0
Total	9,390	Special Regeneration	1,020	1,010	1,020	1,020	0
		Riparian	1,390	3,940	1,370	1,390	1,390
		Special Habitat Area	90	340	320	90	90
Ship Mountain		Special Regeneration	0	10	0	0	0
Outside Wilderness	1,640	Riparian	230	190	230	230	230
Total	1,640	Special Habitat Area	1,350	1,300	1,370	1,350	1,350
		Smith River NRA Managed	60	140	40	60	60
Siskiyou A		Smith River NRA Dedicated	180	180	180	180	180
Outside Wilderness	350	Wild River	170	170	170	170	170
Total	32,640	Wilderness	32,290	32,290	32,290	32,290	32,290
Siskiyou B		Special Regeneration	10	0	0	10	0
Outside Wilderness	1,960	Special Interest Area	0	20	0	0	0
Total	2,060	Riparian	40	20	40	40	40
		Special Habitat Area	110	140	150	110	110
		Smith River NRA Dedicated	1,450	1,450	1,450	1,450	1,450
		Smith River NRA Managed	30	10	0	30	40
		Wild River	320	320	320	320	320
		Wilderness	100	100	100	100	100
Soldier		General Forest	5,790	4,280	3,740	5,910	8,160
Outside Wilderness	14,800	Partial Retention	0	20	0	0	0

Table C-1 Management Area Allocation of Areas that do not Meet Roadless Criteria by Alternative.

Roadless Area	NFS Acres	Alternative					
		CUR	PRF	OGR	MKT	ECR	
Total	14,840	Managed Habitat Area	1,140	0	1,300	1,110	0
		Retention	40	0	0	460	0
		Special Regeneration	1,300	1,520	1,010	1,310	0
		Riparian	3,210	5,370	3,050	3,340	3,220
		Special Habitat Area	1,660	1,880	3,970	1,740	1,680
		Research Natural Area	750	750	750	750	750
		Wild River	910	990	990	190	990
		Wilderness	40	40	40	40	40
South Kalmiopsis	10	Smith River NRA Dedicated	10	10	10	10	10
Underwood		General Forest	0	860	0	0	2,400
Outside Wilderness	6,620	Partial Retention	0	20	0	0	0
Total	6,620	Managed Habitat Area	1,500	0	1,610	1,500	0
		Retention	170	80	170	360	0
		Special Regeneration	730	750	750	550	0
		Riparian	530	950	540	530	530
		Special Habitat Area	2,080	2,340	1,930	2,080	2,080
		Wild River	1,610	1,610	1,610	1,610	1,610
Yolla Bolly Exten	100	Wilderness	100	100	100	100	100

DESCRIPTION AND ANALYSIS OF WILD AND SCENIC RIVER CANDIDATES

INTRODUCTION

In 1968, Congress passed the Wild and Scenic Rivers Act. The purpose of this Act was to preserve certain select rivers that possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, botanical or other similar values. These select rivers would be preserved in free-flowing conditions and their immediate environments would be protected and managed for the benefit and enjoyment of present and future generations.

In October, 1979, the President's Environmental Message directed the Department of Interior to inventory all rivers and assess their potential for additions to the National Wild and Scenic Rivers System. The Heritage, Conservation and Recreation Service (HCRS) published a Nationwide Rivers Inventory (NRI), Phase I in March, 1980. This list was revised on May 1, 1981, and includes what that agency considers the best remaining relatively natural and free-flowing stream segments in California, Nevada and Arizona.

All inventoried rivers, including those already designated, are in the Pacific Border Province, and are either in the Klamath Section (24D) or in the California Coast Ranges Section (24F). Most of the rivers on the Six Rivers National Forest that were inventoried in the NRI have been designated as wild and scenic rivers by the Secretary of Interior on January 19, 1981 (see Chapter 3 for more information on these designated rivers).

EVALUATION CRITERIA FOR RIVER ELIGIBILITY

The eligibility of a river for the National Wild and Scenic Rivers System is determined by applying the criteria in sections 1(b) and 2(b) of the Wild and Scenic Rivers Act and the supplemental criteria in the USDA-USDI Guidelines and Forest Service Handbook. A river is eligible for inclusion into the national system if it is free-

flowing and has at least one outstandingly remarkable value, such as botanic, geologic, or other values listed in the Wild and Scenic Rivers Act.

To determine eligibility and the possible later determination of river classification, it may be desirable to divide rivers into segments. Considerations in defining segment limits should include obvious changes in land status or ownership, changes in river character such as the presence of dams and reservoirs, significant changes in development or the presence of important resource values. A river segment should be long enough to enable the protection of any outstandingly remarkable values, if the area was managed as a wild, scenic or recreational river. There is no standard established for a minimum segment length.

There are no specific requirements concerning minimum flows for an eligible segment. The Wild and Scenic Rivers Act provides definitions in Sections 16(a) and (b). Flows are considered sufficient if they sustain or complement the outstandingly remarkable values for which the river would be designated.

The potential classification of a river is based on the condition of the river and the adjacent lands as they exist at the time of the study. The Act specifies the following three classification categories for eligible rivers. The guidelines provide further definition of the criteria for classification of each segment.

Wild river areas are defined by the Act as:

Those rivers or sections of rivers that are free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.

Scenic river areas are defined as:

Those rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

Recreational river areas are defined as:

Those rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

**DESCRIPTION OF NRI RIVERS
(NOT DESIGNATED)**

The rivers in the Nation-wide Rivers Inventory that are not currently designated as wild and scenic rivers are described below. Those portions that have not been

designated are Redwood Creek, the Van Duzen from Dinsmore to its headwaters and the upper mile and a half of the North Fork of the Eel River.

Through the following analysis the Van Duzen and the North Fork Eel River have been determined to have no outstandingly remarkable features and consequently considered ineligible for inclusion into the national Wild and Scenic River system. The analysis also indicates that Redwood Creek may have outstandingly remarkable values and will be protected during this planning period in a condition that will not diminish its potential for wild, scenic or recreational classification.

DESCRIPTION AND ANALYSIS OF NRI RIVER SEGMENTS

Name: Van Duzen

Counties: Trinity, Humboldt

Physiographic Section: 24F

Segment: That portion of the river occurring on the Six Rivers National Forest (beginning pt. = SW 1/4, Sec. 2, T.1N., R.5E.; ending pt. = NW 1/4, Sec. 15, T.2S., R.6E.), a distance of about 21 miles.

Physical Description: The river habitat has two distinct characters. In the lower portion (ten miles), the river meanders through a flood plain. Pools are shallow, infrequent, and summer flows are low. The river flows through a moderate V-shaped canyon in the upper 11 miles, where pools are frequent and riparian vegetation is common.

Notable Features:

Scenic: The area is characterized by glades on each side of the river, with no outstanding vistas, rock outcrops or spectacular views.

Recreational: The river generally parallels a county road that provides numerous opportunities for access. Dispersed recreation use includes swimming, wading, tubing, camping, biking and picnicking.

Geologic: Mule Slide at the headwaters of the west fork is an ancient, natural, extremely large landslide. Several house-sized boulders are present in and along the river corridor.

Fishery: Pools are shallow and infrequent, and summer flows are low. Trout populations are consequently low; however, the upper portion produces a moderate trout population. No data has been collected on angling usage, but observations indicate usage is low.

Wildlife: The bald eagle and peregrine falcon (endangered) are known to frequent the area. Other species associated with riparian vegetation are also present.

Botanic: Tracy's sanicle (*Sanicula tracyi*) is the only known sensitive plant. The vegetation type (Kuchler) is the Klamath Montane Forest with Douglas-fir.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted, the river is considered important from a contemporary (Indian), ethnographic and historic standpoint.

Other Features: None

Outstandingly Remarkable Features: There are no outstandingly remarkable features; the presence of private ownership and recently abandoned sawmills are evident. The segment is characterized by conifer forest and glades on each side of the river without the existence of outstanding vistas, views or rock outcrops. The river flows through a moderate v-shaped canyon in the upper region with frequent pools. In the lower region the river meanders through a flood plain where pools are shallow, infrequent, and summer flows are low.

Water Quality: The water quality is generally good. The river is characterized by very low flows, drying up in spots during the summer. The river has a high algae content.

Land Use: The river is generally paralleled by a paved road. The road is moderately populated with small towns, residences, airports, sawmills, etc., along the lower river corridor. The upper portion of the river is less accessible and developed.

Access and Ownership: The access along the river is restricted in many areas by private ownership. Federal ownership is approximately 60 percent.

Water Resource Development: None.

Threats: Continued private development on the lower portion.

Current Protection: On National Forest portions, the immediate environment of the river is protected by a riparian management zone to preserve fish, water and wildlife values.

Description and Analysis

Name: Redwood Creek

Counties: Trinity and Humboldt

Physiographic Section: 24D

Segment: Beginning at a point in the SW 1/4 of section 6, T.5N., R.4E. and ending at the confluence of Prairie Creek near the Pacific Ocean, a distance of about 57 miles. Of the total 57 mile length of this stream, only about one-half mile near the headwaters flows through National Forest land; the remainder flows through Redwood National Park (about 20 miles) and private land (36 miles).

Physical Description: The portion of the stream on the Six Rivers National Forest flows through a moderate canyon with mixed deciduous and coniferous vegetation.

Notable Features:

Scenic: Redwood Creek flows through old growth and advanced second growth forests along the lower two-thirds of its course. There are numerous boulders and water falls in the Rocky Gap area which is a narrow canyon.

Recreational: Camping is available on gravel bars. Water levels in the stream fluctuate with the season. Fishing in these areas is extremely limited.

Fishery: Redwood Creek supports anadromous populations of chinook and coho salmon and steelhead and cutthroat trout.

Geologic: Grogan Fault follows Redwood Creek through a portion of the stream, separating schist to the west and sandstone to the east. The river runs almost entirely through the Franciscan formation, whose weak materials cause high turbidity.

Wildlife: The bald eagle and peregrine falcon are known to frequent the area. River otter, black bear, black-tailed deer, coyote, bobcat, porcupine, skunk, raccoon and elk occur along the river.

Botanic: The vegetation type (Kuchler) is the Klamath Montane Forest with Douglas-fir. A stand of redwoods containing the world's tallest trees occurs within the National Park and along the River. Riparian vegetation, old growth, and second growth occur along the river.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted, the river is considered important from an Indian and historic standpoint.

Other Features: The botanical features of this river are of scientific and educational interest.

Outstandingly Remarkable Features: Potential outstandingly remarkable scenic features.

Water Quality: Natural landslides and unstable landforms cause high turbidity during winter storms. Summer flows are characterized by high water temperatures and aggraded stream beds.

Land Use and Ownership: Sixty percent private with the remainder National Park Service with a small portion of the headwaters within the Six Rivers National Forest.

Water Resource Development: None.

Threats: Logging on private land.

Current Protection: National Park Service on that portion flowing through the Park, and riparian protection on that portion flowing through the National Forest.

Name: North Fork Eel River

Counties: Trinity

Physiographic Section: 24F

Segment: Beginning at a point in the center of section 15, T.3S., R.7E., for a distance of approximately 1 1/2 miles and ending at a point in the SE 1/4 of Section 9, T.3S., R.7E. (headwaters). The river below this segment (approximately 33 miles) was designated as wild river by the Secretary of Interior.

Physical Description: The river is characterized as a remote, steep, V-shaped canyon with mixed conifer vegetation and open glades. It is open, exposed and moderately constricted, with a low flow.

Notable Features:

Scenic: The river corridor has no outstanding vistas, rock outcrops or outstanding views.

Recreational: Light dispersed recreation use from hunters and fishermen occurs.

Geologic: The river cuts through several members of the Franciscan formation. It is characterized by a steep, narrow gorge where it passes through resistant blocks of sandstone.

Fishery: Steelhead and resident trout occur in the river. Fish populations are unknown and production is probably low. Tributaries provide good small-stream habitat for rainbow trout. Angling use is considered almost non-existent due to lack of access and rugged terrain.

Wildlife: The bald eagle and peregrine falcon (endangered) are known to frequent the river. Other species of wildlife associated with riparian vegetation are also found here.

Botanic: There are no known sensitive plants within the river corridor; however, there is the potential for the occurrence of Tracy's sanicle, a Forest sensitive species. The majority of the vegetation type (Kuchler) is Oregon Oak Forest, with approximately 25% Mixed Evergreen Forest with Rhododendron.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted on the river, it is still considered to be culturally important from a contemporary (Indian) and ethnographic viewpoint.

Other Features: None.

Outstandingly Remarkable Features: The segment of the river occurring above what has been designated as a wild river by the Secretary of the Interior does not possess any outstandingly remarkable features. This segment runs through a remote, steep, v-shaped canyon vegetated by mixed conifers and open glades with the absence of outstanding vistas, views, or rock outcrops.

Water Quality: In summer and early fall, the river is low and warm. Algae-choked pools are common in late summer.

Land Use: The river flows generally through undeveloped, unroaded National Forest land.

Access: Due to remoteness and lack of roads, access is very poor.

Ownership: The majority of the river corridor is Federal ownership.

Water Resource Development: None.

Threats: None.

Current Protection: Riparian protection zone on Six Rivers National Forest land.

DESCRIPTION OF RIVERS NOT ON THE NRI LIST

The following rivers were identified during public scoping or through the Forest's eligibility study as potential Wild and Scenic Rivers.

Potential W&S	
River Segment	River Miles
Blue Creek	13.0 miles
Copper Creek	4.5
Crescent City Fork Blue Ck	12.0
Horse Linto Creek	16.5
Mad River	35.0
Pilot Creek	15.0
Red Cap Creek	26.0
Red Mountain Creek	7.0
Tish Tang a Tang Creek	7.5

Only two of these rivers, Blue Creek and Red Mountain Creek, were determined to have outstandingly remarkable features. The remaining segments were determined to have no outstandingly remarkable features and consequently are not eligible for recommendation as a component of the Wild and Scenic River System. The description and analysis of these rivers follow:

Name: Blue Creek

Counties: Del Norte, Humboldt

Physiographic Section: 24D

Segment: That portion of the river located within the Six Rivers National Forest begins near the center of section 3, T.12N., R.3E. Its ending point is NW 1/4, section 23, T.14N., R.4E.

Physical Description: Blue Creek (approximately 13 miles) meanders through a small flood plain in the lower 7 miles on the Forest. The stream was heavily impacted by the 1964 flood but is recovering at an undetermined rate. The upper portion of the creek flows through steep, heavily forested, V-shaped canyons.

Notable Features:

Scenic: Landslide activity initiated by an intense series of storms in 1964 is immediately adjacent to the lower seven miles of Blue Creek. The foreground and background of the upper creek are dominated by undisturbed Douglas-fir and hardwood forests in steep walled canyons.

Recreational: Access to Blue Creek is extremely difficult because of its remoteness. There are no direct routes on National Forest System land. Other than approximately .3 mile, all of this portion of Blue Creek lies within the Siskiyou Wilderness.

Fishery: Anadromous fish habitat is limited to the lower seven miles of Blue Creek. A steep boulder-jammed gorge, located about .6 mile below the confluence of the East Fork, acts as a natural barrier to fish movement. This habitat was seriously degraded by the 1964 flood but is recovering. The stream supports a low population of salmon, a moderate population of steelhead and good numbers of resident trout. This is considered one of the most important tributaries of the Klamath River basin and is currently under study by the U.S. Fish and Wildlife Service (USFWS). The USFWS was funded to investigate chinook salmon spawning use, juvenile salmonid outmigration and characterize habitats in Blue Creek.

Geologic: The two distinctive bedrock units (one consisting of volcanic sediments and the other including various ultramafic rocks including serpentine) which are present along the streamcourse have brought about dramatically different vegetation types which have caused a picturesque and interesting landscape. The lower reaches comprise a series of entrenched meanders which have formed in flood-generated stream terraces. Natural landslide processes strongly control the landscape within the river corridor. Substantial landslide scars left from the 1964 and earlier floods are visible on many of the adjoining slopes.

Wildlife: The northern spotted owl is known to inhabit the area. Essentially all of Blue Creek is identified for inclusion as critical habitat for both the northern spotted owl and the marbled murrelet. Osprey and goshawk are known to frequent the area.

Botanic: Blue Creek supports some of the best stands of Port-Orford-cedar known on the Forest. Rare plants occur in the drainage. There are no known threatened or endangered plant species.

Historic, Archaeological, Cultural: The portion of Blue Creek in T.13N., R.3E., Sec. 34 and 35, including Bear Pen Flat, is within the Helkau District on the National Register of Historic Places. Bear Pen Flat was the site of Bear Pen village and was considered by noted archaeologist Dr. Arnold Pilling to be the “highest” of villages in the area because of its proximity to the Golden Stairs (trail). The Golden Stairs are considered to be a corridor (ladder) between the earth and the heavens. Houses were reported to have still been standing at this site as late as 1935. The Jedediah Smith party reported that in May 1828 the Creek was 25 to 30 yards wide in places with Indian “fishing establishments” along the Creek.

Other Features: None.

Outstandingly Remarkable Features: By cumulation of the above notable features, especially those concerning recreation, fishery, wildlife, botanic and

historic, archaeological, and cultural values, Blue Creek has potential outstandingly remarkable values.

Water Quality: Blue Creek maintains a good flow in all seasons. Water quality is excellent except during winter storm flows when turbidity is high.

Land Use: The Blue Creek watershed is essentially undeveloped.

River Access and Land Ownership: Access is extremely limited. Ownership is 100 percent federal upstream from the center of section 3, T.12N., R.3E.

Water Resource Development: None.

Threats: None currently exist.

Current Protection: The main fork of Blue Creek is within the Siskiyou Wilderness.

Description and Analysis

Name: Copper Creek

Counties: Del Norte

Physiographic Section: 24D

Segment: Beginning at a point in the SW 1/4 of section 35, T.18N., R.1E. (within the boundaries of the Six Rivers National Forest) for a distance of approximately 4.5 miles and ending at a point where the creek crosses into Sec.16, T.18N., R.1E.

Physical Description: This segment is approximately 4.5 miles in length.

Notable Features

Scenic: very little management activity has taken place in the Copper Creek drainage; most of the human activity has been associated with mining in the headwaters.

Recreational: There is no access to Copper Creek except from the top of the drainage. Very little recreation occurs in Copper Creek proper.

Geologic: The area contains the contact zone of two geologic provinces along the Coast Range Thrust Fault. The Klamath Mountain Province in the east is characterized by ultramafic rocks, mostly peridotite with localized serpentine belts. The Coast Range Province to the west consists of the Franciscan assemblage of sandstone, shale, and schist. Landslides are a common feature of the area.

Fishery: The lower section of Copper Creek supports a good population of winter steelhead and probably a low population of Summer Steelhead. The creek has good salmonid habitat in the lower sections.

Wildlife: The lower section contains critical habitat for the northern spotted owl and the marbled murrelet, as well as habitat for the northern goshawk.

Botanic: Numerous sensitive plant species are known to occur in the area, mostly in areas of serpentine influence.

Historic, Archaeological, Cultural: No complete inventory has been conducted in the area, most of the historical activities have been associated with mining. Contemporary use occurs in the upper portion for the gathering herbs for ceremonial purpose.

Other features: None.

Outstandingly Remarkable Features: Copper Creek does not possess any outstandingly remarkable features.

Water Quality: Outstanding, high turbidity occurs during high precipitation events.

Land Use: Little or no management activities has occurred in the area.

Access and Ownership: The area is accessed by County Road 305 (Wimer Road). Although mostly Six Rivers National Forest lands, there are two private parcels that are mines Copper Creek Mine in section 26, T.18N., R.1E. and the portion of the Alta Mine in the very headwaters of section 35 T.18N., R.1E.

Water Resource Development: None

Threats: None

Current Protection: On national forest lands, the immediate environment of the creek is protected by a riparian management zone to preserve fish, water and wildlife.

Name: Crescent City Fork of Blue Creek

Counties: Del Norte

Physiographic Section: 24 D

Segment: Beginning at a point in section 27, T.14N., R.3E. (within the boundaries of the Six Rivers National Forest) and ending in section 3, T.12., R.3E. at the point where Crescent City Fork Blue Creek intersects with Blue Creek.

Physical Description: Approximately 12 miles in length. The stream was heavily impacted by the 1964 flood but is recovering at an undetermined rate. The upper portion of the creek flows through steep, heavily forested, V-shaped canyons.

Notable Features:

Scenic: The foreground and background of the upper creek are dominated by undisturbed Douglas-fir and hardwood forests in steep-walled canyons.

Recreational: Access to Crescent City Fork Blue Creek is extremely difficult because of its remoteness. There are no direct routes on National Forest System lands. Some white water rafting does occur by accessing the river on roads that pass through conifer plantations. The creek forms the boundary of the Siskiyou Wilderness starting in section 3, T.13N., R.3E. and proceeds downstream.

Fisheries: Anadromous fish habitat is limited to the lower sections. This habitat was seriously degraded by the 1964 flood but is recovering. The stream supports a low population of salmon, a moderate population of steelhead and good numbers of resident trout.

Geologic: The two distinctive bedrock units (one consisting of volcanic sediments and the other including various ultramafic rocks including serpentine which are present along the streamcourse have brought about dramatically different vegetation types which have caused a picturesque and interesting landscape. Natural landslide processes strongly control the landscape within the river corridor.

Wildlife: The northern spotted owl is known to inhabit the area. Osprey and goshawk are also known to frequent the area.

Botanic: Crescent City Fork Blue Creek supports stands of Port-Orford cedar; sensitive plants have been

inventoried and potential habitat for sensitive plants does exist. There are no known threatened or endangered plant species.

Historic, Archaeological, Cultural: The portion of Blue Creek in T.13N., R3E., Sec. 34., including Bear Pen Flat is within the Helkau District on the National Register of Historic Places. Bear Pen Flat was the site of Bear Pen village and was considered by noted archaeologist Dr. Arnold Pilling to be the "highest" of villages in the area because of its proximity to the Golden Stairs (trail). The Golden Stairs are considered to be a corridor (ladder) between the earth and the heavens.

Other Features: None.

Outstandingly Remarkable Features: The Crescent City Fork Blue Creek does not possess any outstandingly remarkable features.

Water Quality: Crescent City Fork Blue Creek maintains a good flow in all seasons. Water quality is excellent except during winter storm flows when turbidity is high.

Land Use: The Crescent City Fork Blue Creek watershed is essentially undeveloped. Timber harvesting has occurred on the west side in the watershed.

River Access and Land Ownership: Access is extremely limited. Ownership is 100 percent federal.

Water Resource Development: None.

Threats: None currently exist.

Current Protection: On National Forest lands, the immediate environment of the creek is protected by a riparian management zone to preserve fish, water and wildlife.

Description and Analysis

Name: Horse Linto Creek

Counties: Humboldt County, California

Physiographic Section: 24D

Segment: Horse Linto Creek, from T.7N., R.5E, Section 3 to source, excluding Cedar Creek and its tributaries. Horse Linto includes the main, east and north forks, approximately 16.5 miles.

Physical Description: The channels are characterized by gradients of 2-10% and side slopes of 40-80%. Side slopes are often marginally stable and landslides occur frequently. Riparian vegetation is generally confined to a strip of 5-15 feet on each side of the channel. Conifers and hardwoods dominate the slopes above the riparian vegetation.

Notable Features:

Scenic: There are several water falls greater than 15 feet high. Two are located on the main fork one mile downstream of the east fork confluence. There is also a waterfall on the north fork immediately downstream from the Bell Swamp tributary confluence.

Recreational: There is an established campground on the lower mile of the Main Fork and dispersed recreation occurs with limited trail access into the vicinity of the headwaters. Horse Linto is open to fishing.

Fishery: Horse Linto supports an important salmon and steelhead population.

Geologic: Waterfalls, as described in scenic section, exist in several locations.

Wildlife: There are fisher and marten territories that include Bell Swamp. Territories are several square miles in area and contain habitat likely to support furbearers. There are also cliffs located along the main fork that could support peregrine falcon.

Botanic: Pacific Douglas fir with white fir, chinquapin and dogwood, with yew near the creek. Sugar pine, Douglas fir, and dogwood is found along the creek. Lower elevations have mixed evergreen with tan oak and madrone with yew along the creek. There are no known sensitive plants in the drainage, but rare plants do occur.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted, sites associated with the river are considered important from a contemporary (Indian), ethnographic and historic/prehistoric standpoint.

Other Features: None

Outstanding Remarkable Features: Horse Linto does not possess any outstandingly remarkable features on Six Rivers National Forest lands. It is characterized by coniferous forests including old-growth Douglas-fir and mixed conifer vegetation types. The creek flows through a v-shaped canyon with high rock bluffs along a half-mile segment. The lower portion of the creek has been manipulated and restored to facilitate anadromous fisheries while the upper portion has cold water trout. The upper reaches are not readily accessible, and so little to no fishing occurs. The high meadows, rock bluffs and much of the old-growth are inside the Trinity Alps Wilderness, which protects these features.

Water Quality: Water quality is good. Horse Linto, like most streams on the north coast, is characterized by high turbidity during winter flows.

Land Use: The land along Horse Linto Creek is generally so steep and unstable that no timber harvest or road building occurs.

Access and Ownership: Public access is permitted throughout the entire portion located within National Forest lands. Roads occur within several hundred yards of the creek near the Cedar Creek confluence.

Water Resource Development: None

Threats: There are no expected threats to water quality from timber management or recreational use.

Current Protection: The upper 1 1/2 miles of the north fork and the upper 6-7 miles of the main fork lie within the Trinity Alps Wilderness.

Name: Mad River

Counties: Trinity and Humboldt

Physiographic Section: 24F

Segment: Beginning at a point in the SE 1/2 of section 12, T.27N., R.12W. (within the boundaries of the Six Rivers National Forest) for a distance of approximately 35 miles and ending at a point in the SE 1/4 of section 36, T.2N., R.5E.

Physical Description: The river has two distinct characters on the Six Rivers Forest. The upstream portion (including below the dam) flows through a moderate canyon with mixed deciduous and coniferous vegetation. The downstream section is in a steep canyon, often inaccessible to the public.

Notable Features:

Scenic: Ruth Reservoir and Mad River Rock are unique vistas associated with the river. There is frequent private development along much of the streamcourse.

Recreational: Water flows in the river above Ruth Dam fluctuate with the season. Fishing in these areas is extremely limited. Ruth Reservoir provides fishing for trout and several warm water species, boating, waterskiing, wind surfing and swimming. There are three Forest Service campgrounds and one County campground that receive heavy use. All but one of these campgrounds are located along Ruth Lake. One Forest Service campground is located along the river below the dam.

Fishery: The river below the dam supports low population levels of summer and winter steelhead. The river has good salmonid habitat by virtue of high basic productivity and flow levels sustained by Ruth Dam releases. It also supports a moderate rainbow trout fishery.

Geologic: The river runs almost entirely through the Franciscan formation, whose weak formation causes high turbidity. The river runs parallel to South Fork Mountain, which is the longest continuous ridge in the Continental U.S.

Wildlife: The bald eagle and peregrine falcon (endangered) are known to frequent the area. Other species associated with riparian vegetation are also present.

Botanic: Tracy's sanicle (*Sanicula tracyi*) is the only known sensitive plant species and it occurs primarily in oak woodlands. The vegetation type (Kuchler) is Klamath Montane forest with Douglas-fir.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted, sites associated with the river are considered important from a contemporary (Indian), ethnographic and historic/prehistoric standpoint.

Other Features: None.

Outstanding Remarkable Features: This segment does not possess any outstandingly remarkable features. The upstream portion flows through a moderate canyon with mixed deciduous and coniferous vegetation. The downstream section is in a steep canyon, often inaccessible to the public. Even though the Mad River is associated with two unique vistas and runs parallel to South Fork Mountain, these notable features are not considered outstandingly remarkable.

Water Quality: Natural landslides and unstable landforms cause high turbidity during winter storms. The river above Ruth Reservoir is characterized by low flows, drying up in spots during the summer. Below the dam, flows can be reduced as low as 5 cubic feet/second to increase storage level of Ruth Reservoir usually during winter and spring. Summer water quality is high.

Land Use: The river is generally paralleled by paved roads. The area along the roads is moderately populated with small towns, residences, airport, etc. Approximately 10 miles above the head of Ruth Reservoir, the river is less accessible and undeveloped.

Access and Ownership: Access along river is restricted in many areas by private ownership. Private lands are primarily used for agricultural and residential purposes.

Water Resource Development: Ruth Dam located in the NW 1/4 of section 19, T.1S., R.7E. creates a reservoir impoundment and restricts free flowing nature of the river below.

Threats: Continued private development.

Current Protection: On National Forest portions, the immediate environment of the river is protected by a riparian management zone to preserve fish, water and wildlife values.

Description and Analysis

Name: Pilot Creek

Counties: Humboldt

Physiographic Section: 24F

Segment: Beginning at a point in the N 1/2 of Section 4, T.3N., R.5E., HB&M, (within the boundaries of the Six Rivers National Forest) and ending at the confluence with the Mad River at a point in the NW 1/4 of Section 21, T.2N., R.5E., HB&M, a distance of 15 miles.

Physical Description: Pilot Creek is a tributary of the Mad River. The stream begins at an elevation of about 4300 feet, flowing into the Mad River at an elevation of about 2200 feet. The channel is broadly exposed in the lower 5 miles. Here the stream is characterized by low summer flows and high temperatures. These conditions are the result of extreme aggradation caused by past large scale landslides adjacent to the channel. In years of below normal rainfall the stream is completely dry in aggraded reaches.

The upper 10 miles of the channel is surrounded primarily by coniferous forest, in contrast to the open glade, mixed hardwood-conifer forest in the lower watershed. In the upper reach the channel is generally well confined and shaded by conifers and alders. The summer flow is perennial, except in extreme drought years.

Notable Features:

Scenic: There are no outstanding views, vistas or scenic quality features associated with Pilot Creek. The combination of a highly variable channel, the adjoining landslide-prone terrain, and a mosaic of conifer and oak woodlands provides for a picturesque landscape.

Recreational: Fishing in Pilot Creek is limited to summer steelhead and resident trout from May through November. It does provide an angling experience for the person wishing to catch a few wild trout in a remote, natural stream. Hunting of deer, bear, turkey, quail and pigeons occurs throughout the drainage. Dispersed recreation includes hiking, horseback riding and off-road vehicle use.

Fishery: Steelhead have access to the lower 10 miles of Pilot Creek. Above the barrier that restricts steelhead, there is a moderate population of resident rainbow trout. Limited angler access is available; hence, very few people fish in the area. The overall productivity of Pilot Creek is moderate.

Sedimentation is the primary limiting factor for fish habitat in Pilot Creek. The primary fishery value of Pilot Creek is the production of winter-run steelhead to Mad River.

Geologic: Pilot Creek is a major tributary to the Mad River, and is almost entirely within the Six Rivers National Forest. It cuts through a variety of metasedimentary rock types in the Franciscan Complex, and is strongly controlled by structural features such as faults and shear zones. Most of its length parallels South Fork Mountain which is one of the longest structural ridges in the U.S. The stream turns abruptly westward to follow a shear zone to its confluence with the Mad River. The character of the channel changes dramatically as it crosses bedrock of different resistance. Some sections are gently meandering, while others are deeply entrenched within a steep, inner gorge. The channel is also influenced greatly by landslides on the adjoining slopes that are locally very unstable. Large block slides and earthflows have constricted the channel and deflected it into the opposing sideslopes.

Wildlife: Northern spotted owls are known to inhabit the area. There is a cliff site within the Pilot Creek drainage which could provide habitat for the peregrine falcon. Sensitive species known to inhabit the area include the Pacific fisher and northern goshawk. Other wildlife species associated with riparian vegetation are also present along the river channel.

Botanic: Tracy's sanicle (*sanicula tracyi*) is the only known sensitive plant species and it occurs primarily in oak woodlands. The vegetation type (Kuchler) is the Klamath Montana forest with Douglas-fir.

Historic, Archaeological, Cultural: Complete inventories have been conducted; many sites associated with the river are considered important from a contemporary (Native American), ethnographic and historic/prehistoric standpoint.

Other Features: None.

Outstanding Remarkable Features: A tributary to the Mad River, Pilot Creek does not possess any outstandingly remarkable features. The upper 10 miles of Pilot Creek's channel is surrounded primarily by coniferous forest, in contrast to the open glade, mixed conifer-hardwood forest in the lower 5-mile broadly exposed channel segment. Although it is associated with some notable features, none of these were found to be outstandingly remarkable.

Water Quality: The stream has relatively high sediment loads, but the water is quite clear except during storm events.

Land Use: The river is accessible by three trails and Forest Road 3N06C. Two roads cross Pilot Creek, but these roads are no longer traveled or maintained. The upper 1/3 of Pilot is relatively untouched by human activities. The lower 2/3 has been impacted by logging.

Access and Ownership: Due to private land ownership, access to the lower 1/4 of the river is restricted. This area is primarily used for residential purposes.

Water Resource Development: None.

Threats: None.

Current Protection: On National Forest portions, the immediate environment of the river is protected by a riparian management zone to maintain fish, water and wildlife values.

Description and Analysis

Name: Red Cap Creek

Counties: Humboldt

Physiographic Section: 24D

Segment: Red Cap Creek is approximately 26 miles long and is almost entirely on the Six Rivers National Forest. It begins in the west-center of section 15, T.10N., R.5E. Just above its mouth, it travels through approximately 1/4 mile of private land. It also crosses private land in sections 19 and 30, T.10N., R.6E. This river segment ends in section 11, T.8N., R.7E.

Physical Description: Red Cap Creek meanders through an extensive flood plain in the lower sections. The stream was heavily impacted by the 1964 flood but is recovering at an undetermined rate. There are four major tributaries: The Leary Creek and the North, Middle and South Forks of Red Cap Creek. These flow through steep, heavily forested, V-shaped canyons, as does the upper portion of Red Cap Creek itself.

Notable Features:

Scenic: Landslide activity is immediately adjacent to Red Cap Creek foreground in the upper 1/3 of the drainage. The far view and near view of the upper creek and tributaries are dominated by the impacts of intensive timber harvesting.

Recreation: Roads access Red Cap Creek through the first eight miles. Beyond that, access would be cross country. There is a limited amount of fishing that takes place on Red Cap Creek and its tributaries, though the fishing is relatively good.

Fishery: Anadromous fish habitat is limited to the main branch of Red Cap Creek and extends up 11 miles to a barrier in section 9, T.9N., R.5E. The habitat was seriously degraded by the 1964 flood but is recovering. Resident trout are in the upper reaches of Red Cap Creek and its tributaries.

Geologic: The stream is divided into three sections geologically. The lower part is underlain by moderately competent metasedimentary and metavolcanic rocks; the middle section traverses various rock types in a tectonic melange unit; and the upper section flows in relatively competent granitic rocks. These three units are separated by major thrust fault contacts (the Orleans Fault). Landslides are fairly common along the lower sections of the stream, and the debris forms extensive flood terraces in which the stream

meanders are entrenched. Gold prospecting has been conducted in these older gravels. There are few unique or remarkable geologic features along the river corridor.

Wildlife: The northern spotted owl is known to inhabit the area.

Botanic: There are no known Forest sensitive species in the drainage but rare plants do occur. The plant communities along the creek are not unique per se, consisting primarily of Douglas-fir/tanoak/madrone forests.

Historic, Archaeological, Cultural: Red Cap Creek has been mined since the late 1800s for gold and copper. Some of the more noteworthy mines include the Wright Placer Mine and the Schnable Placer Mine located near the confluence of the South Fork of Red Cap Creek and Red Cap Creek (T.10N., R.5E., section 36 and T.9N., R.5E., section 1.); Red Cap Central Mine (T.9N., R.6E., section 8); and the Weaver Placer Claim (T.10N., R.5E., section 25). The floods of 1955 and 1964 washed away many of the Red Cap mines.

Sarvorum Mountain (T.10N., R.5E., sections 10,11,14, and 15) borders Red Cap Creek on the north near the Creek's confluence with the Klamath River. Sarvorum has been associated with spiritual and ceremonial activities of the Karuk Indians.

Other Features: None.

Outstandingly Remarkable Features: Red Cap does not possess any outstandingly remarkable features. The upstream portion of the segment lies within the Trinity Alps Wilderness. Historically, water for mining purposes was kept to a minimum and the area has had intensive timber management.

Water Quality: Red Cap Creek maintains a good flow in all seasons. Water quality is good except during winter storm flows when turbidity is high.

Land Use: The Red Cap Creek watershed has had intensive timber management activities in all but the upper half of the main branch and its Middle Fork. Some of the plantations are over 30 years old.

River Access and Land Ownership: Access has been developed for vehicles at several points along the first eight miles (up to the North Fork of Red Cap Creek). No roads or trails exist beyond that point. Ownership is primarily federal.

Water Resource Development: Historical use of water for mining purposes consisted of small diversions and flume networks. No diversions or impoundments currently exist.

Threats: None currently exist.

Current Protection: On National Forest portions, the immediate environment of the river is protected by a riparian management zone to preserve fish, water, and wildlife values. Approximately 9 miles of the upper portion lie within the Trinity Alps Wilderness.

Description and Analysis

Name: Red Mountain Creek

Counties: Trinity

Physiographic Section: 24F

Segment: Red Mountain Creek occurring on the Six Rivers National Forest (beginning point = NW 1/4, Section 26, T.26N., R.12W.; ending point = NW 1/4, Section 5, T.5S., R.8E.), a distance of about 7 miles.

Physical Description: Red Mountain Creek is a tributary stream to the North Fork of the Eel River (a designated wild river); at the confluence the elevation is 1,500 feet, however the headwaters are located at approximately 4,600 feet. The primary riparian vegetation type consists of alders, willows, and cottonwoods. During the summer months when flows are low, water temperatures are high due to the sparsity of vegetative cover.

Notable Features:

Scenic: There are no outstanding views or scenic quality features associated with Red Mountain Creek. The combination of a highly variable channel, the adjoining landslide-prone terrain, and a mosaic of conifer and oak woodlands provides for a picturesque landscape.

Recreational: Red Mountain Creek's headwaters occur in the Yolla-Bolly Middle Eel Wilderness. Dispersed recreational use includes camping, fishing, hunting, backpacking and swimming in a primitive setting. Further, Red Mountain Creek joins the North Fork of the Eel River, a designated wild river, at their confluence.

Fishery: Red Mountain Creek supports a healthy salmonid fish population; however, anadromous fish are limited by stream barriers approximately 1.5 miles upstream from the confluence with the North Fork of the Eel River. Above the barriers, a healthy population of resident trout exists. The pool to riffle ratio averages 3:1.

Geologic: The watershed is underlain by typical Central Belt Franciscan, a mixture of competent sandstone and less competent "melange," as well as a large body of serpentinite in the headwaters. There are a variety of landslide types throughout the watershed. Because of the sparse vegetation, these geologic and geomorphic features are quite visible.

Wildlife: A historically known peregrine falcon site exists in proximity to the confluence of the North Fork of the Eel River and Red Mountain Creek.

Botanic: Tracy's sanicle and pale yellow stonecrop are the only Forest sensitive species known to occur in the area. Rare plants also occur in the drainage.

Historic, Archaeological, Cultural: Although complete inventories have not been conducted, sites associated with the creek are considered important from a contemporary (Indian), ethnographic, and a historic/prehistoric standpoint.

Other Features: None

Outstandingly Remarkable Features: By cumulation of the above notable features, especially those concerning recreation, fishery, wildlife and historic, archaeological, and cultural features, Red Mountain Creek has potential outstandingly remarkable features.

Water Quality: Natural landslides and unstable landforms cause high turbidity during winter storms. Summer flows are characterized by low flows, high water temperatures and aggraded stream beds. Also, cattle are known to graze throughout the area.

Land Use: More than half the creek's distance, beginning at the headwaters, is in the wilderness, with the lower portion going through both USFS system lands and private property. The entire length is primarily undeveloped and not easily accessible.

Access and Ownership: Access to the creek is restricted to some degree by private ownership. Public access is primarily through wilderness. About 70 percent of the area in Federal ownership.

Water Resource Development: There are no developments on the portion located on National Forest lands.

Threats: There is possible private development in lower portions of the stream.

Current Protection: On National Forest lands outside wilderness, the immediate environment of the creek is protected by the riparian management area.

Name: Tish Tang a Tang

Counties: Humboldt, CA

Physiographic Section: 24D

Segment: That portion of the main fork Tish Tang a Tang Creek that lies on National Forest land begins in the southwest corner of section 18, T.8N., R.6E. and continues upstream to its source in the middle of section 10, T.8N., R.6E. for a distance of 4.5 miles. The segment also includes that portion of the South Fork Tish Tang a Tang that lies on National Forest land beginning in the western 1/2 of section 30, T.8N., R.6E. to its source at section 27, T.8N., R.6E., for a distance of 3 miles. The two segments are 7.5 miles in length.

Physical Description: The upper 1 to 2 miles of the stream is characterized by channels with gradients of 15-30% and streamside slopes of 20-70%. The rest of the channel (approximately 3 miles) located within National Forest lands is characterized by gradients of 30% and sideslopes of 50-80%. There are cascades and bedrock pools within this portion of the channel.

Notable Features:

Scenic: Overall the stream is characterized by steep, wooded (conifer) sideslopes and boulder cascades. The headwaters have more gentle sideslopes and channel gradient with several reaches flowing through meadows. There is a 150 feet high falls located 3/4 mile downstream of the Corral Creek confluence where the water plunges over a vertical rock face. Corral Creek cascades into Tish Tang-a-Tang over near vertical rock faces and into an emerald green pool. Access is extremely difficult to either the falls or the confluence.

Recreational: Recreation opportunities are limited to fishing for rainbow trout and some hiking. Trail 6E18 crosses the headwaters of the South Fork as well as several tributaries to the main fork. Hiking along the creek is restricted by steep slopes and rough topography.

Fishery: The section of the creek found within Forest boundaries is a naturally regenerating, cold water, resident trout fishery. There are some introduced (historic) eastern brook trout in Corral Creek. Overall the fishery is good, although stream-side shade is low in isolated reaches.

Geologic: A waterfall is located on the main fork, 3/4 mile downstream of the Corral Creek confluence.

Wildlife: Wolverine and fisher have been sighted in the area.

Botanic: The headwaters area includes multi-layered mature stands of red and white fir, incense cedar and sugar pine. Middle and lower reaches support multi-layered old growth Douglas fir, incense cedar, white fir and sugar pine. Areas near the creek have pacific yew, pacific dogwood and maple. There are no known sensitive plants in the drainage but rare plants do occur.

Historic, Archaeological, Cultural: This creek is located in an area which is of high cultural importance to the Hupa. The portion of the drainage located on National Forest lands forms a bridge between the De-No-To National Register District (Trinity Alps Wilderness) and the Hupa Tribal Cultural Reserve (located on Hupa Tribal Reservation lands, sections 13, 24 and 25, T.8N., R.5E.; sections 19 and 30, T.8N., R.6E.). The area is used ethnographically for access to spiritual areas, hunting and plant gathering; historically by packers, miners and ranchers. A complex network of trails exist, many of them historic, but some are new from cattle. The northern boundary of the drainage (Hostler Ridge/Box Camp Ridge) is also part of De-No-To National Register District. This district is a contemporary spiritual use area for the Hupa people.

Other Features: None

Outstandingly Remarkable Features: Tish Tang a Tang Creek does not possess any outstandingly remarkable features on the Six Rivers National Forest, particularly outside the Trinity Alps Wilderness. The segment between the wilderness and the Hoopa Reservation flows through a moderate canyon with coniferous forest. There is one waterfall and deep bedrock holes that provide for a cold water fishery.

Water Quality: Water quality is good, although high turbidity is a common attribute of north coast streams during high flow.

Land Use: Timber harvest is permitted outside the riparian management area. There is an active grazing allotment in the meadow located on the headwaters of Corral Creek.

Description and Analysis

Name: Tish Tang a Tang continued

Counties: Humboldt, CA

Physiographic Section: 24D

Access and Ownership: The area is accessible on foot via trail 6E13. Access to much of the channel is limited by rough terrain.

Water Resource Development: There are no developments on the portion located on National Forest lands.

Threats: There are no expected threats to water quality from timber management or recreational use. Cattle use has resulted in some isolated creek bank damage and some areas of riparian vegetation have been over-

utilized. This activity is not a severe threat, but should be monitored to ensure that it does not continue to affect fish habitat.

Current Protection: The upper two miles of the main fork lie within the Trinity Alps Wilderness. The environment immediately adjacent to the stream is protected in the riparian management area.

LIST OF RIVERS DETERMINED INELIGIBLE

Table D-1 contains a list of those rivers determined ineligible for inclusion in the Wild and Scenic Rivers System through the Forest's eligibility study process. These rivers are listed by Ranger District. If two or more rivers have the same name, the drainage in which the river is located is listed in parentheses.

Table D-1.

List of Rivers Determined Ineligible

Smith River NRA/Gasquet Ranger District

South Savoy Creek	Idlewild Creek	Wimer Creek
Eighteenmile Creek	Twelvemile Creek	Elevenmile Creek
Boulder Creek	Tenmile Creek	Sheep Pen Creek
Horse Creek	Redwood Creek	Deer Creek
Boulder Creek	High Prarie Creek	Potato Patch Creek
Stephens Creek	Peacock Creek	

Orleans Ranger District

East Fork Blue Creek	Wildcat Creek	Nickowitz Creek
Slide Creek (Blue)	Buzzard Creek	North Fork Bluff Creek
Scorpion Creek	East Fork Klamath River	Notice Creek
East Fork Bluff Creek	Bluff Creek	Cappell Creek
Bee Creek	Aikens Creek	Slide Creek (Bluff)
Serpentine Creek	Slate Creek	Catsup Creek
Hines Creek	Camp Creek	China Creek
1st Creek	2nd Creek	3rd Creek
Wilder Creek	Brown Creek	Mud Creek
Rosalena Creek	Wilson Creek	Fivemile Creek
Ike Creek	Whitmore Creek	Pearch Creek
South Pearch Creek	Ullathorne Creek	Cheenitch Creek
North Fork Boise Creek	Boise Creek	Little South Fork Creek
Trail Creek	Leary Creek	Middle Fork Leary Creek
North Fork Red Cap Creek	South Fork Red Cap Creek	South Fork Leary Creek
Cedar Creek (Camp)	Adams Creek	Allen Creek
Dans Creek	Deer Lick Creek	Fish Creek
Big Foot Creek	Indian Creek	Hopkins Creek
Dot Creek	Mid Fork Red Cap Creek	Captain Haun Creek

Lower Trinity Ranger District

Mill Creek	North Fork Mill Creek	South Fork Mill Creek
Colgrove Branch (Mill)	Crogan Creek	Brett Creek
Corral Creek	South Fork Tish Tang	Cedar Creek
Campbell Creek	East Fork Horse Linto	Horse Range Creek
Groves Prarie Creek	Coon Creek (Trinity)	Kirkham Creek
Supply Creek (Trinity)	Summit Creek	Three Creeks
Gregg Creek	East Fork	Boise Creek (Trinity)
East Fork Willow Creek	Horse Mountain Creek	Ruby Creek
Willow Creek	Victor Creek	Bremer Creek
China Creek (Trinity)	Fourmile Creek (Madden)	Madden Creek
Minon Creek	Hawkins Creek	Surprise Creek
Quinby Creek	Sharber Creek	Gray Creek
Gray Creek (SF Trinity)	Coon Creek	Half Acre Creek

Table D-1. continued

List of Rivers Determined Ineligible

Lower Trinity Ranger District cont.

Underwood Creek	Barney Creek	McAlister Creek
Mingo Creek	North Fork Mingo Creek	Ammon Creek
Mahala Creek	Bear Creek (Grouse)	Spike Buck Creek
Mosquito Creek	Cow Creek	White Oak Creek
Greenwood Creek	Grouse Creek	Sims Creek
Trappers Creek	Last Chance Creek	Panther Creek
Brays Opening Creek	Carson Creek	Deer Creek (Mad)
East Fork Mad River	Bug Creek (Mad)	

Mad River Ranger District

Owl Creek	Wildcat Creek (Pilot)	Rattlesnake Creek
East Creek (Pilot)	Hastings Creek	County Line Creek
Rock Creek (Mad)	Lamb Creek (Mad)	Thompson Creek
Olsen Creek	Hale Creek	Grace Creek
Little Van Duzen River	Crooks Creek	Senteney Creek
Shanty Creek	Black Lassic Creek	Blanket Creek
Mud Creek (Dobbyn)	Bear Creek (Van Duzen)	Red Lassic Creek
West Fork Van Duzen	North Fork Conley Creek	South Fork Conley Creek
Dobbyn Creek	Blueford Creek	Burgess Creek
Big Meadow Creek	Bar Creek	Panther Creek (Eel)
West Fork of NF Eel	East Fork of NF Eel	Soldier Creek
Pickett Creek	Bradburn Creek	Bluff Creek (Kettenpom)
Kettenpom Creek	Deep Hollow Creek	Choptoy Creek
Hobart Creek	Marshall Creek	Hetten Creek
Tompkins Creek	Blue Slide Creek	Dashields Creek
Johnson Creek	Barnes Creek	Jonathon Creek
Lynch Creek	Lousy Creek	Dutchman Creek
Smith Creek (Mad)	Armstrong Creek	Tub Creek
Yellow Jacket Creek	Salt Creek	Hoaglin Creek
Gypsy Creek	Cottonwood Creek	Wildcat Creek (Mad)
Rock Creek (NF Eel)	Willow Creek (NF Eel)	Lightfoot Creek
South Fork Mad River	North Fork Mad River	Lost Creek
Van Horn Creek	Blair Creek	Little Red Mountain Ck

Table D-2.

List of Secretary Designated Rivers

River Segment	Miles	Classification
Klamath River System		
Klamath River	20.0	Recreational
Trinity River System		
Trinity River	1.0	Scenic
Trinity River	4.0	Recreational
South Fork Trinity River	7.0	Wild
South Fork Trinity River	7.0	Scenic
South Fork Trinity River	1.0	Recreational
Eel River System		
North Fork Eel River	15.0	Wild

RECREATION OPPORTUNITY SPECTRUM (ROS)

The Recreation Opportunity Spectrum (ROS) is a system for classifying and managing recreation opportunities based on the following criteria: physical setting, social setting, and managerial setting. The combination of the three criteria results in six different ROS classes which are described below. A map of ROS classes is included in the map packet accompanying these documents.

PRIMITIVE

The area is 3 miles or more from all roads and trails with motorized use and generally 5,000 acres or greater in size or larger. The setting is essentially an unmodified natural environment with some evidence of trails. Motorized use is prohibited. The social setting provides for less than 6 parties encountered on trails and less than 3 parties visible from campsites. Capacities range from 0.5 to 1.0 RVD/acre/year. On-site controls are extremely limited with most regulation accomplished off-site. Typical activities include hiking, horse packing, fishing, hunting and camping. The compatible VQO is preservation.

SEMI-PRIMITIVE NON-MOTORIZED

The area is 1/2 mile from all roads or trails with motorized use and generally exceeds 2,500 acres to 5,000 acres in size unless contiguous to wilderness. The area can include primitive roads and trails if they are usually closed to motorized use. Access roads are Level 1. The natural setting may have subtle modifications that would be noticed but would not draw the attention of an observer in the area. Structures are rare and isolated. The social setting provides for 6 to 15 parties encountered per day on trails and 6 or less parties visible at campsites. On-site controls are present but subtle. Interpretation is through self-discovery with some use of maps, brochures and guide books. Typical activities include hiking, horseback riding, cross-country skiing, canoeing, hunting and fishing. The compatible VQO is retention.

SEMI-PRIMITIVE MOTORIZED

The area is generally 2,500 acres to 5,000 acres in size, and 1/2 mile from Level 3 or better roads. There is strong evidence of roads and motorized use of roads and trails. Access roads are usually Level 1 or 2 roads. The natural setting may have moderately dominant alterations, but would not draw the attention of motorized observers. Structures are rare and isolated. The social setting provides for a low to moderate contact with other parties. Capacity ranges from 1.5 to 2.5 RVDs/acre/year. On-site controls are present, but subtle. Interpretation is through very limited on-site facilities along with the use of guide maps, brochures and guide books. Typical activities include OHV touring, snowmobiling, hiking, horseback riding, cross-country skiing, hunting and fishing. The compatible VQOs are retention and partial retention.

ROADED NATURAL

The area is 1/2 mile or less from roads and trails open to motorized use. Resource modifications and utilization practices are evident but are harmonious with the natural environment. The social setting provides for moderate to high frequency of contact on roads and low to moderate frequency on trails away from roads. Capacity ranges from 10 to 20 RVDs/acre/year. On-site use controls are noticeable, but are harmonious with the natural environment. Typical activities include, but are not limited to: hiking, horseback riding, cross-country skiing, snowmobiling, OHV touring, trailer camping, hunting and fishing. The compatible VQOs are modification, partial retention and retention.

RURAL

The natural environment is substantially modified to the point that developments are dominant to the sensitive observer. Structures are readily evident and may range from scattered to small dominant clusters. Pedestrian or other slow moving observers are constantly within view of culturally changed landscapes. The social setting provides for moderate to high visitor contact. Capacity is estimated at 75 RVDs/acre/year. Controls and regulations are obvious, and law enforcement visible.

Interpretation may be through more complex wayside exhibits including small lighted structures. Typical activities or facilities include, but are not limited to: camping, fishing, information centers, convenience stores and resorts. The compatible VQOs are modification, partial retention and retention.

URBAN

There are no areas classified as “Urban” on the Forest.

THE COALITION GROUP MEMBERS AND THEIR RECOMMENDATIONS

INTRODUCTION

This appendix presents a list of issue resolutions developed by the Coalition Group and describes how the Forest Interdisciplinary Team subsequently incorporated their recommendations into the DEIS, FEIS and Forest Land and Resource Management Plan. Many other subjects were discussed, but not agreed to by the entire group. Only those items agreed to by all of the members present were recorded in the meeting notes as group agreements. It is the group agreements that are tracked in this appendix. Issue resolutions are organized by subject and are not presented in the same order they appear in the meeting notes or necessarily in the order in which the group discussed them. Comments in brackets, [], are clarifications added by the author that are not reflected in the notes. Also, most of the issues presented in this appendix are somewhat different from the issues presented in Chapter 1 of the FEIS and tracked through the document. This is because the issues in this appendix are specific to the discussion that developed as the group's agreements evolved. The issues defined by the public through the scoping process and in response to the 1987 Draft are separate. Copies of the last scoping comments from the public were presented to the coalition group at the first meeting, and these recommendations were developed to address those issues as well as the group-specific issues presented here.

A number of the issue resolutions were later modified by the direction provided in the FSEIS ROD or in response to public comments. These modifications are noted throughout this appendix.

The members of the Coalition Group were as follows:

Tim McKay, North Coast Environmental Center
Herb Pierce, California Department of Fish and Game
Bonnie Neely, Humboldt County Board of Supervisors
Chad Roberts, Audubon Society
Steve Self, Sierra Pacific Industries
Susie Van Kirk, Sierra Club
Jeff Wagner, Louisiana Pacific Corporation

From the Forest Service, Chris Knopp participated through all of the meetings as facilitator and note keeper. Several other Forest Service employees participated as group members, although none through all of the meetings. They were:

Dave Solis/Jeff Mattison, Assistance with wildlife technical information.
Gail Grifantini, NFMA and planning expertise.

In addition, several other Forest Service employees participated, at the group's request, to provide specific information:

Tom Jimerson, Ecological expertise and formulation of the silvicultural strategy.
Bill Jones, Silvicultural expertise and formulation of the silvicultural strategy.

ISSUES, COALITION GROUP AGREEMENTS, AND FOREST ID TEAM RESPONSES

Issue: How should a planning alternative respond to the information contained in the Interagency Scientific Committee's Spotted Owl report?

Agreement:

- (1) The current boundaries of HCAs (ISC Report) would not be substantively changed. [This was presented as a preference by the Forest Service to ensure consistency with the report, and agency planning direction.]
- (2) Within the 50 year planning horizon, all members agreed that the option to enter HCAs following monitoring results that demonstrate that managed stands support owls is a viable management option.
- (3) All members agreed that the current ASQ could be based on a portion of the HCAs being in the timber land base, and that HCAs can be considered as "in the allowable timber base" for purposes of calculation of the annual ASQ, even though no timber may be harvested from them until monitoring establishes that owls can maintain viable populations under managed conditions. Monitoring is likely to take from 30 to 50 years to answer this question.
- (4) Some HCAs should be off limits to any future timber harvest. Some portion of HCAs should be permanently withdrawn from the allowable timber base in order to ensure a representative sample exists of what the Forest had when management began. This means that not all HCAs would be used to calculate the ASQ. (A note was made that nearly 50 percent of the HCAs are located in wilderness areas and would already meet the intent of this objective. However, some additional areas may have to be identified outside of wilderness to ensure that representative habitats are preserved. No specifics agreed to.)
- (5) Timber management outside of HCAs would be designed to support viable populations of owls (consistency with the 50-11-40 rule).

Response:

- (1) The boundaries established by the ISC were used and expanded upon for the designation of LSRs in the FSEIS ROD. The LSRs are part of the Special Habitat Management Area in the preferred alternative.
- (2) Entry into the HCAs was originally incorporated into the alternative; however, the HCAs were replaced with LSRs in the preferred alternative in the FEIS. The direction in the FSEIS ROD states that stands less than 80 years old in LSRs can be managed during the planning period to accelerate the development of late-successional stand characteristics.
- (3) Timber management within LSRs will not count towards the ASQ in the preferred alternative, based on the FSEIS ROD.
- (4) All stands over 80 years old in LSRs are protected from timber harvest during the planning horizon.
- (5) Stands in the matrix and the Hayfork AMA will be managed to provide for timber and other commodity production as well as biodiversity. Riparian reserves throughout the matrix will provide the foundation for dispersal habitat that meets the intent of the 50-11-40 rule.

Issue: How should the alternative address biological diversity?

Agreement:

- Objective: The Forest should be managed to maintain the natural vegetative and biological diversity. The following resolutions were intended by the group to achieve this objective.
- (6) The alternative would maintain species, stand level, landscape and genetic diversity. Diversity would be measured on a Forest-wide or large[r] area basis.
 - (7) Maintain the forest habitat characteristics within a predetermined range of what occurs naturally. Specifics were not discussed.
 - (8) Do no type conversions intended to replace hardwood forests with stands of conifers. The Forest should describe conditions where type conversions would be desirable to meet the diversity objective or where other management objectives would take precedence.

Response:

- (6) Analysis by the Forest's ID Team has determined that the diversity objectives would be met. Diversity was assessed on a Forest-wide basis.
- (7) The preferred alternative would slightly reduce the amount of late successional habitat initially, but would increase it (about 10% from current) after 10 to 15 decades. Habitat quality within late seral stage habitat would improve as low quality habitat and fragmented habitat was regenerated and high quality existing habitat was retained. Early seral stage habitats would decline in direct proportion to the reduction in regeneration acres characteristic of recent past levels (nearly 4,000 acres per year compared to 360 acres per year) with implementation of the preferred alternative.
- (8) Natural stands of oaks would be retained. Conifer stands that have declined to the extent that hardwoods dominate the species mix would be regenerated. All regeneration to reestablish conifers would include hardwoods as a planned and desired component of the species mix (except on sites where hardwoods do not occur naturally).

Issue: How would the alternative reduce the incidence of clearcutting?

Agreement:

- (9) The Forest should greatly reduce the use of clearcutting. Its use would have to be in response to specific conditions.

Response:

- (9) Regeneration of forest stands with clearcutting, where all standing vegetation is removed and the site is then broadcast burned to prepare the seedbed, would be replaced with a regeneration harvest that would retain a combination of large green trees, snags and large downed logs. This change would reduce the yield on a per acre basis by 20 to 25 percent on the average, but retains a legacy that bridges past and future stands as well as shade and suitable habitat for many organisms. Because some existing stands do not contain sufficient volume to allow a regeneration harvest and provide an economically viable sale, up to 10 percent of the acres regenerated each year would be permitted that would not meet the green tree retention component of the retention standard. It is

expected that the use of this option would decline as the poorest stands are regenerated and overall stand quality improves.

Issue: How would this alternative reduce the impact on wildlife and other resources that occur from roads?

Agreement:

- (10) Limit road densities. (This was discussed generally as a desirable objective, but its implementation is dependent on access needs for timber, fire suppression and recreation uses.) [This was subsequently clarified to say limit open road densities on all ground managed for timber production.]
- (11) Within corridors, open road densities would be reduced commensurate with the objective to minimize disturbance to wildlife. Travel routes necessary for administration or essential public access to other areas can remain open. Most closures would be by gating.
- (12) New roads in corridors, or in adjacent habitat that can eventually serve as alternate corridor locations, should be designed to minimize impacts on wildlife. Design objectives for low standard or temporary roads are preferred. New roads should be gated or obliterated (temporary roads) immediately following use to avoid establishing a public use pattern.

Response:

- (10) Open road densities would be reduced with the implementation of the preferred alternative as routes not providing administrative or recreational access would be gated and closed to traffic.
- (11) Open road densities would be reduced in riparian reserves and travel corridors as described in number 10. Some roads essential to administrative or recreational access would remain open.
- (12) New roads would be constructed to the lowest standard consistent with management and resource objectives. Temporary roads, which would be closed and revegetated upon completion of their function, would be constructed whenever possible.

Coalition Members and Their Recommendations

Issue: How would the Plan be monitored to ensure implementation and modification as necessary to achieve the stated objectives?

Agreement:

Objective: The forest should be managed to attain the goals of the Plan.

- (13) Implement a monitoring program that clearly defines a question which is pertinent to current management and;
- Set priorities for the questions to be evaluated.
 - Provide reliable answers to the questions evaluated.
 - Identify acceptable limits of deviation from the stated objective.
 - Identify management response when those limits are exceeded.
 - The monitoring program should vary in a predetermined way with normal fluctuations in the annual Forest budget.

Response:

- (13) These objectives were implemented in Chapter 5 of the Forest Land and Resource Management Plan.

Issue: How would the conflict between timber production and maintenance of wildlife habitat be resolved?

Agreement:

- (14) There is no piece of ground on the Six Rivers where the only emphasis would be on timber.
- (15) The Forest would be managed for boards, not pulp.
- (16) The target harvest diameter would be 18 inches, plus or minus several inches depending on what specific sites can support. Stands would be multi-storied, with the understory containing the 18 inch trees. The overstory would be 30 inch plus trees (where site conditions allow). [It was agreed that this condition represented functional wildlife habitat for animals dependent on late seral stage vegetation.]
- (17) The Forest would maintain from 20 to 40% overstory at all times. 20% would be the minimum.

- (18) Depending on vegetation type, set standards for snags, downed logs and replacements.
- (19) The snag standards would apply on an area basis, with allowances for site specific variation.
- (20) The Forest would minimize the negative impacts of fuels treatment on soil productivity.
- (21) No stand would be entered prior to 95% CMAI. This pertains to entry to regenerate the stand, not to silvicultural entries like thinning.
- (22) Hardwood would be included in the multi-storied standard for the Douglas-fir-tanoak-madrone zone. Oaks would be retained for mast production.

Response:

- (14) All of the land managed for timber production would also be managed to provide biodiversity and ecosystem health. As a consequence, adaptive management process employed in the preferred alternative represents a fundamental departure from prescriptions used in the past that emphasized the rapid development of commercial fiber.
- (15) The silvicultural strategies that apply to the preferred alternative, would yield wood capable of being utilized for the production of boards.
- (16) The ID Team did not implement this recommendation as written. To maintain ecosystem components, structure, and processes, silvicultural treatments will be designed to mimic natural disturbance regimes for different parts of the Forest. Harvesting would restore a distribution of seral stages that reflects the natural/historic distribution for different vegetation types. By providing this distribution, functional wildlife habitat would be provided in locations across the Forest, not just in reserved areas. A mix of thinning and regeneration harvests in the matrix and the AMA would maintain desired stand structure and would also provide timber outputs. Treatments in some reserved areas would also provide desired stand structure, but would not count towards the ASQ.
- (17) Stands that are regenerated with the full retention would likely maintain about a 20 percent conifer overstory, plus additional cover from the hardwoods that are retained. Up to 10 percent of the acres regenerated each year would fall below these standards, since these acres would not necessarily retain the full green tree component. Stands that are thinned to accelerate the

development of late-successional habitat characteristics would generally be designed to retain 40 percent overstory canopy closure, and are expected to recover full wildlife functionality within a maximum of 15 years.

- (18) This issue was complied with in the retention standards. See the standards and guidelines in Chapter 4 of the Forest Land and Resource Management Plan for discussion of these standards and guidelines.
- (19) The retention standards and guidelines are expected to apply over the cutting unit (stand) and not strictly acre by acre. This would result in a clumpier distribution of snags and large trees, which more closely reflects a natural condition.
- (20) Fuels treatment would be designed to maintain both retention components as well as soil productivity. However, retention of snags and large downed woody debris would require a departure from the site preparation techniques of the past. The result will be cooler burns (favorable for maintaining site productivity) and or added emphasis on piling unwanted debris rather than broadcast burning an entire unit.
- (21) Under the planned management strategy, no stand would be entered prior to culmination of mean annual increment.
- (22) Hardwoods would be retained and would become a desired component of all managed stands that would support them. Pure hardwood stands would be retained (and not be converted to conifer production).

Issue: How would control of unwanted vegetation be accomplished?

Agreement:

- (23) The full complement of silvicultural tools would be available. [Aerial application of herbicides was not accepted, hand application was.]

Response:

- (23) All silvicultural tools, except the aerial application of herbicides would be available under the preferred alternative.

Issue: How would Research Natural Areas be dealt with?

Agreement:

- (24) The group agreed that eight Research Natural Areas would be incorporated as proposed. The eight areas would be removed from the available land base.

Response:

- (24) The eight Research Natural Areas would be established and protected under the preferred alternative.

Issue: What management should occur inside Riparian Reserves?

Agreement:

- (25) Reserves would be required around lakes and ponds. (agreed)
 - (A) Reserves would be established for all perennial and intermittent streams.
 - (B) For perennials; reserves would extend a minimum of 100 feet, horizontal distance from the high water mark on both sides of the channel, or to the extent of the inner gorge or to the extent of the riparian vegetation, whichever is greater.
 - (C) For intermittents; reserves would range from 100 feet to a minimum of 50 feet depending on the resources present or to the extent of the inner gorge or to the extent of the riparian vegetation, whichever is greater.
 - (D) Ephemeral streams would not have reserves, but would be protected from surface disturbance by designation on the sale area maps (which requires that equipment be excluded within 50 feet) and by site-specific prescriptions as appropriate to maintain water quality.
Note: Ephemeral streams must show evidence of annual scour or have a reasonable likelihood of transporting sediment for designation.

- (26) Management related to reserves:
- (A) No regulated harvest would be planned for reserves.
 - (B) Limited management can occur to:
 - (a) Maintain desired habitat structure (management intended to benefit the riparian dependent resources).
 - (b) Provide for public safety.

Response:

- (25) Reserves have been established for all perennial and intermittent streams. Reserve management and boundary designations for the preferred alternative are consistent with those from the FSEIS ROD, and are discussed in detail in Chapter 4 under Riparian Reserve Management Area direction.
- (26) Management within riparian reserves does not permit a regulated timber harvest or routine salvage program. Management to maintain a desired habitat structure would be permitted under the preferred alternative. This applies equally to all reserves whether associated with perennial or intermittent streams.

Issue: How would this alternative address salamander habitat?

Agreement:

- (27) Address salamander habitat through standards and guidelines.

Response:

- (27) Habitat for salamanders would be protected on a site-specific basis through protection buffers and survey and manage standards and guidelines as directed in the FSEIS ROD.

Issue: How would the alternative provide linkages between large functional blocks of late seral stage habitat?

Agreement:

- (28) Corridors: The discussion on corridors was limited to large, habitat connectors rather than

riparian based corridors. Some conceptual agreements were made:

- (A) Linkages between habitat areas would be needed.
 - (B) Connections (corridors) would be located within a specified area that is defined on a map.
- (29) Corridors do not need to be set aside. What is important is that a continuous cover of vegetation with the desired structure and dimensions exist between large habitat areas. We agreed that the desired structure should vary naturally in response to site class, aspect and elevation, and that our prescription for corridors should reflect that variability to the extent that it is consistent with the purpose of corridors. (There would not be a single structure/vegetation type that would serve the corridor function).
- (30) Because the timber prescription would result in a stand structure that eventually should be compatible with most wildlife needs related to diverse, multi-storied stands, a specific area would not be designated to contain the functional core corridor.
- (31) A corridor is envisioned that consists of a core or functional component (correct structure and dimension) and replacement habitat of some undetermined multiple of the width of the core.
- (32) We envision core areas migrating within the defined corridor over time such that the entire corridor would be available for timber management. This assumes that replacement habitat exists in sufficient quantity within the defined corridor to provide alternate core areas. Corridors could have bottlenecks where habitat is limited due to site or topography. These circumstances were not discussed, but could be covered by a standard or guideline to ensure that the corridor's functionality is not diminished [below the natural capability of the terrain].
- (33) The preferred alternative's multi-storied stand prescriptions would normally provide the desired structure for corridors.
- (34) Corridors would be designated by identifying the specific connection points between habitats. The path of the functional corridor would be established following on-site review.
- (35) Corridors: The need for corridors to allow transfer of individuals and genes between large habitat areas, especially for the more sedentary species,

has been agreed to. However, the implementation of the concept stalled at setting a width for the corridors. A review of the literature and discussions with experts on the subject pointed out that insufficient information currently exists to scientifically establish functional corridor widths. This issue was resolved by both sides agreeing that the Forest Service would make the decision. Everyone then would comment on the outcome during the normal comment period for the FEIS. This resolution also applied to setting the number and location of the corridors.

- (36) New roads in corridors, or in adjacent habitat that can eventually serve as alternate corridor locations, should be designed to minimize impacts on wildlife. Design objectives for low standard or temporary roads are preferred. New roads should be gated or obliterated (temporary roads) immediately following use to avoid establishing a public use pattern. (see issue 12)
- (37) The treatment of fuels within and adjacent to corridors would reflect wildlife requirements to maintain more woody debris on the ground.

Response:

- (28) Riparian reserves provide the core for ecological corridors in the preferred alternative. Additional managed corridors outside riparian reserves would also be provided if determined necessary through landscape analysis.
- (29) Corridors would be comprised of “functional habitat”. Riparian reserves would be reserved; additional corridors, if determined necessary, would be managed. Variability, based on the native productivity of the land, would be permitted.
- (30) Specific corridor locations are not determined at the Forest Planning level.
- (31) Ecological corridors would provide approximately interior core habitat, plus a buffer outside the core habitat. These areas are expected to move across the landscape as replacement habitat is developed.
- (32) Corridors outside riparian reserves would be managed utilizing silvicultural strategy 5. Management would maintain corridor function and ensure that suitable replacement habitat was available.
- (33) The preferred alternative assumes that a mature, multi-storied stand would provide suitable habitat to function as an ecological or travel corridor.

- (34) As part of landscape analyses, ID Teams will analyze whether riparian reserves alone can provide travel and ecological corridors. If corridors outside these reserves are needed, the path of the corridor would be established through a combination of landscape analysis and on-site review.
- (35) The width of the ecological corridors were set by the Forest’s ID Team, based on current literature regarding the habitat structure necessary to provide functional routes for the migration of species (genetic information) over several generations. The width in the DEIS was established at 1200 feet, assuming a 600 foot functional core with a 300 foot buffer on each side. The FSEIS ROD assumed that riparian reserves would serve as ecological corridors; additional widths outside these reserves is not established as a part of the FEIS and Final Plan; rather, widths will be determined on a site-specific basis following landscape-level analyses.
- (36) This issue was addressed in response 12. The concepts offered were incorporated without change into the preferred alternative.
- (37) Fuels treatment under the preferred alternative would be designed to reduce the risk of catastrophic fire, and would maintain large green trees, snags and downed logs. Site specific prescriptions are likely to change to achieve these goals.

Issue: How would interior habitat conditions be maintained in riparian reserves if the surrounding habitat could be managed?

Agreement:

- (38) [The group believed that] management along reserves could open the adjacent canopy, devaluing the reserves’ habitat functionality. This risk would be mitigated with a standard, whose objective would be to maintain interior habitat conditions in the riparian reserves. The standard would accommodate management prescriptions.

Response:

- (38) The biological diversity standard and guidelines in Chapter 4 of the Land and Resource Management Plan ensures that habitat will remain in functional blocks and not become dissected by roads and harvest units.

Issue: How would harsh growing sites be treated?

Agreement:

- (39) Special Regeneration Areas (Harsh Sites): Productive soils that are overlain with 18 to 24 inches of rock scree would be managed using silvicultural strategy 3 with a 240 to 300 year rotation. Sites that exhibit low productivity but meet the NFMA criteria for timber capability (20 cubic feet per acre per year) would have no regulated timber harvest.

Response:

- (39) Based on public comment during the 90-day review period, all harsh-growing sites have been removed from the regulated landbase in the preferred alternative.

Issue: How would furbearers be managed in this alternative?

Agreement:

- (40) Furbearers: Manage all non-HCA furbearer habitat as recommended in the Regional Draft Literature Review for suitable to optimum habitat (related to background). Relate the habitat capability models to the natural forest condition.

Response:

- (40) Most of the furbearer network was incorporated into LSRs and other reserves in the preferred alternative. A small number of marten and fisher territories fell outside reserved areas. Three of the marten areas are included in the Managed Habitat Management Area as part of a special habitat area in the red fir zone along South Fork Mountain. Based on the viability assessments in the FSEIS, the other territories were dropped for both the marten and the fisher.

Issue: How would visual quality be maintained in sensitive areas?

Agreement:

- (41) Visual Quality Objectives (VQO): Manage retention VQO using silvicultural strategy 3. Use standards and guidelines to control the creation of openings in “foreground” areas, (limit them to maintain visual quality). Keep Highway 36 in retention. [no agreement on this issue].

Response:

- (41) This recommendation was incorporated verbatim.

Issue: How would habitat for the bald eagle, peregrine falcon and goshawk be managed?

Agreement:

- (42) Bald eagle: Follow the recovery plan; manage six territories to meet the recovery goal of four breeding pairs and two wintering areas.
(43) Peregrine falcon: Follow the recovery plan; manage 14 territories to meet the recovery goal of 7 breeding pairs. Feeding zone managed with standards and guidelines to provide compatibility with wildlife using silvicultural strategy 5.
(44) Goshawk: Forest-Service-set direction. Manage 19 known sites at 200 acres, or 55 sites at 50 acres. The group suggested that the Forest provide a single prescription. [no group decision]

Response:

- (42) Incorporated into the preferred alternative.
(43) Incorporated into the preferred alternative.
(44) Goshawk standards and guidelines have evolved with the development of a conservation strategy for the northern goshawk (not yet complete). The original network has been replaced with interim Forest-wide standards and guidelines that establish a primary nest zone with a 0.5-mile radius, a foraging habitat zone with a 1.0 mile radius, and seasonal activity restrictions around known nest sites. These interim guidelines would be superseded by the adoption of a conservation strategy for the northern goshawk.

GLOSSARY

ABBREVIATIONS

Abbreviations and acronyms used in this document are listed below. Those with an asterisk (*) after them are further defined in the Glossary section.

AMA	adaptive management area*	GIS	geographic information system*
AM	animal month*	GRI	geological resources inventory*
AMS	analysis of the management situation	GTR	green tree retention*
ASQ	allowable sale quantity*		
AUM	animal-unit month*	HBMWD	Humboldt Bay Municipal Water District
		HCA	habitat conservation area*
BIA	Bureau of Indian Affairs	HCRS	Heritage Conservation and Recreation Service*
BLM	Bureau of Land Management		
BMP	best management practice*	HRV	historic range of variability*
CAS	capable, available, suitable*	IDT	interdisciplinary team*
CDF	California Department of Forestry	IPM	integrated pest management*
CDF&G	California Department of Fish and Game	ISC	Interagency Scientific Committee*
CEQ	Council on Environmental Quality*	IVQO	inventory visual quality objective*
CFR	Code of Federal Regulations*		
CHU	critical habitat unit*	K-V	Knutson-Vandenberg*
CMAI	culmination of mean annual increment*		
CNPS	California Native Plant Society*	LMP	land and resource management plan*
CRI	coordinated resource inventory*	LSR	late successional reserve*
CRIR	cultural resource inventory report*	LS/OG	late-successional/old growth 1 and 2*
CWD	coarse woody debris*	LTSY	long-term sustained yield*
dbh	diameter at breast height*	MAMU	marbled murrelet
DC	desired condition*	MBF	thousand board feet
DCA	designated conservation area*	MIR	minimum implementation requirements*
DFC	desired future condition	MIS	management indicator species*
DEIS	draft environmental impact statement*	MKV	minimum management requirements (market value only)*
		MLV	minimum level management*
EA	environmental assessment	MMBF	million board feet
EDD	Employment Development Department	MMR	minimum management requirements*
EIS	environmental impact statement*	MOU	memorandum of understanding*
EM	ecosystem management*		
EPA	Environmental Protection Agency	NACUA	Native American contemporary use area*
ESA	Endangered Species Act	NCIDC	Northern California Indian Development Council
EVC	existing visual condition*		
		NEPA	National Environmental Policy Act*
FEIS	final environmental impact statement	NFMA	National Forest Management Act*
FEMAT	Federal Ecosystem Management Assessment Team	NNL	national natural landmark*
		NMFS	National Marine Fisheries Service
FERC	Federal Energy Regulatory Commission	NPB	net public benefit*
FLW	maximum present net value*	NPS	National Park Service
FSEIS	final supplemental environmental impact statement	NRA	National Recreation Area
		NSO	northern spotted owl
FWS	U.S. Fish & Wildlife Service		

Glossary

OHV	off-highway vehicle	SIA	special interest area*
ORV	off-road vehicle	SMARA	State Surface Mining and Reclamation Act*
PACFISH	Pacific Fishery Management Council	SMZ	streamside management zone*
PAOT	persons-at-one-time*	SOHA	spotted owl habitat area*
PNV	present net value*	SRNRA	Smith River National Recreation Area
PSQ	probable sale quantity*	STA	Small Tracts Act*
PSW	Pacific Southwest Forest and Range Experiment Station	T&E	threatened and endangered
REO	Regional Ecosystem Office*	TBD	maximum timber production with departure*
RIEC	Regional Interagency Executive Committee*	TBR	maximum timber production for one decade*
RMR	recommended management range*	TNC	The Nature Conservancy*
RMZ	riparian management zone	TSI	timber stand improvement*
RNA	research natural area*	UDR	undeveloped dispersed recreation area
ROD	record of decision	USDA	United States Department of Agriculture
ROS	recreation opportunity spectrum*	USDI	United States Department of the Interior
RPA	Forest and Rangeland Renewable Resources Planning Act of 1974*	USFWS	United States Fish and Wildlife Service*
RVD	recreation visitor day*	VQO	visual quality objectives*
S&Gs	standards and guidelines*	WFUD	wildlife and fish user day*
SFP	special forest product*	YCC	Youth Conservation Corps
SHPO	State Historic Preservation Officer*		

GLOSSARY

This glossary gives definitions of technical terms used in the Final Environmental Impact Statement (FEIS) and Land and Resource Management Plan (Forest Plan). These definitions are specific to the Forest Service; they may not always correspond to common usage or usages in other contexts.

A

abiotic

The nonliving material components of the environment such as air, rocks, and water.

active adaptive management

See: adaptive management

activity center (spotted owl activity center)

An area of concentrated activity of either a pair of spotted owls or a territorial single owl.

adaptive management

A continuing process of action-based planning, monitoring, researching, evaluating and adjusting with the objective of improving implementation and achieving management goals. Two types of adaptive management activities are discussed in this FEIS:

- Active adaptive management implements policy decisions in the form of rigorously designed management experiments, which forces a blending of monitoring and research, with subsequent evaluation and adjustment.
- Passive adaptive management implements the best consensus plan as if it were correct.

Adaptive Management Area (AMA)

A landscape unit designated for development and testing of technical and social approaches to achieving desired ecological, economic, and other social objectives. The Hayfork Adaptive Management Area is located on the Forest.

Administratively Withdrawn Areas

Areas removed from the suitable timber base through agency direction and land management plans.

aggradation

Building of an area of earth surface by deposition, usually on a uniform grade; as the deposit of detritus and sediment by watercourses.

air shed

A region with common sources and problems of air quality.

allowable sale quantity (ASQ)

The quantity of timber that may be sold from the area of suitable land covered by the forest plan for a time period specified by the plan. This quantity is usually expressed on an annual basis as the "average annual allowable sale quantity."

alternative lifestyle

A social/residential subcategory under amenity-emphasis residents; broadly, a generic term for a rural lifestyle valuing self-sufficiency and preponderantly natural and organic practices and processes, with an emphasis on amenity resources.

amenity, amenity resource, amenity value

A Forest resource to which it is difficult to assign a quantifiable measure of value. A non-commodity resource such as most wildlife and plant species, scenery, soil, water, air, and biodiversity.

amenity-emphasis resident

People residing in the Forest sphere of influence who value amenity resources with a "greater than" emphasis in relation to commodity resources; they generally do not work in the wood products industry.

anadromous fish

Fish such as salmon, steelhead, or shad which migrate to, mature, and spend most of their adult lives in the ocean, returning to their natal freshwater streams to spawn.

animal-unit

One mature cow of approximately 1,000 pounds, either dry or with calf up to 6 months of age, or their equivalent, based on a standardized amount of forage consumed.

A

animal-unit month (AUM)

Amount of dry forage required by one animal-unit for one month; 1200 pounds is the standard in Region 5.

aquatic ecosystem

Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

arthropods

Invertebrates belonging to the largest animal phylum (over 800,000 species) including

crustaceans, insects, centipides, and arachnids. Characterized by a segmented body, jointed appendages, and an exoskeleton composed of chitin.

at-risk fish stocks

Stocks of anadromous salmon and trout that have been identified by professional societies, fish management agencies, and in the scientific literature as being in need of special management consideration because of low or declining populations.

available land

Capable forest land that has not been legislatively or administratively withdrawn from timber production. (See also: capable land, CAS.)

B

background

The most distant part of a landscape; the view of the landscape from 3-5 miles to the horizon. (See also: distance zone.)

benchmark

An analysis of the supply potential of a particular resource, or of a set of resources, subject to specific management objectives or constraints. Benchmarks define the limits within which alternatives can be formulated.

best management practices (BMPs)

The methods, measures and practices adopted by management to protect and maintain high water quality in Forest watersheds, with emphasis on preventive rather than corrective action.

biodiversity

see biological diversity

biological diversity

The abundance and distribution of plant and animal species and communities over time and space; refers to the complex of living organisms within the Forest ecosystem, emphasizing the synergism of the system and uniqueness of its various individual components. Also, the expanded genetic parameters realizable from the fullest possible expression of biological diversity. This definition is meant to be neither legal nor limiting.

biomass

The total quantity (at any given time) of living organisms of one or more species per unit of space (species biomass), or all of the species in a biotic community.

biotic

All living organisms in an area and their life processes.

board foot

A unit of measurement equal to an unfinished board one inch thick by one foot square.

botanical area

A type of special interest area intended to protect and preserve unique botanical values; areas are identified by the Forest and classified by the Regional Forester.

browse

That part of the current leaf and twig growth on woody vegetation available for animal consumption.

brush

Stands of vegetation dominated by shrubby, woody plants or low growing trees.

B**bryophytes**

Plants of the phylum Bryophyta, including mosses, liverworts and hornworts, characterized by the lack of true roots, stems, and leaves.

buffer

a designated land or water area, along the perimeter of some feature, whose use is regulated to resist, absorb, or preclude unwanted effects to the protected feature.

C**California Native Plant Society (CNPS)**

A private botanical society that cooperates with the Forest Service in identifying, studying, preserving, and enhancing native flora of California on Forest Service lands.

California Natural Diversity Database

A flora and fauna inventory and database maintained by the Natural Heritage Division of the California Department of Fish and Game, available to the Forest Service.

California Significant Natural Areas

Areas identified by the California Department of Fish and Game and included in its Natural Diversity Data Base; a type of Special Interest Area.

California Wilderness Act of 1984

The federal Act which set aside certain Wilderness Areas in California, including those in the Six Rivers National Forest. (See: Wilderness Area.)

candidate species

Species currently being reviewed by the Fish and Wildlife Service which are under consideration for possible listing as endangered or threatened. The Fish and Wildlife Service recognizes, in the Federal Notice of Review, two categories of candidate species (taxa):

category 1: Taxa for which the Fish and Wildlife Service has sufficient biological information to support a proposal to list as endangered or threatened.

category 2: Taxa for which existing information indicated may warrant listing, but for which substantial biological information to support a proposed rule is lacking.

canopy

The uppermost branch and foliage layer of a stand or forest, formed from the crowns of adjacent trees to be nearly continuous.

canopy closure

The degree to which the canopy blocks sunlight or obscures the sky. It can only be accurately determined from measurements taken under the canopy as openings in the branches and crowns must be accounted for.

capability

The potential of an area to produce resources, supply goods and services, and allow resource uses under an assumed set of management practices at a given level of management intensity. Capability depends upon current conditions and site conditions such as climate, slope, landform, soils and geology, as well as the application of management practices, such as silviculture, or protection from fire, insects and disease.

Capability Area

Geographic delineations used to describe characteristics of the land and resources in integrated forest planning. Capability areas may be synonymous with ecological land units, ecosystems, or land response units.

capable land

Forest land that produces or has the ability to produce at least 20 cubic feet of timber per acre annually.

carrying capacity

The number of organisms of a given species and quality that can survive in, and not cause deterioration of, an ecosystem through the least favorable environmental conditions that occur within a given interval of time.

C

capable, available, suitable (CAS)

Refers to Forest land capable of, available for, and suitable for timber management. (See also: capable land, available land, suitable land, tentatively suitable land.)

catastrophic event

A large-scale, high-intensity natural disturbance that occurs infrequently.

categorical exclusion

Under the National Environmental Policy Act, those actions that are categorically excluded from documentation in an environmental analysis or environmental impact statement.

cavity nester

Wildlife species, most frequently birds, that require cavities (holes) in trees for nesting and reproduction.

Class I Areas

An area designated for the most stringent degree of protection under the Clean Air Act. Included are National Parks and wildernesses designated by the 1964 Wilderness Act.

clearcut

One of several silvicultural systems designed to regenerate an even-aged stand; harvests all trees in a given contiguous area, which may be a patch, strip or stand. (See also: regeneration harvest, even-aged management, stand, silviculture, silvicultural systems.)

coarse woody debris (CWD)

The portion of a tree that has fallen or been cut and left in the woods. It usually refers to pieces at least 20 inches in diameter.

Code of Federal Regulations (CFR)

A codification of the general and permanent rules published in the Federal Register by the Executive departments and agencies of the Federal government.

commercial-interest residents

People residing in the Forest sphere of influence who, as a group, value economic diversification as a necessity; generally, that part of the business

community not directly dependent on the wood products industry, although sympathetic toward resource-dependent residents.

commercial thinning

The removal of generally merchantable trees from a stand, usually to encourage growth of the remaining trees.

commodity, commodity resource, commodity value

Monetarily quantifiable resource such as timber and recreation.

confine

To limit fire spread within a predetermined area principally by use of natural or preconstructed barriers or environmental conditions. Suppression action may be minimal and limited to surveillance under appropriate conditions.

Congressionally Reserved Areas

Areas that require Congressional enactment for their establishment, such as National Parks, Wild and Scenic Rivers, National Recreation Areas, National Monuments, and Wilderness. Also referred to as Congressional Reserves.

conifer release

Freeing trees from competing vegetation, either by manual, mechanical, or chemical means, in order to promote stand survival and growth.

connectivity

A measure of the extent to which intervening habitat truly connects forested stands, particularly older forests, for plant and animal species dispersing or moving between them.

contain

To surround a fire, and any spot fire therefrom, with control line, as needed, which can reasonably be expected to check the fire's spread under prevailing and expected conditions. The normal tactic is indirect attack and burn to human-made or natural barriers with little or no mop up.

control

To complete the control line around a fire, any spot fires therefrom and any interior islands to be saved;

C

burn any unburned area adjacent to the fire side of the control line; and cool down all hot spots that are immediate threats to the control line, until the line can reasonably be expected to hold under foreseeable conditions. The normal tactic is direct attack on the fire, if possible, and mop-up.

coordinated resource inventory (CRI)

An inventory currently being conducted on Forest to map ecological types, existing vegetation, soils, and geology in areas where site specific information is needed to address management concerns. This is being done in conjunction with an ecological classification program that establishes the ecological types to be inventoried.

corridor

In reference to wildlife, a defined tract of land, usually linear, through which a species must travel to reach habitat suitable for reproduction and other life-sustaining needs.

Council on Environmental Quality (CEQ)

An advisory council to the President established by the National Environmental Policy Act of 1969. It reviews federal programs for their effect on the environment, conducts environmental studies, and advises the President on environmental matters.

critical habitat

Under the Endangered Species Act, critical habitat is defined as “the specific areas within the geographic area occupied by a species ... on which are found those physical and biological features essential to the conservation of the species and that may require special management considerations or protection, and specific areas outside the geographic area occupied by a species at the time it is listed, upon determination that such areas are essential for the conservation of the species”. Critical habitat is designated by the Secretary, United States Department of Interior.

critical habitat unit (CHU)

An area designated by the US Fish and Wildlife Service as critical habitat for the northern spotted owl.

crown

The upper part of a tree or other woody plant carrying the main branch system and foliage above a more or less clean stem.

cubic foot

A unit of volume (of wood) equal to a cube 12 inches on all sides; an average of 6.6 board feet on this Forest.

culmination of mean annual increment (CMAI)

The point in time at which a tree or stand achieves its highest average annual growth.

cultural area

An area distinguished by significant prehistorical, historical or other cultural remains or usages.

cultural resource

Physical districts, sites, structures, buildings, networks, routes, or objects used by people historically, and in some cases still in use; may be prehistoric, historic, archeological, anthropological, architectural, or archival in nature, and are nonrenewable aspects of our national heritage.

cultural resource inventory report (CRIR)

Documentation of the inventory and evaluation of cultural resources when an area is likely to be directly or indirectly affected by projects such as timber sales or road construction. The inventory is prepared pursuant to the National Historic Preservation Act of 1966.

cumulative effects

Those effects on the environment which result from the incremental effects of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

D

decay class

See log decomposition class.

decommission

To remove those elements of a road that reroute hillslope drainage and present slope stability hazards.

dedicated lands

Lands which are withdrawn from production of commodity resources.

departure

A schedule which deviates from the principle of nondeclining flow by exhibiting a planned decrease in the timber sale and harvest schedule at any time in the future.

designated conservation area (DCA)

A contiguous area of habitat to be managed and conserved for spotted owls. This general description can be applied to two categories:

DCA 1: Category intended to support at least 20 pairs of spotted owls.

DCA 2: Category intended to support one to 19 pairs of spotted owls.

designated lands

In reference to wildlife, specifically refers to lands identified as displaying the proper habitat attributes necessary for and capable of helping to support a viable population of a given species. Key designated areas include important winter range, fawning areas, transition range, and roost sites, nesting and foraging areas.

desired condition (DC)

A portrayal of land or resource conditions which are expected to result if planning goals and objectives are fully achieved.

desired future condition (DFC)

see desired condition

diameter at breast height (dbh)

The diameter of a standing tree at a point 4.5 feet from ground level.

direct effect

An effect that occurs in generally the same time and place as the causal agent.

dispersal

The movement, usually one way, and on any time scale, of plants or animals from their point of origin to another location where they subsequently produce offspring.

dispersal habitat

The habitat, with its characteristic forest structure and composition, which is used by dispersing wildlife.

dispersed recreation

Recreation activities that may occur over a wide area and require few improvements. Examples are hiking, backpacking, hunting, fishing, wildlife watching, botanical field trips, swimming, boating, driving.

distance zone

A visual frame of reference within which to measure the impacts of management activities on the landscape, divided into three categories: foreground, middleground, and background. (See also: inventory visual quality objective.)

disturbance

A force that causes significant change in structure and/or composition through natural events such as floods, fire, wind, mortality caused by insect or disease outbreaks, or by human-caused events, such as the harvest of forest products.

diversity

The variety, distribution, and abundance of different plant and animal communities and species within the area covered by the Forest Plan.

draft environmental impact statement (DEIS)

The review form of a statement of environmental effects anticipated by implementing any Federal land management plan. It is a formal document required by law (Section 102 of the National Environmental Policy Act of 1969) and must be submitted to the public and other agencies for review and comment.

D**draft land and resource management plan (Draft LMP)**

The draft Forest Plan that accompanies the Draft Environmental Impact Statement; it develops the preferred alternative. See: Forest Plan.

drainage

An area (basin) mostly bounded by ridges or other similar topographic features, encompassing part, most, or all of a watershed.

driving issue

An issue whose resolution will force compromise between resources and shape land allocations and outputs for the various management alternatives.

E**earthflow**

A mass-movement landform and slow to rapid process characterized by downslope translation of soil and weathered rock over a discrete shear zone at the base, with most of the particles being smaller than sand.

ecological area

A primarily botanical special interest area, requiring a specific management implementation schedule, with an emphasis on ecological uniqueness and/or diversity.

ecological corridor

Natural linkages reserved on the Forest to connect large areas of wildlife habitat to serve the dispersal and movement needs of wildlife and plants, especially with the object of facilitating genetic exchange of otherwise isolated subpopulations. The linkages, or corridors, are comprised of the same or similar habitat type as the patches they are connecting. These connections include riparian areas, mid-slopes, and ridges. In the case of old-growth forest habitat connections, each corridor is planned to be sufficiently wide to retain interior old-growth associated species.

ecological integrity

The condition in which all key components of an ecological system are intact and functioning normally.

ecological process

The flow or cycling of energy, materials, and nutrients through space and time, and the linkages that exist among ecosystem elements.

ecological unit inventory (EUI)

A process to map ecological types.

ecosystem

The complex of a community of organisms and its environment functioning as an ecological unit in nature; biotic communities and their environment.

ecosystem management

The use of an ecological approach to land management to sustain diverse, healthy, and productive ecosystems. Ecosystem management is applied at various scales to blend long-term societal and environmental values in a dynamic manner that may be adapted as more knowledge is gained through scientific research and experience.

ecotone

A transition zone between two or more ecosystems.

edge

Where plant communities meet or where successional stages of vegetative conditions within plant communities come together; for example, forest and meadow, forest stand and harvest area.

E**edge effect**

Differences in microclimate, flora, fauna, stand structure, habitat values, and stand integrity (including resistance to blow down by high winds) that occur in or as a result of a transition zone where two plant communities or successional stages are joined. In this FEIS, it usually refers to the changes in the forested stand, particularly old-growth, when the stand abuts a harvested area. The effects from edge listed above generally extend two tree lengths into the forest interior, though topography, aspect, slope, and height of neighboring vegetation may increase or decrease this distance.

emphasis species

Plant or animal species identified as endangered, threatened, sensitive, or special interest; such species are given management priorities.

endangered species

Any species of plant or animal that is in danger of extinction throughout all or a significant portion of its range. Plant or animal species identified by the Secretary of the Interior as endangered in accordance with the 1973 Endangered Species Act.

endemic

A species that is unique to a specific locality.

environmental impact statement (EIS)

A statement of environmental effects anticipated by implementing any federal land management plan. A final EIS responds to comments on the draft EIS submitted to the public and other agencies for review and comment.

ephemeral stream

A stream that contains running water only sporadically, such as during and following storm events.

escapement

Adult anadromous fish who elude capture and successfully return to the streams in which they hatched to spawn.

even-aged management

The application of a combination of actions that results in the creation of stands in which trees of essentially the same age grow together. Managed even-aged forests are characterized by a distribution of stands of varying ages (and, therefore, tree sizes) throughout the forest area. The difference in age between trees forming the main canopy level of a stand usually does not exceed 20 percent of the age of the stand at harvest rotation age. Regeneration in a particular stand is obtained during a short period at or near the time that a stand has reached the desired age or size for regeneration and is harvested. Clearcut, shelterwood, or seed tree cutting methods produce even-aged stands.

existing visual condition (EVC)

An inventory conducted to measure and classify physical alteration of the Forest landscape at the present time, based on five graduated categories of visible management activity (roads, timber harvests, etc.). The categories are untouched-wilderness, unnoticed, minor disturbance, disturbed, and major disturbance.

exotic species

A species that was introduced through human activity (also called non-native species).

experimental forest

An area of a Forest reserved for research; specifically, the Yurok Experimental Forest is a portion of the Six Rivers National Forest.

“ex situ”

A genetic conservation strategy employing artificial methods outside a species' natural environment to maintain genetic variability, such as nurseries, seed banks, and fish hatcheries. (See also: in situ, biodiversity.)

extirpation

The elimination of a species from a particular area.

F

“50-11-40” rule

A rule for Forest Service land management within the range of the northern spotted owl, proposed by the Interagency Scientific Committee to facilitate the long term viability of the species. The rule requires that 50 percent of forest outside of and adjacent to habitat conservation areas be managed to maintain stands of trees with an average conifer diameter of 11 inches (dbh) and 40 percent canopy.

fecundity

The number of female young produced per adult female in a population.

fire regime

The characteristic frequency, extent, intensity, severity, and seasonality of fires in an ecosystem.

fish-bearing stream

A stream containing any species of fish for any period of time.

floodplain

A level lowland bordering a stream or river onto which the flow spreads at flood stage.

forage

All browse and herbaceous plants that are available to feed livestock or wildlife.

foreground

The view of the landscape up to one quarter to one half mile distant. (See also: distance zone.)

Forest and Rangeland Renewable Resources Planning Act of 1974 (RPA)

A federal law requiring that National Forests develop Forest Plans encompassing a 10 to 15 year planning period.

forest matrix

Land within the range of the northern spotted owl that lies outside reserved areas.

Forest Plan

The Forest Land and Resource Management Plan, source of management direction for an individual Forest specifying activity and output levels for 10 to 15 years.

FORPLAN

The primary computerized Forest Plan modeling tool; a linear programming software package used to help allocate land for particular resource emphasis, develop schedules for outputs (timber harvest, for example), and analyze the planning alternatives.

forest types

Vegetation types found within the Forest and identified through the on-going ecological classification program. Types of vegetation based on timber stands of similar development and species composition are: Douglas-fir-tanoak-madrone, pacific Douglas-fir, white fir, red fir, Port-Orford cedar, Jeffrey pine, and white oak-black oak. Chapparral and grassland are the two other vegetation types found on Forest. (See also: timber type.)

fragmentation

Process of reducing size and connectivity of stands that comprise a forest, eventually isolating forest stands; the creation of habitat islands through harvest, land development or through natural causes such as fire.

FSEIS ROD

The Record of Decision for the "Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl." Also called the President's Plan or Option 9.

fuels

Any material capable of sustaining or carrying a fire, usually natural material both live and dead.

fuel loading

The weight of fuel present at a given site; usually expressed in tons per acre. The value generally refers to the fuel that would typically be available for consumption by fire. Fuel loading varies as a result of disturbance, the magnitude of disturbance, the successional stage of the vegetation, and other site conditions.

F

functional habitat

Here, an area of forest vegetation, usually managed, with the age-class, species of trees, structure, canopy closure, sufficient area, and adequate food source to meet some or all of the life needs of the spotted owl, as well as other mature and late successional stage species. Functional habitat implies that all key components of an old-growth forest ecosystem are intact and functioning normally.

functional plan

A plan developed prior to the Forest Plan that outlined the activities and projects for a particular resource or functional area. Such plans will be superseded by the Forest Plan or the guidance in them used for site-specific management until they are replaced by implementation plans or schedules.

furbearer

Wildlife species formerly trapped for their pelts and currently protected, such as fisher, marten, and wolverine.

G

general forest management area

An area of the Forest not managed for special or unique resource values— such as wilderness or botanical resources—that may be managed for multiple-use, including wildlife habitat, timber production, and so forth.

geologic area

A type of special interest area intended to protect and preserve outstanding geologic features.

genetically local source

Plant materials that originated at or within the same seed zone and elevation band as a project site.

geologic resources inventory (GRI)

An inventory used to map geologic areas on the Forest and identify landslide hazard areas.

genetic variability

The prerequisite biological condition for maintaining biodiversity; refers to the available genetic combinations in a population's gene pool. In general, the greater the variety of possible combinations the better the population's chances of sustaining itself in the wild.

grazing

The consumption of forage by animals

genetic viability

The ability of a species to maintain a healthy gene pool; a function of genetic variability and population dynamics.

greensticker

A green sticker that is received and displayed on an OHV as a result of registering the vehicle under the State of California OHV registration program. Also used as a reference to the OHV registration program itself.

genotype

The unique genetic constitution of an individual or group.

green tree retention

A stand management practice in which live trees, as well as snags and large downed wood, are left as biological legacies within harvest units to provide habitat components over the next management cycle.

geographic information system

A computerized system for storing and analyzing information about the resource attributes of geographic points, lines, or areas.

group selection

A timber harvest method in which trees are removed in small groups, primarily to manage for uneven-aged stands.

guideline, guide

See standard and guideline

H

habitat capability

The estimated ability of an area, given existing or predicted habitat conditions to support a wildlife, fish, or plant population. It is measured in terms of potential population numbers.

habitat conservation area (HCA)

A contiguous block of habitat to be managed and conserved for breeding pairs, connectivity, and distribution of owls, application may vary throughout the range according to local conditions. HCAs were identified by the Interagency Scientific Committee.

habitat diversity

Distribution and abundance of plant and wildlife habitats.

habitat island

The occurrence of a habitat, such as an old-growth forest, that is physically separated from the next closest habitat of the same type by vegetation that is markedly different in composition and structure.

“half-pounder”

A steelhead 10-16 inches in length that migrates twice from freshwater to the ocean and back again in its life span; found only on the Klamath, Eel, and Rogue rivers and prized by sport fishers.

harvest

Refers principally to commercial logging operations (exclusive of salvage sales) on the Forest; also applied to other seasonal bioresource gathering, as in the commercial and sport harvest of anadromous fish.

implementation schedules

The schedules of projects and specific actions to implement a Land and Resource Management Plan.

indicator species

Species of fish, wildlife, or plants which reflect ecological changes caused by land management activities.

indirect effect

Those effects occurring at a later time or distance from the triggering action.

harvest species

Wildlife species seasonally subject to sport or commercial harvest under regulation; game species (deer, bear, quail, and so on).

hazard tree

A tree is considered hazardous if it has visible defects that may cause personal injury, death, or significant property damage. Examples of defects include detectable deformities causing loss in structural integrity, dead or dying trees, visible signs of slope instability or loss of root strength, or significant lean or large trees which could impact persons directly be either falling or rolling.

helibase

A location within the general area of a wildfire or emergency event that it used to park, maintain, fuel and load helicopters.

Heritage Conservation and Recreation Service (HCRS)

A Federal agency in the Department of the Interior responsible for identifying candidate streams for potential inclusion in the National Wild and Scenic Rivers system.

Historic Range of Variability (HRV)

The historic spectrum of conditions possible in ecosystem composition, structure, and function considering temporal, spatial, and environmental factors. Generally does not include large-scale human-induced alterations.

in-lieu-of-tax fees

Fees disbursed to counties by the Bureau of Land Management in lieu of property taxes on Federal lands; the current rate for Six Rivers NF is 10 cents an acre.

inner gorge

A stream reach bounded by steep valley walls that terminate upslope into a more gentle topography. Common in areas of rapid stream downcutting or uplift, such as northern California.

I
=

in situ

Conserving genetic variability within a species' natural environment; basically promoted by habitat maintenance and avoidance, as in Wilderness Areas. (See also: ex situ, biodiversity.)

integrated pest management (IPM)

A strategy for controlling pests by integrating pest information and treatment methodology with other pertinent management considerations; a 5-step procedure of prevention, detection, evaluation, suppression, monitoring. IPM may use one, all, or any combination of available suppression techniques, subject to the integrated management considerations. A basic principle governing choice of techniques is that they be ecologically acceptable.

Interagency Scientific Committee (ISC)

A committee of scientists from federal land and resource management agencies commissioned by the Forest Service to evaluate strategies for ensuring the long term viability of the northern spotted owl.

interdisciplinary team (IDT; ID team)

A group of individuals with different training and expertise assembled as a team to solve a problem or perform a task. The guiding principle is that no one discipline is sufficiently broad to adequately solve the problem, and no single discipline is of overriding importance to the performance of the task. The team works through the dynamics of

interaction, rather than each member completing a portion of the solution or task independently (the multidisciplinary team).

intermittent stream

Any non-permanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams (FSEIS ROD).

inventory visual quality objective (IVQO)

An inventory of the potential scenic objectives on Forest as derived from a matrix of three elements: variety class, sensitivity levels, distance zones. The IVQOs define different levels of visible landscape alteration possibilities. (See also: visual quality objectives, visual management system, variety class, sensitivity level, distance zone.)

irretrievable commitments

Applies to losses of production or use of renewable natural resources for a period of time. For example, timber production from an area is irretrievably lost during the time an area is used for skiing. If the use is changed, timber production can be resumed. The production lost is irretrievable, but the action is not irreversible.

irreversible commitments

Decisions causing changes which cannot be reversed. Once used, the resource cannot be reinstated, nor can opportunities be recovered. Applies to nonrenewable resources such as minerals and cultural resources.

K
=

key watershed

A watershed containing: (1) habitat for potentially threatened species or stocks of anadromous salmonids or other potentially threatened fish; or (2) greater than six square miles with high-quality water and fish habitat.

known pairs or resident singles (owls)

Northern spotted owl activity centers identified as of January 1, 1994.

Knutson-Vandenberg Act of 1930

This authority allows funds from timber sale receipts to be allocated to reforestation, wildlife, and other resource improvement in the timber sale area. Funds authorized under this Act are known as K-V funds.

L

Late Successional Reserve (LSR)

A Forest in its mature and/or old-growth stages that has been reserved to protect habitat. LSRs are one of the land allocations designated in the FSEIS ROD.

landscape

An ecosystem planning term used to describe a cluster of interacting ecosystems which repeat in a similar form throughout a land area. Landscapes are areas measured in terms of hundreds to millions of acres, and are relatively homogenous with respect to climate, landforms and disturbance regimes.

legacy

Remnant trees of original forest stands, both alive and dead, that are left on harvest units to assist in meeting habitat requirements of various species in the next forest rotation, as well as to provide genetic continuity. See green tree retention.

limits of acceptable change (LAC)

A planning framework that establishes explicit measures of the acceptable and appropriate resource

and social conditions in wilderness settings as well as the appropriate management strategies for maintaining or achieving those desired conditions.

log decomposition class

Any of five stages of deterioration of logs in the forest. Stages range from essentially sound (class 1) to almost total decomposition (class 5).

long-term sustained yield (LTSY)

The maximum timber harvest that can be sustained, indefinitely, when all stands have been converted to a managed state.

LS/OG 1s and 2s

Most significant old-growth, and significant old-growth, as mapped by the Scientific Panel on Late-Successional Forest Ecosystems, Johnson et. al. 1991. These designated areas are a component of Late-Successional Reserves.

M

maintenance species

Animal species which are not listed as Endangered, Threatened, or Sensitive nor given any special management emphasis; habitat is managed to maintain viable populations.

Managed Late-Successional Areas

Protection buffers for a number of species. These land allocations from the FSEIS ROD are a component of the managed habitat management area.

management area

An area with similar management objectives and a common management prescription.

management area direction (MAD)

The particular management prescription and resource emphasis for any given management area; a fixed commitment that cannot be altered without amending the Forest Plan.

management indicator species (MIS)

Animals or plants selected for special attention in the Forest plan for one or more of three reasons:

- emphasis species- species to be managed as key resources on the basis of identified issues, such as threatened, endangered, rare, sensitive, harvest, or special interest species;
- indicate special habitat conditions - species that require specific habitat such as snags, riparian, old-growth forest stands.
- indicate cumulative forest ecosystem change - generally species having large home ranges and requiring a diversity of habitats.

M**management opportunities**

Opportunities for resource management suggested by both the public and Forest Service staff in the development of the DEIS and Forest Plan; along with issues and concerns, they influence the formulation of alternatives.

management requirements and constraints

A specific set of standards for resource protection, vegetation manipulation, silvicultural practices, riparian areas, soil, water, and diversity imposed by law and regulation, Regional standards and guidelines, and Forest standards and guidelines. (See also: minimum management requirements, minimum implementation requirements, timber policy constraints.)

marbled murrelet

A robin-sized seabird belonging to the family Alcidae, that nests in large conifers in old-growth forests along the coast of the north Pacific ocean. The marbled murrelet is listed by the state of California as endangered and is proposed for Federal listing as threatened.

marbled murrelet zone 1

A 10 to 40 mile-wide zone adjacent to marine areas in which the majority of marbled murrelet detections and nests are located.

marbled murrelet zone 2

An inland zone that abuts marbled murrelet zone 1. Numbers of murrelet detections in zone 2 indicate that it is used by only a small fraction of the breeding population.

matrix

Federal lands outside of reserves and withdrawn areas.

mature forest

Generally a conifer stand that has reached culmination of mean annual increment, with an average diameter at breast height of at least 21 inches and exhibiting a low degree of decadence; stands are both even-aged and uneven-aged in structure, with varying degrees of understory development, and large diameter snags and down material are present.

maximum present net value (FLW)

A benchmark analysis that simulates the Forest at maximum marketable output in the most unconstrained manner possible; timber policy constraints, minimum management requirements, and minimum implementation requirements do not apply.

maximum timber production for one decade (TBR)

A benchmark analysis that simulates the Forest for a maximum timber output in the first decade, subject to minimum management requirements and timber policy constraints.

maximum timber production with departure (TBD)

A benchmark analysis that simulates the Forest for a maximum timber output in the first decade, not subject to non-declining yield.

McDonald's rock-cress

The only Endangered plant species on the Forest.

mean annual increment

The average yearly growth of a tree or stand of trees, determined by dividing the cubic foot volume of the tree or stand by its age.

mechanized recreation

Recreational activities involving the use of mechanized vehicles such as bicycles.

memorandum of understanding (MOU)

A legal agreement between the Forest Service and other agencies or organizations that states specific measures the signatories will take to accomplish a large or complex project; not a fund obligating document.

microclimate

The climatic condition within a small or local habitat that is well defined.

microhabitat

A restricted set of distinctive environmental conditions that constitute a small habitat, such as under a log.

M**middleground**

The view of the landscape from a quarter to half mile up to three to five miles; the viewed area between the foreground and background. (See: distance zone.)

mineral fractions

Small parcels of National Forest System lands interspersed with or adjacent to lands transferred out of Federal ownership under the mining laws.

mineral withdrawal

An area of Federal land withdrawn from mineral location, exploration, and development.

minimum implementation requirements (MIRs)

Forest Service requirements intended to ensure that management plans are acceptable and implementable on the ground; includes sensitive plant management and visual quality management on highways 299, 199, 96, and 36.

minimum level management (MLV)

A benchmark analysis that simulates the Forest at zero marketable output, determining the minimum cost of maintaining the Forest in federal ownership. The FLW and MLV provide the extreme upper and lower parameters of Forest resource and economic capability.

minimum management requirements (MMRs)

Minimum constraints needed for consistency of analysis between Forests; from National Forest Management Act Regulations (36 CFR 219.27). MMRs define minimum standards in the following areas:

- determination of lands suitable for timber production
- threatened and endangered species
- viable populations
- diversity of plant and animal communities
- riparian areas
- soil and water productivity

MMR is also a benchmark analysis that simulates the Forest at maximum present net value, subject to MMRs and timber policy constraints, for both market and assigned (qualitative) values.

minimum management requirements [market value only] (MKV)

A benchmark analysis that simulates the Forest at maximum present net value, subject to MMRs and timber policy constraints, for established market values only.

mitigation

Mitigation includes (a) avoiding the impact altogether by not taking a certain action or parts of an action; (b) minimizing impacts by limiting the degree or magnitude of the action and its implementation; (c) rectifying the impact by repairing, rehabilitating, or restoring the affected environment; (d) reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and (e) compensating for the impact by replacing or providing substitute resources or environments.

model

An idealized representation of reality developed to describe, analyze, or understand the behavior of some aspect of it; a mathematical representation of the relationships under study. Here, computerized simulations describing and projecting Forest resource composition, land allocations, and output schedules for the various alternatives.

monitoring

A process of collecting information to evaluate whether or not objectives of a management plan are being realized.

motorized recreation

Recreational activities involving the use of motorized vehicles such as automobiles, OHVs, motorboats, jet skis, or snowmobiles.

multilayered canopy

Forest stands with two or more distinct tree layers in the canopy, synonymous with multistoried stands.

multiple-use

The management of all the various renewable surface resources of the National Forest System so that they are utilized in the combination that will best meet the needs of the American people; making the most judicious use of the land for some or all of

M

these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; that some lands will be used for less than all of the resources; and harmonious and coordinated management of the various resources, each with the other, without impairment of the productivity of the land, with consideration being given to the relative values of the various resources, and not necessarily the combination of uses that will give the greatest dollar return or the greatest unit output.

Multiple-Use Sustained Yield Act, 1960

This act states the policy of Congress that the national forests are established and administered for multiple-use.

N

National Environmental Policy Act of 1969 (NEPA)

An Act declaring a Federal policy to encourage productive harmony between humans and their natural environment, to promote efforts which will prevent or eliminate damage to the environment and the biosphere and stimulate the health and welfare of humans, to enrich the understanding of the ecological systems and natural resources important to the nation, and to establish a Council on Environmental Quality.

National Forest Management Act of 1976 (NFMA)

Amends the Forest and Rangeland Renewable Resources Planning Act of 1974 and requires the preparation of Forest Plans.

National Forest System

The National Forest System consists of units of Federally owned forest, range, and related lands throughout the United States and its territories, united into a nationally significant system dedicated to the long-term benefit for present and future generations. The National Forest System includes all national forest lands acquired through purchase, exchange, donation, or other means, the national grasslands and land utilization projects administered under Title III of the Bankhead-Jones Farm Tenant Act, and other lands, waters, or interests therein which are administered by the Forest Service or are designated for administration through the Forest Service as a part of the system.

national natural landmark (NNL)

Areas identified by the National Park Service which represent the geologic or ecological character of the United States in an outstanding way; for example, the Trinity Alps or Stony Creek Bog. Regarded as special interest areas, they may be managed for multiple-use if designated, as long as the integrity of their features is protected from alteration.

National Register of Historic Places

A register of cultural resources of national, state or local significance maintained by the Department of the Interior.

National Forest Scenic Byway

State highways, county roads, and forest development roads that are designated by the Chief of the Forest Service for their existing or potential high degree of scenic, recreation, historical, educational, scientific, or cultural features of interest to the motoring public.

National Wild and Scenic River System

Rivers with outstanding scenic, recreational, geologic, fish and wildlife, historic, cultural or other similar values, designated by Congress for preservation of their free-flowing condition.

Native American contemporary use area (NACUA)

Areas designated on the Forest as being of particular historic and contemporary interest to local Indian communities; they are protected in recognition of the spiritual and cultural values associated with them.

N**native plant**

A plant that occurs and has evolved naturally in an area as determined by climate, soil, and biotic factors.

natural

Existing in, or formed by, nature; not artificial.

natural range of variability

see historic range of variability

neotropical

Of the biogeographic realm that includes South America, the Indies, Central America and tropical Mexico.

nesting, roosting, and foraging habitat

The forest vegetation with the age class, species of trees, structure, sufficient area, and adequate food source to meet some or all of the life needs of a particular species.

net annual growth

The average annual growth of a stand by volume.

net public benefit (NPB)

An expression used to signify the overall long-term value to the nation of all outputs and positive effects (benefits) less all associated inputs and negative effects (costs) whether they can be quantitatively valued or not. Net public benefits are measured by both quantitative and qualitative criteria rather than a single measure or index. The maximization of net public benefits to be derived from management of units of the National Forest System is consistent with the principles of multiple-use and sustained-yield.

new perspectives

An approach to managing forests and rangelands to sustain their full array of values. New perspectives incorporates public participation, and focuses on leaving a larger portion of the timber sale area to meet wildlife habitat needs, improve esthetics, protect soil and water quality, maintain genetic resources, and so on.

new rural

Amenity-emphasis residents who are professional by trade and have immigrated to this area from more developed urban and suburban areas, chiefly to enjoy the quality of life.

1990 Farm Bill

Directs the Forest Service to cooperate with state and local agencies and authorities to develop rural economic diversification; authorizes loans and expenditures to local communities.

non-attainment area

A geographic area in which the level of a criteria air pollutant is higher than the level allowed by federal standards set by the Environmental Protection Agency. A single geographic area may have acceptable levels of one criteria air pollutant, but unacceptable levels of other criteria pollutants, resulting in an area that is in both attainment and nonattainment status at the same time.

non-commercial tree species

Conifer and hardwood species whose yields are not reflected in the commercial conifer forest land allowable sale quantity.

non-consumptive species

Wildlife species other than game animals or furbearers in general, but may also include game and furbearers; species appreciated via non-consumptive uses, such as birdwatching.

non-declining yield

Timber harvest policy in which a given decade's timber removal does not fall below the level of the previous decade.

non-driving issues

Issues identified by the scoping process which do not require a substantial trade-off between resources to be resolved.

non-forest land

Lands that are incapable of having 10 percent or more of the area occupied by forest trees, or lands developed for other uses.

N

northern spotted owl

Wildlife species occurring on the Forest that was classified as a Threatened species by the US Fish and Wildlife Service on June 23, 1990, in accordance with the directives of the Endangered Species Act. Maintaining a viable population of this species was a driving issue in the formulation of this DEIS and Forest Plan.

nutrient cycle

The circulation of chemical elements, such as nitrogen and carbon, in specific pathways from the abiotic portions of the environment into the organic substances of the flora and fauna and then back again into abiotic forms.

O

off-highway vehicle (OHV)

Generally, vehicles designed to travel over rough terrain; any vehicle that is restricted by law from operating on public roads for general motor vehicle traffic, including motorbikes, minibikes, trailbikes, snowmobiles, dune buggies, and all-terrain vehicles. OHV also includes highway legal, four wheel drive, high clearance vehicles. Often referred to as off-road vehicles.

off-road vehicle (ORV)

See definition of off-highway vehicle.

old-growth

Refers to old-growth forest; in general, ecosystems distinguished by old trees and related structural attributes. Old-growth encompasses the later stages of seral development that typically differ from earlier stages in a variety of characteristics which usually include larger tree size, higher accumulations of large dead woody material, multiple canopy layers, different species composition, and different ecosystem function. The structure and function will be influenced by stand size. On Six Rivers, old-growth usually averages 21-30 inches or greater in diameter at breast height and 120-150 or more years of age, with a basically closed (70% or greater) canopy.

No standard biological definition for old-growth as yet exists; the above is a working definition and is not intended to be either comprehensive or conclusive. It should be noted, however, that in common usage, old-growth is those forests or stands in which the evidence of humans is unobtrusive, and human landscape or ecosystem altering activities nonexistent; as such, old-growth represents vestiges of America's original natural condition.

old-growth associated species

Plant and animal species that exhibit a strong association with old-growth forests.

open road density

The length of Forest development roads open for public access and use per unit area of land; usually expressed as miles of open road per square mile of land.

output

A good, service, or on-site use that is produced from forest and rangeland resources.

overstory

Trees in a forest which form the uppermost layer of foliage in a forest with more than one roughly horizontal layer of foliage.

P

Pacific yew

Evergreen tree species found on Forest. The anti-cancer drug taxol can be extracted from its bark.

partial cutting

The removal of selected trees from a forest stand.

passive adaptive management

See: adaptive management

patch

A small (20-60 acres) part of the forest. An area of vegetation that is internally homogenous, differing from what surrounds it.

perennial stream

A stream that typically has running water on a year-round basis.

persons-at-one-time (PAOT)

A measure of the potential of a Forest recreation resource; the number of people that can use a facility or area at the same time. PAOT-days are the number of PAOTs multiplied by the number of days the facility or area is publicly available for use.

pest

Either a native or exotic organism found on the Forest that may interfere with the attainment of the Forest's goals and objectives regarding resource management; that is, fungal diseases of trees, parasitic plants, certain insects, and so on. Native species are recognized as a naturally occurring part of the ecosystem and may or may not be regarded as a pest in a given situation, depending on the management prescription.

pest complex

Condition of vegetation, environmental factors, and/or management activities in association with a pest which results in increased damage; for example, the spread of the fungus *Phytophthora lateralis* (Port-Orford cedar root disease), a soil borne fungus, on muddy wheels and undercarriages, or the infestation of drought weakened trees by parasitic insects.

physiographic province

A large geographical area having a similar set of biophysical characteristics and processes due to

effects of climate and geology which result in patterns of soils and broad-scale plant communities. Habitat patterns, wildlife distributions, and historical land use patterns may differ significantly from those of adjacent provinces. The Forest lies within two physiographic provinces, the California Klamath and the California Coast Range Provinces.

planning horizon

The overall time period considered in the planning process that spans all activities covered in the analysis or plan and all future conditions and effects of proposed actions which would influence the planning decisions.

planning period

One decade. The time interval within the planning horizon that is used to show incremental changes in yields, costs, effects, and benefits.

plantation

A stand of trees resulting from planting or artificially seeding a harvested area.

PM10

Particulate matter smaller than 10 micrometers in size. A criteria pollutant comprised of airborne solid and liquid particles that are 10 micrometers or smaller in size. Because of its small size, PM10 readily lodges in the lungs, thus increasing respiratory and cardiac diseases in humans and other organisms.

pole size

A tree 5-10.9 inches in diameter (dbh).

population persistence

General term for the capacity of a population to maintain sufficient numbers and distribution over time.

population viability

Probability that a population will persist for a specified period of time across its range despite normal fluctuations in population and environmental conditions.

P**Port-Orford cedar**

A conifer species of high commercial value occurring on forest; it occupies a restricted range in SW Oregon and NW California and is threatened by a fungal root disease, *Phytophthora lateralis*.

potential natural vegetation

The vegetation that would be established if all successional sequences of its ecosystem were completed without additional human-caused disturbance under present environmental conditions. Grazing by native fauna, natural disturbances such as drought, floods, wildfire, insects and disease, and windstorms, are inherent in the development of potential natural vegetation.

precommercial thinning

See: thinning.

preferred alternative

The Forest Plan alternative which, in the judgement of Forest Service staff, best achieves the goal of maximizing long-term public benefits while responding effectively to the issues identified in the scoping process.

prescribed burn

Intentional use of fire under predetermined weather and fuel conditions to achieve specific objectives, such as disposing of slash, controlling competing vegetation, or reducing wildfire hazards.

prescription

The set of management practices applied to a specific area to attain specific objectives.

present net value (PNV)

The difference between the discounted value (benefits) of all outputs to which monetary values or established market prices are assigned and the total discounted costs of managing the planning areas.

primary range

Areas which animals prefer to use when management is limited. Primary range will be overused before secondary range is fully used.

probable sale quantity (PSQ)

Probable sale quantity was used by the Federal Ecosystem Management Assessment Team (FEMAT) rather than allowable sale quantity (ASQ) to describe the allowable harvest levels for the various alternatives in the Final SEIS that could be maintained without decline over the long-term if the schedule of harvests and regeneration were followed. "Allowable" was changed to "probable" to reflect some uncertainty in the calculations for the various alternatives, for example, many of the alternatives require watershed analysis in key watersheds before timber harvest can occur. Estimates were made of probable sale levels using a set of interim rules for those key watersheds. PSQ is otherwise comparable to ASQ. PSQ includes only scheduled or regulated yields from the matrix and does not include "other wood", or volume of cull and other products that are normally not part of the ASQ calculation.

proposed species

Any species of fish, wildlife, or plant that is proposed in the Federal Register by the Fish and Wildlife Service or the National Marine Fisheries Service to be listed as threatened or endangered. Two species on the Forest are proposed for federal listing, the marbled murrelet and the Pacific yew.

protocol

A particular methodology used to survey and inventory for specific wildlife species, such as the spotted owl or marbled murrelet. Protocols incorporate techniques that have been developed using specific criteria based on the biology of the species, and usually involve complex surveying requirements. One of the main objectives of using a protocol is to have it recognized and approved by the scientific research community and management agencies so that data collection throughout the range of the species is standardized, and can be compared across administrative boundaries (between National Forests, for example).

province

see physiographic province

R

range

Any land supporting vegetation suitable for grazing including rangeland, grazable woodland, and shrubland. Range is not a use.

rare

Plant or animal species which are uncommon in a specific area. All threatened, endangered, and sensitive species can be considered rare, but the converse is not true.

recommended management range (RMR)

A recommended range of environmental conditions that is expected to maintain ecosystem process and function; usually a subset of the historic range of variability.

record of decision

A document separate from but associated with an environmental impact statement that states the management decision, identifies all alternatives including both the environmentally preferable and selected alternatives, states whether all practicable means to avoid environmental harm from the selected alternative have been adopted, and if not, why not.

recovery plan

A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act, to improve the status of the species to justify delisting in accordance with the Endangered Species Act.

recreation opportunity spectrum (ROS)

A system for planning and managing recreation resources based on physical setting, experience potential, and appropriate activities, with social setting and managerial situation also considered; the spectrum is divided into five classes:

Primitive (P): an area 3 miles or more from roads and trails with motorized use; generally 5000 acres or more in an essentially unmodified, natural environment.

Semi-primitive non-motorized (SPNM): an area 0.5 mile from roads and trails with motorized use; generally 2500-5000 acres with only subtle modifications to an otherwise natural setting.

Semi-primitive motorized (SPM): same as SPNM but with motorized use of roads and trails, including OHV touring, snow-mobile use, etc.

Roaded natural (RN): an area 0.5 mile or less from roads; resource modifications range from evident to strongly dominant.

Rural (R): setting is substantially modified with structures or other cultural modifications.

recreational river

A classification of the National Wild and Scenic River System: rivers or sections of rivers that are readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

recreation visitor day (RVD)

Standard unit of measurement for recreational use of an area; 12 hours of use in any combination of persons and hours.

reforestation

The natural or artificial restocking of an area usually to produce timber and other wood products, but also to protect watersheds, prevent soil erosion, and improve wildlife, recreation and other natural resources.

refugia

Locations and habitats that support populations of organisms that are limited to small fragments of their previous geographic range.

regeneration

The renewal of a Forest stand after harvest or wildfire, either by natural or artificial means.

regeneration harvest

Any harvest of trees that will be followed by the establishment of a new stand; accomplished by clearcut, shelterwood or seed tree cut.

R

Regional Guide for the Pacific Southwest Region

The Regional management directive for the National Forests in Region 5 that distributes the Region's portion of Forest Service national objectives to the individual forests, provides standards and guidelines for various management activities, and provides planning direction for developing Forest Plans.

Region 5

The Forest Service administrative unit comprising all of the National Forests in California, Hawaii, Guam, and the Trust Territories of the Pacific Islands. The Regional Office is in San Francisco.

Regional Interagency Executive Committee (RIEC)

Regional or state heads of various agencies implementing the FSEIS ROD direction, such as the USFS, BLM, USFWS, EPA, and NMFS. This committee makes decision regarding implementation of the FSEIS ROD.

Regional Ecosystem Office (REO)

A working team established to implement the direction provided in the FSEIS ROD. It consists of representatives from various agencies whose primary role is to coordinate and facilitate implementation decisions, prepare implementation plans, establish necessary working teams, make recommendations to the Regional Interagency Executive Committee, and to take whatever actions are needed to implement the policy and decisions flowing from the RIEC.

Regional Forester

The executive official charged with administering a Forest Service Region.

regulated harvest

The volume of timber in the allowable sale quantity (ASQ) that is based on the growth and yield projections for growing trees on a sustained yield basis on all suitable commercial Forest land.

rehabilitation

Improving a project site to a more desired condition than previously existed, usually as a result of a major disturbance.

Research Natural Area (RNA)

A component of a nationwide network of areas that will eventually represent and preserve the full array of American ecosystems, in as near a natural condition as possible. They are primarily designed for scientific and educational purposes and are not open to commercial or most public uses.

reserved land

Federal lands, often in preserved or protected status, that have been removed from the acreage base used to calculate timber yields; for example, wilderness areas or parks.

reserved pair area

Area of suitable habitat identified for pairs and territorial single spotted owls in those portions of the range where habitat and owl populations are inadequate to apply the criteria of designated conservation areas. The acreage of these areas is variable, depending on the data for pairs in each province. All suitable habitat is reserved within an area equal to the mean home range for that province.

residual habitat area

Area of nesting, roosting, and foraging habitat equal to 100 acres, that encompasses the activity center for a pair of owls or territorial single owl in the forest matrix.

resilience

A system's ability to maintain structure and patterns of behavior in the face of disturbance.

resource

Any Forest attribute of value, either qualitative or quantitative; resource elements include recreation, wilderness, fish and wildlife, timber, range, water, soil, air, minerals, biodiversity, culture.

resource-dependent resident

People in the Forest sphere of influence who value commodity resources with a "greater-than" emphasis in relation to amenity resources; often employed in the wood products industry or at least partially dependent on people employed in the wood products industry. (See also: commercial-interest resident.)

R

restoration

re-establishing a project site to a previously existing natural condition using similar or identical native vegetation.

revegetation

a general term for renewing the vegetation on a project site, which may include restoration and rehabilitation.

riparian reserves

Designated riparian buffers around perennial and intermittent streams.

riparian zone

The aquatic ecosystem, the riparian ecosystem, floodplains, wetlands, ponds, and the riparian

management zone. Riparian zones are lands situated along the banks of a stream or other body of water and directly influenced by its presence.

roadless area

An area typically exceeding 5,000 acres that was inventoried during the Forest Service's Roadless Area Review and Evaluation (RARE II) process and remain in a roadless condition.

rotation

The planned number of years between the establishment of a stand of timber and its final harvest at a specified stage of maturity.

S

salmonid

Refers to fish of the family salmonidae. These include all salmon, trout, and whitefish.

salvage

Harvest of dead or dying trees resulting from wildfire, insect infestation or disease.

sanitation cut

The removal and utilization of dead, damaged, diseased, or insect-infested trees to minimize losses from pests.

sawtimber

Trees suitable in size and quality for the production of dimension lumber.

scenic river

A classification of the National Wild and Scenic River System: rivers or sections of rivers that are free of impoundments, with shorelines or watersheds still largely undeveloped and primitive but accessible in places by roads.

scoping

The process by which the array of issues and concerns addressed in an environmental impact

statement are determined, and the most significant, or "driving," issues identified; an open forum in which the public is encouraged to participate.

secondary range

Range which is lightly used or unused by livestock under minimal management and will ordinarily not be fully used until the primary range has been overused.

section

One of the levels in the National Hierarchical Framework of ecological units. Sections are subdivisions of provinces that have similar regional climate, geomorphic process, stratigraphy, geologic origin, topography, drainage networks, and potential natural vegetation.

sediment threshold

The maximum volume of sediment that a watercourse can carry without causing aggradation and subsequent bank cutting and landslides.

seed tree

Seed-bearing trees left either singly or in small groups after timber harvest to provide seed for regeneration of the site.

S

selection cut

Removal of mature timber either as single, scattered trees or in small groups; performed in the same stand at relatively short intervals (5-20 years) in order to achieve a balance between diameter classes needed to realize sustained yield. This silvicultural system encourages natural regeneration and maintains an uneven-aged stand.

selective cutting

Not a silvicultural system, but often used as a term to describe the harvest of individual trees from a stand as part of a thinning (even-age system) or as a selection cut (uneven-aged system).

sensitive species

Those plant and animal species identified by the Regional Forester for which population viability is a concern as evidenced by significant current or predicted downward trends in a) population numbers or density; or b) habitat capability that would reduce a species' existing distribution.

sensitivity level

A measure of viewer interest for the scenic qualities of a landscape, based on the view from roads, trails, and other use areas. For example, a Level 1 (highest) sensitivity rating is assigned Highway 299; a Level 3 (lowest) rating is assigned most Forest access roads. (See also: Inventory Visual Quality Objective.)

seral stage

A stage in the successional development of an ecosystem; an ecological stage, usually identified by vegetation types.

shelterwood cut

A silvicultural system designed to regenerate an even-aged stand; differs from clearcut in that the stand is harvested in two or more stages. After the first cut some mature trees are left to help reestablish seedlings; these "leave trees" are taken once the seedlings are established.

significant

As used in NEPA, requires consideration of both context and intensity. Context means that the significance of an action must be analyzed in several contexts such as society as a whole, and the affected

region, interests, and locality. Intensity refers to the severity of the impacts.

silvicultural prescription

A prescribed sequence of cultural treatments to a stand designed to meet specific management objectives, such as producing a specific wood product or creating a certain type of habitat.

silvicultural system

A management process whereby forests are tended, harvested, and replaced, resulting in a forest of distinctive form. Systems are classified according to the method of carrying out the fellings that remove the mature crop and provide for regeneration and according to the type of forest thereby produced.

single tree selection

A silvicultural system designed to manage for uneven-aged stands and small canopy openings, in which individual trees are harvested.

site-potential tree

A tree that has attained the average maximum height possible given site conditions where it occurs.

slope stability

The resistance of a natural or artificial slope or other inclined surface to failure by landsliding (mass movement).

slash

Debris left on the ground from timber cutting, storm or fire; includes logs, uprooted stumps, bark, branches, heavy brush, and so on.

Small Tracts Act (STA)

An act which enables the Forest Service to sell, exchange, or interchange the United States' right, title, and interest—including the mineral estate—in National Forest System land when it is in the public interest to resolve certain land ownership disputes associated with encroachments and land management problems associated with mineral survey fractions and road rights-of-way.

snag

A standing dead tree from which the leaves and most of the branches have fallen.

S**special forest products**

Nontimber, renewable plant material that is collected either for personal or commercial use.

special interest area (SIA)

An area of unique scenic, geological, botanical, zoological, paleontological, ecological, or cultural characteristics identified by the Forest and managed primarily for recreation, in accordance with a Memorandum of Understanding between the Region and certain other state and federal agencies and private organizations. The MOU extends Forest Service cooperation and participation in California's Natural Area Program. See also: Botanical Area, Cultural Area, Ecological Area, Geologic Area, National Natural Landmarks, California Significant Natural Areas.

special interest species

Wildlife emphasis species other than federal or state listed (Threatened or Endangered), proposed, Candidate, or forest sensitive species. Includes State-identified Species of Special Concern; for example, osprey or golden eagle.

special regeneration management area

Includes those areas of the Forest which are timber suitable but would require extremely high investment to successfully regenerate within five years, due to harsh conditions, such as areas with 8-24" rock cover at the surface.

special use authorization

A permit, term permit, temporary permit, lease, or easement that allows occupancy, use, rights, or privileges of National Forest System land.

spotted owl additions

Areas mapped by the Scientific Panel on Late-Successional Forest Ecosystems that when added to LS/OG1s, provided a level of protection for spotted owls comparable to that of the Interagency Scientific Committee's 1990 Conservation Strategy for the northern spotted owl.

spotted owl habitat area (SOHA)

An area originally proposed in the Forest's 1987 DEIS as protected habitat for the northern spotted owl to support one pair of owls; these areas have been superseded by the habitat conservation areas (HCAs) and critical habitat.

stand

A community of trees sufficiently uniform in composition, constitution, age, spatial arrangement, or condition to be distinguishable from adjacent communities and so form a silvicultural or management entity.

standard and guideline (S&G)

Performance criterion indicating acceptable norms, specifications, or quality that actions must meet. A principle requiring a specific level of attainment; a rule to measure against.

State Historic Preservation Officer (SHPO)

The official appointed under authority of the National Historic Preservation Act of 1966 to administer the State Historic Preservation System; the Forest has a Memorandum of Understanding with the SHPO regarding the identification, conservation, and maintenance of cultural properties on Forest.

state species of special concern

Wildlife species designated by the California Department of Fish and Game; populations are considered to be declining and in danger of extinction. Examples include the sharp-shinned hawk and great blue heron. Species of Special Concern are included among the Forest's Special Interest Species.

State Surface Mining and Reclamation Act (SMARA)

State law requiring mitigation of adverse impacts from mining activities. Region 5 has a Memorandum of Understanding with the state to coordinate compliance with this act; the Forest has a similar MOU with Del Norte County.

streamside management zone

An area of land extending beyond the riparian area, and included in the riparian zone, managed with caution as a buffer to protect riparian habitat, watershed and water quality; minimum of 50 feet or the width of the inner gorge (whichever is greater) on either side of an intermittent watercourse, and 100 feet or the width of the inner gorge on either side of a perennial watercourse. Also called the riparian management zone.

S

structural diversity

The diversity of forest structure, both vertical and horizontal, which provides for a variety of forest habitats, such as logs and multilayered forest canopy, for plants and animals. Also the diversity in a forest stand that results from layering or tiering of the canopy; an increase in layering or tiering leads to an increase in structural diversity.

subpopulation

A well defined set of interacting individuals that comprise a proportion of a larger, interbreeding population.

succession

The evolution of an ecosystem through several seral stages; each stage is characterized by a dominant vegetative community and species, culminating in a climax stage. See also: seral stage.

suitable habitat

Here, an area of forest vegetation with the age-class, species of trees, structure, canopy closure, sufficient area, and adequate food source to meet some or all of the life needs of the spotted owl, as well as other mature and late successional stage species.

suitable land (timber-suited land)

Acres of land selected for regulated commercial timber production from land identified as tentatively suitable forest land. See also: tentatively suitable forest land)

sustained yield

The volume of output at which a renewable resource can be utilized on a continuous basis in perpetuity, measured annually or by the decade; particularly refers to commercial timber harvest. Sustained yield is the object of regulated commercial timber harvest.

T

take

Under the Endangered Species Act, take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect an animal, or to attempt to engage in any such conduct.

taxol

A cancer treatment drug derived from the Pacific yew.

tentatively suitable forest land

Those Forest lands (in acres) that meet the following conditions:

- are presently forested, currently producing, or capable of producing, crops of industrial wood;
- are not withdrawn from timber production by Congress, the Secretary of Agriculture, or the Chief of the Forest Service;

- for which technology and knowledge exist and are available to ensure timber production without irreversible damage to soils, productivity, or watershed conditions;
- where there is reasonable assurance that adequate restocking can be attained within five years after final harvest; and
- where adequate information is available to project responses to timber management activities.

territory

The area than an animal defends, usually during breeding season, against intruders of its own species.

territorial single

An unpaired spotted owl that is defending a territory.

T**The Nature Conservancy (TNC)**

A private organization involved in purchasing and preserving representative ecosystems throughout the United States and the world, with a view toward maintaining as diverse a gene pool as possible and saving rare species; works in partnership with the Forest Service through a Memorandum of Understanding to survey and inventory sensitive plant species, develop species management guides, and so on.

thinning

Cutting timber to improve the quality and growth of the trees that remain by reducing competition for sunlight, water and nutrients; or to change the characteristics of a stand for wildlife or other purposes. There are two kinds of thinning, performed at different stages in a stand's development: precommercial refers to the removal of non-merchantable trees when the stand is young; commercial refers to the harvest of merchantable trees for thinning purposes.

threatened species

Those plant and animal species likely to become endangered species throughout all or a significant portion of their range within the foreseeable future as is defined in the Endangered Species Act. See also: endangered species). The northern spotted owl is the only threatened species on the Forest.

threshold

The point or level of activity beyond which an undesirable set of responses begins to take place within a given resource system.

tiered environmental analysis

The practice of incorporating by reference the discussion in a broad environmental impact statement into a narrower, project-specific environmental assessment.

timber policy constraints

Regional requirements intended to ensure that timber is managed for non-declining sustained yield.

timber stand improvement

All noncommercial intermediate cuttings and other treatments to improve composition, condition, and volume growth of a timber stand.

timber sale program quantity

The volume of timber planned for sale during the first decade of the planning horizon. It includes the allowable sale quantity (chargeable volume) and any additional material (non-chargeable volume) planned for sale; usually expressed as an annual average.

timber type

Older vegetation type models that precede the forest types identified by the ongoing ecological classification on Forest; much of the analysis in this document is based on these timber types, since they are the only completely mapped vegetation information currently available. Six Rivers is comprised of two types: Douglas-fir (below 4000 ft.) and mixed conifer (above 4000 ft.).

transitory range

Range made suitable as a result of partial or complete removal of forest cover by logging, fire, insects, or disease, and for which the management objective is to re-establish timber cover as soon as possible.

true fir

Generic term for fir species other than Douglas-fir, which is not regarded as a true fir: examples are white fir, red fir, noble fir.

“twenty-five percent fund”

Refers to funds contributed by the Forest, from its annual receipts, to the counties in which the forest is situated. The funds are divided among the counties on the basis of the forest acreage in each county and are earmarked for school districts and county roads. These funds are also referred to as “Forest Reserve Fund payments” or “Receipts Act payments.” The level of reimbursement was established by the Twenty-Five Percent Fund Act of May 23, 1908.

two story stand

See: uneven-aged management.

type conversion

The conversion of one type of vegetation cover to another, such as converting hardwood stands to conifer stands.

U

understory

Low growing vegetation (herbaceous, brush, reproduction) growing under a stand of trees; also, those trees in a forest stand below the overstory.

undesirable plant

A plant which may be a non-native species, non-adapted source, genetically changed through selection in a foreign dissimilar environment, possesses trait(s) that conflict with accomplishment of objectives.

uneven-aged management

The application of a combination of actions needed to simultaneously maintain continuous high-forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes to provide a sustained yield of forest products. Cutting is usually regulated by specifying the number or proportion of trees of particular sizes to retain within

each area, thereby maintaining a planned distribution of size classes. Cutting methods that develop and maintain uneven-age stands are single-tree selection and group selection.

United States Fish and Wildlife Service (USFWS)

The Federal agency within the Department of the Interior which chiefly enforces the Endangered Species Act, by identifying and placing species at risk on the Threatened and Endangered species list.

unregulated timber harvest

Not charged against the allowable sale quantity; includes removals from unsuitable lands and occasional removals of noncommercial species, cull or dead material not recognized in calculating the allowable sale quantity.

unsuitable forest land

Lands not suitable for timber production because they are nonproductive, not regenerative, unstable, or unavailable.

V

variety class

A measure of the scenic variety of a landscape, based on diversity of landform, water form, rock form and vegetation, in three graded classifications:

Class A, Distinctive: unusual and/or outstanding landscape variety that contrasts dramatically with ordinary features.

Class B, Common: ordinary or typical landscape variety.

Class C, Minimal: little or no variety in the landscape; common features in the landscape.

See also: Inventory Visual Quality Objective

vegetative diversity

Forest-wide diversity and relative abundance of plant communities.

viability

Ability of a population to maintain sufficient size so that it persists over time in spite of normal

fluctuations in numbers, usually expressed as a probability of maintaining a specific population for a specific period.

viable population

A population which has adequate numbers and dispersion of reproductive individuals to ensure the continued existence of the species population on the planning area.

viewshed

An expansive landscape or panoramic vista as seen from specific points on a logical part of a travel route or water body.

visual management system

The Forest Service system for measuring and managing visual resources, based on a 3-element inventory (see variety class, sensitivity level, distance zone) as a basis for establishing scenic objectives and goals (see existing visual condition, visual quality objective, inventory visual quality objective).

V**visual quality objective (VQO)**

A management objective for scenic quality based on physical and sociological characteristics of an area and derived from the Inventory Visual Quality Objectives; establishes the maximum level of future alteration to an area's landscape. The five levels and their corresponding existing visual condition (EVC) are:

Level 1 - preservation: management activities are generally not allowed; only natural ecological changes occur (untouched).

Level 2 - retention: management activities are not evident to the casual Forest visitor (unnoticed disturbance).

Level 3 - partial retention: management activity may be evident but must remain

subordinate to the characteristic landscape (minor disturbance).

Level 4 - modification: management activity may dominate the characteristic landscape but must follow natural form, line, color, and texture; should appear as a natural occurrence when viewed in the foreground or middleground (moderate disturbance).

Level 5 - maximum modification: management activities may dominate the characteristic landscape but should appear as a natural occurrence when viewed as background (major disturbance).

W**watershed**

The entire land area that drains to a specific point.

watershed analysis

A systematic procedure for characterizing watershed and ecological processes to meet specific management and social objectives. Watershed analysis provides a basis for ecosystem management planning that is applied to watersheds of approximately 20 to 200 square miles.

wetlands

Areas that are covered by shallow surface or ground water. These areas usually support the growth of plants that are associated with water or saturated soils.

Wild and Scenic Rivers Act of 1968

The act which established the National Wild and Scenic Rivers System.

wilderness

Undeveloped federal land retaining its primeval character and influence without permanent improvements or human habitation.

wilderness area

An area designated by Congressional action under the 1964 Wilderness Act or subsequent acts. Wilderness areas are protected and managed to preserve their natural conditions, which generally appear to have been affected primarily by the forces of nature, with the imprint of human activity substantially unnoticeable; have outstanding opportunities for solitude or for a primitive and confined type of recreation; include at least 5000 acres or are of sufficient size to make practical their preservation, enjoyment, and use in an unimpaired condition; and may contain features of scientific, educational, scenic, or historic value as well as ecologic and geologic interest. Six Rivers includes 122,460 acres of designated wilderness.

wildlife and fish user day (WFUD)

12 hours of recreational fish or wildlife use (viewing, hunting, fishing, and so on) by any combination of persons and hours; examples: 12 people for one hour apiece, one person for 12 hours.

W

wildlife capability model

Model used to estimate the ability of an area, given existing or predicted habitat conditions, to support a population of wildlife. Here, it is expressed in terms of high, moderate, and low capability.

wild river

A classification of the National Wild and Scenic Rivers System: rivers or sections of rivers that are

free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Most wild rivers occur on public lands.

windthrow

Trees uprooted by wind; may be a single tree or a catastrophic windstorm event covering many acres.

Y

yield tax

A county timber-dependent fund source; timber purchasers pay taxes on timber harvested to the California Franchise Tax Board, which allocates the proceeds back to the counties.

VEGETATION SERIES DESCRIPTIONS

The primary vegetation series found on the Forest are described below. The data used to describe these series was collected during the ecological classification program currently underway in northwest California. Data from approximately 2800 plots spread throughout Six Rivers and the west side of the Klamath National Forest are included here.

Tables and figures summarize the data described below for each series. Table III-3, showing approximate acreages for the vegetation series, is in Chapter 3. The following tables and figures are at the end of this Appendix. Figure H-1 shows the position of each series in relation to environment. Figure H-2 shows mean elevations, with confidence intervals. Table H-1 shows the frequency of each series by slope position. Table H-2 shows the relationship of parent material to vegetation series. Table H-3 shows the relationship between stand age and slope position. Figure H-3 shows mean stand age by series with confidence intervals.

The principal tree, shrub, herb and grass species are listed for each series, along with a brief environmental description. Species with constancies of 20% or more within a series are listed. Sensitive plant occurrences are listed for each series.

REDWOOD SERIES

The redwood series is the least extensive (1,000 acres) series sampled on the Forest (see Chapter 3, Table III-3). It is found primarily in the coastal zone just outside the boundaries of the study area. It occurs primarily on moist, moderate (26 percent), lower one-third slopes, with linear and undulating horizontal and vertical micro-relief (Table H-1), between 250 and 2150 feet elevation (Figure H-2). Soils are derived from metamorphic (100 percent) parent material made up of schist and phyllite rocks (Table H-2). They are deep (100 percent), with fine loamy textures, in the Inceptisol (64 percent) and Ultisol (28 percent) orders, found in the mesic soil temperature regime (100 percent). A-horizon coarse

fragments average 28 percent and generally range from 20 to 50 percent. Sub-surface coarse fragments average 35 percent and range from 20 to 65 percent.

The redwood series has the highest mean age of all series sampled (375 years) (Figure H-3). Due to the limited number of samples in this series, stand age may be underestimated.

The vegetation of the redwood series is dominated by conifer species. The tree layer includes the conifer species redwood, Douglas-fir, and Port-Orford-cedar, along with the hardwood species tanoak, red alder, bigleaf maple, and Pacific madrone. The shrub layer is dominated by salal, evergreen huckleberry, Pacific rhododendron, red huckleberry, trailing blackberry, hazelnut, and poison oak. The herb layer contains swordfern, star-flower, redwood-sorrel, white trillium, whipplevine, bracken fern, starwort, and redwood violet. Grass cover in this series is lacking due to heavy shade from a dense tree canopy.

The redwood series contains no currently listed Forest Service Sensitive plant species.

TANOAK SERIES

The tanoak series is the second most extensive (330,000 acres) series on the Forest (see Chapter 3, Table III-3). It occurs on steep (48 percent), moist, lower one-third slopes (Table H-1), with linear, concave and undulating micro-relief, between 700 and 3900 feet elevation. Soils are derived from metamorphic (63 percent) and igneous intrusive (21 percent) parent material (Table H-2). They are primarily deep (60 percent) and moderately deep (33 percent), with loamy-skeletal and fine loamy textures, in the Inceptisol (64 percent) and Alfisol (28 percent) orders, found in the mesic soil temperature regime (100 percent). A-horizon coarse fragments average 38 percent and generally range from 20 to 50 percent. Sub-surface coarse fragments average 39 percent and range from 20 to 65 percent.

The tanoak series has the fourth highest mean stand age (263 years) of all series sampled (Figure H-3). It displays significant differences in stand age by slope position. Tanoak stands found in the lower one-third slope position have a mean stand age of 308 years, compared to ridgetop positions with a mean stand age of 220 years. Stands on lower one-third slopes are significantly older than stands on all other slope positions. This is probably related to the reduced frequency of stand-replacing fires that occur in the lower one-third slope positions. In addition, significant differences are found between stands on north and south aspects that occur in the ridgetop and upper one-third slope positions.

An examination of stand age frequency shows the advanced age of most of the tanoak stands sampled. The highest frequency of stands sampled occurs in the 226-275 year range (23 percent). The proportion of stands greater than 300 years stand age was 34 percent, compared to 28 percent of the stands less than 200 years stand age.

Vegetation dominance in the tanoak series is shared by both conifers and hardwoods. Conifers dominate the overstory, while hardwoods dominate in the mid and understory layers. The overstory tree layer is composed of the conifer species Douglas-fir, sugar pine, and Port-Orford-cedar. The mid and regeneration layers are dominated by tanoak, Pacific madrone, giant chinquapin, Pacific dogwood, canyon live oak, and bigleaf maple. The shrub layer is dominated by dwarf Oregon grape, salal, poison oak, evergreen huckleberry, trailing blackberry, wild rose, hazelnut, red huckleberry, Pacific rhododendron, and honeysuckle. The herb layer contains swordfern, bracken fern, rattlesnake plantain, western modesty, little princes pine, princes pine, vanilla-leaf, Hooker's fairybells, starflower, wintergreen, inside-out flower, beargrass, and iris as its dominant species. The grass layer in this forest type is lacking due to heavy shade from a dense tree canopy.

A small population of the Sensitive plant, Humboldt milk-vetch, was found in the tanoak series just outside the Forest boundary.

DOUGLAS-FIR SERIES

The Douglas-fir series is highest in extent (350,000 acres) within the Forest (see Chapter 3, Table III-3). It occurs on moderately steep (44 percent) mid-slopes (Table H-1), with linear, undulating, and convex micro-relief, between 2700 and 4800 feet elevation (Figure H-2). Soils are derived from metamorphic (52 percent),

igneous intrusive (25 percent), and sedimentary (16 percent) parent material (Table H-2). They are primarily deep (57 percent) and moderately deep (31 percent), with loamy-skeletal (53 percent) and fine loamy (33 percent) textures, in the Inceptisol (67 percent), Alfisol (22 percent), and Entisol (2 percent) orders, found in the mesic soil temperature regime (93 percent). A-horizon coarse fragments average 36 percent and generally range from 10 percent to 50 percent. Sub-surface coarse fragments average 44 percent and generally range from 20 percent to 65 percent.

The Douglas-fir series has the fifth highest mean stand age (248 years, Figure H-3). It also displays significant differences in stand age by slope position. Douglas-fir stands found in the middle and lower one-third slope positions have mean stand ages of 269 and 255 years, respectively, compared to stands in ridgetop positions with a mean stand age of 196 years. Stands on middle one-third slopes are significantly older than those on ridgetop and upper one-third slope positions. In addition, stands on north slopes are significantly older than those on south slopes in the ridgetops, upper, and middle one-third slopes.

An examination of Douglas-fir stand age frequency shows a similar advanced age to that of the tanoak series. The highest frequency of stands sampled occurs in the 226-275 year range (17 percent). The proportion of stands greater than 300 years stand age is 32 percent, compared to 37 percent of the stands below 200 years stand age.

The Douglas-fir series differs from the tanoak series in that it lacks a consistent midlayer of hardwoods, and tanoak is an occasional associate of low cover, rather than the dominant hardwood species. The tree layer is composed of the conifer species Douglas-fir, white fir, sugar pine, and incense-cedar, and the hardwood species giant chinquapin, Pacific madrone, canyon live oak, tanoak, and black oak. The shrub layer contains wild rose, dwarf Oregon grape, hazelnut, snowberry, trailing blackberry, sadler oak, Oregon boxwood, huckleberry oak, poison oak, red huckleberry, and oceanspray. The prominence of the herb and grass layers increase in this type due to a more open canopy and the lack of a dense hardwood mid-layer. The herb layer contains princes pine, wintergreen, Hooker's fairybells, rattlesnake plantain, vanilla leaf, western modesty, hawkweed, trail plant, swordfern, wild iris, starflower, little princes pine, bracken fern, beargrass, and twinflower. The grass layer has significantly higher cover than found in the tanoak series. It contains western fescue, mountain brome, bearded fescue, California fescue, and oniongrass as the dominant species.

The Douglas-fir series contains a large number of Sensitive plants on sites dominated by serpentine soils; they include Waldo rock-cress, McDonald's rock-cress, slender paintbrush, Oregon bleeding heart, Waldo buckwheat, two-flowered pea, and Howell's jewelflower. Sensitive plants found on other soil types within the Douglas-fir series include bensoniella, Heckner's lewisia, Howell's lewisia, Tracy's sanicle, paly yellow stonecrop, Marble Mountain campion, and beaked tracyina.

WHITE FIR SERIES

The white fir series is third in extent (90,000 acres) within the Forest (see Chapter 3, Table III-3). It occurs on moderately steep (35 percent) slopes in the upper one-third slope position (Table H-1), with linear, undulating, and convex micro-relief, between 3800 and 5500 feet elevation (Figure H-2). Soils are derived from metamorphic (35 percent), igneous intrusive (36 percent), and sedimentary (19 percent) parent material (Table H-2). They are deep (52 percent), moderately deep (36 percent), and shallow (12 percent), with loamy-skeletal (53 percent) and fine loamy (33 percent) textures, in the Inceptisol (86 percent) and Alfisol (10 percent) orders, found in the frigid (58 percent) and mesic (40 percent) soil temperature regimes. A-horizon coarse fragments average 36 percent and generally range from 10 percent to 50 percent. Sub-surface coarse fragments average 41 percent and range from 20 percent to 65 percent.

The white fir series has a mean stand age of 241 years (Figure H-3). It also displays significant differences in stand age by slope position. White fir stands found in the lower one-third slope position have a mean stand age of 276 years, compared to stands in ridgetop positions with a mean stand age of 184 years. Stands on lower one-third slopes are significantly older than those on ridgetop and upper one-third slope positions. Aspect also influences stand age; stands on north slopes are significantly older than stands on south slopes in the ridgetops, upper, and middle one-third slopes.

An examination of white fir stand age frequency shows a shift toward dominance by younger stands. The highest frequency of stands sampled occurs in the 126-175 year ranges (18 percent). The proportion of stands greater than 300 years stand age is 29 percent, compared to 42 percent of the stands below 200 years stand age.

The white fir series differs from the tanoak and Douglas-fir series in its shift in dominance from Douglas-fir to

white fir and the reductions in hardwood cover. The overstory includes the conifer species white fir, Douglas-fir, incense-cedar, sugar pine, and Shasta red fir; the hardwood species giant chinquapin, and Pacific dogwood are the dominant understory tree species. Snowberry, wild rose, hazelnut, dwarf Oregon grape, Sadler oak, trailing blackberry, huckleberry oak, thinleberry, and Oregon boxwood are dominants in the shrub layer. The herb layer has as its dominant species wintergreen, princes pine, Hooker's fairybells, hawkweed, trail-plant, vanilla leaf, rattlesnake plantain, little princes pine, bedstraw, bracken fern, starflower, wild iris, stream yellow violet, California harebell, one-sided wintergreen, western modesty, swordfern, twinflower, queenscup, and false solomons seal. The grass layer has as its dominant species western fescue, mountain brome, oniongrass, blue wild rye, reedgrass, and bearded fescue.

Sensitive plants found within the white fir series include bensoniella, green gentian, Heckner's lewisia, Howell's lewisia, Lassics' sandwort, scabrid raillardella, and pale yellow stonecrop.

RED FIR SERIES

The red fir series is of limited extent (19,000 acres) within the Forest (see Chapter 3, Table III-3). It is found at the highest elevation sites in the study area, on moderately steep slopes (32 percent), in the upper one-third slope position (Table H-1), with linear and convex micro-relief, between 4300 and 6600 feet elevation (Figure H-2). Here soil temperatures reach their lowest point, with most stands occurring within the frigid (94 percent) soil temperature regime. Soils here are primarily derived from igneous intrusive (51 percent) and metamorphic (49 percent) parent material (Table H-2). They are mainly moderately deep (45 percent), deep (39 percent), and shallow (16 percent), with loamy-skeletal (56 percent) and fine loamy (25 percent) textures, found in the Inceptisol (88 percent), Entisol (6 percent), and Alfisol (3 percent) orders. A-horizon coarse fragments average 32 percent and range from 10 percent to 50 percent. Sub-surface coarse fragments average 38 percent and range from 20 percent to 65 percent.

The red fir series has a mean stand age of 228 years (Figure H-3). It displays no significant differences in stand age by slope position. This is probably related to the tendency for this series to occur in the ridgetop and upper one-third slope positions.

An examination of red fir stand age frequency shows a continuing shift toward dominance by younger stands. The highest frequency of stands sampled occurs in the 176-225 year range (25 percent). The proportion of stands greater than 300 years stand age was 22 percent, compared to 49 percent of the stands below 200 years stand age.

These high elevation sites contain a hardy group of plants adapted to an environment which is devoid of snow for as little as four months a year. The tree layer in this type is composed of the conifer species red fir, white fir, Douglas-fir, sugar pine, and occasionally Brewer's spruce. The shrub layer is dominated by snowberry, Sadler oak, wild rose, pinemat manzanita, thinleaf huckleberry, mountain maple, thimbleberry, and gooseberry. Wintergreen, princes pine, one-sided wintergreen, little princes pine, hawkweed, windflower, Siskiyou penstemon, rattlesnake plantain, brackenfern, vanilla leaf, false solomens seal, bedstraw, Sheltons violet, and sticky starwort are the dominant species of the herb layer. Little grass is found in this type.

The red fir series contains one Sensitive plant, the green gentian.

PORT-ORFORD-CEDAR SERIES

The Port-Orford-cedar series is of limited extent (10,000 acres) within the Forest (see Chapter 3, Table III-3), but of high ecological importance due to its high community diversity. It is found along stream sides, in the lower one-third slope position (Table H-1), with linear, concave, and undulating micro-relief, in all the previously mentioned vegetation types. It spans an elevation range from near sea-level to 5300 feet (Figure H-2). Soils are derived from metamorphic (47 percent), igneous intrusive (32 percent), and sedimentary (7 percent) parent materials (Table H-2). A high proportion of Port-Orford-cedar stands were found on soils derived from ultramafic (13 percent) and serpentine (28 percent) rocks. Soils are primarily deep (48 percent) and moderately deep (42 percent), with loamy-skeletal (66 percent) and fine loamy (30 percent) textures, in the Inceptisol (70 percent), Alfisol (10 percent), and Entisol (8 percent) orders, found in the mesic (80 percent) and frigid (17 percent) soil temperature regimes. A-horizon coarse fragments average 37 percent and generally range from 20 percent to 50 percent. Sub-surface coarse fragments average 44 percent and range from 20 percent to 65 percent.

The Port-Orford-cedar series has the second highest mean stand age, 373 years (Figure H-3), of all series

sampled. It also displays no significant differences in stand age by slope position. This is probably related to the tendency for this series to occur in stream-side locations that tend to have low stand-replacing fire frequencies due to the moist environment.

Port-Orford-cedar stand age frequency shows a reverse shift toward dominance by older stands. The highest frequency of stands sampled occurs in the 326-375 year range (19 percent). The proportion of stands greater than 300 years stand age is 72 percent, compared to 9 percent of the stands below 200 years stand age.

The Port-Orford-cedar series is dominated by the conifer species Port-Orford-cedar, along with Douglas-fir, white fir, sugar pine, and incense-cedar, and the hardwood species giant chinquapin and tanoak. Which associated tree species dominates is dependent on elevation. Shrub layer dominance is also determined by elevation. It includes red huckleberry, huckleberry oak, trailing blackberry, Sadler oak, wild rose, dwarf Oregon grape, western azalea, salal, Pacific rhododendron, serviceberry, slender salal, hazelnut, thimbleberry, and green huckleberry. The herb layer is diverse due to its position in wet areas; it contains princes pine, rattlesnake plantain, twinflower, beargrass, starflower, white flowered trillium, Hooker's fairybells, vanilla leaf, wintergreen, queenscup, western modesty, wild iris, swordfern, bracken fern, windflower, one sided wintergreen, and inside-out flower. The grass layer is dominated by sedges.

One Sensitive plant was identified in the Port-Orford-cedar series: the slender indian paintbrush. It also contains a host of species listed as rare by the California Native Plant Society.

JEFFREY PINE SERIES

The Jeffrey pine series is of limited extent (17,000 acres) within the Forest (see Chapter 3, Table III-3). It is found mainly on serpentine soils between 1000 and 5100 feet elevation (Figure H-2), in the ridgetop and upper one-third slope positions (Table H-1), with linear and convex micro-relief. Soils are derived from metamorphic (49 percent) and igneous intrusive (37 percent) parent materials. The igneous intrusive category is dominated by ultramafic rocks (76 percent), while the metamorphic category is represented primarily by serpentine rocks (90 percent) (Table H-2). Soils are primarily moderately deep (60 percent) and shallow (29 percent), with loamy-skeletal (61 percent), fine loamy (22 percent), and loam (13 percent) textures, in the Inceptisol (68 percent) and Alfisol (29 percent) orders, found in the mesic (74

percent) and frigid (25 percent) soil temperature regimes. A-horizon coarse fragments average 28 percent and generally ranged from 10 percent to 50 percent. Sub-surface coarse fragments average 39 percent and ranged from 10 percent to 65 percent.

The Jeffrey pine series has a mean stand age of 245 years (Figure H-3). It also displays no significant differences in stand age by slope position. This is probably related to the tendency for this series to occur in ridgetop and upper one-third slope positions.

Jeffrey pine stand age frequency also shows a shift toward dominance by younger stands. The highest frequency of stands sampled occurs in the 126-175 year range (19 percent). The proportion of stands greater than 300 years stand age is 31 percent, compared to 48 percent of the stands below 200 years stand age. Jeffrey pine can be the dominant tree species where serpentine rock formations reach the surface. It is found in association with Douglas-fir, incense-cedar, sugar pine, white fir, western white pine, and knobcone pine. The dominant shrub species on these harsh sites include huckleberry oak, pinemat manzanita, prostrate ceanothus, California coffeeberry, greenleaf manzanita, creeping barberry, oceanspray, serviceberry, red huckleberry, and boxleaf siltassel. The dominant herbs include beargrass, wild iris, princes pine, yarrow, indian paintbrush, hawkweed, and California lace fern. The grass layer is often a dominant feature in this type due to its open stand condition. The grass layer is dominated by California fescue, Idaho fescue, various sedge species, and western fescue.

The Jeffrey pine series contains the highest number of Sensitive plants on its serpentine soils. They include Waldo rock-cress, McDonald's rock-cress, Preston Peak rock-cress, Oregon bleeding heart, Mt. Eddy draba, Siskiyou fireweed, Waldo buckwheat, two-flowered pea, opposite-leaved lewisia, Lassics' lupine, Lassics' sandwort, scabrid railardella, Howell's jewelflower, and western bog violet.

WHITE OAK SERIES

The white oak series is of moderate extent (50,000 acres) within the Forest (see Chapter 3, Table III-3). It is found primarily in the North Coast Mountains Section on the Mad River Ranger District where the environment is drier. This type is found between 2100 and 5200 feet

elevation (Figure H-2), in the upper one-third slope position (Table H-1), on sites with linear and convex micro-relief, usually in association with grasslands. Soils are derived from sedimentary (78 percent) and metamorphic (17 percent) parent materials (Table H-2). Soils are primarily deep (70 percent), moderately deep (13 percent) and shallow (17 percent), with loamy-skeletal (37 percent) and fine loamy (63 percent) textures, in the Inceptisol (78 percent) and Alfisol (19 percent) orders, found in the mesic (93 percent) and frigid (7 percent) soil temperature regimes. A-horizon coarse fragments average 20 percent and generally range from 10 percent to 35 percent. Sub-surface coarse fragments average 32 percent and range from 10 percent to 50 percent.

The white oak series is significantly younger than most other series with a mean stand age of 139 years (Figure H-3). It also displays no significant differences in stand age by slope position. This is probably related to the tendency for this series to occur in upper one-third slope positions.

White oak stand age frequency also shows a shift toward dominance by younger stands. The highest frequency of stands sampled occurs in the 76-125 year range (41 percent). The proportion of stands greater than 300 years stand age is 4 percent, compared to 83 percent of the stands below 200 years stand age.

The white oak series is different from the previously described types due to its dominance by hardwood tree species. White oak, black oak, Douglas-fir and white fir are the dominant tree species. The shrub layer is sparse in this type with poison oak and snowberry as occasional members. The herb layer contains a host of dry area plants including mountain sweetroot, yarrow, western houndstongue, soap plant, firecracker flower, fragrant bedstraw, American vetch, miners lettuce, western buttercup, snakeroot, parsley, wild iris, brodiaea, wild cucumber, checker bloom, wild pea, and common dandelion. The grass layer is prominent in this vegetation type. It is dominated by California fescue, annual dogtail, tall oatgrass, blue wild-rye, California brome, western fescue, orchard grass, and wood rush.

One Sensitive plant was confirmed in the white oak series: Tracy's sanicle.

BLACK OAK SERIES

The black oak series is also of limited extent (3,500 acres) within the Forest (see Chapter 3, Table III-3). It reaches its greatest extent in the bottom end of the Klamath Mountains Subregion and throughout the North Coast Mountains Section. On the Forest it is found primarily on the Lower Trinity and Mad River Ranger Districts on slightly wetter sites than white oak. This type was found between 3000 and 4000 feet elevation (Figure H-2), in the middle and lower one-third slopes (Table H-1), on sites with undulating micro-relief, usually in association with grasslands. Soils are derived from sedimentary (75 percent) and metamorphic (25 percent) parent materials (Table H-2). Soils are primarily deep (75 percent), and moderately deep (25 percent), with loamy-skeletal (25 percent) and fine loamy (75 percent) textures, in the Inceptisol (25 percent) and Alfisol (75 percent) orders, found in the mesic (100 percent) soil temperature regime. A-horizon coarse fragments average 18 percent and generally range from 10 percent to 50 percent. Sub-surface coarse fragments average 68 percent and range from 50 percent to 80 percent.

The black oak series is older than the white oak series with a mean stand age of 181 years (Figure H-3). It has insufficient samples for further analysis.

The black oak series is similar to the white oak series due to its dominance by hardwood tree species. Black oak, white oak, Douglas-fir, bigleaf maple, Ponderosa pine, Pacific madrone, sugar pine, and canyon live oak are the dominant tree species. The shrub layer is sparse in this type with poison oak, wild rose, dwarf Oregon grape, and hazelnut as occasional members. The herb layer contains mountain sweetroot, yarrow, western houndstongue, soap plant, bedstraw, wild iris, and braken fern. The grass layer is prominent in this vegetation type. It is dominated by annual dogtail, blue wild-rye, lemmon needlegrass, and silver hairgrass.

No Sensitive plants were identified in the black oak series during this study.

GRASSLAND TYPE

The grassland type is of limited extent (19,000 acres) in the Forest (see Chapter 3, Table III-3) and is found with highest frequency in the North Coast Mountains Section. It is also found primarily on the Mad River Ranger District. This type is found between 2500 and 4200 feet elevation (Figure H-2), in the middle one-third through

ridgetop slope positions (Table H-1), on sites with undulating and linear micro-relief. Soils are derived from sedimentary (87 percent) and metamorphic (13 percent) parent materials (Table H-2). Soils are primarily deep (56 percent), and moderately deep (44 percent), with fine loamy (53 percent) and loamy-skeletal (45 percent) textures, in the Inceptisol (63 percent) and Alfisol (24 percent) orders, found in the thermic (53 percent) and mesic (45 percent) soil temperature regimes. A-horizon coarse fragments average 22 percent and generally range from 10 percent to 50 percent. Sub-surface coarse fragments average 36 percent and range from 10 percent to 65 percent.

The grassland series is distinguished from the other vegetation types in being dominated by the grass layer. It has an occasional white oak or Douglas-fir in the tree layer. The shrub layer is also sparse with few shrubs except poison oak. The herb layer is rich in dry area plants such as yarrow, sheep-sorrel, common dandelion, narrow leaf flax, small-flower lotus, soap plant, rib-grass, wild-hyacinth, western buttercup, American vetch, lomatium, tarweed, wild cucumber, rabbit plant, and red-stem filaree. The grass layer is the dominant feature of this vegetation type. It contains a mixture of perennial and annual grasses including annual dogtail, mountain brome, silver hairgrass, tall oatgrass, Kentucky bluegrass, common wild oats, blue wild-rye, ripgut, cheat grass, rush, wood rush, and lemon needlegrass.

One Sensitive Plant, leafy reed grass, is thought to occur in this type but has not been verified on the Forest.

MOUNTAIN HEMLOCK SERIES

The mountain hemlock series is of minor extent (500 acres) in the Forest and is found on high elevation, cold sites on moderately steep (35 percent) linear slopes, in upper one-third and ridgetop positions (Table H-1), between 4200 and 6600 feet elevation (Figure H-2). Here soil temperatures are thought to reach their lowest point, with stands occurring within the cryic (100 percent) soil temperature regime. Soils here are derived from igneous intrusive parent material made up of granitic (80 percent) and mafic (20 percent) rocks (Table H-2). They are mainly moderately deep (60 percent) and deep (40 percent), with fine loamy (83 percent) and loamy-skeletal (17 percent) textures, found in the Inceptisol (68 percent), and Alfisol (22 percent) orders. A-horizon coarse fragments average 22 percent and range from 10 percent to 50 percent. Sub-surface coarse fragments average 42 percent and range from 20 percent to 65 percent.

The mountain hemlock series has the third highest mean stand age of 300 years (Figure H-3). It had insufficient samples for further analysis.

The mountain hemlock series is dominated by conifers in the overstory. It includes mountain hemlock, red fir, white fir, Brewer's spruce, Douglas-fir, lodgepole pine, and western white pine. The shrub layer is dominated by thinleaf huckleberry, Sadler oak, mountain maple, pinemat manzanita, slender salal, Oregon boxwood, and snowberry. The herb layer includes one-sided wintergreen, princes pine, wintergreen, queen's cup, vanilla leaf, windflower, California strawberry, rattlesnake plantain, twinflower,, white flowered trillium, and inside-out flower. The grass layer is dominated by sedges and California brome.

No Sensitive plants were identified in the mountain hemlock series. This may be related to the limited number of samples in this series.

LOGEPOLE PINE SERIES

The lodgepole pine series has the fourth highest extent (50,000 acres) in the Forest (see Chapter 3, Table III-3). It is found on harsh, cool sites with heavy winter snowpacks, in proximity to the Pacific Ocean. These sites occur on moderately steep (37 percent), linear, upper one-third slopes (Table H-1), with high surface rock (25 percent), between 2950 and 3800 feet elevation (Figure H-2). Soils here are derived from igneous intrusive (50 percent) and metamorphic (50 percent) parent material made up of ultramafic (100 percent) and serpentine (100 percent) rocks (Table H-2). They are mainly moderately deep (50 percent) and deep (25 percent), with fine loamy (75 percent) and loamy-skeletal (25 percent) textures, found in the mesic (100 percent) soil temperature regime, of the Alfisol (75 percent) and Inceptisol (25 percent) orders. A-horizon coarse fragments average 31 percent and range from 10 percent to 50 percent. Sub-surface coarse fragments average 27 percent and range from 10 percent to 50 percent.

The lodgepole pine series is among the youngest series found in the study area with a mean stand age of 145 years (Figure H-3). It had insufficient samples for further analysis.

The lodgepole pine series is dominated by conifers in the tree layer. It includes lodgepole pine, Douglas-fir, sugar pine, and western white pine. The shrub layer is a prominent feature of this series with the highest cover of all layers. It includes dwarf tanbark, huckleberry oak,

red huckleberry, pinemat manzanita, greenleaf manzanita, coffeeberry, Pacific rhododendron, silktassel, tall Oregon grape, western azalea, evergreen huckleberry, and dwarf juniper. The herb layer is dominated by beargrass, large pyrola, wintergreen, and western modesty. The grass layer is lacking in this type due to the dense layer of shrubs.

The lodgepole pine series is also rich in Sensitive plants. It contains Waldo rock-cress, McDonald's rock-cress, Oregon bleeding heart, and Siskiyou fireweed.

WESTERN WHITE PINE SERIES

The western white pine series is also of limited extent (5,000 acres) in the Forest (see Chapter 3, Table III-3). It is found on cool sites with heavy winter snowpacks in proximity to the Pacific Ocean. These sites occur on benches or gentle (21 percent), linear, upper one-third slopes (Table H-1), between 2700 and 3580 feet elevation (Figure H-2). Soils here are derived from igneous intrusive (40 percent) and metamorphic (60 percent) parent material made up of ultramafic (100 percent) and serpentine (100 percent) rocks (Table H-2). They are mainly deep (80 percent) and moderately deep (20 percent), with fine loamy (60 percent) and loamy-skeletal (40 percent) textures, found in the mesic (100 percent) soil temperature regime, of the Inceptisol (60 percent) and Alfisol (40 percent) orders. A-horizon coarse fragments average 44 percent and range from 20 percent to 50 percent. Sub-surface coarse fragments average 36 percent and range from 10 percent to 65 percent.

The western white pine series is the youngest series found in the study area with a mean stand age of 123 years (Figure H-3). It had insufficient samples for further analysis.

The western white pine series is also dominated by conifers in the tree layer. It includes western white pine, Douglas-fir, lodgepole pine, and knobcone pine. The shrub layer here is also the dominant layer. It includes dwarf tanbark, huckleberry oak, coffeeberry, red huckleberry, dwarf juniper, pinemat manzanita, oceanspray, whiteleaf manzanita, pacific rhododendron, greenleaf manzanita, silktassel, and serviceberry. The herb layer is dominated by beargrass, western modesty, large pyrola, wintergreen, princes pine, and arnica. The grass layer is also lacking here due to the dense shrub layer.

The western white pine series contains the Sensitive plants Oregon bleeding heart, Mt. Eddy draba, and Siskiyou fireweed.

Figure H-1. Distribution of vegetation series by elevation and moisture/temperature.

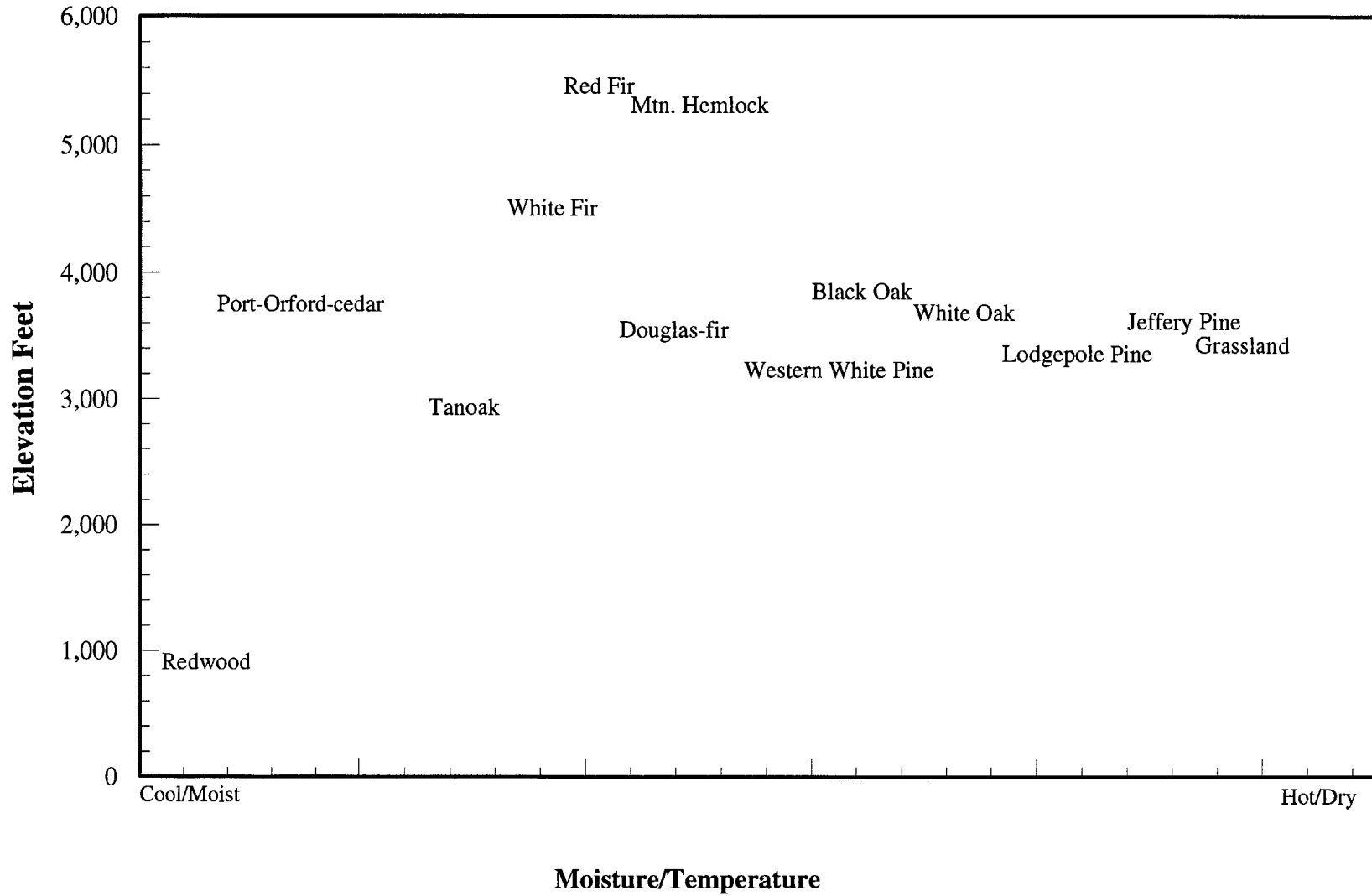


Figure H-2. Mean elevation and standard error for vegetation series on the Six Rivers National Forest

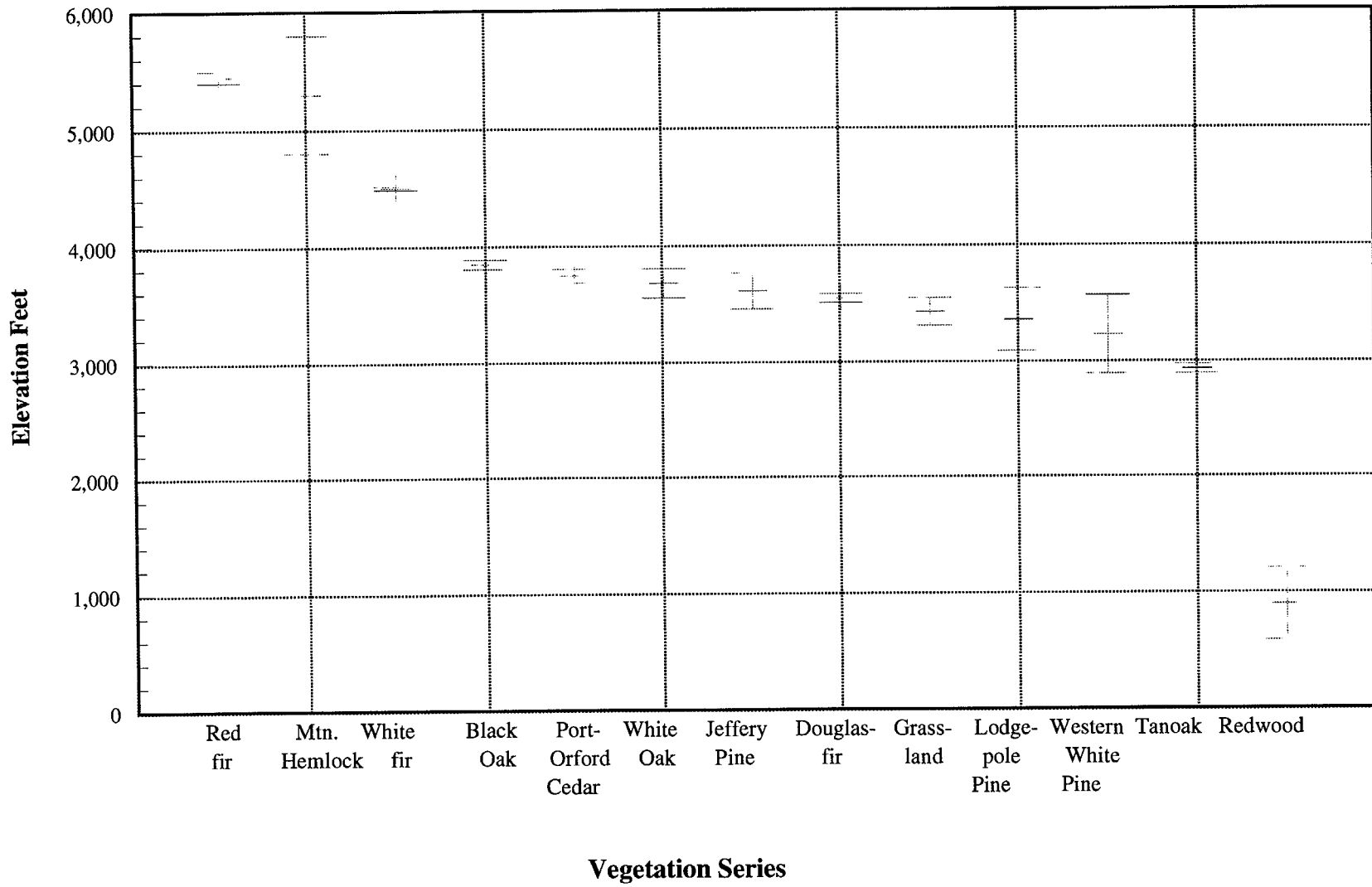


Table H-1.

Vegetation Series by Slope Position

Slope Position	Vegetation Series ¹ (Percent in Each Slope Position)												
	RW	PO	TO	DF	WF	RF	MH	JP	LP	WP	WO	BO	Gr
Ridgetop	14	1	5	6	13	22	40	46	10	20	17	-	24
Upper 1/3	13	17	34	43	41	60	60	32	62	80	47	-	15
Middle 1/3	29	27	31	31	30	6	-	14	20	-	20	50	46
Lower 1/3	44	55	30	20	16	12	-	8	8	-	16	50	15

1/ RW = redwood, PO = Port-Orford-cedar, TO = tanoak, DF = Douglas-fir, WF = white fir, RF = red fir, MH = mountain hemlock, JP = Jeffrey pine, LP = lodgepole pine, WP = western white pine, WO = white oak, BO = black oak, Gr = grassland.

Table H-2.

Vegetation Series by Parent Material Type

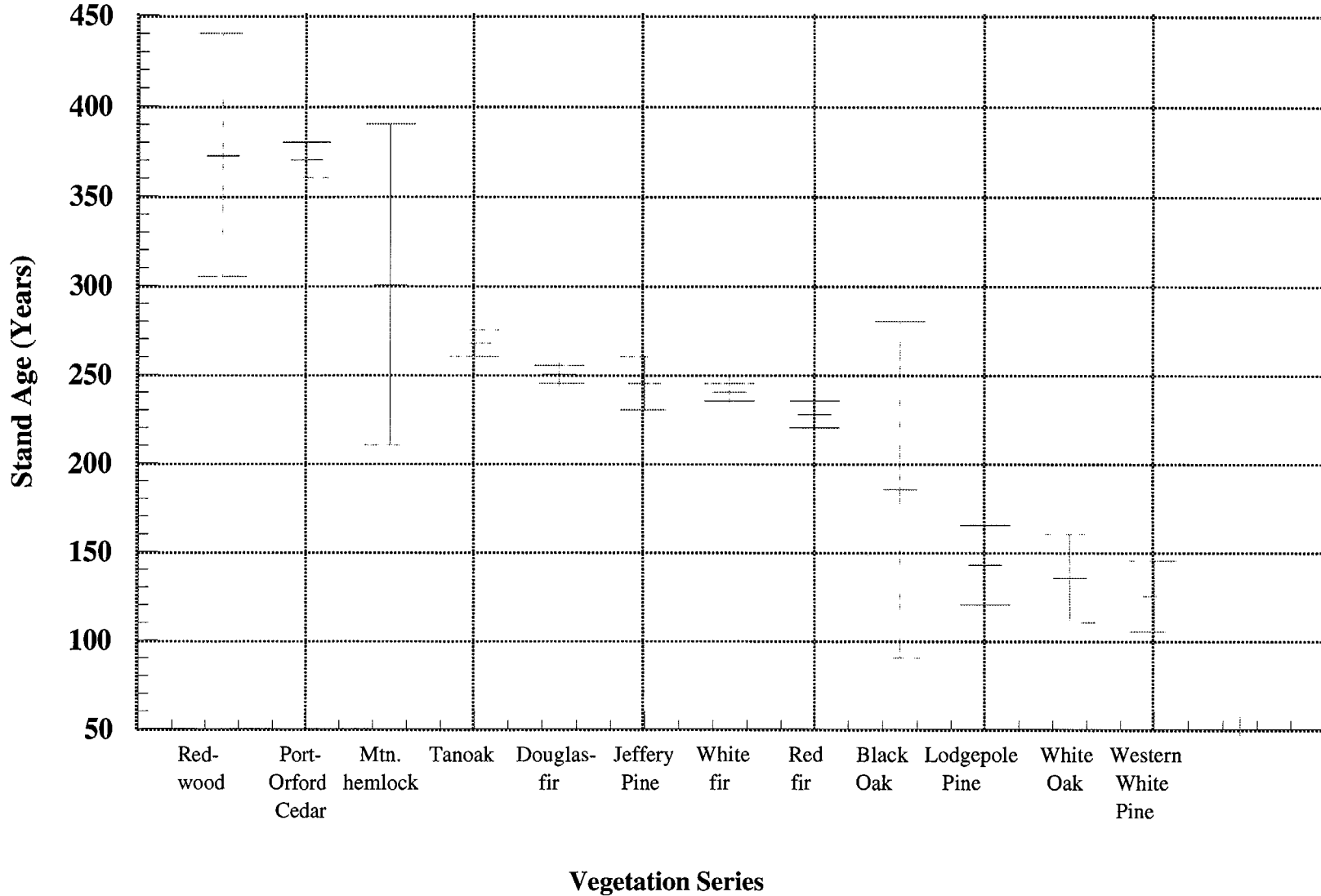
Rock Type	Vegetation Series ¹ (Percent by Rock Type)												
	PO	TO	DF	WF	RF	JP	LP	MH	RW	WP	WO	BO	Gr
Igneous intrusive													
granitic	9	7	9	18	28	5	-	80	-	-	-	-	-
mafic	10	10	12	15	20	4	-	20	-	-	4	-	-
ultramafic	13	4	4	3	3	28	50	-	-	40	-	-	-
Metamorphic													
slate	-	1	1	1	-	-	-	-	-	-	-	-	-
schist	5	15	16	15	19	1	-	-	80	-	17	-	-
semischist	2	6	8	3	1	4	-	-	-	-	-	-	11
gneiss	3	2	-	-	-	-	-	-	-	-	-	-	-
serpentine	20	3	7	2	3	40	50	-	-	60	-	-	-
greenstone	8	13	7	4	5	4	-	-	-	-	-	-	-
quartzite	-	-	-	-	3	-	-	-	-	-	-	25	2
Sedimentary													
sandstone	7	7	16	19	9	3	-	-	-	-	74	75	87
shale	-	1	-	-	-	-	-	-	-	-	4	-	-
Mixed	7	4	1	5	4	-	-	-	-	-	-	-	-

1/ PO = Port-Orford-cedar, TO = tanoak, DF = Douglas-fir, WF = white fir, RF = red fir, JP = Jeffrey pine, LP = lodgepole pine, MH = mountain hemlock, RW = redwood, WP = western white pine, WO = white oak, BO = black oak, Gr = grassland.

Table H-3.
Mean Stand Age by Slope Position

Slope Position	Number of Plots	Mean Stand Age	Standard Error of the Mean	Standard Deviation
Ridgetop	258	199	6	101
Upper 1/3	972	239	4	115
Middle 1/3	696	267	4	116
Lower 1/3	608	302	5	125

Figure H-3. Mean age and standard error for vegetation series on the Six Rivers National Forest



ECONOMIC EFFICIENCY ANALYSIS

CONCEPTUAL BACKGROUND

PRESENT NET VALUE

Present net value (PNV) is the criterion used to maximize net benefits in planning benchmarks and alternatives for the Six Rivers National Forest. For each alternative, PNV is the difference between the discounted value of all priced outputs and all Forest Service management and investment costs over the analysis period. The priced outputs are those that are or can be exchanged in the market place. They include the value of forage, the stumpage value of timber, the value of commercial fish in the stream, fur animals and other harvested miscellaneous products, the value of any increased water flow quantities, the in-the-ground value of minerals, and all recreation visitor days, including those for wildlife, fishing, and wilderness experiences.

The alternatives are designed and analyzed to achieve their goals and objectives for priced outputs in a manner that achieves the greatest excess in the value of priced outputs in relation to their cost while meeting all specified constraints and objectives for non-priced outputs. The alternatives are also designed to achieve the specified non-priced outputs and to meet constraints at the least cost. The PNV of each alternative estimates the value of the maximum attainable net benefits of priced outputs as the value of priced benefits realized in excess of all the Forest Service costs of producing priced outputs and non-priced outputs and meeting management constraints. Therefore, PNV is an estimate of the market value of the current forest resources after all costs of producing outputs and meeting constraints have been subtracted from the value of the expected flow of priced outputs.

NET PUBLIC BENEFIT

Net public benefit is defined as the overall value to the Nation of all outputs and positive effects (benefits) less all the associated Forest Service inputs and negative effects (costs) for producing those primary benefits whether they can be quantitatively valued or not. Thus,

net public benefits conceptually are the sum of PNV plus the full value of non-priced outputs. The full value of non-priced benefits is used because their cost of production has been accounted for in PNV. The non-priced benefits included here are maintenance or enhancement of threatened and endangered species, natural and scientific areas, cultural site reservations such as Indian religious sites, and historical or anthropological sites, visual quality in excess of ROS class needs, diversity objectives, or air quality in excess of minimum management requirements. Minimum management requirements in this context are standards that must be met in the production of any or all outputs from the Forest. Therefore, the minimum level is a cost of production in the multiple use context.

There are also second-level benefits or effects that are the concern of National Forest policy and management. These include local income and job effects on economic development of communities, net cost impacts on taxpayers, price effects on consumers of forest products and producers of those products, payments to communities in lieu of taxes, benefits to specific users of National Forest outputs who pay no fees or fees less than the price of the valued outputs. All these are distributive welfare effects of National Forest production. All the foregoing distributive effects and impacts have been the object of National policy issues and discussions in both the Administration and the Congress. Because they are distributive effects, they are essentially questions of equity rather than efficiency; they involve questions of who should get benefits and who pays the costs. They cannot be assessed in the context of the efficiency criteria associated with the PNV and the net public benefit concepts.

EIS PRESENTATION

The methodology, background, and results of the economic efficiency analysis that was conducted during the planning process is presented throughout the FEIS. As a result, all of the major sections of the FEIS (including those listed below) must be read in order to get a complete picture of the analysis that was conducted.

CONTEXT

Discussion of how economic efficiency analysis was used in the process of developing alternatives.

Outputs, total cost and PNV for each of the benchmarks.

Results of the constraint analysis and a comparison of the alternatives terms of PNV. This is the most comprehensive summary of the analysis results in the DEIS.

Background information on economic conditions and the resource supply-demand situation for the Forest.

Technical details of the modeling and analysis process, including a description of basic estimates and assumptions on benefits, costs and interest rates.

REFERENCES

Chapter II, "Formulation of Alternatives: Modeling Process"

Chapter II, "Benchmarks" section and Table II-1 (Benchmarks: Outputs, Activities and Costs)

Chapter II, "Comparison of Alternatives" section and Tables II-18, 19, 20 and 21

Chapter III, "Economic Environment" section

Appendix B

THE REGIONAL TIMBER SUPPLY - DEMAND SITUATION IN CALIFORNIA

This appendix was created to address public concern about the broad level timber supply and demand situation in relation to supplies from individual National Forests. Existing information from recent RPA assessments, University of California research, Forest Service research, and the State of California's Forest and Rangeland Resources Assessment Program (now renamed the Strategic Planning Program) was used for this purpose.

HISTORICAL HARVESTS FROM PUBLIC AND PRIVATE LANDS - STATEWIDE

Timber harvest in California has been in a downward trend for over 30 years. In 1955, record timber harvests in the State from all lands totaled 6 billion board feet. In that year, harvest from private lands was 4.9 billion and harvest from National Forest was 1.0 billion. Less than 100 million board feet were harvested from other public lands. Since that time, total harvest in the State has trended downward, with shorter term fluctuations associated with the business cycle.

As shown in Table J-1, harvest levels fluctuate widely from year to year rather than following a smooth pattern. Year to year variations are influenced primarily by changes in housing markets and general business conditions. Only over the long term do available timber inventory and growth levels limit harvests.

STATEWIDE DEMAND FOR TIMBER PRODUCTS AND THE RELATIONSHIP TO HARVEST LEVELS

With a population of over 30 million people and a high level of income per capita, California is one of the largest markets for lumber, wood, and paper products in the world. When discussing the relationship between the demand for timber products (lumber, wood, and paper) and the demand for timber harvest (stumpage), it is necessary to translate the demand for timber products into its timber harvest equivalent. Expressed in these terms, the demand for timber has been increasing, at a rate about equal to the population growth rate. Per capita consumption of lumber has declined while per capita consumption of paper and reconstituted wood products has increased over the past 40 years. As population in the State grew from 10.6 million in 1950 to over 30 million at present, total demand increased from 4 billion board feet annually in 1950 to about 12 billion board feet annually.

While the demand for timber has been increasing, timber harvests in the State have been decreasing. The difference between the growing demand and the

Table J-1.
California Timber Harvests
by Ownership, 1952-93

Year	Private	Other Public	National Forest	Total
-billion board feet-				
1952	4.40	.05	.61	5.06
1953	5.32	.04	.63	5.99
1954	4.79	.05	.76	5.60
1955	4.93	.06	1.03	6.02
1956	4.69	.08	1.09	5.86
1957	4.36	.07	.92	5.35
1958	4.47	.09	1.11	5.67
1959	4.29	.12	1.48	5.89
1960	3.70	.11	1.33	5.14
1961	3.85	.11	1.38	5.34
1962	4.05	.11	1.38	5.54
1963	3.69	.11	1.66	5.46
1964	3.50	.11	1.86	5.47
1965	3.21	.14	1.92	5.27
1966	2.97	.11	1.93	5.01
1967	3.06	.11	1.89	5.06
1968	2.82	.16	2.36	5.34
1969	2.88	.12	2.00	5.00
1970	2.62	.10	1.84	4.57
1971	2.59	.13	2.06	4.78
1972	2.66	.12	2.22	5.00
1973	2.81	.10	2.01	4.92
1974	2.86	.11	1.73	4.70
1975	2.71	.10	1.52	4.33
1976	2.76	.08	1.89	4.73
1977	2.96	.09	1.74	4.79
1978	2.78	.08	1.80	4.66
1979	2.26	.09	1.73	4.08
1980	1.86	.07	1.51	3.44
1981	1.72	.04	1.09	2.86
1982	1.50	.06	.94	2.50
1983	1.89	.08	1.68	3.65
1984	2.09	.03	1.56	3.68
1985	2.17	.06	1.82	4.05
1986	2.31	.09	1.96	4.36
1987	2.58	.10	1.97	4.65
1988	2.60	.06	2.18	4.84
1989	2.64	.06	2.02	4.72
1990	2.67	.05	1.53	4.25
1991	2.07	.06	1.34	3.47
1992	2.12	.06	1.03	3.21
1993	2.26	.05	.58	2.89

Sources: Calif. Department of Forestry and Fire Protection
 California State Board of Equalization
 Bureau of Indian Affairs, USDI
 Bureau of Land Management, USDI
 Forest Service, USDA

declining supply has been made up by increased imports to the State - primarily from Oregon, Washington, and Canada. The State has changed from a net exporter to a net importer of timber products over the last three decades.

California now relies on imports from other States and countries for more than 75 percent of its overall timber product needs. Although California receives only a small proportion of its imports from Canada, Canadian shipments to the U.S. have a significant effect on the State's ability to import timber products from the Pacific Northwest. In contrast to California's reliance on imports, the bulk of the timber products produced in both Washington and Oregon are exported to other States and countries. Increases in Canadian shipments to the eastern half of the U.S. have displaced timber products from the Pacific Northwest. The result has been an increase in the availability of timber products from the Pacific Northwest for California markets. Increased production in the South has also been displacing the Pacific Northwest in eastern markets, which has also increased the availability of products from the Northwest in California markets.

BROAD LEVEL SOCIOECONOMIC EFFECTS

About 95 percent of California's population lives in urban areas. As consumers, the primary effect of changes in harvest levels in the State on them is a change in prices paid for timber products. A reduction in timber harvests in the State reduces competition among suppliers, raises market prices, and leads to increased use of imported products. Econometric analysis done by the Pacific Northwest Forest and Range Experiment Station in 1990 indicates that a one billion board foot change in harvest level would change lumber prices by about four percent. This translates into a \$250 change in the price of the typical new house at current conversion efficiencies. For the U.S. economy as a whole, this would amount to a cost to home buyers of about \$400 million annually. The high level of competition in the market for timber products means that individual National Forests or individual private timber owners can not significantly affect consumer prices. However, National Forests or private timber owners in aggregate can significantly affect consumer prices. For example, the price relationship described above means that changes in overall National Forest timber supplies since 1990 have resulted in timber product price increases of more than 25 percent.

Another effect on the urban population is through “indirect and induced” employment. While the employment effect of changes in harvest levels is felt most strongly in the communities where the logging and sawmilling takes place, some broader level employment effects also occur. This is because most firms that manufacture and supply goods and services to logging and sawmill companies are typically located in the major urban centers rather than in the rural areas where the logging and milling takes place.

Logging and milling by itself typically requires 3-6 person years of employment per million board feet processed. Newer, more specialized and automated mills using readily accessible timber are at the bottom of this range, while more labor intensive operations are at the top of this range. This direct employment generates indirect employment in firms that supply goods and services to logging and milling firms and induced employment in firms and governments providing goods and services to those employed directly and indirectly. In undeveloped rural areas there is little if any indirect and induced effect because suppliers are located outside of the area and logging and sawmilling employees must “drive into the city” to make major purchases. In addition, on most National Forests a portion of the logs harvested are trucked well outside of the primary zone of influence for manufacturing into lumber products. As a result, total statewide employment effects of changes in harvest levels are larger than employment effects occurring in the primary zones of influence for individual National Forests. Employment effects on a statewide basis range between 10 and 20 person years per million board feet of timber harvested. These employment effect estimates were made with input-output models constructed by the Forest Service and the U.S. Department of Commerce. They reflect present technologies. As the trend toward increased timber utilization efficiency continues, employment generated per unit of timber processed is expected to decline.

THE OUTLOOK FOR TIMBER SUPPLIES - PRIVATE LANDS

According to projections completed by the University of California in July 1990, timber supplies from private lands in California can be maintained at over 2.2 billion board feet annually over the 10-15 year life of the Forest Plans. An alternative projection prepared by the California Department of Forestry and Fire Protection in 1988 projected private timber harvests at 1.96 billion board feet annually during the life of the Forest Plans. The primary difference between the two projections is the projected response of nonindustrial private owners to higher market demand for their timber. Timber harvests from this ownership are well below the level that can be supported by available timber inventories and growth.

Both projections indicate reduced timber supplies from industrial timberland ownerships and increased supplies from nonindustrial timberland ownerships during the life of the Forest Plans. The primary reason for this shift is that harvest levels on industrial ownerships have been at a higher rate than can be sustained by available timber inventories and growth. By contrast, nonindustrial ownership harvests have been well below the level that can be sustained by the timber inventory and growth on these ownerships. Both projections consider the fact that many of the smaller nonindustrial owners do not consider timber harvesting, and the income derived from it, to be a management objective. Neither of the two projections account for harvest restrictions that may be imposed on private harvests as a result of the listing of the northern spotted owl as threatened or changing State regulatory policies. Large reductions in harvesting as a result of increased regulation of private timberlands are possible, but reliable projections are not currently available.

Table J-2.

**Projected Timber Harvest, Growth, and Inventory on Private Land in
the Four Major Timber Supply Regions of California.**

Area	Average Annual Harvest, MMBF 1995-2005	Net Annual Sawtimber Growth MMBF, 1995-2005	Sawtimber Inventory BBF, 1995-2005
North Coast	1100	1080	39.4
Northern Interior	542	503	18.0
Sacramento	467	413	19.7
San Joaquin	145	148	6.4
All Private Land	2254	2144	83.5
Industrial Private	1760	1169	41.5
Nonindustrial Private	496	974	42.1

Source: Krumland, Bruce, and William McKillop, Prospects for Supply of Private Timber in California, University of California, July 1990.

OUTLOOK FOR TIMBER SUPPLIES - IMPORTS

As discussed above, the Pacific Northwest is the primary source of imported timber products in California. Through displacement effects in national markets, Canada and the South also play a major role in determining the supply of timber products from the Northwest that is available to California markets.

According to studies conducted by Forest Service research units, timber supplies from all regions of the United States - except the Pacific Coast - are projected to increase during the life of the Forest Plans. The South is by far the largest timber supply region in the United States.

Studies conducted in Canada indicate that available sawtimber supplies are not expected to restrain exports to the U.S. during the life of the Forest Plans. However, tariff and trade policies may affect Canadian exports to the U.S. over this period.

A decline in timber harvests in the Pacific Northwest over the next 10-15 years is expected. This is due to reduced availability of timber inventories on both public and private lands.

Siberia contains the largest undeveloped softwood timber resource in the world. Chile and New Zealand are increasingly active exporters in world markets.

Increased supplies of logs and manufactured wood products from foreign sources appear likely to be imported to California in the future.

The overall outlook is that imports to California from other States and countries will continue to support increased demands by California consumers over the next 10-15 years. However, imports will likely increase at a lower rate than over the last 20 years — particularly if growth of the State's economy continues at the slower pace of recent years.

THE OUTLOOK FOR TIMBER SUPPLIES - NATIONAL FORESTS

The allowable sale quantities from individual Forest Plans are an indicator of future timber supply levels from National Forests in California. The allowable sale quantity places an upper limit on the average annual amount of green sawtimber from suitable timberlands that can be sold from a National Forest in the first ten year period of the Plan. Nonchargeable timber (dead timber and fuelwood from either suitable or unsuitable timberlands) is in addition to the allowable sale quantity. Historically, nonchargeable volume increased the total amount sold by a few percentage points. However, as a result of changes currently being made in Forest Plans, nonchargeable volume is likely to increase in relation to allowable sale quantities in the future.

The amount of timber offered for sale in an individual year is determined through the budget process. When the amount of timber sold in an individual year is less than the allowable sale quantity, sales in future years may be higher than the allowable sale quantity, since the ASQ is a limit on the average annual amount that can be sold over a ten year period.

Over the long term, the volume harvested equals the volume sold. However, over shorter periods the volume harvested can exceed (or fall short of) the volume sold by causing the uncut volume under contract to decline (or increase).

In the early 1980's the volume harvested was less than the volume sold, and in the late 1980's and early 1990's volume harvested exceeded the volume sold.

Timber sales projected under the individual National Forest Plans in Region 5 total between 540 and 725 million board feet annually. This projection is based on likely allowable sale quantities and nonchargeable volumes from Forest Plans that are being completed or are undergoing amendment. These projections are subject to change as a result of decisions made through the Forest planning and budget processes.

Table J-3.

Recent Average Annual National Forest Timber Sales Compared to Projected Timber Sale Program Quantities

Timber Supply Area	National Forest	1989-91 Average Volume Sold, MMBF	Projected Timber Sale Program Quantity MMBF *
North Coast	Six Rivers	77	12-26
Northern Interior	Klamath (1)	118	40-70
	Modoc	51	30-40
	Lassen	147	60-80
	Shasta-Trinity	123	75-95
Sacramento	Mendocino (2)	39	10-15
	Plumas (3)	175	70-90
	Tahoe	88	50-60
	Eldorado (4)	166	50-70
	Lake Tahoe Basin	8	4-10
San Joaquin	Stanislaus (5)	117	30-40
	Sierra	99	60-70
	Sequoia	70	40-50
	Inyo (6)	8	8-10
Total		1,286	540-725

- (1) Typically about one half of the logs from the Klamath National Forest flow into Oregon. Most of the remainder are milled in the Northern Interior area.
- (2) Mendocino logs typically flow 30 percent to the Sacramento area, 30 percent to the Northern Interior area, and 40 percent to the North Coast.
- (3) Plumas logs typically flow 40 percent to the Northern Interior area, 60 percent to the Sacramento area.
- (4) Eldorado logs typically flow 60 percent to the Sacramento area and 40 percent to the San Joaquin area.
- (5) Stanislaus logs typically flow 20 percent to the Sacramento area and 80 percent to the San Joaquin area.
- (6) Inyo logs typically flow 50 percent to the San Joaquin area and 50 percent to the Northern Interior area.
- (*) All figures are subject to change as a result of decisions made through planning and budget processes. Forest Plans for the Six Rivers, Klamath, Shasta-Trinity, and Mendocino National Forests are now being finalized. Forest Plans for all other Forests shown are undergoing amendment.

The timber sale program quantities projected are below the average annual volume sold in the early 1990's. Timber supplies are also below the 1990 RPA sale offering goal of 1.49 billion board feet for the period 1995-2000. The 1990 RPA goal was based on information developed prior to the amendment of Forest Service planning documents to reflect new information on management of habitat for northern and California spotted owls and other old-growth related species.

THE SUBREGIONAL OUTLOOK

Based on the historical pattern of log flows to mills, the State can be divided into four major timber market areas: North Coast, Northern Interior, Sacramento, and San Joaquin. The Central Coast and Southern California areas are minor producing areas.

Up until the 1990's, virtually all of the decline in the State's timber harvest that occurred over the last 30 years took place in the North Coast market area on private lands. The outlook now is for relatively stable output from private lands over the 10-15 year life of the Forest Plans in all major market areas.

Since the early 1990's the contribution of National Forests to regional timber supplies has declined sharply.

During the 1980's, National Forests provided roughly 40 percent of the regional timber supply. In the mid 1990's and the future, they will provide roughly 25 percent of the timber available for processing by local mills on a Statewide basis.

The relative contribution of National Forests to the timber supply also differs between market areas of the State. In the North Coast area, private supplies are dominant and National Forests are projected to supply less than 2 percent of the timber. In the Northern Interior and Sacramento areas, National Forests supply roughly 30 percent of the timber. In the San Joaquin area they supply roughly one half of the timber.

Timber supplies from National Forests are projected to remain well below levels of the early 1990's. Since sawmill capacity exceeded available timber supplies in all major producing areas in the early 1990's, and many existing mills had not been upgraded to use the best currently available technology, mills have been closing in all areas of the State. This pattern is expected to continue until there is a better balance between available supplies and sawmill capacity that employs the most efficient technology. Closures are expected to continue in all areas of the State during the life of the Forest Plans.

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MAJOR SILVICULTURAL SYSTEMS AND THEIR APPLICATION

INTRODUCTION

The purpose of this appendix is to describe the major silvicultural systems used to manage forest stands, and the advantages and disadvantages of each.

Logging practices in the early part of this century consisted of clearcutting expansive tracts of land, or selectively harvesting the most valuable trees, leaving behind understocked stands often predisposed to wildfire due to heavy fuel concentrations). These practices frequently resulted in conversion to less desirable tree species, or even complete reforestation failures.

Silvicultural practices were originally developed to provide for reforestation of logged lands. In more recent times, the field of silviculture has grown to include management of forest composition and structure, health, productivity, and genetics. In managing forests for a wide variety of values, the field of silviculture is highly integrated with such disciplines as wildlife biology, hydrology, soil science, fisheries management, and geology.

Humans have altered forest ecosystems markedly by logging and road construction; atmospheric pollution; hunting and other recreation disturbance; man-caused ignition of conflagration fires; suppression of beneficial wildfires; introduction of non-native plants, insects, and disease organisms; and by affecting the distribution and range of native plants and wildlife species. Population growth trends indicate that human effects will increase in the future as disturbance of forest ecosystems and demand for forest resources increases. The aim of modern silvicultural practices is to avoid or counteract the negative effects of these activities, to the extent possible, to maintain the health and resilience of forest ecosystems.

Forest stands are uniform communities of trees. They are managed to meet the land management plan direction for the management area in which they occur. For example, stands within the Streamside Management Area are managed to provide the structural components important to streamside dependent resources, such as adequate shading to maintain cool stream temperatures,

and large logs for stream channel structure. Stand size is selected to facilitate management, and is determined by the logging and transportation systems used and the specific management area objectives. On the Six Rivers, stands typically range in size from five to forty acres.

A silvicultural system is a method of stand management to achieve the management area objectives. Selection of an appropriate silvicultural system is strongly influenced by such factors as stand age and condition, soils, and biology of the tree species and understory vegetation. An example of a silvicultural system that could maintain shade in streamside areas would be the single-tree selection method.

A silvicultural prescription differs from a silvicultural system in that a prescription is a planned sequence of treatments developed for individual stands to meet specific stand management objectives, such as producing a specific wood product, creating a certain type of wildlife habitat, etc. A silvicultural prescription for the single-tree selection system would include a schedule of all necessary treatments including designating trees for harvest, determining skidding patterns, harvesting trees, thinning dense patches of understory trees, providing for establishment of new seedlings, protecting seedlings from animal damage, and controlling competing vegetation.

Forest stands are constantly changing over time as trees grow, die, and are replaced by other vegetation. These characteristic patterns of vegetation change, or successional trends, are specific to each forest type and are further influenced by site conditions such as soil type, aspect, and elevation.

Achievement of stand management objectives invokes the concept of “desired future condition.” This simply refers to what the land manager would like the stand to develop into, and can be defined by a wide range of ecosystem components such as species composition, sizes of trees, age distribution, number of canopy layers, amount of canopy closure, understory vegetation, amount of soil organic material, and numbers and sizes of snags. An understanding of successional trends is key to achieving a desired future condition.

Therefore, in developing a silvicultural prescription, important considerations could include: how would the stand develop if left alone, how and when should the stand be manipulated to meet a desired condition in the future, when will the desired future condition occur and how long will it persist? To help answer these questions various computer models are used to simulate stand development over time.

Natural processes such as fire, wind storms, flood, disease, and insect attack have been important forest evolutionary factors. For thousands of years, man has been an important part of these natural processes through the lighting of wildfires (and in other areas of the world through clearing land for agriculture and fuelwood gathering.) These disturbances created stand openings ranging from a single tree to hundreds or even thousands of acres. Forests have evolved to regenerate in the aftermath of such disturbances. In many cases, interference with the process of disturbance, such as fire suppression, results in a change in forest composition, health and vigor.

Silvicultural systems are applied to forest stands largely to imitate natural ecological processes. A primary difference between these natural processes and past silvicultural management has been the pattern of stand replacement (sizes and shapes of disturbance areas) and the rate at which it has occurred. On many commercial forest lands, regeneration harvesting has probably far exceeded past levels of natural disturbance.

Silvicultural management also differs from natural processes in that harvesting removes woody biomass from the site. If left on the site this material would either burn-up or be decomposed. If burned, some of the nutrients contained in the woody material would be recycled into the ecosystem. If woody material is left on the site, organic matter is added to the soil in addition to nutrients.

DESCRIPTIONS OF THE SILVICULTURAL SYSTEMS

A silvicultural system includes treatments to manipulate stand development and eventually provide for stand regeneration. This is accomplished through cutting trees, growing new trees, and controlling competing plants. Cuttings are classified as intermediate cuttings and regeneration cuttings. Intermediate cutting is performed to improve the health or alter the structure or species composition of an existing stand. Examples of

intermediate cuttings include thinning, sanitation, and salvage. The goal of regeneration cutting is to open up the stand sufficiently to provide for establishment of new trees. Examples of regeneration cuttings include clearcut, seedtree, shelterwood, group selection, and individual tree selection. Silvicultural systems are named for the method of regeneration cutting utilized.

Ecosystem Management concepts are changing silvicultural practices on the National Forests. Therefore, most silvicultural prescriptions on National Forests no longer rigidly conform to any of the classic silvicultural systems. These systems are important, however, as they represent fundamental methods of stand regeneration and improvement, and they provide a framework within which site-specific silvicultural prescriptions are derived.

Silvicultural systems can be broken into two major categories: even-age systems and uneven-age systems. In even-age management most or all of the stand is harvested to create site conditions favorable for seedling establishment. All seedlings are established at the same time, and the stand is composed of desired species. Since residuals may be left, even-age stands may be composed of more than one identifiable age class. As the stand grows, thinnings are conducted to harvest trees that would otherwise die due to overcrowding, and to maintain stand density at a level that provides for stand health and desired diameter growth. The period of time necessary for a stand to reach a specified size or age is known as the rotation age. When the stand reaches the rotation age, the stand is regenerated and the cycle is repeated. Thus, a forest managed under the even-age system would consist of a mosaic of different-age stands.

Uneven-age management is quite different because the objective is to maintain a variety of tree ages and sizes within the stand. There is no rotation age for the stand because trees of all sizes and ages are harvested selectively or in small groups or patches. Also, there is no beginning or end to the stand because there are always trees of various sizes and ages present. In general, the tree species comprising the stand must be shade tolerant to effectively reproduce and grow beneath an overstory canopy. The trees that require extensive sunlight to become established (intolerant species) are usually reduced to minor stand components.

Even-age silvicultural systems create site conditions similar to those following large scale disturbance such as a conflagration fire, insect epidemic, or massive wind blown wood debris. Uneven-age systems approximate

small scale disturbances associated with ground fires, insect kill of an individual tree, or windthrow of a small patch of trees.

Selection of an even-age or uneven-age system is largely dependent upon the biology of the tree species and the complex ecological relationships of the forest type. While some tree species are adapted to growing in even-age stands, others are well suited to an uneven-age structure. These categories represent two extremes; in nature, most stands fall somewhere in between.

EVEN-AGE SYSTEMS

Clearcutting is harvesting all merchantable trees in a stand with the objective of regenerating an even-age stand. The clearcutting system has been widely used because it often results in the lowest logging and site preparation costs. It also provides a favorable environment for the establishment and growth of shade intolerant tree species. On the Six Rivers National Forest, clearcuts have most commonly been regenerated by hand planting of seedlings.

In the **seed tree** system, individual high quality overstory trees are left after harvesting to provide a seed source for stand regeneration. Generally about three to six trees per acre remain standing. This equates to an average spacing between trees of 120 to 85 feet respectively. This method is most frequently used where good seed trees exist and some natural regeneration is desired. In the past, after the site was fully stocked with seedlings, the seed trees were harvested for their economic value. With Ecosystem Management in silvicultural management, the seed trees will usually be left on the site for their importance to wildlife, visual quality, and soil productivity. Due mostly to the unpredictability of successful seed crops, nearly all seed tree stands are planted with nursery stock.

The objective of the **shelterwood** system is to open the stand up sufficiently to provide for regeneration but, at the same time, leave enough standing trees to shelter the site from sun and wind. In shelterwoods, seven to fifteen overstory trees per acre are left (79 to 54 foot spacing respectively). Although these trees compete for soil moisture needed by the seedlings, the shelter they provide can increase seedling survival, especially on sites with south or west exposures. Although the shelterwood trees do contribute some seed to the site, due to the infrequency of seed crops most shelterwoods are also planted with nursery seedlings.

In the past, the shelterwood system included a final harvest of the overstory trees once the seedlings were established. This was performed because of their economic value, and also because of their competitive effect causing a growth reduction in the newly-established trees. Under Ecosystem Management, these shelterwood trees will generally be left standing through-out the development of the regenerated stand.

Regeneration with legacy is a new system which has evolved out of Ecosystem Management direction. The objective of the system is to open up the stand sufficiently to provide for seedling establishment and growth while retaining on-site those structures which provide a "legacy" of the previous overmature stand. These legacy structures may consist of snags, mature conifers, hardwoods, large logs, groups of seedlings and saplings, etc. This system most closely approximates large scale fire disturbance which typically results in live trees remaining both singly and in groups. Prescribed burning for site preparation is carried out to maintain a low fire intensity. This increases costs and difficulty of application, but is necessary to preserve the soil organic (duff) layer and large woody material important in reducing erosion and maintaining long term soil productivity.

UNEVEN-AGE SYSTEMS

In the **single-tree selection** system, each tree is evaluated for its contribution to the desired characteristics of the uneven-age stand. Regeneration and intermediate cuttings are usually done in one operation. New trees are established in spaces created by harvesting of selected mature or overmature trees. Dense groups of young trees are thinned to provide for the growth of desired individuals. The interval of time between stand entries is termed the cutting cycle. Cutting cycles typically range from ten to sixty years.

Generally, the longer the cycle, the more difficult it is to control stand structure and species composition. Since the single-tree selection system favors regeneration of shade tolerant species, it is very difficult to apply in forest types dominated by shade intolerant conifers, such as Douglas-fir and ponderosa pine. Where these types of stands have been selectively logged in the past, the species composition has shifted towards species such as tanoak and white fir. These types of changes in natural successional patterns have resulted in insect and disease outbreaks. The subsequent tree mortality, often accompanied by wildfire, often results in converting the forest back to the original shade intolerant species.

The **group selection** system requires harvesting trees in small groups less than three acres in size. The openings created in the stand resemble miniature clearcuts. The uneven-aged stand consists of a mosaic of even-aged groups. Thus, the group selection system uses the principles of even-age systems described above to manage much smaller units of land. Because of the relatively small size of harvest areas, the group selection system generally requires more roads and landings than any of the even-age systems. Therefore it is difficult to apply on steep terrain where cable logging systems are used.

CONTRASTS BETWEEN SILVICULTURAL SYSTEMS

This section compares the major silvicultural systems in terms of the resulting pattern of the forested landscape, the structure of individual stands, species composition, forest health, productivity, regulation, and genetics.

LANDSCAPE PATTERNS

A forest managed under the classic clearcut, seed tree, and shelterwood systems consists of a mosaic of even-aged stands. Under Ecosystem Management, however, the forest would be comprised of two or three-aged stands, each consisting of scattered residual overstory trees and an even-age layer of understory reproduction. The even-age method results in the greatest spatial diversity across the landscape since the forest consists of dispersed stands representing each of the various seral stages: grass/forb/seedling, sapling/shrub, pole, immature timber, mature timber, and overmature timber.

A forest managed by the group selection system is structurally similar to forests managed by the even-age silvicultural systems, except that the even-age components (groups) are much smaller and more numerous. By contrast, each stand in a forest managed by the single-tree selection system would have trees of many ages. If applied over a large area, the single-tree selection method results in very low spatial diversity as there is only one type of forest cover represented, that being a multi-layered forest consisting of trees of all ages.

Regardless of the silvicultural system, it is the specified rotation age, more than any other factor, that determines what the forest will look like. Under the even-age system, rotation age markedly affects forest structure. Table K-1 illustrates the difference in structures

between a hypothetical forest regulated under 100 and 300 year rotations (actual values would depend on specific management practices, species composition, and growth potential of the sites).

Table K-1.
Hypothetical Structure of Forests Managed Under Even-Age Systems with Rotation Ages of 100 and 300 Years

Seral Stage	Age	Percent of Forest Area by Seral Stage	
		100yr Rotation	300yr Rotation
grass/forb/seedling	0 - 10	10	3
sapling/shrub	11 - 30	20	7
pole	31 - 60	30	10
immature timber	61 - 90	30	10
mature timber	91 - 180	10	30
overmature timber	181 - 300	0	40

Under a 300 year rotation seventy percent of the forest would consist of mature and overmature stands of trees, whereas a 100 year rotation age forest would have approximately only 10 percent of acres in the mature class.

Historic application of even-age systems has resulted in stand openings which dominate the landscape because of their large size, highly distinct edges, and geometric shapes. These practices were implemented primarily to reduce logging costs and facilitate site preparation, but they have been unpopular with many forest visitors since they have resulted in a obviously altered appearance.

As previously discussed, many forest types naturally regenerate in one-age or two-age stands as a result of large scale disturbance, such as conflagration fire. Under natural conditions the landscape reflects these patterns of disturbance in the form of contiguous even-age blocks of vegetation, including large and small stand openings. These natural stand patterns appear quite different from traditional geometric logging units because they typically follow the topographic features that influence wildfire spread, e.g. ridges and draws.

Uneven-age systems best meet the public’s perception of a “natural appearing” landscape because there are no large stand openings or apparent variation in stand ages. In the single-tree selection system every acre has mature trees present at all times. However, managing forests strictly to meet the public’s perception of what a natural landscape should look like may undermine natural ecological processes which influence such things as tree health, wildlife distribution, and soil fertility.

Under the Regional Ecosystem Management concepts, the sizes, shapes, and distribution of regeneration areas more closely approximates natural disturbance patterns. Furthermore, retention of legacy trees and snags aids in softening the edges of regeneration openings. In forest types dominated by fire-adapted vegetation, careful application of even-age systems and the group selection method best provides a natural landscape appearance.

STAND STRUCTURE

Under the even-age system, stands may be comprised of one or more same-age tree layers. A true clearcut will result in a single-age stand of trees and brush. As the stand develops and trees compete for growing space, many of the slower-growing trees will be overtopped and eventually die. In stands of mixed conifers and hardwoods, the conifers will typically outgrow the hardwoods to form an upper canopy. Some time after the stand reaches overmaturity individual conifers begin to die. As more light is transmitted through gaps in the canopy, an understory of shade tolerant brush, hardwoods, or conifers will develop.

Seed trees, shelterwoods, and regeneration with legacy harvests result in the development of multi-layer stands with two or three distinct age classes of trees. Although they are true even-age methods in terms of management techniques, these silvicultural systems can, over time result in stands with many of the characteristics of uneven-age stands, especially in terms visual quality, and habitat for mature or overmature forest-dependent wildlife species.

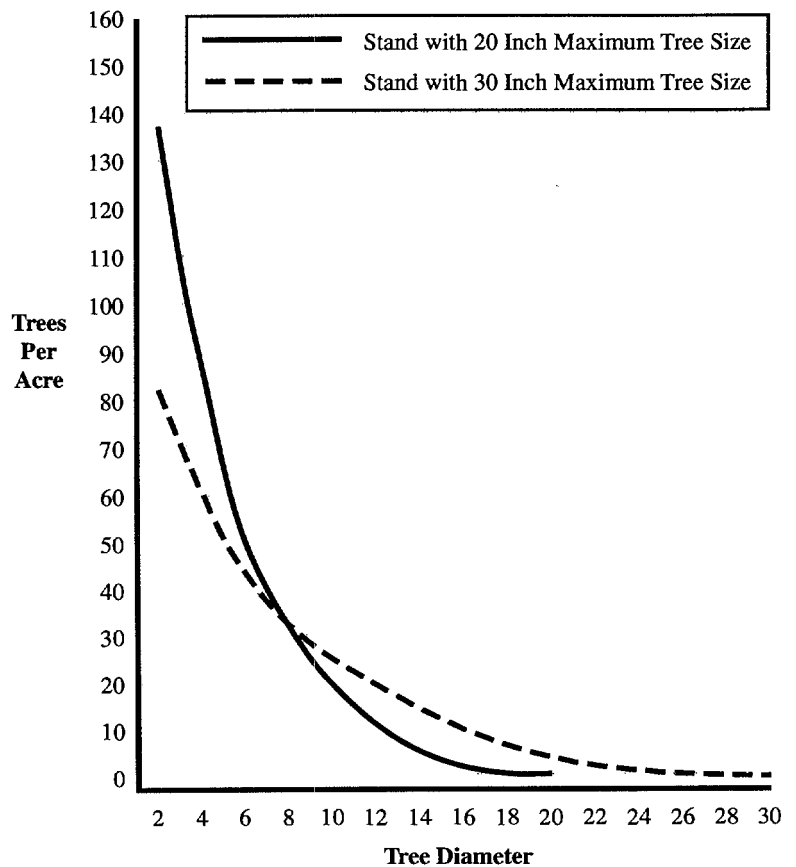
The group selection method initially results in numerous interspersed stand openings. Because of the small size of individual openings, the overall canopy of the stand is

essentially intact. However, as harvesting continues over time, patches of mature and overmature forest become fairly widely separated. Eventually, the stand is comprised of equal numbers of same-age groups. The oldest age class represented in the stand is dependent upon the selected rotation age.

The single-tree selection system yields stands with the greatest structural diversity. Under this system, all sizes of trees are present on each acre. The greatest number of trees per acre are in the seedling class, then the sapling class, poles, etc. To provide for establishment of seedlings and growth of understory trees, the canopy closure must be carefully controlled to allow adequate light penetration. Therefore, there are relatively few large overstory trees in single-tree selection stands. Stand structure is affected by varying the maximum size tree to be retained. The following table indicates how the structure of a hypothetical uneven-age stand would vary with maximum tree size.

Figure K-1.

Hypothetical Diameter Distributions for Uneven-Age Stands Managed for a Maximum Tree Size of 20 and 40 Inches



As the maximum tree size for retention increases, the single-tree selection method becomes increasingly difficult to implement since it is necessary to maintain trees of the older age classes while creating openings for regeneration and providing adequate light for growth of younger understory trees.

SPECIES COMPOSITION

The distribution of plant species is controlled by a complex array of interactions involving site adaptations, competition strategies, and regeneration strategies. Plants have evolved to grow on specific sites. Therefore, the distribution of a species may be controlled by such factors as soil pH, length of frost-free period, patterns and amounts of rainfall, etc. Also, plants are in keen competition with each other for light, water, and nutrients, in effect growing space. Finally, different species of plants have adapted specific regeneration strategies, and these strategies strongly influence their distribution. Matching species to the site and controlling competition are two areas of concern that silviculturists consider in developing stand management prescriptions. The regeneration strategies of various species of plants is a field of knowledge from which the major silvicultural systems were derived.

For many species, regeneration is most successful in large clearings created by a disturbance such as a fire or clearcutting. Examples include grasses; some forbs; shrubs such as deerbrush, snowbrush, and manzanita; hardwoods such as madrone, and black oak; and some of the most valuable commercial conifer species, such as Douglas-fir, ponderosa pine, and sugar pine. These species require long daily periods of direct sunlight, adequate soil moisture, and warm soil temperatures for seed germination, seedling establishment, and growth. Even-age systems tend to favor these species which are known as shade intolerant or invader species.

Other species regenerate best on sites that are sheltered by mature trees. These species are sensitive to the high temperatures resulting from prolonged exposure to direct sunlight, and to desiccating winds. Uneven-age systems tend to favor these shade tolerant species. Examples on the forest include a few grasses; ferns; some forbs; shrubs such as rhododendron, azalea, and huckleberry; hardwoods such as tanoak, and bigleaf maple; and a few commercial conifer tree species, such as white fir, incense cedar, and Port-Orford cedar.

On low quality forest lands where lack of soil moisture or other soil conditions limit the amount of vegetation, canopy shading is greatly reduced. In these areas, shade intolerant plants can become established and grow in uneven-age stands.

Silvicultural practices are designed to create site conditions which best meet the regeneration requirements of specific target species of trees and understory plants. The conditions considered optimal for a given species vary somewhat with elevation, latitude, aspect, and soil type. Treatments such as broadcast burning, mulching, artificial shading, and control of competing plants can substantially broaden the range of site conditions in which a species can propagate and grow.

Neither even-age or uneven-age systems inherently provide for a greater diversity of plant species. Under either system, silvicultural practices may be utilized to encourage species diversity. However, since each system creates distinctly different site conditions, the types of species growing on a site will vary markedly depending upon which system is used. In managing forests, it is important to consider species diversity on a landscape basis, as well as on an individual stand basis.

FOREST HEALTH

A wide variety of forest insect and disease pests adversely affect the health of trees. The ecological relationships that exist between these pests and their hosts are highly complex, however, some generalities exist:

- **Tree vigor is positively correlated with resistance to insects and disease.** Trees growing in overstocked conditions are much more susceptible to pests. Likewise, trees are more susceptible during periods of prolonged drought. Silvicultural practices such as thinning and release are carried out to increase tree vigor, thus minimizing insect and disease losses.
- **Tree injuries increase susceptibility to insects and disease.** Trees are most commonly damaged by the falling of adjacent trees (either by logging or windthrow), yarding operations, road construction, or mass soil movement. Injuries to the bole and roots of trees are the most significant. These wounds not only weaken the tree, but may serve as entry points for disease organisms. The amount of damage a logged stand may experience varies greatly with such factors as tree sizes, logging systems, topography, time of year, and the skill of the individual operator. However, damage to residual trees generally increases as the number

of trees removed per acre increases, and the number of entries into a stand increases.

- **Trees growing on sites to which they are not adapted are highly susceptible to pests.** A widespread example is the invasion of ponderosa pine and Douglas-fir sites by white fir. On many of these sites in California, the ecological pattern of stand replacement has been interrupted by decades of fire suppression. White fir seedlings, which normally would be killed by naturally occurring ground fires, persist in the understory. These trees grow to comprise the new stand once the overstory conifers begin to die. The white fir are not well adapted to the droughty site conditions, and insect and disease losses become excessively high as the trees mature. The eventual result is often an understocked forest with an extreme wildfire risk due to the amount of dead woody material.
- **Maintaining a diversity of plant species and age classes over the landscape is expected to be important in preventing pest outbreaks.** There is a growing knowledge base concerning the complex interactions between forest pest levels and populations of animals and beneficial insects. Maintaining these animals and beneficial insects is accomplished through creating habitat diversity over the landscape. Also, since most forest pests are extremely host-specific, vegetational diversity tends to discourage their spread.

Within forest types dominated by shade intolerant conifers, such as the Douglas-fir/tanoak/madrone type, even-age systems best provide for tree growth and resistance to disease. This is because in even-age systems, young trees do not have to compete as much with overstory trees, therefore more site resources are available to them. Even-age systems also afford the greatest potential for controlling species composition, since site preparation and release treatments can be designed to remove or reduce the numbers of unwanted species. Under Ecosystem Management, even-age systems retain legacy structures (snags, down logs, green trees, etc.) considered important to maintaining forest health.

Some of the greatest concern over applying uneven-age systems to shade intolerant tree species is the demonstrated increased susceptibility of stands to insects

and disease. In even-age systems, if a pest such as dwarf mistletoe or a root disease pathogen occurs on the site, it may be possible to remove infected trees and reforest with a different, unsusceptible species. In uneven-age systems, however, this is not generally possible. The disease remains in the stand to infect young trees as they grow.

FOREST PRODUCTIVITY

Forest productivity, can be discussed in terms of the effects of silvicultural management on the production of commercial forest products, and the effects of silvicultural treatments on long term soil productivity.

1) Forest Production: Silvicultural management can dramatically affect production of commercial forest products. The following are some examples:

- Varying the number and species of trees planted
- Increasing growth of commercial trees by removing competing vegetation.
- Varying the spacing of “crop” trees through precommercial thinning.
- Fertilizing sites to increase growth.
- Managing the density of young stands to influence tree diameter growth, provide for branch pruning, and control understory vegetation. This directly affects productivity and the type and quality of wood product.
- Controlling diseases and insect pests which can negatively affect timber productivity.

It is difficult to make generalizations about the silvicultural systems in terms of timber productivity. On many sites, and in many forest types, even-age systems provide the lowest management costs and greatest yields. This is especially true on high quality forest sites which are best suited to shade intolerant species. For other types of stands, however, the uneven-age system is more productive and less costly to implement; notably, easily accessible stands of shade tolerant species, or stands with very low regeneration potential. As with any stand management objective, when considering timber productivity it is important to select the silvicultural system that is most appropriate for the forest type and site conditions.

Because uneven-age systems, in general, require more frequent stand entries, the risk of tree injury is greater. This can result in less timber productivity due to losses from root pathogens and heartrot organisms. Also, as previously discussed, it is more difficult to eliminate some diseases from stands managed under an uneven-age system.

In evaluating timber productivity, it is important to consider associated costs as well as the economic benefits.

2) Long Term Soil Productivity: Soil productivity is affected by a wide variety of factors. Those factors which can most be affected by forest management practices are soil depth, structure, humus content, and nutrient content. Soil depth can potentially be reduced by any activity which increases erosion rates, such as yarding logs and burning slash. Soil structure is important as it allows for proper root development and rainfall infiltration. Activities such as ground skidding and mechanical slash piling can adversely affect soil structure through compaction. Humus, which is a highly developed organic soil component, beneficially contributes to soil texture, structure, and fertility. Activities which remove organic material, such as logging, piling, or burning, can eventually reduce the humus content of soil. Likewise, these activities remove nutrients from the site.

The effects of timber utilization on long term soil productivity is a function of the frequency and intensity of these impacts, the current soil formation trend (whether gain, loss, improvement, or degradation) and the background rate of change.

As previously discussed, in many forest types periodic site disturbance is an integral part of the successional pathways resulting in a climax forest community. Although these “background” disturbance levels often result in some short term loss of soil organics and nutrients, the frequency and intensities of disturbance is such that their effects are usually compensated for by various naturally occurring soil-improving processes such as weathering of parent material, incorporation of organic matter, and nutrient cycling.

Some forest management practices can negatively affect soil productivity, especially if carried out repeatedly over successive rotations. Some examples include:

- Intense burns can damage soil by removing duff and large organic debris, and reducing the soil nutrient pool.
- Slash piling can redistribute organic debris and the nutrients it contains into concentrated areas.
- Intensive harvesting can result, over time, in a decrease in humus. This can negatively affect soil structure, texture, and nutrient content. Examples of intensive harvesting include removal of the whole top including bole, branches and foliage; or whole tree harvesting where the stump and a portion of the roots is also removed. Generally, the more organic matter left on the site after harvesting, the better for the soil. However, excessive amounts of organic debris can interfere with or preclude establishment of conifer seedlings. This same debris can pose an extreme risk of a soil-damaging conflagration fire if ignition occurs.
- The shorter the rotation length in even-age management and group selection, or the smaller the maximum tree size in single-tree selection, the greater the potential loss of soil organic matter.
- Soil erosion is related to the percentage of area impacted by ground skidding, piling, or road building equipment, and to the frequency of stand entry.

As with timber productivity, it is difficult to make generalizations about even-age and uneven-age systems in terms of their effect on long term soil productivity. Under even-age systems, regeneration is accomplished by significantly reducing the amounts of live vegetation and organic debris on relatively large areas to provide for seedling establishment. This can result in somewhat higher erosion losses than in uneven-age systems, where regeneration occurs in small patches. However, since uneven-age systems typically require more frequent stand entries, erosion and compaction may be greater where ground-skidding is utilized.

FOREST REGULATION

Timber yield refers to the amount of wood that is available for harvest from a specified forest area. It is based on the growth of stands. The maximum annual harvest allowed from a National Forest is termed the allowable sale quantity. By Federal law, the allowable sale quantity generally cannot exceed the long term, sustained capacity of that Forest to grow wood. Within each National Forest, stands are managed by silvicultural systems to achieve continuous production of the allowable sale quantity. When this continuous production level is achieved, the Forest and stands are said to be regulated. Timber yield is based only on those lands which are 1) capable of producing commercial forests, 2) suitable for timber management practices, and 3) available for timber management. Lands which meet these criteria are termed the "regulated landbase." Areas not capable, suitable, and available for timber management (such as wilderness, dedicated wildlife habitat, research natural areas, botanical areas, etc.) are not considered in yield determination.

Under the even-age system, forests are generally regulated in terms of acres harvested per decade, which is a function of the selected rotation age. A rotation age used for regulation purposes is quite different from a rotation age applied to a specific stand. The regulation rotation age represents the average age of stand replacement over the forest as a whole, rotation ages applied to individual stands vary somewhat depending upon such factors of stand growth and incidence of disease. A forest regulated under the even-age system would have an equal number of acres in each age class. The oldest age class would be the selected rotation age.

By contrast, under uneven-age systems regulation is achieved when individual stands are converted to desired age class structures. Continuous production from the forest is achieved by entering stands to harvest trees on a periodic basis and carefully controlling stand age class structures.

Since in actual practice a combination of silvicultural systems is utilized over a forest landbase, regulation is achieved by dividing the forest into units called regulation classes. Each regulation class represents a different intensity of management and therefore yield expectation. The conversion of the Forest's timber-suited lands to a regulated age structure is a long term process, many decades would be required before a regulated forest structure could be achieved on lands allocated to timber production.

FOREST GENETICS

Native forest trees are highly adapted to the climate, soil conditions, and fire cycles of the sites where they grow. Furthermore, trees have evolved together with native insect and disease organisms. As a result of this co-evolution, trees have developed highly specific resistance mechanisms which normally protect young, vigorous trees from damage. Interference with this natural system has occurred with introduction of non-native insect and disease pests into forest ecosystems, atmospheric pollution, interruption of natural fire cycles, cattle grazing, and manipulation of forest species composition and structure.

Tree improvement programs have been involved in genetic selection for a variety of tree characteristics including disease resistance, growth potential, and wood quality. Silviculturists are concerned with both selection for tree improvement and maintenance or enhancement of genetic diversity. Because of the typical distribution of genotypes in forests, and the guidelines used in collecting seed, these two objectives are not mutually exclusive.

Introduced diseases, such as white pine blister rust, continue to cause widespread losses. Because natural forest ecosystems commonly have high genotypic variability, some individuals are invariably resistant. Genetic selection utilizes these resistant strains to reforest devastated areas and thus maintain the species range.

It is expected that other diseases, such as black stain root disease, have been increasing in importance due to forest practices which simplified forest ecosystems (e.g. created large contiguous monotypic stands). Ecosystem Management direction was devised in part to avoid these types of adverse ecosystem effects.

Genotypic diversity is an important forest management consideration as many of the interrelationships that exist between damaging agents and the forest ecosystem are unknown or unpredictable. Silvicultural practices can maintain or enhance genetic diversity on a stand basis. This is especially true where artificial regeneration is utilized. Due to both the prevalence of inbreeding between neighbor trees and to the seed-dissemination strategies of conifers, genetic variability within a stand is usually quite low. Large stand openings facilitate pollen movement from more distant, less closely related trees.

Therefore, when natural regeneration is prescribed, seed trees are selected not only for their physical characteristics, but for their distribution in the stand to minimize inbreeding and thus enhance genetic variability. Natural regeneration in the shelterwood method can be highly inbred because of the close spacing of shelterwood seed trees.

Seed for artificial regeneration is collected from within specific seed zones and elevations to ensure genotypes are adapted to the site conditions. Within these constraints, seed is collected from a large number of widely scattered stands to ensure that a broad genetic base is included. Because of this, an artificially regenerated stand contains higher genetic variability than a natural stand.

Because of the above considerations, even-age systems tend to produce the highest genetic gain of selected tree characteristics and provide for the greatest genetic

diversity within managed stands. Where both natural and artificial regeneration is included in the silvicultural scheme, genetic diversity is maximized. This is best accomplished through the seed tree and group-selection methods.

The single-tree selection system is the least suited to improving or maintaining both genetic gain and diversity. This is primarily true because of the high rate of inbreeding that occurs. Also, a great deal of consideration must be given when selecting merchantable trees for harvest. While single-tree selection requires identification and harvest of the oldest individual trees, if improperly applied, the largest, fastest growing trees may actually be removed from the stand. Likewise, because of economic concerns, there has been a tendency to remove the highest value trees. This practice, commonly known as "high grading," can result in a loss of desired genetic traits.

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SIMULATION OF TIMBER HARVEST METHODS

The figures in this appendix were generated by a computer program to aid the reader in visualizing how the timber harvest methods used in the various alternatives would appear. It should be noted that these simulations are included as a guide only; the appearance of each harvest area will vary depending on ground conditions in the specific area.



Figure M-1 depicts a stand which has been regenerated using a clearcut. This regeneration method would be used as the primary tool only in the MKT alternative; all other alternatives would use clearcutting as a last resort and would limit the number of acres clearcut annually. This simulation meets the Maximum Modification VQO.



Figure M-2 portrays a stand which has been regenerated with a green tree retention. An average of six live conifers would be left per acre. This regeneration would be used in the CUR alternative. Although not depicted here, regenerated areas would also retain 1.5 snags, 3 cull logs and varying numbers of hardwoods per acre. This simulation meets the Modification VQO.



Figure M-3 depicts a stand which has been regenerated leaving 5 to 10 percent of the unit area clumped. This regeneration method would be used in the CUR and MKT alternatives in areas where there is co-emphasis on timber and other resources. This simulation meets the Partial Retention VQO.



Figure M-4 shows a stand which has been regenerated leaving 20 percent of the unit area clumped and 2 to 5 trees randomly distributed per acre. This regeneration method would be the primary silvicultural tool used in the PRF, OGR and PRF alternatives. Although not depicted here, regenerated areas would also retain an average of 3 to 6 snags, 4 to 6 cull logs and 4 hardwoods (where present) per acre. This simulation meets the partial retention VQO.



Figure M-5 depicts a stand which has had an intermediate treatment using an individual tree selection. This type of treatment would be used in all alternatives where timber is harvested to meet other resource objectives such as riparian and wildlife habitat or visual quality. This simulation meets the Retention VQO.



Figure M-6 depicts a stand which has had an intermediate treatment using group selection with residuals. As in figure M-5, this type of treatment would be used in all alternatives in areas where timber is harvested to meet other resource objectives. This simulation meets the Partial Retention VQO.

Table N-1. Northern spotted owl represents the habitat needs of approximately 137 wildlife species that use mature or late successional forests for breeding, feeding and resting.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service sensitive	B117
RED-TAILED HAWK	Buteo jamaicensis		B123
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
MARbled MURRELET	Brachyramphus marmoratus	Federally threatened	B240
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaida macroura		B255
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
VAUX'S SWIFT	Chaetura vauxi		B281
RUFous HUMMINGBIRD	Selasphorus rufus		B291
LEWIS' WOODPECKER	Melanerpes lewis		B294
RED-BREAStED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
NORTHERN FLICKER	Colaptes auratus		B307
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordidulus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondi		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318
WESTERN FLYCATCHER	Empidonax difficilis		B320
VIOLET-GREEN SWALLOW	Tachycineta thalassina		B340
GRAY JAY	Perisoreus canadensis		B345
STELLER'S JAY	Cyanocitta stelleri		B346
CLARK'S NUTCRACKER	Nucifraga columbiana		B350
COMMON RAVEN	Corvus corax		B354
MOUNTAIN CHICKADEE	Parus gambeli		B356

Table N-1. Northern spotted owl represents the habitat needs of approximately 137 wildlife species that use mature or late successional forests for breeding, feeding and resting.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
CHESTNUT-BACKED CHICKADEE	Parus rufescens		B357
RED-BREASTED NUTHATCH	Sitta canadensis		B361
WHITE-BREASTED NUTHATCH	Sitta carolinensis		B362
PYGMY NUTHATCH	Sitta pygmaea		B363
BROWN CREEPER	Certhia americana		B364
WINTER WREN	Troglodytes troglodytes		B370
GOLDEN-CROWNED KINGLET	Regulus satrapa		B375
RUBY-CROWNED KINGLET	Regulus calendula		B376
WESTERN BLUEBIRD	Sialia mexicana		B380
TOWNSEND'S SOLITAIRE	Myadestes townsendi		B382
SWAINSON'S THRUSH	Catharus ustulatus		B385
HERMIT THRUSH	Catharus guttatus		B386
AMERICAN ROBIN	Turdus migratorius		B389
VARIED THRUSH	Ixoreus naevius		B390
CEDAR WAXWING	Bombycilla cedrorum		B407
EUROPEAN STARLING	Sturnus vulgaris		B411
SOLITARY VIREO	Vireo solitarius		B415
HUTTON'S VIREO	Vireo huttoni		B417
ORANGE-CROWNED WARBLER	Vermivora celata		B425
NASHVILLE WARBLER	Vermivora ruficapilla		B426
YELLOW WARBLER	Dendroica petechia		B430
YELLOW-RUMPED WARBLER	Dendroica coronata		B435
BLACK-THROATED GRAY WARBLER	Dendroica nigrescens		B436
TOWNSEND'S WARBLER	Dendroica townsendi		B437
HERMIT WARBLER	Dendroica occidentalis		B438
WESTERN TANAGER	Piranga ludoviciana		B471
BLACK-HEADED GROSBEAK	Pheucticus melanocephalus		B475
DARK-EYED JUNCO	Junco hyemalis		B512
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
PURPLE FINCH	Carpodacus purpureus		B536
CASSIN'S FINCH	Carpodacus cassinii		B537
RED CROSSBILL	Loxia curvirostra		B539
PINE SISKIN	Carduelis pinus		B542
EVENING GROSBEAK	Coccothraustes vespertinus		B546
PACIFIC SHREW	Sorex pacificus		M005
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycterus noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
RED TREE VOLE	Phenacomys longicaudus		M132
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
BLACK BEAR	Ursus americanus		M151
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156

Table N-1. Northern spotted owl represents the habitat needs of approximately 137 wildlife species that use mature or late successional forests for breeding, feeding and resting.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
LONG-TAILED WEASEL	Mustela frenata		M157
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
MULE DEER	Odocoileus hemionus		M181
WESTERN FENCE LIZARD	Sceloporus occidentalis		R022
NORTHERN ALLIGATOR LIZARD	Gerrhonotus coeruleus		R042
GOPHER SNAKE	Pituophis melanoleucus		R057
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063
WESTERN RATTLESNAKE	Crotalus viridis		R076

137 species

Table N-2. Pileated Woodpecker represents the habitat needs of 197 wildlife species which utilize mature and late successional forests, and snags and down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
WOOD DUCK	Aix sponsa		B076
MALLARD	Anas platyrhynchos		B079
COMMON MERGANSER	Mergus merganser		B105
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service Sensitive	B117
RED-SHOULDERED HAWK	Buteo lineatus		B119
RED-TAILED HAWK	Buteo jamaicensis		B123
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
MERLIN	Falco columbarius		B128
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaida macroura		B255
COMMON BARN OWL	Tyto alba		B262
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
COMMON POORWILL	Phalaenoptilus nuttallii		B277
VAUX'S SWIFT	Chaetura vauxi		B281
ANNA'S HUMMINGBIRD	Calypte anna		B287
CALLIOPE HUMMINGBIRD	Stellula calliope		B289
RUFIOUS HUMMINGBIRD	Selasphorus rufus		B291
BELTED KINGFISHER	Ceryle alcyon		B293
LEWIS' WOODPECKER	Melanerpes lewis		B294
ACORN WOODPECKER	Melanerpes formicivorus		B296
RED-BREASTED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
BLACK-BACKED WOODPECKER	Picoides arcticus		B306
NORTHERN FLICKER	Colaptes auratus		B307

Table N-2. Pileated Woodpecker represents the habitat needs of 197 wildlife species which utilize mature and late successional forests, and snags and down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordiolulus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondii		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318
WESTERN FLYCATCHER	Empidonax difficilis		B320
BLACK PHOEBE	Sayornis nigricans		B321
WESTERN KINGBIRD	Tyrannus verticalis		B333
PURPLE MARTIN	Progne subis		B338
TREE SWALLOW	Tachycineta bicolor		B339
VIOLET-GREEN SWALLOW	Tachycineta thalassina		B340
NORTHERN ROUGH-WINGED SWALLOW	Stelgidopteryx serripennis		B341
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
GRAY JAY	Perisoreus canadensis		B345
STELLER'S JAY	Cyanocitta stelleri		B346
SCRUB JAY	Aphelocoma coerulescens		B348
CLARK'S NUTCRACKER	Nucifraga columbiana		B350
COMMON RAVEN	Corvus corax		B354
BLACK-CAPPED CHICKADEE	Parus atricapillus		B355
MOUNTAIN CHICKADEE	Parus gambeli		B356
CHESTNUT-BACKED CHICKADEE	Parus rufescens		B357
PLAIN TITMOUSE	Parus inornatus		B358
BUSHTIT	Psaltriparus minimus		B360
RED-BREASTED NUTHATCH	Sitta canadensis		B361
WHITE-BREASTED NUTHATCH	Sitta carolinensis		B362
PYGMY NUTHATCH	Sitta pygmaea		B363
BROWN CREEPER	Certhia americana		B364
ROCK WREN	Salpinctes obsoletus		B366
CANYON WREN	Catherpes mexicanus		B367
BEWICK'S WREN	Thryomanes bewickii		B368
HOUSE WREN	Troglodytes aedon		B369
WINTER WREN	Troglodytes troglodytes		B370
AMERICAN DIPPER	Cinclus mexicanus		B373
GOLDEN-CROWNED KINGLET	Regulus satrapa		B375
RUBY-CROWNED KINGLET	Regulus calendula		B376
WESTERN BLUEBIRD	Sialia mexicana		B380
TOWNSEND'S SOLITAIRE	Myadestes townsendi		B382
SWAINSON'S THRUSH	Catharus ustulatus		B385
HERMIT THRUSH	Catharus guttatus		B386
AMERICAN ROBIN	Turdus migratorius		B389
VARIED THRUSH	Ixoreus naevius		B390
CEDAR WAXWING	Bombycilla cedrorum		B407
EUROPEAN STARLING	Sturnus vulgaris		B411
SOLITARY VIREO	Vireo solitarius		B415
HUTTON'S VIREO	Vireo huttoni		B417
ORANGE-CROWNED WARBLER	Vermivora celata		B425
NASHVILLE WARBLER	Vermivora ruficapilla		B426
YELLOW WARBLER	Dendroica petechia		B430
YELLOW-RUMPED WARBLER	Dendroica coronata		B435
BLACK-THROATED GRAY WARBLER	Dendroica nigrescens		B436
TOWNSEND'S WARBLER	Dendroica townsendi		B437
HERMIT WARBLER	Dendroica occidentalis		B438
WILSON'S WARBLER	Wilsonia pusilla		B463
WESTERN TANAGER	Piranga ludoviciana		B471
BLACK-HEADED GROSBEAK	Pheucticus melanocephalus		B475
GREEN-TAILED TOWHEE	Pipilo chlorurus		B482
RUFIOUS-SIDED TOWHEE	Pipilo erythrophthalmus		B483
CHIPPING SPARROW	Spizella passerina		B489
FOX SPARROW	Passerella iliaca		B504
SONG SPARROW	Melospiza melodia		B505

Table N-2. Pileated Woodpecker represents the habitat needs of 197 wildlife species which utilize mature and late successional forests, and snags and down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
DARK-EYED JUNCO	Junco hyemalis		B512
WESTERN MEADOWLARK	Sturnella neglecta		B521
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
BROWN-HEADED COWBIRD	Molothrus ater		B528
NORTHERN ORIOLE	Icterus galbula		B532
PURPLE FINCH	Carpodacus purpureus		B536
CASSIN'S FINCH	Carpodacus cassinii		B537
RED CROSSBILL	Loxia curvirostra		B539
PINE SISKIN	Carduelis pinus		B542
EVENING GROSBEAK	Coccothraustes vespertinus		B546
VIRGINIA OPOSSUM	Didelphis virginiana		M001
VAGRANT SHREW	Sorex vagrans		M003
PACIFIC SHREW	Sorex pacificus		M005
WATER SHREW	Sorex palustris		M010
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
BROAD-FOOTED MOLE	Scapanus latimanus		M018
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
FRINGED MYOTIS	Myotis thysanodes		M026
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycterus noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
SNOWSHOE HARE	Lepus americanus		M049
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
BEAVER	Castor canadensis		M112
WESTERN HARVEST MOUSE	Reithrodontomys megalotis		M113
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
RED TREE VOLE	Phenacomys longicaudus		M132
CALIFORNIA VOLE	Microtus californicus		M134
LONG-TAILED VOLE	Microtus longicaudus		M136
CREEPING VOLE	Microtus oregoni		M137
MUSKRAT	Ondatra zibethicus		M139
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
COYOTE	Canis latrans		M146
BLACK BEAR	Ursus americanus		M151
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156
LONG-TAILED WEASEL	Mustela frenata		M157
MINK	Mustela vison		M158
STRIPED SKUNK	Mephitis mephitis		M162
RIVER OTTER	Lutra canadensis		M163
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
MULE DEER	Odocoileus hemionus		M181

Table N-2. Pileated Woodpecker represents the habitat needs of 197 wildlife species which utilize mature and late successional forests, and snags and down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004
WESTERN FENCE LIZARD	Sceloporus occidentalis		R022
SAGEBRUSH LIZARD	Sceloporus graciosus		R023
WESTERN SKINK	Eumeces skiltonianus		R036
NORTHERN ALLIGATOR LIZARD	Gerrhonotus coeruleus		R042
RUBBER BOA	Charina bottae		R046
SHARP-TAILED SNAKE	Contia tenuis		R049
RACER	Coluber constrictor		R051
GOPHER SNAKE	Pituophis melanoleucus		R057
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063
NORTHWESTERN GARTER SNAKE	Thamnophis ordinoides		R064
WESTERN RATTLESNAKE	Crotalus viridis		R076

197 wildlife species

Table N-3. Black Bear represents the Habitat needs of 239 wildlife species that are associated with mid and late successional forests, meadows and large down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
CALIFORNIA SLENDER SALAMANDER	Batrachoseps attenuatus		A014
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
FOOTHILL YELLOW-LEGGED FROG	Rana boylei		A043
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
GREAT EGRET	Casmerodius albus		B052
WOOD DUCK	Aix sponsa		B076
MALLARD	Anas platyrhynchos		B079
COMMON MERGANSER	Mergus merganser		B105
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BLACK-SHOULDERED KITE	Elanus caeruleus		B111
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
NORTHERN HARRIER	Circus cyaneus		B114
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service sensitive	B117
RED-SHOULDERED HAWK	Buteo lineatus		B119
RED-TAILED HAWK	Buteo jamaicensis		B123
ROUGH-LEGGED HAWK	Buteo lagopus		B125
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
MERLIN	Falco columbarius		B128
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaida macroura		B255
GREATER ROADRUNNER	Geococcyx californianus		B260
COMMON BARN OWL	Tyto alba		B262
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
GREAT GRAY OWL	Strix nebulosa	Forest Service sensitive	B271
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
COMMON POORWILL	Phalaenoptilus nuttallii		B277
VAUX'S SWIFT	Chaetura vauxi		B281
ANNA'S HUMMINGBIRD	Calypte anna		B287
CALLIOPE HUMMINGBIRD	Stellula calliope		B289
RUFIOUS HUMMINGBIRD	Selasphorus rufus		B291
ALLEN'S HUMMINGBIRD	Selasphorus sasin		B292
BELTED KINGFISHER	Ceryle alcyon		B293
LEWIS' WOODPECKER	Melanerpes lewis		B294

Table N-3. Black Bear represents the Habitat needs of 239 wildlife species that are associated with mid and late successional forests, meadows and large down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
ACORN WOODPECKER	Melanerpes formicivorus		B296
RED-BREASTED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
BLACK-BACKED WOODPECKER	Picoides arcticus		B306
NORTHERN FLICKER	Colaptes auratus		B307
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordiolus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondii		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318
WESTERN FLYCATCHER	Empidonax difficilis		B320
BLACK PHOEBE	Sayornis nigricans		B321
ASH-THROATED FLYCATCHER	Myiarchus cinerascens		B326
WESTERN KINGBIRD	Tyrannus verticalis		B333
HORNED LARK	Eremophila alpestris		B337
PURPLE MARTIN	Progne subis		B338
TREE SWALLOW	Tachycineta bicolor		B339
VIOLET-GREEN SWALLOW	Tachycineta thalassina		B340
NORTHERN ROUGH-WINGED SWALLOW	Stelgidopteryx serripennis		B341
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
GRAY JAY	Perisoreus canadensis		B345
STELLER'S JAY	Cyanocitta stelleri		B346
SCRUB JAY	Aphelocoma coerulescens		B348
CLARK'S NUTCRACKER	Nucifraga columbiana		B350
AMERICAN CROW	Corvus brachyrhynchos		B353
COMMON RAVEN	Corvus corax		B354
BLACK-CAPPED CHICKADEE	Parus atricapillus		B355
MOUNTAIN CHICKADEE	Parus gambeli		B356
CHESTNUT-BACKED CHICKADEE	Parus rufescens		B357
PLAIN TITMOUSE	Parus inornatus		B358
BUSHTIT	Psaltriparus minimus		B360
RED-BREASTED NUTHATCH	Sitta canadensis		B361
WHITE-BREASTED NUTHATCH	Sitta carolinensis		B362
PYGMY NUTHATCH	Sitta pygmaea		B363
BROWN CREEPER	Certhia americana		B364
ROCK WREN	Salpinctes obsoletus		B366
CANYON WREN	Catherpes mexicanus		B367
BEWICK'S WREN	Thryomanes bewickii		B368
HOUSE WREN	Troglodytes aedon		B369
WINTER WREN	Troglodytes troglodytes		B370
AMERICAN DIPPER	Cinclus mexicanus		B373
GOLDEN-CROWNED KINGLET	Regulus satrapa		B375
RUBY-CROWNED KINGLET	Regulus calendula		B376
BLUE-GRAY GNATCATCHER	Polioptila caerulea		B377
WESTERN BLUEBIRD	Sialia mexicana		B380
MOUNTAIN BLUEBIRD	Sialia currucoides		B381
TOWNSEND'S SOLITAIRE	Myadestes townsendi		B382
SWAINSON'S THRUSH	Catharus ustulatus		B385
HERMIT THRUSH	Catharus guttatus		B386
AMERICAN ROBIN	Turdus migratorius		B389
VARIED THRUSH	Ixoreus naevius		B390
WRENTIT	Chamaea fasciata		B391
CEDAR WAXWING	Bombycilla cedrorum		B407
EUROPEAN STARLING	Sturnus vulgaris		B411
SOLITARY VIREO	Vireo solitarius		B415
HUTTON'S VIREO	Vireo huttoni		B417
ORANGE-CROWNED WARBLER	Vermivora celata		B425
NASHVILLE WARBLER	Vermivora ruficapilla		B426

Table N-3. Black Bear represents the Habitat needs of 239 wildlife species that are associated with mid and late successional forests, meadows and large down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
YELLOW WARBLER	Dendroica petechia		B430
YELLOW-RUMPED WARBLER	Dendroica coronata		B435
BLACK-THROATED GRAY WARBLER	Dendroica nigrescens		B436
TOWNSEND'S WARBLER	Dendroica townsendi		B437
HERMIT WARBLER	Dendroica occidentalis		B438
MACGILLIVRAY'S WARBLER	Oporornis tolmiei		B460
WILSON'S WARBLER	Wilsonia pusilla		B463
WESTERN Tanager	Piranga ludoviciana		B471
BLACK-HEADED GROSBEAK	Pheucticus melanocephalus		B475
LAZULI BUNTING	Passerina amoena		B477
GREEN-TAILED TOWHEE	Pipilo chlorurus		B482
RUFIOUS-SIDED TOWHEE	Pipilo erythrophthalmus		B483
BROWN TOWHEE	Pipilo fuscus		B484
CHIPPING SPARROW	Spizella passerina		B489
LARK SPARROW	Chondestes grammacus		B495
SAVANNAH SPARROW	Passerculus sandwichensis		B499
FOX SPARROW	Passerella iliaca		B504
SONG SPARROW	Melospiza melodia		B505
LINCOLN'S SPARROW	Melospiza lincolni		B506
GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla		B509
WHITE-CROWNED SPARROW	Zonotrichia leucophrys		B510
DARK-EYED JUNCO	Junco hyemalis		B512
WESTERN MEADOWLARK	Sturnella neglecta		B521
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
BROWN-HEADED COWBIRD	Molothrus ater		B528
NORTHERN ORIOLE	Icterus galbula		B532
PURPLE FINCH	Carpodacus purpureus		B536
CASSIN'S FINCH	Carpodacus cassinii		B537
HOUSE FINCH	Carpodacus mexicanus		B538
RED CROSSBILL	Loxia curvirostra		B539
PINE SISKIN	Carduelis pinus		B542
LESSER GOLDFINCH	Carduelis psaltria		B543
AMERICAN GOLDFINCH	Carduelis tristis		B545
EVENING GROSBEAK	Coccothraustes vespertinus		B546
HOUSE SPARROW	Passer domesticus		B547
VIRGINIA OPOSSUM	Didelphis virginiana		M001
VAGRANT SHREW	Sorex vagrans		M003
PACIFIC SHREW	Sorex pacificus		M005
WATER SHREW	Sorex palustris		M010
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
TOWNSEND'S MOLE	Scapanus townsendii		M016
COAST MOLE	Scapanus orarius		M017
BROAD-FOOTED MOLE	Scapanus latimanus		M018
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
FRINGED MYOTIS	Myotis thysanodes		M026
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasioryctes noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
BRUSH RABBIT	Sylvilagus bachmani		M045
SNOWSHOE HARE	Lepus americanus		M049
BLACK-TAILED HARE	Lepus californicus		M051
MOUNTAIN BEAVER	Apodonta rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080

Table N-3. Black Bear represents the Habitat needs of 239 wildlife species that are associated with mid and late successional forests, meadows and large down logs.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
BOTTA'S POCKET GOPHER	Thomomys bottae		M081
WESTERN POCKET GOPHER	Thomomys mazama		M084
BEAVER	Castor canadensis		M112
WESTERN HARVEST MOUSE	Reithrodontomys megalotis		M113
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
RED TREE VOLE	Phenacomys longicaudus		M132
CALIFORNIA VOLE	Microtus californicus		M134
LONG-TAILED VOLE	Microtus longicaudus		M136
CREEPING VOLE	Microtus oregoni		M137
MUSKRAT	Ondatra zibethicus		M139
HOUSE MOUSE	Mus musculus		M142
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
COYOTE	Canis latrans		M146
GRAY FOX	Urocyon cinereoargenteus		M149
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156
LONG-TAILED WEASEL	Mustela frenata		M157
MINK	Mustela vison		M158
BADGER	Taxidea taxus		M160
WESTERN SPOTTED SKUNK	Spilogale gracilis		M161
STRIPED SKUNK	Mephitis mephitis		M162
RIVER OTTER	Lutra canadensis		M163
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
FALLOW DEER	Cervus dama		M178
MULE DEER	Odocoileus hemionus		M181
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004
WESTERN FENCE LIZARD	Sceloporus occidentalis		R022
SAGEBRUSH LIZARD	Sceloporus graciosus		R023
WESTERN SKINK	Eumeces skiltonianus		R036
SOUTHERN ALLIGATOR LIZARD	Gerrhonotus multicarinatus		R040
NORTHERN ALLIGATOR LIZARD	Gerrhonotus coeruleus		R042
RUBBER BOA	Charina bottae		R046
RINGNECK SNAKE	Diadophis punctatus		R048
SHARP-TAILED SNAKE	Contia tenuis		R049
RACER	Coluber constrictor		R051
GOPHER SNAKE	Pituophis melanoleucus		R057
COMMON KINGSSNAKE	Lampropeltis getulus		R058
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063
NORTHWESTERN GARTER SNAKE	Thamnophis ordinoides		R064
WESTERN RATTLESNAKE	Crotalus viridis		R076

239 species

Table N-4. American marten represents the habitat needs of 166 wildlife species which utilize high elevation mature and late successional Klamath Montane and Coast Range (true fir) forests, and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service Sensitive	B117
RED-TAILED HAWK	Buteo jamaicensis		B123
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
MERLIN	Falco columbarius		B128
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaida macroura		B255
COMMON BARN OWL	Tyto alba		B262
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
GREAT GRAY OWL	Strix nebulosa	Forest Service Sensitive	B271
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
VAUX'S SWIFT	Chaetura vauxi		B281
ANNA'S HUMMINGBIRD	Calypte anna		B287
CALLIOPE HUMMINGBIRD	Stellula calliope		B289
RUFIOUS HUMMINGBIRD	Selasphorus rufus		B291
LEWIS' WOODPECKER	Melanerpes lewis		B294
RED-BREASTED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
BLACK-BACKED WOODPECKER	Picoides arcticus		B306
NORTHERN FLICKER	Colaptes auratus		B307
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordidulus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondii		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318

Table N-4. American marten represents the habitat needs of 166 wildlife species which utilize high elevation mature and late successional Klamath Montane and Coast Range (true fir) forests, and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WESTERN FLYCATCHER	<i>Empidonax difficilis</i>		B320
VIOLET-GREEN SWALLOW	<i>Tachycineta thalassina</i>		B340
BARN SWALLOW	<i>Hirundo rustica</i>		B344
GRAY JAY	<i>Perisoreus canadensis</i>		B345
STELLER'S JAY	<i>Cyanocitta stelleri</i>		B346
CLARK'S NUTCRACKER	<i>Nucifraga columbiana</i>		B350
COMMON RAVEN	<i>Corvus corax</i>		B354
MOUNTAIN CHICKADEE	<i>Parus gambeli</i>		B356
CHESTNUT-BACKED CHICKADEE	<i>Parus rufescens</i>		B357
RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>		B361
WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>		B362
PYGMY NUTHATCH	<i>Sitta pygmaea</i>		B363
BROWN CREEPER	<i>Certhia americana</i>		B364
WINTER WREN	<i>Troglodytes troglodytes</i>		B370
GOLDEN-CROWNED KINGLET	<i>Regulus satrapa</i>		B375
RUBY-CROWNED KINGLET	<i>Regulus calendula</i>		B376
WESTERN BLUEBIRD	<i>Sialia mexicana</i>		B380
TOWNSEND'S SOLITAIRE	<i>Myadestes townsendi</i>		B382
SWAINSON'S THRUSH	<i>Catharus ustulatus</i>		B385
HERMIT THRUSH	<i>Catharus guttatus</i>		B386
AMERICAN ROBIN	<i>Turdus migratorius</i>		B389
VARIED THRUSH	<i>Ixoreus naevius</i>		B390
CEDAR WAXWING	<i>Bombycilla cedrorum</i>		B407
EUROPEAN STARLING	<i>Sturnus vulgaris</i>		B411
SOLITARY VIREO	<i>Vireo solitarius</i>		B415
HUTTON'S VIREO	<i>Vireo huttoni</i>		B417
ORANGE-CROWNED WARBLER	<i>Vermivora celata</i>		B425
NASHVILLE WARBLER	<i>Vermivora ruficapilla</i>		B426
YELLOW WARBLER	<i>Dendroica petechia</i>		B430
YELLOW-RUMPED WARBLER	<i>Dendroica coronata</i>		B435
BLACK-THROATED GRAY WARBLER	<i>Dendroica nigrescens</i>		B436
TOWNSEND'S WARBLER	<i>Dendroica townsendi</i>		B437
HERMIT WARBLER	<i>Dendroica occidentalis</i>		B438
WESTERN TANAGER	<i>Piranga ludoviciana</i>		B471
BLACK-HEADED GROSBEAK	<i>Pheucticus melanocephalus</i>		B475
GREEN-TAILED TOWHEE	<i>Pipilo chlorurus</i>		B482
RUFIOUS-SIDED TOWHEE	<i>Pipilo erythrophthalmus</i>		B483
CHIPPING SPARROW	<i>Spizella passerina</i>		B489
FOX SPARROW	<i>Passerella iliaca</i>		B504
SONG SPARROW	<i>Melospiza melodia</i>		B505
GOLDEN-CROWNED SPARROW	<i>Zonotrichia atricapilla</i>		B509
WHITE-CROWNED SPARROW	<i>Zonotrichia leucophrys</i>		B510
DARK-EYED JUNCO	<i>Junco hyemalis</i>		B512
WESTERN MEADOWLARK	<i>Sturnella neglecta</i>		B521
BREWER'S BLACKBIRD	<i>Euphagus cyanocephalus</i>		B524
BROWN-HEADED COWBIRD	<i>Molothrus ater</i>		B528
PURPLE FINCH	<i>Carpodacus purpureus</i>		B536
CASSIN'S FINCH	<i>Carpodacus cassinii</i>		B537
HOUSE FINCH	<i>Carpodacus mexicanus</i>		B538
RED CROSSBILL	<i>Loxia curvirostra</i>		B539
PINE SISKIN	<i>Carduelis pinus</i>		B542
LESSER GOLDFINCH	<i>Carduelis psaltria</i>		B543
EVENING GROSBEAK	<i>Coccothraustes vespertinus</i>		B546
VIRGINIA OPOSSUM	<i>Didelphis virginiana</i>		M001
PACIFIC SHREW	<i>Sorex pacificus</i>		M005
WATER SHREW	<i>Sorex palustris</i>		M010
TROWBRIDGE'S SHREW	<i>Sorex trowbridgii</i>		M012
SHREW-MOLE	<i>Neurotrichus gibbsii</i>		M015
LITTLE BROWN MYOTIS	<i>Myotis lucifugus</i>		M021
YUMA MYOTIS	<i>Myotis yumanensis</i>		M023

Table N-4. American marten represents the habitat needs of 166 wildlife species which utilize high elevation mature and late successional Klamath Montane and Coast Range (true fir) forests, and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
LONG-EARED MYOTIS	Myotis evotis		M025
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycters noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
RED TREE VOLE	Phenacomys longicaudus		M132
LONG-TAILED VOLE	Microtus longicaudus		M136
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
COYOTE	Canis latrans		M146
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service Sensitive	M154
FISHER	Martes pennanti	Forest service Sensitive	M155
ERMINE	Mustela erminea		M156
LONG-TAILED WEASEL	Mustela frenata		M157
WESTERN SPOTTED SKUNK	Spilogale gracilis		M161
STRIPED SKUNK	Mephitis mephitis		M162
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
MULE DEER	Odocoileus hemionus		M181
WESTERN FENCE LIZARD	Sceloporus occidentalis		R022
SAGEBRUSH LIZARD	Sceloporus graciosus		R023
WESTERN SKINK	Eumeces skiltonianus		R036
NORTHERN ALLIGATOR LIZARD	Gerrhonotus coeruleus		R042
RACER	Coluber constrictor		R051
GOPHER SNAKE	Pituophis melanoleucus		R057
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063
NORTHWESTERN GARTER SNAKE	Thamnophis ordinoides		R064
WESTERN RATTLESNAKE	Crotalus viridis		R076

166 wildlife species

Table N-5. Pacific fisher represents the habitat needs of 164 wildlife species which use mid elevation mature and late successional forests and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service sensitive	B117
RED-TAILED HAWK	Buteo jamaicensis		B123
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
MERLIN	Falco columbarius		B128
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
MARbled MURRELET	Brachyramphus marmoratus	Federally threatened	B240
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaida macroura		B255
COMMON BARN OWL	Tyto alba		B262
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
GREAT GRAY OWL	Strix nebulosa	Forest Service sensitive	B271
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
VAUX'S SWIFT	Chaetura vauxi		B281
ANNA'S HUMMINGBIRD	Calypte anna		B287
CALLIOPE HUMMINGBIRD	Stellula calliope		B289
RUFous HUMMINGBIRD	Selasphorus rufus		B291
LEWIS' WOODPECKER	Melanerpes lewis		B294
RED-BREASTED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
NORTHERN FLICKER	Colaptes auratus		B307
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordidulus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondii		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318
WESTERN FLYCATCHER	Empidonax difficilis		B320
VIOLET-GREEN SWALLOW	Tachycineta thalassina		B340
BARN SWALLOW	Hirundo rustica		B344
GRAY JAY	Perisoreus canadensis		B345
STELLER'S JAY	Cyanocitta stelleri		B346
CLARK'S NUTCRACKER	Nucifraga columbiana		B350

Table N-5. Pacific fisher represents the habitat needs of 164 wildlife species which use mid elevation mature and late successional forests and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
COMMON RAVEN	Corvus corax		B354
MOUNTAIN CHICKADEE	Parus gambeli		B356
CHESTNUT-BACKED CHICKADEE	Parus rufescens		B357
RED-BREASTED NUTHATCH	Sitta canadensis		B361
WHITE-BREASTED NUTHATCH	Sitta carolinensis		B362
PYGMY NUTHATCH	Sitta pygmaea		B363
BROWN CREEPER	Certhia americana		B364
WINTER WREN	Troglodytes troglodytes		B370
GOLDEN-CROWNED KINGLET	Regulus satrapa		B375
RUBY-CROWNED KINGLET	Regulus calendula		B376
WESTERN BLUEBIRD	Sialia mexicana		B380
TOWNSEND'S SOLITAIRE	Myadestes townsendi		B382
SWAINSON'S THRUSH	Catharus ustulatus		B385
HERMIT THRUSH	Catharus guttatus		B386
AMERICAN ROBIN	Turdus migratorius		B389
VARIED THRUSH	Ixoreus naevius		B390
CEDAR WAXWING	Bombycilla cedrorum		B407
EUROPEAN STARLING	Sturnus vulgaris		B411
SOLITARY VIREO	Vireo solitarius		B415
HUTTON'S VIREO	Vireo huttoni		B417
ORANGE-CROWNED WARBLER	Vermivora celata		B425
NASHVILLE WARBLER	Vermivora ruficapilla		B426
YELLOW WARBLER	Dendroica petechia		B430
YELLOW-RUMPED WARBLER	Dendroica coronata		B435
BLACK-THROATED GRAY WARBLER	Dendroica nigrescens		B436
TOWNSEND'S WARBLER	Dendroica townsendi		B437
HERMIT WARBLER	Dendroica occidentalis		B438
WESTERN Tanager	Piranga ludoviciana		B471
BLACK-HEADED GROSBEAK	Pheucticus melanocephalus		B475
GREEN-TAILED TOWHEE	Pipilo chlorurus		B482
RUFOUS-SIDED TOWHEE	Pipilo erythrophthalmus		B483
CHIPPING SPARROW	Spizella passerina		B489
FOX SPARROW	Passerella iliaca		B504
SONG SPARROW	Melospiza melodia		B505
GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla		B509
WHITE-CROWNED SPARROW	Zonotrichia leucophrys		B510
DARK-EYED JUNCO	Junco hyemalis		B512
WESTERN MEADOWLARK	Sturnella neglecta		B521
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
BROWN-HEADED COWBIRD	Molothrus ater		B528
PURPLE FINCH	Carpodacus purpureus		B536
CASSIN'S FINCH	Carpodacus cassinii		B537
HOUSE FINCH	Carpodacus mexicanus		B538
RED CROSSBILL	Loxia curvirostra		B539
PINE SISKIN	Carduelis pinus		B542
LESSER GOLDFINCH	Carduelis psaltria		B543
EVENING GROSBEAK	Coccothraustes vespertinus		B546
VIRGINIA OPOSSUM	Didelphis virginiana		M001
PACIFIC SHREW	Sorex pacificus		M005
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasioryctes noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
PINYON MOUSE	Peromyscus truei		M120

Table N-5. Pacific fisher represents the habitat needs of 164 wildlife species which use mid elevation mature and late successional forests and down woody debris.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
DUSKY-FOOTED WOODRAT	<i>Neotoma fuscipes</i>		M127
BUSHY-TAILED WOODRAT	<i>Neotoma cinerea</i>		M128
WESTERN RED-BACKED VOLE	<i>Clethrionomys californicus</i>		M129
RED TREE VOLE	<i>Phenacomys longicaudus</i>		M132
PACIFIC JUMPING MOUSE	<i>Zapus trinotatus</i>		M144
PORCUPINE	<i>Erethizon dorsatum</i>		M145
COYOTE	<i>Canis latrans</i>		M146
BLACK BEAR	<i>Ursus americanus</i>		M151
RINGTAIL	<i>Bassariscus astutus</i>		M152
RACCOON	<i>Procyon lotor</i>		M153
MARTEN	<i>Martes americana</i>	Forest Service sensitive	M154
FISHER	<i>Martes pennanti</i>	Forest Service sensitive	M155
ERMINE	<i>Mustela erminea</i>		M156
LONG-TAILED WEASEL	<i>Mustela frenata</i>		M157
WESTERN SPOTTED SKUNK	<i>Spilogale gracilis</i>		M161
STRIPED SKUNK	<i>Mephitis mephitis</i>		M162
MOUNTAIN LION	<i>Felis concolor</i>		M165
BOBCAT	<i>Felis rufus</i>		M166
WILD PIG	<i>Sus scrofa</i>		M176
ELK	<i>Cervus elaphus</i>		M177
MULE DEER	<i>Odocoileus hemionus</i>		M181
WESTERN FENCE LIZARD	<i>Sceloporus occidentalis</i>		R022
SAGEBRUSH LIZARD	<i>Sceloporus graciosus</i>		R023
WESTERN SKINK	<i>Eumeces skiltonianus</i>		R036
NORTHERN ALLIGATOR LIZARD	<i>Gerrhonotus coeruleus</i>		R042
RACER	<i>Coluber constrictor</i>		R051
GOPHER SNAKE	<i>Pituophis melanoleucus</i>		R057
COMMON GARTER SNAKE	<i>Thamnophis sirtalis</i>		R061
WESTERN TERRESTRIAL GARTER SNAKE	<i>Thamnophis elegans</i>		R062
WESTERN AQUATIC GARTER SNAKE	<i>Thamnophis couchi</i>		R063
NORTHWESTERN GARTER SNAKE	<i>Thamnophis ordinoides</i>		R064
WESTERN RATTLESNAKE	<i>Crotalus viridis</i>		R076

164 species

Table N-6. Black-tailed deer represent the habitat needs of approximately 237 species of wildlife which utilize early and mid successional forest habitat.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
DEL NORTE SALAMANDER	Plethodon elongatus		A010
ENSATINA	Ensatina eschscholtzi		A012
CALIFORNIA SLENDER SALAMANDER	Batrachoseps attenuatus		A014
BLACK SALAMANDER	Aneides flavipunctatus		A020
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
FOOTHILL YELLOW-LEGGED FROG	Rana boylei		A043
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
GREAT EGRET	Casmerodius albus		B052
WOOD DUCK	Aix sponsa		B076
MALLARD	Anas platyrhynchos		B079
COMMON MERGANSER	Mergus merganser		B105
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BLACK-SHOULDERED KITE	Elanus caeruleus		B111
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
NORTHERN HARRIER	Circus cyaneus		B114
SHARP-SHINNED HAWK	Accipiter striatus		B115
COOPER'S HAWK	Accipiter cooperii		B116
NORTHERN GOSHAWK	Accipiter gentilis	Forest Service sensitive	B117
RED-SHOULDERED HAWK	Buteo lineatus		B119
RED-TAILED HAWK	Buteo jamaicensis		B123
ROUGH-LEGGED HAWK	Buteo lagopus		B125
GOLDEN EAGLE	Aquila chrysaetos		B126
AMERICAN KESTREL	Falco sparverius		B127
MERLIN	Falco columbarius		B128
PEREGRINE FALCON	Falco peregrinus	Federally endangered	B129
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
BAND-TAILED PIGEON	Columba fasciata		B251
MOURNING DOVE	Zenaidia macroura		B255
GREATER ROADRUNNER	Geococcyx californianus		B260
COMMON BARN OWL	Tyto alba		B262
FLAMMULATED OWL	Otus flammeolus		B263
WESTERN SCREECH OWL	Otus kennicottii		B264
GREAT HORNED OWL	Bubo virginianus		B265
NORTHERN PYGMY OWL	Glaucidium gnoma		B267
SPOTTED OWL	Strix occidentalis	Federally threatened	B270
NORTHERN SAW-WHET OWL	Aegolius acadicus		B274
COMMON NIGHTHAWK	Chordeiles minor		B276
COMMON POORWILL	Phalaenoptilus nuttallii		B277
VAUX'S SWIFT	Chaetura vauxi		B281
ANNA'S HUMMINGBIRD	Calypte anna		B287
CALLIOPE HUMMINGBIRD	Stellula calliope		B289
RUFIOUS HUMMINGBIRD	Selasphorus rufus		B291
ALLEN'S HUMMINGBIRD	Selasphorus sasin		B292
BELTED KINGFISHER	Ceryle alcyon		B293
LEWIS' WOODPECKER	Melanerpes lewis		B294
ACORN WOODPECKER	Melanerpes formicivorus		B296

Table N-6. Black-tailed deer represent the habitat needs of approximately 237 species of wildlife which utilize early and mid successional forest habitat.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
RED-BREASTED SAPSUCKER	Sphyrapicus ruber		B299
NUTTALL'S WOODPECKER	Picoides nuttallii		B302
DOWNY WOODPECKER	Picoides pubescens		B303
HAIRY WOODPECKER	Picoides villosus		B304
WHITE-HEADED WOODPECKER	Picoides albolarvatus		B305
NORTHERN FLICKER	Colaptes auratus		B307
PILEATED WOODPECKER	Dryocopus pileatus		B308
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordiolulus		B311
HAMMONDS' FLYCATCHER	Empidonax hammondii		B317
DUSKY FLYCATCHER	Empidonax oberholseri		B318
WESTERN FLYCATCHER	Empidonax difficilis		B320
BLACK PHOEBE	Sayornis nigricans		B321
ASH-THROATED FLYCATCHER	Myiarchus cinerascens		B326
WESTERN KINGBIRD	Tyrannus verticalis		B333
HORNED LARK	Eremophila alpestris		B337
PURPLE MARTIN	Progne subis		B338
TREE SWALLOW	Tachycineta bicolor		B339
VIOLET-GREEN SWALLOW	Tachycineta thalassina		B340
NORTHERN ROUGH-WINGED SWALLOW	Stelgidopteryx serripennis		B341
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
GRAY JAY	Perisoreus canadensis		B345
STELLER'S JAY	Cyanocitta stelleri		B346
SCRUB JAY	Aphelocoma coerulescens		B348
CLARK'S NUTCRACKER	Nucifraga columbiana		B350
AMERICAN CROW	Corvus brachyrhynchos		B353
COMMON RAVEN	Corvus corax		B354
BLACK-CAPPED CHICKADEE	Parus atricapillus		B355
MOUNTAIN CHICKADEE	Parus gambeli		B356
CHESTNUT-BACKED CHICKADEE	Parus rufescens		B357
PLAIN TITMOUSE	Parus inornatus		B358
BUSHTIT	Psaltriparus minimus		B360
RED-BREASTED NUTHATCH	Sitta canadensis		B361
WHITE-BREASTED NUTHATCH	Sitta carolinensis		B362
PYGMY NUTHATCH	Sitta pygmaea		B363
BROWN CREEPER	Certhia americana		B364
ROCK WREN	Salpinctes obsoletus		B366
CANYON WREN	Catherpes mexicanus		B367
BEWICK'S WREN	Thryomanes bewickii		B368
HOUSE WREN	Troglodytes aedon		B369
WINTER WREN	Troglodytes troglodytes		B370
AMERICAN DIPPER	Cinclus mexicanus		B373
GOLDEN-CROWNED KINGLET	Regulus satrapa		B375
RUBY-CROWNED KINGLET	Regulus calendula		B376
BLUE-GRAY GNATCATCHER	Poliophtila caerulea		B377
WESTERN BLUEBIRD	Sialia mexicana		B380
MOUNTAIN BLUEBIRD	Sialia currucoides		B381
TOWNSEND'S SOLITAIRE	Myadestes townsendi		B382
SWAINSON'S THRUSH	Catharus ustulatus		B385
HERMIT THRUSH	Catharus guttatus		B386
AMERICAN ROBIN	Turdus migratorius		B389
VARIED THRUSH	Ixoreus naevius		B390
WRENTIT	Chamaea fasciata		B391
CEDAR WAXWING	Bombycilla cedrorum		B407
EUROPEAN STARLING	Sturnus vulgaris		B411
SOLITARY VIREO	Vireo solitarius		B415
HUTTON'S VIREO	Vireo huttoni		B417
ORANGE-CROWNED WARBLER	Vermivora celata		B425
NASHVILLE WARBLER	Vermivora ruficapilla		B426
YELLOW WARBLER	Dendroica petechia		B430
YELLOW-RUMPED WARBLER	Dendroica coronata		B435

Table N-6. Black-tailed deer represent the habitat needs of approximately 237 species of wildlife which utilize early and mid successional forest habitat.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
BLACK-THROATED GRAY WARBLER	Dendroica nigrescens		B436
TOWNSEND'S WARBLER	Dendroica townsendi		B437
HERMIT WARBLER	Dendroica occidentalis		B438
MACGILLIVRAY'S WARBLER	Oporornis tolmiei		B460
COMMON YELLOWTHROAT	Geothlypis trichas		B461
WILSON'S WARBLER	Wilsonia pusilla		B463
YELLOW-BREADED CHAT	Icteria virens		B467
WESTERN Tanager	Piranga ludoviciana		B471
BLACK-HEADED GROSBEAK	Pheucticus melanocephalus		B475
LAZULI BUNTING	Passerina amoena		B477
GREEN-TAILED TOWHEE	Pipilo chlorurus		B482
RUFIOUS-SIDED TOWHEE	Pipilo erythrophthalmus		B483
BROWN TOWHEE	Pipilo fuscus		B484
CHIPPING SPARROW	Spizella passerina		B489
LARK SPARROW	Chondestes grammacus		B495
SAVANNAH SPARROW	Passerculus sandwichensis		B499
FOX SPARROW	Passerella iliaca		B504
SONG SPARROW	Melospiza melodia		B505
LINCOLN'S SPARROW	Melospiza lincolnii		B506
GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla		B509
WHITE-CROWNED SPARROW	Zonotrichia leucophrys		B510
DARK-EYED JUNCO	Junco hyemalis		B512
WESTERN MEADOWLARK	Sturnella neglecta		B521
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
BROWN-HEADED COWBIRD	Molothrus ater		B528
NORTHERN ORIOLE	Icterus galbula		B532
PURPLE FINCH	Carpodacus purpureus		B536
CASSIN'S FINCH	Carpodacus cassinii		B537
HOUSE FINCH	Carpodacus mexicanus		B538
PINE SISKIN	Carduelis pinus		B542
LESSER GOLDFINCH	Carduelis psaltria		B543
AMERICAN GOLDFINCH	Carduelis tristis		B545
EVENING GROSBEAK	Coccothraustes vespertinus		B546
HOUSE SPARROW	Passer domesticus		B547
VIRGINIA OPOSSUM	Didelphis virginiana		M001
VAGRANT SHREW	Sorex vagrans		M003
PACIFIC SHREW	Sorex pacificus		M005
WATER SHREW	Sorex palustris		M010
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
TOWNSEND'S MOLE	Scapanus townsendii		M016
COAST MOLE	Scapanus orarius		M017
BROAD-FOOTED MOLE	Scapanus latimanus		M018
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
FRINGED MYOTIS	Myotis thysanodes		M026
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycterus noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
BRUSH RABBIT	Sylvilagus bachmani		M045
SNOWSHOE HARE	Lepus americanus		M049
BLACK-TAILED HARE	Lepus californicus		M051
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
BOTTA'S POCKET GOPHER	Thomomys bottae		M081

Table N-6. Black-tailed deer represent the habitat needs of approximately 237 species of wildlife which utilize early and mid successional forest habitat.

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WESTERN POCKET GOPHER	Thomomys mazama		M084
BEAVER	Castor canadensis		M112
WESTERN HARVEST MOUSE	Reithrodontomys megalotis		M113
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
RED TREE VOLE	Phenacomys longicaudus		M132
CALIFORNIA VOLE	Microtus californicus		M134
LONG-TAILED VOLE	Microtus longicaudus		M136
CREEPING VOLE	Microtus oregoni		M137
MUSKRAT	Ondatra zibethicus		M139
HOUSE MOUSE	Mus musculus		M142
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
COYOTE	Canis latrans		M146
GRAY FOX	Urocyon cinereoargenteus		M149
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156
LONG-TAILED WEASEL	Mustela frenata		M157
MINK	Mustela vison		M158
BADGER	Taxidea taxus		M160
WESTERN SPOTTED SKUNK	Spilogale gracilis		M161
STRIPED SKUNK	Mephitis mephitis		M162
RIVER OTTER	Lutra canadensis		M163
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ROOSEVELT ELK	Cervus elaphus		M177
BLACK - TAILED DEER	Odocoileus hemionus columbianus		M181
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004
WESTERN FENCE LIZARD	Sceloporus occidentalis		R022
SAGEBRUSH LIZARD	Sceloporus graciosus		R023
WESTERN SKINK	Eumeces skiltonianus		R036
SOUTHERN ALLIGATOR LIZARD	Gerrhonotus multicarinatus		R040
NORTHERN ALLIGATOR LIZARD	Gerrhonotus coeruleus		R042
RUBBER BOA	Charina bottae		R046
RINGNECK SNAKE	Diadophis punctatus		R048
SHARP-TAILED SNAKE	Contia tenuis		R049
RACER	Coluber constrictor		R051
GOPHER SNAKE	Pituophis melanoleucus		R057
COMMON KINGSNAKE	Lampropeltis getulus		R058
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063
NORTHWESTERN GARTER SNAKE	Thamnophis ordinoides		R064
WESTERN RATTLESNAKE	Crotalus viridis		R076

237 species

Table N-7. The Bog, seep, spring, wet meadow and talus assemblage represent the needs of up to 101 species of wildlife. [Assemblage species are highlighted]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
LONG TOED SALAMANDER	Ambystoma macrodactylum		A003
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
DEL NORTE SALAMANDER	Plethodon elongatus		A010
WESTERN TOAD	Bufo boreas		A032
PACIFIC TREEFROG	Hyla regilla		A039
RED-LEGGED FROG	Rana aurora aurora		A040
BULLFROG	Rana catesbeiana		A046
GREAT BLUE HERON	Ardea herodias		B051
GREAT EGRET	Casmerodius albus		B052
SNOWY EGRET	Egretta thula		B053
CANADA GOOSE	Branta canadensis		B075
WOOD DUCK	Aix sponsa		B076
GREEN-WINGED TEAL	Anas crecca		B077
MALLARD	Anas platyrhynchos		B079
NORTHERN PINTAIL	Anas acuta		B080
CINNAMON TEAL	Anas cyanoptera		B083
NORTHERN SHOVELER	Anas clypeata		B084
EURASIAN WIGEON	Anas penelope		B086
AMERICAN WIGEON	Anas americana		B087
RING-NECKED DUCK	Aythya collaris		B091
LESSER SCAUP	Aythya affinis		B094
BUFFLEHEAD	Bucephala albeola		B103
COMMON MERGANSER	Mergus merganser		B105
TURKEY VULTURE	Cathartes aura		B108
OSPREY	Pandion haliaetus		B110
BLACK-SHOULDERED KITE	Elanus caeruleus		B111
BALD EAGLE	Haliaeetus leucocephalus	Federally threatened	B113
NORTHERN HARRIER	Circus cyaneus		B114
RED-SHOULDERED HAWK	Buteo lineatus		B119
MERLIN	Falco columbarius		B128
PRAIRIE FALCON	Falco mexicanus		B131
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
TURKEY	Meleagris gallopavo		B138
CALIFORNIA QUAIL	Callipepla californica		B140
MOUNTAIN QUAIL	Oreortyx pictus		B141
VIRGINIA RAIL	Rallus limicola		B145
SORA	Porzana carolina		B146
AMERICAN COOT	Fulica americana		B149
SPOTTED SANDPIPER	Actitis macularia		B170
COMMON SNIPE	Gallinago gallinago		B199
COMMON BARN OWL	Tyto alba		B262
GREAT HORNED OWL	Bubo virginianus		B265
BELTED KINGFISHER	Ceryle alcyon		B293
OLIVE-SIDED FLYCATCHER	Contopus borealis		B309
WESTERN WOOD-PEWEE	Contopus sordidulus		B311
WESTERN FLYCATCHER	Empidonax difficilis		B320
BLACK PHOEBE	Sayornis nigricans		B321
TREE SWALLOW	Tachycineta bicolor		B339
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
ROCK WREN	Salpinctes obsoletus		B366
MARSH WREN	Cistothorus palustris		B372
SWAINSON'S THRUSH	Catharus ustulatus		B385
CALIFORNIA THRASHER	Toxostoma redivivum		B398
NORTHERN SHRIKE	Lanius excubitor		B409
COMMON YELLOWTHROAT	Geothlypis trichas		B461
LAZULI BUNTING	Passerina amoena		B477

Table N-7. The Bog, seep, spring, wet meadow and talus assemblage represent the needs of up to 101 species of wildlife. [Assemblage species are highlighted]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
GREEN-TAILED TOWHEE	Pipilo chlorurus		B482
BROWN TOWHEE	Pipilo fuscus		B484
CHIPPING SPARROW	Spizella passerina		B489
SONG SPARROW	Melospiza melodia		B505
LINCOLN'S SPARROW	Melospiza lincolni		B506
GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla		B509
WHITE-CROWNED SPARROW	Zonotrichia leucophrys		B510
DARK-EYED JUNCO	Junco hyemalis		B512
RED-WINGED BLACKBIRD	Agelaius phoeniceus		B519
WATER SHREW	Sorex palustris		M010
MARSH SHREW	Sorex bendirii		M011
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
FRINGED MYOTIS	Myotis thysanodes		M026
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycters noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
TOWNSEND'S BIG-EARED BAT	Plecotus townsendii	Candidate Category 2	M037
SNOWSHOE HARE	Lepus americanus		M049
BLACK-TAILED HARE	Lepus californicus		M051
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
BEAVER	Castor canadensis		M112
MUSKRAT	Ondatra zibethicus		M139
COYOTE	Canis latrans		M146
GRAY FOX	Urocyon cinereoargenteus		M149
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156
STRIPED SKUNK	Mephitis mephitis		M162
RIVER OTTER	Lutra canadensis		M163
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
FALLOW DEER	Cervus dama		M178
MULE DEER	Odocoileus hemionus		M181
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004
COMMON GARTER SNAKE	Thamnophis sirtalis		R061

101 wildlife species

Table N-8. The marsh, lake pond assemblage provides special habitat for over 58 species of wildlife. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
LONG TOED SALAMANDER	Ambystoma macrodactylum		A003
ROUGH-SKINNED NEWT	Taricha granulosa		A006
WESTERN TOAD	Bufo boreas		A032
BULLFROG	Rana catesbeiana		A046
RED LEGGED FROG	Rana aurora aurora		A040
PIED-BILLED GREBE	Podilymbus podiceps		B006
EARED GREBE	Podiceps nigricollis		B009
WESTERN GREBE / CLARK'S GREBE	Aechmophorus occidentalis / Clarkii		B010
DOUBLE-CRESTED CORMORANT	Phalacrocorax auritus		B044
GREAT BLUE HERON	Ardea herodias		B051
GREAT EGRET	Casmerodius albus		B052
SNOWY EGRET	Egretta thula		B053
CANADA GOOSE	Branta canadensis		B075
WOOD DUCK	Aix sponsa		B076
GREEN-WINGED TEAL	Anas crecca		B077
MALLARD	Anas platyrhynchos		B079
NORTHERN PINTAIL	Anas acuta		B080
CINNAMON TEAL	Anas cyanoptera		B083
NORTHERN SHOVELER	Anas clypeata		B084
EURASIAN WIGEON	Anas penelope		B086
AMERICAN WIGEON	Anas americana		B087
CANVASBACK	Aythya valisineria		B089
REDHEAD	Aythya americana		B090
RING-NECKED DUCK	Aythya collaris		B091
LESSER SCAUP	Aythya affinis		B094
BUFFLEHEAD	Bucephala albeola		B103
HOODED MERGANSER	Lophodytes cucullatus		B104
COMMON MERGANSER	Mergus merganser		B105
RUDDY DUCK	Oxyura jamaicensis		B107
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
NORTHERN HARRIER	Circus cyaneus		B114
AMERICAN COOT	Fulica americana		B149
SNOWY PLOVER	Charadrius alexandrinus		B154
KILLDEER	Charadrius vociferus		B158
SPOTTED SANDPIPER	Actitis macularia		B170
LEAST SANDPIPER	Calidris minutilla		B185
LONG-BILLED DOWITCHER	Limnodromus scolopaceus		B197
COMMON SNIFE	Gallinago gallinago		B199
CALIFORNIA GULL	Larus californicus		B215
FORSTER'S TERN	Sterna forsteri		B233
BELTED KINGFISHER	Ceryle alcyon		B293
BLACK PHOEBE	Sayornis nigricans		B321
NORTHERN ROUGH-WINGED SWALLOW	Stelgidopteryx serripennis		B341
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
LONG-EARED MYOTIS	Myotis evotis		M025
BEAVER	Castor canadensis		M112
MUSKRAT	Ondatra zibethicus		M139
RACCOON	Procyon lotor		M153
MINK	Mustela vison		M158
RIVER OTTER	Lutra canadensis		M163
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004
COMMON GARTER SNAKE	Thamnophis sirtalis		R061
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063

58 wildlife species

Table N-9. River, stream, and creek assemblage represents the habitat need of over 62 wildlife species that utilize moving open water and the associated riparian vegetation for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	Ambystoma gracile		A002
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
OLYMPIC SALAMANDER	Rhyacotriton olympicus		A005
ROUGH-SKINNED NEWT	Taricha granulosa		A006
DUNN'S SALAMANDER	Plethodon dunni		A009
TAILED FROG	Ascaphus truei		A026
WESTERN TOAD	Bufo boreas		A032
RED-LEGGED FROG	Rana aurora		A040
FOOTHILL YELLOW-LEGGED FROG	Rana boylei		A043
BULLFROG	Rana catesbeiana		A046
PIED-BILLED GREBE	Podilymbus podiceps		B006
EARED GREBE	Podiceps nigricollis		B009
WESTERN GREBE / CLARK'S GREBE	Aechmophorus occidentalis / Clarkii		B010
DOUBLE-CRESTED CORMORANT	Phalacrocorax auritus		B044
GREAT BLUE HERON	Ardea herodias		B051
GREAT EGRET	Casmerodius albus		B052
SNOWY EGRET	Egretta thula		B053
WOOD DUCK	Aix sponsa		B076
GREEN-WINGED TEAL	Anas crecca		B077
MALLARD	Anas platyrhynchos		B079
NORTHERN PINTAIL	Anas acuta		B080
CINNAMON TEAL	Anas cyanoptera		B083
AMERICAN WIGEON	Anas americana		B087
CANVASBACK	Aythya valisineria		B089
REDHEAD	Aythya americana		B090
LESSER SCAUP	Aythya affinis		B094
HOODED MERGANSER	Lophodytes cucullatus		B104
COMMON MERGANSER	Mergus merganser		B105
OSPREY	Pandion haliaetus		B110
BALD EAGLE	Haliaeetus leucocephalus	Federally endangered	B113
RUFFED GROUSE	Bonasa umbellus		B136
AMERICAN COOT	Fulica americana		B149
KILLDEER	Charadrius vociferus		B158
SPOTTED SANDPIPER	Actitis macularia		B170
LEAST SANDPIPER	Calidris minutilla		B185
LONG-BILLED DOWITCHER	Limnodromus scolopaceus		B197
COMMON SNIPE	Gallinago gallinago		B199
CALIFORNIA GULL	Larus californicus		B215
FORSTER'S TERN	Sterna forsteri		B233
BELTED KINGFISHER	Ceryle alcyon		B293
BLACK PHOEBE	Sayornis nigricans		B321
TREE SWALLOW	Tachycineta bicolor		B339
NORTHERN ROUGH-WINGED SWALLOW	Stelgidopteryx serripennis		B341
CLIFF SWALLOW	Hirundo pyrrhonota		B343
BARN SWALLOW	Hirundo rustica		B344
WINTER WREN	Troglodytes troglodytes		B370
AMERICAN DIPPER	Cinclus mexicanus		B373
YELLOW-BRESTED CHAT	Icteria virens		B467
WATER SHREW	Sorex palustris		M010
MARSH SHREW	Sorex bendirii		M011
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycterus noctivagans		M030
BEAVER	Castor canadensis		M112
RACCOON	Procyon lotor		M153
MINK	Mustela vison		M158
RIVER OTTER	Lutra canadensis		M163
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004

Table N-9. River, stream, and creek assemblage represents the habitat need of over 62 wildlife species that utilize moving open water and the associated riparian vegetation for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WESTERN TERRESTRIAL GARTER SNAKE	Thamnophis elegans		R062
WESTERN AQUATIC GARTER SNAKE	Thamnophis couchi		R063

62 wildlife species

Table N-10. Snag assemblage represents the habitat needs of up to 60 wildlife species which utilize hard and soft snags for breeding, feeding or resting. (Assemblage species in bold)

SPECIES NAME	SCIENTIFIC NAME	CALIFORNIA WHR ID
CLOUDED SALAMANDER	<i>Aneides ferreus</i>	A021
DOUBLE-CRESTED CORMORANT	<i>Phalacrocorax auritus</i>	B044
WOOD DUCK	<i>Aix sponsa</i>	B076
BUFFLEHEAD	<i>Bucephala albeola</i>	B103
COMMON MERGANSER	<i>Mergus merganser</i>	B105
TURKEY VULTURE	<i>Cathartes aura</i>	B108
OSPREY	<i>Pandion haliaetus</i>	B110
AMERICAN KESTREL	<i>Falco sparverius</i>	B127
FLAMMULATED OWL	<i>Otus flammeolus</i>	B263
WESTERN SCREECH OWL	<i>Otus kennicottii</i>	B264
GREAT HORNED OWL	<i>Bubo virginianus</i>	B265
NORTHERN PYGMY OWL	<i>Glaucidium gnoma</i>	B267
SPOTTED OWL	<i>Strix occidentalis</i>	Federally threatened B270
GREAT GRAY OWL	<i>Strix nebulosa</i>	Forest Service sensitive B271
NORTHERN SAW-WHET OWL	<i>Aegolius acadicus</i>	B274
VAUX'S SWIFT	<i>Chaetura vauxi</i>	B281
LEWIS' WOODPECKER	<i>Melanerpes lewis</i>	B294
ACORN WOODPECKER	<i>Melanerpes formicivorus</i>	B296
RED-BREASTED SAPSUCKER	<i>Sphyrapicus ruber</i>	B299
NUTTALL'S WOODPECKER	<i>Picoides nuttallii</i>	B302
DOWNY WOODPECKER	<i>Picoides pubescens</i>	B303
HAIRY WOODPECKER	<i>Picoides villosus</i>	B304
WHITE-HEADED WOODPECKER	<i>Picoides albolarvatus</i>	B305
BLACK-BACKED WOODPECKER	<i>Picoides arcticus</i>	B306
NORTHERN FLICKER	<i>Colaptes auratus</i>	B307
PILEATED WOODPECKER	<i>Dryocopus pileatus</i>	B308
ASH-THROATED FLYCATCHER	<i>Myiarchus cinerascens</i>	B326
PURPLE MARTIN	<i>Progne subis</i>	B338
TREE SWALLOW	<i>Tachycineta bicolor</i>	B339
VIOLET-GREEN SWALLOW	<i>Tachycineta thalassina</i>	B340
BLACK-CAPPED CHICKADEE	<i>Parus atricapillus</i>	B355
MOUNTAIN CHICKADEE	<i>Parus gambeli</i>	B356
CHESTNUT-BACKED CHICKADEE	<i>Parus rufescens</i>	B357
PLAIN TITMOUSE	<i>Parus inornatus</i>	B358
RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>	B361
WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>	B362
PYGMY NUTHATCH	<i>Sitta pygmaea</i>	B363
BROWN CREEPER	<i>Certhia americana</i>	B364
BEWICK'S WREN	<i>Thryomanes bewickii</i>	B368
HOUSE WREN	<i>Troglodytes aedon</i>	B369
WESTERN BLUEBIRD	<i>Sialia mexicana</i>	B380
MOUNTAIN BLUEBIRD	<i>Sialia currucoides</i>	B381
EUROPEAN STARLING	<i>Sturnus vulgaris</i>	B411
YUMA MYOTIS	<i>Myotis yumanensis</i>	M023
LONG-LEGGED MYOTIS	<i>Myotis volans</i>	M027
SILVER-HAIRED BAT	<i>Lasioryctes noctivagans</i>	M030
SNOWSHOE HARE	<i>Lepus americanus</i>	M049
WESTERN GRAY SQUIRREL	<i>Sciurus griseus</i>	M077
DOUGLAS SQUIRREL	<i>Tamiasciurus douglasii</i>	M079
NORTHERN FLYING SQUIRREL	<i>Glaucomys sabrinus</i>	M080
RED FOX	<i>Vulpes vulpes</i>	M147
BLACK BEAR	<i>Ursus americanus</i>	M151
RINGTAIL	<i>Bassariscus astutus</i>	M152
RACCOON	<i>Procyon lotor</i>	M153
MARTEN	<i>Martes americana</i>	Forest Service sensitive M154
FISHER	<i>Martes pennanti</i>	Forest Service sensitive M155
ERMINE	<i>Mustela erminea</i>	M156

Table N-10. Snag assemblage represents the habitat needs of up to 60 wildlife species which utilize hard and soft snags for breeding, feeding or resting. (Assemblage species in bold)

SPECIES NAME	SCIENTIFIC NAME	CALIFORNIA WHR ID
LONG-TAILED WEASEL	<i>Mustela frenata</i>	M157
MINK	<i>Mustela vison</i>	M158
WESTERN SPOTTED SKUNK	<i>Spilogale gracilis</i>	M161

60 wildlife species

Table N-11. Down woody material assemblage represents over 53 wildlife species which utilize down woody debris for breeding feeding or resting ; and 24 species require down logs. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
PACIFIC GIANT SALAMANDER	Dicamptodon ensatus		A004
DEL NORTE SALAMANDER	Plethodon elongatus		A010
CLOUDED SALAMANDER	Aneides ferreus		A021
ARBOREAL SALAMANDER	Aneides lugubris		A022
WESTERN TOAD	Bufo boreas		A032
BLUE GROUSE	Dendragapus obscurus		B134
RUFFED GROUSE	Bonasa umbellus		B136
PILEATED WOODPECKER	Dryocopus pileatus		B308
WINTER WREN	Troglodytes troglodytes		B370
DUSKY FOOTED WOOD RAT	Neotoma fuscipes		M127
RED FOX	Vulpes vulpes		M147
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	ForestService sensitive	M155
LONG-TAILED WEASEL	Mustela frenata		M157
MINK	Mustela vison		M158
WOLVERINE	Gulo gulo		M159
WESTERN SPOTTED SKUNK	Spilogale gracilis		M161
BOBCAT	Felis rufus		M166
WESTERN FENCE LIZARD	Sceleporus occidentalis		R022
RUBBER BOA	Charina bottae		R046
SHARP-TAILED SNAKE	Contia tenuis		R049

24 wildlife species

Table N-12. Black oak / white oak assemblage represents the habitat needs of an estimated 197 wildlife species which utilize oak hardwood forest for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
NORTHWESTERN SALAMANDER	<i>Ambystoma gracile</i>		A002
PACIFIC GIANT SALAMANDER	<i>Dicamptodon ensatus</i>		A004
OLYMPIC SALAMANDER	<i>Rhyacotriton olympicus</i>		A005
ROUGH-SKINNED NEWT	<i>Taricha granulosa</i>		A006
DEL NORTE SALAMANDER	<i>Plethodon elongatus</i>		A010
CALIFORNIA SLENDER SALAMANDER	<i>Batrachoseps attenuatus</i>		A014
BLACK SALAMANDER	<i>Aneides flavipunctatus</i>		A020
CLOUDED SALAMANDER	<i>Aneides ferreus</i>		A021
ARBOREAL SALAMANDER	<i>Aneides lugubris</i>		A022
TAILED FROG	<i>Ascaphus truei</i>		A026
WESTERN TOAD	<i>Bufo boreas</i>		A032
PACIFIC TREEFROG	<i>Hyla regilla</i>		A039
FOOTHILL YELLOW-LEGGED FROG	<i>Rana boylei</i>		A043
BULLFROG	<i>Rana catesbeiana</i>		A046
GREAT BLUE HERON	<i>Ardea herodias</i>		B051
GREAT EGRET	<i>Casmerodius albus</i>		B052
WOOD DUCK	<i>Aix sponsa</i>		B076
TURKEY VULTURE	<i>Cathartes aura</i>		B108
OSPREY	<i>Pandion haliaetus</i>		B110
BLACK-SHOULDERED KITE	<i>Elanus caeruleus</i>		B111
BALD EAGLE	<i>Haliaeetus leucocephalus</i>	Federally endangered	B113
SHARP-SHINNED HAWK	<i>Accipiter striatus</i>		B115
COOPER'S HAWK	<i>Accipiter cooperii</i>		B116
NORTHERN GOSHAWK	<i>Accipiter gentilis</i>	Forest Service sensitive	B117
RED-SHOULDERED HAWK	<i>Buteo lineatus</i>		B119
RED-TAILED HAWK	<i>Buteo jamaicensis</i>		B123
ROUGH-LEGGED HAWK	<i>Buteo lagopus</i>		B125
GOLDEN EAGLE	<i>Aquila chrysaetos</i>		B126
AMERICAN KESTREL	<i>Falco sparverius</i>		B127
MERLIN	<i>Falco columbarius</i>		B128
PEREGRINE FALCON	<i>Falco peregrinus</i>	Federally endangered	B129
PRAIRIE FALCON	<i>Falco mexicanus</i>		B131
BLUE GROUSE	<i>Dendragapus obscurus</i>		B134
RUFFED GROUSE	<i>Bonasa umbellus</i>		B136
TURKEY	<i>Meleagris gallopavo</i>		B138
CALIFORNIA QUAIL	<i>Callipepla californica</i>		B140
MOUNTAIN QUAIL	<i>Oreortyx pictus</i>		B141
BAND-TAILED PIGEON	<i>Columba fasciata</i>		B251
MOURNING DOVE	<i>Zenaida macroura</i>		B255
COMMON BARN OWL	<i>Tyto alba</i>		B262
FLAMMULATED OWL	<i>Otus flammeolus</i>		B263
WESTERN SCREECH OWL	<i>Otus kennicottii</i>		B264
GREAT HORNED OWL	<i>Bubo virginianus</i>		B265
NORTHERN PYGMY OWL	<i>Glaucidium gnoma</i>		B267
SPOTTED OWL	<i>Strix occidentalis</i>	Federally threatened	B270
NORTHERN SAW-WHET OWL	<i>Aegolius acadicus</i>		B274
COMMON NIGHTHAWK	<i>Chordeiles minor</i>		B276
COMMON POORWILL	<i>Phalaenoptilus nuttallii</i>		B277
VAUX'S SWIFT	<i>Chaetura vauxi</i>		B281
ANNA'S HUMMINGBIRD	<i>Calypte anna</i>		B287
CALLIOPE HUMMINGBIRD	<i>Stellula calliope</i>		B289
RUFIOUS HUMMINGBIRD	<i>Selasphorus rufus</i>		B291
ALLEN'S HUMMINGBIRD	<i>Selasphorus sasin</i>		B292
LEWIS' WOODPECKER	<i>Melanerpes lewis</i>		B294
ACORN WOODPECKER	<i>Melanerpes formicivorus</i>		B296
RED-BREASTED SAPSUCKER	<i>Sphyrapicus ruber</i>		B299
NUTTALL'S WOODPECKER	<i>Picoides nuttallii</i>		B302
DOWNY WOODPECKER	<i>Picoides pubescens</i>		B303
HAIRY WOODPECKER	<i>Picoides villosus</i>		B304
WHITE-HEADED WOODPECKER	<i>Picoides albolarvatus</i>		B305
NORTHERN FLICKER	<i>Colaptes auratus</i>		B307

Table N-12. Black oak / white oak assemblage represents the habitat needs of an estimated 197 wildlife species which utilize oak hardwood forest for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
PILEATED WOODPECKER	<i>Dryocopus pileatus</i>		B308
OLIVE-SIDED FLYCATCHER	<i>Contopus borealis</i>		B309
WESTERN WOOD-PEWEE	<i>Contopus sordiolulus</i>		B311
HAMMONDS' FLYCATCHER	<i>Empidonax hammondi</i>		B317
DUSKY FLYCATCHER	<i>Empidonax oberholseri</i>		B318
WESTERN FLYCATCHER	<i>Empidonax difficilis</i>		B320
ASH-THROATED FLYCATCHER	<i>Myiarchus cinerascens</i>		B326
WESTERN KINGBIRD	<i>Tyrannus verticalis</i>		B333
HORNED LARK	<i>Eremophila alpestris</i>		B337
PURPLE MARTIN	<i>Progne subis</i>		B338
TREE SWALLOW	<i>Tachycineta bicolor</i>		B339
VIOLET-GREEN SWALLOW	<i>Tachycineta thalassina</i>		B340
NORTHERN ROUGH-WINGED SWALLOW	<i>Stelgidopteryx serripennis</i>		B341
BARN SWALLOW	<i>Hirundo rustica</i>		B344
STELLER'S JAY	<i>Cyanocitta stelleri</i>		B346
SCRUB JAY	<i>Aphelocoma coerulescens</i>		B348
AMERICAN CROW	<i>Corvus brachyrhynchos</i>		B353
COMMON RAVEN	<i>Corvus corax</i>		B354
MOUNTAIN CHICKADEE	<i>Parus gambeli</i>		B356
CHESTNUT-BACKED CHICKADEE	<i>Parus rufescens</i>		B357
PLAIN TITMOUSE	<i>Parus inornatus</i>		B358
BUSHTIT	<i>Psaltriparus minimus</i>		B360
RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>		B361
WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>		B362
BROWN CREEPER	<i>Certhia americana</i>		B364
ROCK WREN	<i>Salpinctes obsoletus</i>		B366
BEWICK'S WREN	<i>Thryomanes bewickii</i>		B368
HOUSE WREN	<i>Troglodytes aedon</i>		B369
WINTER WREN	<i>Troglodytes troglodytes</i>		B370
GOLDEN-CROWNED KINGLET	<i>Regulus satrapa</i>		B375
RUBY-CROWNED KINGLET	<i>Regulus calendula</i>		B376
BLUE-GRAY GNATCATCHER	<i>Poliophtila caerulea</i>		B377
WESTERN BLUEBIRD	<i>Sialia mexicana</i>		B380
MOUNTAIN BLUEBIRD	<i>Sialia currucoides</i>		B381
TOWNSEND'S SOLITAIRE	<i>Myadestes townsendi</i>		B382
SWAINSON'S THRUSH	<i>Catharus ustulatus</i>		B385
HERMIT THRUSH	<i>Catharus guttatus</i>		B386
AMERICAN ROBIN	<i>Turdus migratorius</i>		B389
VARIED THRUSH	<i>Ixoreus naevius</i>		B390
CEDAR WAXWING	<i>Bombycilla cedrorum</i>		B407
EUROPEAN STARLING	<i>Sturnus vulgaris</i>		B411
SOLITARY VIREO	<i>Vireo solitarius</i>		B415
HUTTON'S VIREO	<i>Vireo huttoni</i>		B417
ORANGE-CROWNED WARBLER	<i>Vermivora celata</i>		B425
NASHVILLE WARBLER	<i>Vermivora ruficapilla</i>		B426
YELLOW WARBLER	<i>Dendroica petechia</i>		B430
YELLOW-RUMPED WARBLER	<i>Dendroica coronata</i>		B435
BLACK-THROATED GRAY WARBLER	<i>Dendroica nigrescens</i>		B436
TOWNSEND'S WARBLER	<i>Dendroica townsendi</i>		B437
HERMIT WARBLER	<i>Dendroica occidentalis</i>		B438
WILSON'S WARBLER	<i>Wilsonia pusilla</i>		B463
WESTERN Tanager	<i>Piranga ludoviciana</i>		B471
BLACK-HEADED GROSBEAK	<i>Pheucticus melanocephalus</i>		B475
LAZULI BUNTING	<i>Passerina amoena</i>		B477
GREEN-TAILED TOWHEE	<i>Pipilo chlorurus</i>		B482
RUFIOUS-SIDED TOWHEE	<i>Pipilo erythrophthalmus</i>		B483
BROWN TOWHEE	<i>Pipilo fuscus</i>		B484
CHIPPING SPARROW	<i>Spizella passerina</i>		B489
LARK SPARROW	<i>Chondestes grammacus</i>		B495
SAVANNAH SPARROW	<i>Passerculus sandwichensis</i>		B499
FOX SPARROW	<i>Passerella iliaca</i>		B504

Table N-12. Black oak / white oak assemblage represents the habitat needs of an estimated 197 wildlife species which utilize oak hardwood forest for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
SONG SPARROW	Melospiza melodia		B505
GOLDEN-CROWNED SPARROW	Zonotrichia atricapilla		B509
WHITE-CROWNED SPARROW	Zonotrichia leucophrys		B510
DARK-EYED JUNCO	Junco hyemalis		B512
WESTERN MEADOWLARK	Sturnella neglecta		B521
BREWER'S BLACKBIRD	Euphagus cyanocephalus		B524
BROWN-HEADED COWBIRD	Molothrus ater		B528
NORTHERN ORIOLE	Icterus galbula		B532
PURPLE FINCH	Carpodacus purpureus		B536
HOUSE FINCH	Carpodacus mexicanus		B538
PINE SISKIN	Carduelis pinus		B542
LESSER GOLDFINCH	Carduelis psaltria		B543
AMERICAN GOLDFINCH	Carduelis tristis		B545
EVENING GROSBEAK	Coccothraustes vespertinus		B546
HOUSE SPARROW	Passer domesticus		B547
VIRGINIA OPOSSUM	Didelphis virginiana		M001
PACIFIC SHREW	Sorex pacificus		M005
TROWBRIDGE'S SHREW	Sorex trowbridgii		M012
SHREW-MOLE	Neurotrichus gibbsii		M015
LITTLE BROWN MYOTIS	Myotis lucifugus		M021
YUMA MYOTIS	Myotis yumanensis		M023
LONG-EARED MYOTIS	Myotis evotis		M025
FRINGED MYOTIS	Myotis thysanodes		M026
LONG-LEGGED MYOTIS	Myotis volans		M027
CALIFORNIA MYOTIS	Myotis californicus		M028
SILVER-HAIRED BAT	Lasionycters noctivagans		M030
BIG BROWN BAT	Eptesicus fuscus		M032
HOARY BAT	Lasiurus cinereus		M034
BLACK-TAILED HARE	Lepus californicus		M051
MOUNTAIN BEAVER	Aplodontia rufa		M052
ALLEN'S CHIPMUNK	Tamias senex		M057
CALIFORNIA GROUND SQUIRREL	Spermophilus beecheyi		M072
WESTERN GRAY SQUIRREL	Sciurus griseus		M077
DOUGLAS' SQUIRREL	Tamiasciurus douglasii		M079
NORTHERN FLYING SQUIRREL	Glaucomys sabrinus		M080
WESTERN POCKET GOPHER	Thomomys mazama		M084
WESTERN HARVEST MOUSE	Reithrodontomys megalotis		M113
PINYON MOUSE	Peromyscus truei		M120
DUSKY-FOOTED WOODRAT	Neotoma fuscipes		M127
BUSHY-TAILED WOODRAT	Neotoma cinerea		M128
WESTERN RED-BACKED VOLE	Clethrionomys californicus		M129
PACIFIC JUMPING MOUSE	Zapus trinotatus		M144
PORCUPINE	Erethizon dorsatum		M145
COYOTE	Canis latrans		M146
GRAY FOX	Urocyon cinereoargenteus		M149
BLACK BEAR	Ursus americanus		M151
RINGTAIL	Bassariscus astutus		M152
RACCOON	Procyon lotor		M153
MARTEN	Martes americana	Forest Service sensitive	M154
FISHER	Martes pennanti	Forest Service sensitive	M155
ERMINE	Mustela erminea		M156
LONG-TAILED WEASEL	Mustela frenata		M157
WESTERN SPOTTED SKUNK	Spilogale gracilis		M161
STRIPED SKUNK	Mephitis mephitis		M162
MOUNTAIN LION	Felis concolor		M165
BOBCAT	Felis rufus		M166
WILD PIG	Sus scrofa		M176
ELK	Cervus elaphus		M177
FALLOW DEER	Cervus dama		M178
MULE DEER	Odocoileus hemionus		M181
WESTERN POND TURTLE	Clemmys marmorata	Forest Service sensitive	R004

Table N-12. Black oak / white oak assemblage represents the habitat needs of an estimated 197 wildlife species which utilize oak hardwood forest for breeding, feeding or resting. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WESTERN FENCE LIZARD	<i>Sceloporus occidentalis</i>		R022
SAGEBRUSH LIZARD	<i>Sceloporus graciosus</i>		R023
WESTERN SKINK	<i>Eumeces skiltonianus</i>		R036
SOUTHERN ALLIGATOR LIZARD	<i>Gerrhonotus multicarinatus</i>		R040
NORTHERN ALLIGATOR LIZARD	<i>Gerrhonotus coeruleus</i>		R042
RINGNECK SNAKE	<i>Diadophis punctatus</i>		R048
SHARP-TAILED SNAKE	<i>Contia tenuis</i>		R049
RACER	<i>Coluber constrictor</i>		R051
GOPHER SNAKE	<i>Pituophis melanoleucus</i>		R057
COMMON KINGSSNAKE	<i>Lampropeltis getulus</i>		R058
COMMON GARTER SNAKE	<i>Thamnophis sirtalis</i>		R061
WESTERN TERRESTRIAL GARTER SNAKE	<i>Thamnophis elegans</i>		R062
WESTERN AQUATIC GARTER SNAKE	<i>Thamnophis couchi</i>		R063
WESTERN RATTLESNAKE	<i>Crotalus viridis</i>		R076

197 wildlife species

Table N-13. Tanoak and Madrone assemblage represents the habitat needs of over 53 wildlife species that utilize these hardwoods. [Assemblage species in bold]

SPECIES NAME	SCIENTIFIC NAME	TES STATUS	CALIFORNIA WHR ID
WOOD DUCK	<i>Aix sponsa</i>		B076
TURKEY VULTURE	<i>Cathartes aura</i>		B108
OSPREY	<i>Pandion haliaetus</i>		B110
AMERICAN KESTREL	<i>Falco sparverius</i>		B127
TURKEY	<i>Meleagris gallopavo</i>		B138
BAND-TAILED PIGEON	<i>Columba fasciata</i>		B251
FLAMMULATED OWL	<i>Otus flammeolus</i>		B263
WESTERN SCREECH OWL	<i>Otus kennicottii</i>		B264
GREAT HORNED OWL	<i>Bubo virginianus</i>		B265
NORTHERN PYGMY OWL	<i>Glaucidium gnoma</i>		B267
SPOTTED OWL	<i>Strix occidentalis</i>	Federally threatened	B270
NORTHERN SAW-WHET OWL	<i>Aegolius acadicus</i>		B274
VAUX'S SWIFT	<i>Chaetura vauxi</i>		B281
LEWIS' WOODPECKER	<i>Melanerpes lewis</i>		B294
ACORN WOODPECKER	<i>Melanerpes formicivorus</i>		B296
RED-BREASTED SAPSUCKER	<i>Sphyrapicus ruber</i>		B299
NUTTALL'S WOODPECKER	<i>Picoides nuttallii</i>		B302
DOWNY WOODPECKER	<i>Picoides pubescens</i>		B303
HAIRY WOODPECKER	<i>Picoides villosus</i>		B304
WHITE-HEADED WOODPECKER	<i>Picoides albolarvatus</i>		B305
NORTHERN FLICKER	<i>Colaptes auratus</i>		B307
PILEATED WOODPECKER	<i>Dryocopus pileatus</i>		B308
HAMMOND'S FLYCATCHER	<i>Empidonax hammondii</i>		B317
TREE SWALLOW	<i>Tachycineta bicolor</i>		B339
VIOLET-GREEN SWALLOW	<i>Tachycineta thalassina</i>		B340
SCRUB JAY	<i>Aphelocoma coerulescens</i>		B348
MOUNTAIN CHICKADEE	<i>Parus gambeli</i>		B356
CHESTNUT-BACKED CHICKADEE	<i>Parus rufescens</i>		B357
PLAIN TITMOUSE	<i>Parus inornatus</i>		B358
RED-BREASTED NUTHATCH	<i>Sitta canadensis</i>		B361
WHITE-BREASTED NUTHATCH	<i>Sitta carolinensis</i>		B362
BROWN CREEPER	<i>Certhia americana</i>		B364
HOUSE WREN	<i>Troglodytes aedon</i>		B369
WESTERN BLUEBIRD	<i>Sialia mexicana</i>		B380
EUROPEAN STARLING	<i>Sturnus vulgaris</i>		B411
WESTERN Tanager	<i>Piranga ludoviciana</i>		B471
BLACK-HEADED GROSBEAK	<i>Pheucticus melanocephalus</i>		B475
RUFOS-SIDED TOWHEE	<i>Pipilo erythrophthalmus</i>		B483
YUMA MYOTIS	<i>Myotis yumanensis</i>		M023
LONG-LEGGED MYOTIS	<i>Myotis volans</i>		M027
SILVER-HAIRED BAT	<i>Lasioryctes noctivagans</i>		M030
WESTERN GRAY SQUIRREL	<i>Sciurus griseus</i>		M077
DOUGLAS' SQUIRREL	<i>Tamiasciurus douglasii</i>		M079
NORTHERN FLYING SQUIRREL	<i>Glaucomys sabrinus</i>		M080
BLACK BEAR	<i>Ursus americanus</i>		M151
RINGTAIL	<i>Bassariscus astutus</i>		M152
RACCOON	<i>Procyon lotor</i>		M153
MARTEN	<i>Martes americana</i>	Forest Service sensitive	M154
FISHER	<i>Martes pennanti</i>	Forest Service sensitive	M155
ERMINE	<i>Mustela erminea</i>		M156
LONG-TAILED WEASEL	<i>Mustela frenata</i>		M157
WESTERN SPOTTED SKUNK	<i>Spilogale gracilis</i>		M161
WILD PIG	<i>Sus scrofa</i>		M176

53 species

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RESPONSE TO PUBLIC COMMENTS

INTRODUCTION

The public comment period for the Draft Six Rivers National Forest Environmental Impact Statement (DEIS) and Draft Forest Plan began on September 27, 1993, and closed on January 6, 1994. Agencies, officials, and the public were invited to comment on these documents. Public meetings were held in Arcata, Eureka, Crescent City, Orleans, Willow Creek, and Mad River California. A number of other briefings were given upon request from interested groups, including the county boards of supervisors for Humboldt and Trinity counties; the Hoopa Tribe; the local California Department of Fish and Game office; the U.S. Environmental Protection Agency (Region IX); the Humboldt County Planning Department; The Humboldt Bioregional Group; the local chapter of the California Native Plant Society; the Fortuna Kiwanis Club; and classes at Humboldt State University.

During the 90-day public comment period, a total of 325 letters were received containing approximately 1,400 comments. Of the 325 letters, 204 were form letters or modified form letters. More than 10 untimely (postmarked after January 6, 1994) comments were received and reviewed. Letters came from a number of states, including California (270 letters), Illinois (33 letters), Oregon (7 letters), Minnesota (4 letters), Washington DC (3 letters), Ohio (2 letters), and Arizona, Iowa, Nevada, New York, North Carolina, and Washington (1 letter from each of these states). Within California, cities with five or more respondents included Arcata, Chico, Eureka, Jamul, La Mesa, Los Angeles, Monterey, Newark, Orinda, Orleans, Sacramento, San Diego, San Francisco, and Thousand Oaks.

Of the 325 letters, 252 were written by individuals, 46 by various groups (including environmental, forest products, recreation, and church groups), 12 by businesses, 5 by state agencies, 4 by elected officials, 3 by federal agencies, and 3 by Indian Tribes.

Federal agencies commenting on the Draft EIS and Forest Plan included the U.S. Fish and Wildlife Service (California Coastal Fishery Resource Office), Environmental Protection Agency (Region IX), and Department of the Interior (Office of Environmental Quality and Compliance).

State agencies included the California Department of Fish and Game, California Department of Forestry and Fire Protection, Resources Agency of California, California Department of Parks and Recreation (Off-Highway Motor Vehicle Recreation), and California Regional Water Quality Control Board (North Coast Region).

Local governments included Del Norte, Humboldt, and Trinity counties, and the city of Fortuna.

Federally-recognized Indian Tribes included the Karuk and Yurok Tribes; the Tsnungwe Council also commented on the Draft EIS and Forest Plan.

A list of the respondents by letter number is included at the end of this Appendix in Table O-1. Form letters are denoted throughout the appendix with letter code rather than a number code. The letter numbers corresponding to each letter code are listed at the end of the appendix in Tables O-2 through O-5.

The largest volume of comments were related to timber, riparian and aquatic ecosystems, roadless and wilderness areas, wildlife, recreation, wild and scenic rivers, biological diversity and old-growth ecosystems, and transportation and facilities.

ORGANIZATION OF APPENDIX O

This appendix contains summaries of the public comments and the responses to them. After analyzing the substantive comments described above, the Planning Interdisciplinary (ID) Team grouped and summarized related topics to avoid cumbersome text duplications, and then responded to the concerns expressed in the comments. The comments and responses are organized in the same order as in Chapters 3 and 4 of the final EIS, plus a section for general comments. The letter number in which the comment was made is listed between the comment and the response. The comments and responses are intended to be only explanatory in nature. If there are any inadvertent contradictions between this Appendix and the text of the final EIS and Plan, the final EIS and Plan prevail.

The Environmental Protection Agency has a legal obligation under Section 309 of the Clean Air Act to review and comment on environmental impact statements. Their letter reviewing the DEIS appears following the comments and responses.

The acronym FSEIS ROD used throughout this appendix refers to the Record of Decision for the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl.



COMMENTS AND RESPONSES

GENERAL SUBJECTS

Relationship to the President’s Plan

Comment 1: How can the public provide substantive comment on the draft Forest Plan when it is not clear how it will be affected by the President’s Plan? The documents as they stand are legally insufficient and in violation of NEPA. An additional comment period should be allowed after the President’s Plan is finalized or a supplemental draft EIS and Forest Plan should be developed incorporating the President’s Plan with the preferred alternative. If a Supplemental Draft is developed, an additional comment period should be provided to allow for public input to the Supplemental Draft EIS and Forest Plan.

A	7	60	63	66	198	207	208
217	219	223	224	225	227	230	245
259	260	274	288	319	325		

Response: How the draft Forest Plan would be affected by the draft President’s Plan was disclosed by the following methods:

The Draft President’s Plan was referenced in the DEIS and was made available to the public. The Draft President’s Plan (DSEIS) described the relationship to the draft Forest Plan.

The DEIS included an Addendum that described the relationship to the draft President’s Plan.

The relationship between the Forest Plan and the President’s Plan was described at public meetings and briefings held on both the draft Forest Plan and the draft President’s Plan.

The Record of Decision for the final President’s Plan (FSEIS ROD) was signed on April 13, 1994. Changes made between the draft and final President’s Plan were described in the Final Supplemental Environmental Impact Statement (FSEIS) and the FSEIS ROD. The changes made between draft and final versions of the President’s Plan were relatively minor and did not warrant reissuance of another supplemental Six Rivers National Forest EIS on the President’s Plan.

The relationship of the President’s Plan to the draft and final Forest Plan was explained further in the FSEIS and the FSEIS ROD. The FSEIS supplemented the DEIS for the draft Forest Plan (FSEIS ROD, page 12), and

provided direction for completion of the final Forest Plan (FSEIS ROD, Appendix A, page A-2). That direction has been fully incorporated into the final Forest Plan.

Based on the opportunities for comment that have already been provided, the relatively minor changes made to the Forest Plan as a result of public comment, and finalization of the President’s Plan, an additional opportunity for comment is not warranted.

Comment 2: It is difficult to determine which forest areas will have their prescriptions and land allocations changed due to the President’s Plan. The effects of the President’s Plan are clearly too extensive and complex to be adequately described in a seven page addendum. More importantly, the President’s Plan is not finalized. In fact, serious scientific challenges have been made to Option 9 which may require substantive revision of the President’s Plan.

48	50	223	226	227	230	325
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Response: The areas affected by the President’s Plan (FSEIS ROD) can be identified by comparing the management area map for the preferred alternative in the final EIS and Plan with that from the draft EIS and Plan, as well as the map of the FSEIS ROD land allocations. The Preamble to Chapter 4 of the final Plan further outlines the relationship between the final Plan land allocations and the President’s Plan allocations. In Plan Chapter 4, an * indicates which standards and guidelines were incorporated from the FSEIS ROD. The draft President’s Plan was referred to in the draft Forest Plan, and both were made available to the public. The addendum described the relationship of the draft EIS and Plan to the draft President’s Plan. The relationship between the Forest Plan and the President’s Plan was also described in the draft and final SEIS as well as at numerous public meetings and briefings on both plans.

Legal challenges to the FSEIS ROD are outside the scope of this Forest Plan. The ROD does provide regional direction for the final Forest Plan. The Forest Plan is the result of an EIS which considers a broad range of alternatives. The planners and management of the Forest coordinated frequently with the team preparing the FSEIS and FSEIS ROD, and much of our direction co-evolved with the regional planning effort, which is one of the reasons why the plans were released within a short time frame of each other. The differences between the draft Forest Plan and the President’s Plan have been reconciled in the final Forest Plan and EIS. The final documents have been modified to clearly show the details adopted from the President’s Plan.

Comment 3: The comment period for the draft Forest Plan will end before the public has the opportunity to see the final President’s Plan. Evaluation of the draft Forest Plan through an addendum, without the knowledge of the final President’s Plan, makes it difficult or impossible to make reasonable analyses and comments.

23 47 48 50 174 200 213 217
221 224 225 227 230 259 325

Response: See the response to comments 1 and 2.

Comment 4: The Forest should extend the comment period for review of the draft EIS and Plan. The following reasons were mentioned: the inability to read and comment on four Forest Plans within the allotted comment period and the need to see the final President’s Plan.

17 54 145 153 171 230 319

Response: See the response to comment 1.

Comment 5: We are concerned that the process as it pertains to the President’s Plan and the development of this document is flawed and does not allow true public participation. It is clear also that the preferred plan’s development did not include all user groups (DEIS II-1 and Appendix F) and that shows throughout the document. The environmental consequences section is woefully inadequate and biased against motorized recreation. Many portions of the document appear to be written to support a desired direction rather than provide unbiased and relevant information for an informed decision.

230

Response: See the response to comments 1 and 2 regarding the public participation process for both the Forest Plan and the President’s Plan. The development of the EIS and Plan was an open process; scoping was performed to get input from all interested publics prior to the development of alternatives. A coalition group did provide input on issues regarding wildlife, timber, and biological biodiversity; however, this group did not address recreational use and therefore could not bias the documents against motorized recreation. Portions of the document have been revised between the draft and final versions to remove the apparent bias.

Comment 6: Some respondents included a copy of their comments on the President’s Plan and Option 9, and wanted the Forest to respond to those comments as well

as the comments on the Six Rivers EIS and Plan. The respondents are listed below by letter number.

48 225

Response: The comments on the President’s Plan and Option 9 were considered by the team developing the FSEIS and the FSEIS ROD. The response to comments regarding the President’s Plan and Option 9 is included as Appendix F in the FSEIS and in the FSEIS ROD.

Comment 7: One area of great confusion that must be clarified is the land that is designated as administratively withdrawn. FEMAT relied on the draft Forest Plans in designating administratively withdrawn lands. In calculating the suitable timber base, the Plans allocated acres to various categories that were “withdrawn from timber production.” However, the total of those acres exceeds the total of acres listed as administratively withdrawn by FEMAT by a factor of 200 percent. The Plans thus fail to provide the information necessary to determine what acres Option 9 has designated as administratively withdrawn. The Plans need to clarify this contradiction and provide maps and text describing the precise location of the withdrawn acres.

200 227

Response: The administratively withdrawn areas described in the FEMAT report and the FSEIS ROD include allocations such as research natural areas, special interest areas, or NACUAs; they do not include lands that are not capable, available, and suitable for timber management in the matrix or the Hayfork AMA. Page C-39 of the FSEIS ROD states that “the matrix includes nonforested areas, and forested areas that are technically unsuitable for timber production, and therefore do not contribute to PSQ.”

Comment 8: What Forest areas will have their prescriptions and land allocations changed due to Option 9 implementation considerations?

325

Response: The direction in the FSEIS ROD has affected the following: riparian reserve direction was slightly modified (the direction in the FSEIS ROD was based on the riparian reserves direction in the four northern Californian draft Plans); Late-Successional Reserves (LSRs) replaced HCAs in the special habitat management area, and LSR direction replaced HCA direction; and key watersheds are the same in both documents, but the direction in the FSEIS ROD is

different than that in the draft Plans. The direction in the FSEIS ROD influences many other programs indirectly; for example, the increased size of LSRs and riparian reserves decreased the acres available for timber production, and roadless areas received added protection through the FSEIS ROD. Many other Forest Plan land allocations and prescriptions were not affected by the FSEIS ROD, such as wilderness, research natural areas, special interest areas, NACUAs, range and recreation management outside riparian reserves, and wild and scenic rivers.

Option 9

Comment 1: A number of general comments were related to Option 9 and the assumptions used to develop Option 9. Subjects addressed included: inadequate protection or viability ratings for the northern spotted owl and other species, support for other alternatives (Option 1), the need to manage rather than preserve coastal redwoods, inadequate assumptions regarding historical levels of old-growth vegetation, reduced harvest levels, potential future reductions in Option 9 harvest levels as additional species are listed, losses of significant late-successional and old-growth forest in unprotected areas, erroneous methods for estimating timber yields, and the lack of recommendations for non-Federal lands.

A 6 24 51 139 206 221 227
325

Response: The FSEIS and the FSEIS ROD had a number of changes based on public comments on the DSEIS. The FSEIS ROD is an amendment to the overall Regional Guide that provides direction to the final Forest Plan, and had its own extensive public involvement process. These comments are outside the scope of this Forest Plan and were addressed in the FSEIS and FSEIS ROD.

Comment 2: There were a number of comments discussing the Late-Successional Reserves (LSRs) in Option 9. Subjects addressed included: the need for additional acres in LSRs; a request to leave open the option for limited timber management using adaptive management strategies compatible with the biological requirements of late-seral forests; the inadequacy of the LSRs to ensure the survival of the northern spotted owl and other old-growth species; the superimposition of LSRs onto roadless areas, opening those areas for salvage, thinning, and other management activities; the risks of proposed thinning and salvage in LSRs; requests to eliminate thinning and salvage in LSRs; and a request

to add specific areas of the Forest to the LSR system, including Pilot Creek (for fisheries, fisher, and other sensitive species), Blue Creek (it is in a LSR, but there should be no logging or salvage), and Slate Creek and Slate Creek Butte (for genetic exchange purposes).

6 62 195 206 227 271

Response: As mentioned in the response to comment 1, these comments are outside the scope of this Forest Plan and were addressed in the FSEIS and the FSEIS ROD. The FSEIS contains an analysis of the effects of management within LSRs on wildlife and other species, as well as the risks of not managing within LSRs. The roadless and wilderness section of FEIS Chapter 4 contains a discussion of the environmental consequences of the alternative's management strategies on the Forest's roadless and RARE II areas. Pilot Creek is located within the Hayfork AMA; the final Plan includes a managed habitat area within Pilot Creek to maintain habitat for a number of species. Blue Creek contains a large roadless area and is a key watershed. Blue Creek would be managed to maintain riparian and late-successional habitat and to provide semi-primitive non-motorized recreational opportunities. Genetic exchange is provided for in the final Plan through a system of riparian reserves and travel and ecological corridors. See the Managed Habitat Management Area direction for more information.

Comment 3: Do not drop standards for Adaptive Management Areas.

3 195

Response: The land allocations and standards and guidelines in the final Plan provide the starting point for AMA standards and guidelines. Although specific standards and guidelines are not prescribed in the FSEIS ROD for the AMA, the intent of matrix and riparian reserve standards and guidelines must be met in the AMA. A management plan will be developed for the AMA; a part of this plan will discuss how the intent of standards and guidelines will be met with innovative approaches.

Comment 4: Certainly, all of Pilot Creek should not be in an Adaptive Management Area.

271

Response: The selection of lands designated as Adaptive Management Areas was a part of the development of the President's Plan, and is outside the

scope of this planning effort. Pilot Creek was included as part of the Hayfork AMA because of the innovative efforts already taking place to provide habitat for late-successional dependent species such as the fisher and marten, and the experiments in maintaining habitat through silvicultural treatments which also provide timber outputs.

Comment 5: I have assumed that there are no “partnership” groups or AMA groups involved with the Forest Service that are trying to resolve issues or agree on programs or projects. The latest information on AMA guidance from the interagency implementation team in Portland states that AMAs are not to be set up to achieve consensus but to receive information from individuals with expertise. If this guidance continues, then AMAs, where conflict resolution groups have started, could fail from this alone.

325

Response: The information on AMA guidance has been further developed since the time of your comments. The role of agencies will be to facilitate collaborative efforts, partnerships, mutual learning, and innovation. Land management agencies retain the authority and responsibility to make decisions; those decisions are expected to flow from collaboration with other agencies and interested publics.

Public Involvement

Comment 1: In the letter accompanying the draft Forest Plan you ask for assistance in evaluating the documents and providing comments. Just what is it you are looking for? Are you seeking substantive and educated comments on a document completely without substance? Do you want editing of the documents for procedural correctness and context? Or are you simply fulfilling the NEPA mandate for public participation? I strongly suspect the latter.

3

Response: We received 325 comments on the draft Forest Plan, and have made a number of changes in response to those comments. Some of the changes include: adding biological diversity and special forest products sections to the Plan; increasing the acres of fuels treatment; and performing an evaluation study of potential wild and scenic river segments.

Comment 2: We were not notified to be a part of your task force regarding our knowledge and or/expertise.

140

Response: Numerous letters, notices of public meetings, and media announcements were issued regarding the development and release of the draft EIS and Plan; refer to Chapter 1 and Appendix A of the EIS.

Comment 3: The Backcountry Horsemen of California wants to be involved in all levels of the planning process to help identify concerns and issues within the environmental analysis.

171

Response: You have been added to the Forest Plan and the quarterly project mailing lists, and will be informed of upcoming planning efforts on the Forest.

Comment 4: The EISs should provide for processes that will result in cooperative conservation strategies with neighboring landowners; they are deficient in providing for a role for non-Federal land. The Forest Service should delay activities in mixed ownership until a Coordinated Resource Management Plan (CRMP) is in place.

325

Response: The Forest strives to obtain the best information available and to encourage stewardship on neighboring lands. The Forest has had mixed success with existing CRMPs. Land owner willingness to share data and harvest plans is increasing rapidly. The provision for a 10-year harvest plan by CDF will facilitate coordination with inholders and adjacent lands. The Forest will continue to try to coordinate with adjacent land owners in the future.

Comment 5: How will the public be involved in the “review of conditions of the lands covered by this Plan at least every five years” to adhere to NEPA procedures?

200

Response: The forest planning team will conduct the review of conditions; if there is an important change in the condition of the lands covered by the Plan, the Plan will be amended or revised, depending on the scope of the changes. The public will be informed of the review, and will have the opportunity to provide their input as part of the amendment or revision process.

Comment 6: We are concerned that public comment on the four northern California draft Plans may prove to be a meaningless exercise, and that the Forest Service will choose to disregard most public comments on the Plans. The agency has already hinted that it will only utilize comments on matters that are not covered by the President's Plan. We have to wonder whether we are engaging in a sham public participation process that is essentially irrelevant to agency decision-making on all forest-related issues in the Plans.

227

Response: As stated in the response to comment 1, we have made a number of changes in the documents in response to the comments made on the draft EIS and Plan. The FSEIS ROD amended the Region 5 Regional Guide and provides direction for the Six Rivers Forest Plan. The FSEIS and FSEIS ROD had an extensive public involvement process, and a number of changes were made to the FSEIS and the ROD in response to public comment.

Comment 7: Scenic Shoreline requests that its comments on previous Six Rivers LMP-DEIS and Shasta Trinity LMP-DEIS be included in the record of comments on current LMP-DEIS revisions. The latter two sets of documents are similarly applicable to the current editions.

24

Response: The management situation on both Forests has changed drastically since the date of your comments. It would be difficult, highly speculative, and very unproductive to relate comments on previously issued drafts to the current proposed alternatives for the Forest. Comments on subjects which may or may not be related do not help improve the analyses or discussions on the proposed action and its alternatives, nor help the decision-maker.

Comment 8: Planning should take advantage of local and regional groups established to foster stewardship of watersheds and natural resources. Goal development, management planning, and data collection and analysis must include private industry, local landowners, and the public. These groups should be involved in planning, implementation, monitoring, and evaluation on National Forest Plans. These groups may be particularly valuable in exploring emerging land use pressures, management opportunities, and innovative management practices. The Forest should consider incentives for public participation in the planning process, the role of public

interest groups or contractors for monitoring, and access to information and analysis.

221

Response: We agree that there is great benefit in collaborating with local and regional groups. The Forest is currently working with such groups while performing watershed analysis, river basin assessments, and collecting data, and developing management projects. Chapter 5 of the Forest Plan outlines how the public will be involved in the implementation of the Plan.

Agency/Interagency/Tribal Coordination

Comment 1: The Six Rivers National Forest should coordinate through aggregate planning with the Klamath, Shasta-Trinity, and Mendocino National Forests to develop a single final EIS and Plan.

24

Response: The National Forest Management Act (NFMA) required that each National Forest develop a Land Management Plan. The Six Rivers has closely coordinated with the other northern Forests in developing our draft and final Plans. The Forests are also coordinating at the Klamath and California Coast Range Province level on efforts such as watershed analysis, restoration, and surveys and monitoring.

Comment 2: These four plans are proof that for the Federal Forests of the Klamath Siskiyou region there is still no integration all the way down the line.

217

Response: The four Forests have coordinated closely in recent years in the development of our Forest Plans. In fact, the aquatic conservation strategy in the FSEIS ROD adopted many of its features from the riparian standards and guidelines developed by these four Forests, with coordination from agency scientists. As the Forests have been developing the plans for over 16 years, there are some basic differences that are the result of decisions made many years ago (an example is how management areas were developed). The four Forests have incorporated direction from the FSEIS ROD, which provides consistency in the areas covered in the ROD. Other differences in the Plans are due to differences among the Forests, such as vegetation, climate, fire regimes, and recreational use.

Comment 3: To facilitate public input and analysis, the Six Rivers National Forest should work towards standardization of its Final LRMP and EIS with those of other northern California National Forests, in approach, content, and format. They represent a lack on consensus over the meaning of ecosystem management. In areas where the Plans are generally consistent with each other (such as riparian management) the proposed management direction is often contrary to the recommendations of the Forest Service's own scientists.

225 227

See the response to comment 2 above.

Comment 4: The Karuk Tribe has invested a great deal of time and money in preparation of our Ancestral Lands Forest Management Plan, which we submitted to you in 1989, along with detailed comments submitted to you in 1983 and our efforts to review these current draft documents. Please refer to all of our previous correspondence to you in relation to your proposed Forest Plan along with our current comments.

207

Response: The Forest reviewed the Ancestral Lands Management Plan and met with the Tribe during the development of the final EIS and Plan to address their concerns.

Comment 5: The Tribe recognizes that the Plan and EIS are to be considered as a whole, rather than as separate documents. In recognition of these facts, along with the reality that the Karuk Tribal Council has been unable to adequately discuss the ramifications of your Forest Plan and EIS documents, the Karuk Tribe is formally requesting consultation with you and your planning and management staff as the final Forest Plans are being prepared and implemented.

207

Response: The final Plan has been modified to include standards and guidelines for Tribal consultation that emphasize the intent to follow the Government-to-Government protocol and to consult and coordinate on all projects that have the potential to affect Native American values. The Government-to-Government agreement provides a process for this type of consultation. Forest Plan provisions such as how to provide for ceremonial areas and special forest products needs have been discussed at meetings since the agreement was signed, and future meetings are planned.

Comment 6: National Park Service staff at Redwood National Park is available to share knowledge and experience in watershed management and rehabilitation with the Six Rivers, to coordinate the development of ecosystem-wide GIS, and to cooperate in managing recreational use on park lands adjacent to the Smith River NRA according to the national recreation strategy. Increased cooperation and coordination between the Six Rivers National Forest and Redwood National Park will promote the mutual goal of ecosystem management and strengthen Redwood National Park's ability to protect Park resources.

289

Response: The Forest has been coordinating with Redwood National Park on a number of activities. Redwood National Park staff have worked with the Forest on watershed rehabilitation projects, including road obliteration; we are working closely together on GIS activities and data sharing; we have been coordinating watershed analysis efforts at the Interagency Watershed Analysis Center in McKinleyville; we are coordinating recreational activities in the Smith River NRA and the Park; and Forest and Park staff are members of both the local interagency implementation team (LIIT) and the Klamath Province Interagency Executive Committee (PIEC), groups that have evolved to implement the FSEIS ROD. We agree that coordination between the two agencies is helping in promoting the mutual goal of ecosystem management and protecting resources on both Park and Forest lands.

Comment 7: We feel that it is very important that the Forest Service contact appropriate California Department of Fish and Game (CDF&G) units during (not after) the development of the final Plan so that issues and concerns can be dealt with prior to the issuance of a final document.

47

Response: Planning staff met with local unit CDF&G representatives between the draft and final Plans.

Comment 8: Additional interagency cooperation will be needed to ensure adaptive ecosystem management. Federal and state agencies must resolve existing policy and regulatory conflicts that impede ecosystem management.

221

Response: The Forest is currently working with other federal agencies and with state agencies at the watershed and river basin scales while developing watershed analyses and river basin assessments. These collaborative efforts will help address issues at an ecosystem scale. The resolution of existing policy and regulatory conflicts is beyond the scope of these documents.

Adequacy of the Documents

Comment 1: Do the final EIS and Plan analysis comply with existing laws and regulations [NFMA, NEPA, ESA, etc.]? Is the scientific data sufficient for the EIS analysis, including viability assessments?

226

Response: The EIS and Plan were developed within the framework of existing laws and regulations, such as NFMA, NEPA, and ESA. The analyses included in the EIS used all local research, reviews of literature cited by our respondents, and incorporated the FSEIS ROD, which was based on the professional opinion of some of the most knowledgeable scientists available in the field of forest resources and their biota.

Comment 2: The four northern Forest Plans are grossly inadequate and would result in the destruction of the 5 million-plus acre ancient forest ecosystem of northern California.

A 241

Response: The Forest Plan emphasizes maintaining and restoring ecosystem health, particularly providing habitat for late-successional and aquatic/riparian dependent species. It is consistent with the FSEIS ROD, which was developed using the latest scientific information. The Plan's ASQ is approximately 10 percent of the ASQ proposed in the 1987 draft Plan; about 91 percent of the Forest will be reserved from timber harvest activities.

Comment 3: NyCal believes that the Forest Plan, draft EIS, and Smith River NRA Management Plan are woefully deficient in that they fail to recognize and adequately address the economic and strategic value of the Gasquet Mountain and High Plateau/Judy area laterite deposits and the valid existing rights of CalNickel to develop these deposits. NyCal believes that the erroneous position advanced in the NRA Management Plan (that an assessment of commercial development of laterite deposits proved to be sub-economic) has resulted in avoidance of further discussion of these issues in the

draft EIS and Plan. Absence of a meaningful analysis regarding mineral development renders inadequate the planning process and environmental review embodied in these documents.

169

Response: CalNickel is the only entity currently holding a large number of claims in the NRA; no claims have been determined to have valid existing rights. Claims in the NRA with valid existing rights would be managed according to law, regulation, and direction in Forest Service manuals and handbooks. An addendum has been included in Appendix A of the final Plan (Smith River NRA Management Plan) to correct the discussion of minerals.

Comment 4: We are concerned that the scoping process as described in Appendix A of the EIS was so inadequate as to ignore the Gasquet Mountain project, a project of significant size and visibility during the scoping period. In fact, at the time of scoping, the Gasquet Mountain project was the subject of considerable public discussion. Unless this omission is rectified, the Forest Plan and the Draft EIS can never be adequate. The failure to consider the Gasquet Mountain project seriously calls into question the comprehensiveness and reliability of the planning process and the environmental review.

169

Response: The Gasquet Mountain project was discussed in the 1987 draft EIS as a public issue identified through scoping. This issue was not carried forward to the present EIS and Plan because it was resolved with the establishment of the Smith River National Recreation Area.

Comment 5: By law, EIS's and planning documents must be readable. These are not. There is no index in either document. The tables of contents are merely broad statements indicating what general topics are available in each chapter. The only way to find discussion on specific references is to leaf through the entire documents, page by page.

48

Response: An index has been added to the FEIS. The table of contents indicates the page numbers of all the headings and sub-headings in the chapters; thereby eliminating the need to "leaf through the entire documents, page by page."

Comment 6: Recent wildlife studies have shown that the northern spotted owl is thriving in our second growth forests on the north coast. These factors were not adequately addressed in the EIS since a broad brush approach was taken for the entire Pacific Northwest. In other words, the north coast of California is quite different than other parts of the Pacific Northwest and this factor was not considered in the overall plan for the Six Rivers or the Option 9 plan.

51

Response: The northern California National Forests, the California Resources Agency, and many other agencies, groups and individuals provided information to the team developing the President's Plan. The local conditions were considered in the development of both the Six Rivers Forest Plan and the President's Plan.

Comment 7: In addition to the RPA Act, NFMA, NEPA, and Option 9, how does the Multiple Use Act of 1960, the Trinity River Restoration Act of 1975, and the Klamath Restoration Act and the restoration programs created by them affect the forest management options described in the draft Plan and EIS?

200

Response: The EIS alternatives were developed within the framework of existing laws and regulations, including those you mention. The Forest is working with other Forests and agencies on the restoration programs associated with the Klamath and Trinity Restoration Acts.

Comment 8: The DEIS indicates that the Plans will induce more harvest on adjacent private lands but do not adequately assess the cumulative impact on the entire landscape. It is at least plausible that the four plans will together lead to a regional landscape with a very pronounced contrast between private and public lands, with neither emulating pre-management conditions. This cumulative effect may not be optimal for either biological or social values in northwestern California.

221

Response: The FSEIS team evaluated cumulative effects at the regional level; the evaluation included consideration of the incremental impact of actions of lands owned and/or managed by other nonfederal agencies, states, American Indian Tribes, corporations, and individuals. Road construction and use, and timber harvest are the principal activities of nonfederal forest

lands which make an incremental contribution to the cumulative impacts disclosed in the SEIS. Modeling indicates that, although reductions in federal harvests tend to spur some supply responses on the part of private landowners in the region (timber harvest), the level of supply response is short-lived and is limited by the age distribution of the timber on private lands. Moreover, changes to local and state environmental laws are outside the scope of this document and beyond the authority of the agency.

Comment 9: The DEIS and draft Plan violate NEPA in a number of ways: 1) they incorporate the DSEIS and the FEMAT report, and thus suffer from violation of NEPA and other environmental laws in those documents; 2) the draft Plan presents and the DEIS analyzes a set of alternatives that does not include the alternative to be implemented under Option 9; 3) the DEIS contains impermissibly conclusory and contradictory analysis; 4) the DEIS fails to consider the cumulative impacts of proposed activities; 5) the DEIS fails to present sufficient scientific data; and 6) the DEIS fails to consider the preferred alternative's compliance with applicable laws. Because the documents violate NEPA in these ways they should be remanded for proper environmental review and further comment on their legality.

226 247

Response: 1) The final EIS and Plan incorporate the FSEIS ROD, which was signed in April 1993, and amended the Region 5 Regional Guide; 2) the addendum to the DEIS contained a description of the changes to the preferred alternative as a result of the SEIS. The final EIS and Plan have fully incorporated the direction from the FSEIS ROD; 3) the interdisciplinary team worked together to develop the alternatives and provide a coordinated analysis; 4) Chapter 4 of the EIS contains a discussion of the cumulative impacts, by type of environment and resource area, of the proposed activities; 5) the planning team worked with local scientists in areas such as wildlife, riparian protection, biological diversity, range management, and fire and fuels management. Scientific data is included throughout the documents and in the planning records; and 6) the preferred alternative and the final Plan are consistent with all applicable laws and regulations.

Comment 10: The Forest Service's failure to evaluate species viability cannot be excused by lack of knowledge. The FEMAT report estimated the viability likelihoods for hundreds of species in all biological families. The DEIS however, commits a much more severe violation of NEPA than merely excusing

uncertainty for lack of knowledge. It actually assumes the best possible outcome in the face of uncertainty: “due to this uncertainty about population thresholds, the designation of a well-distributed array of suitable contiguous habitat areas for selected wildlife species is expected to maintain adequate numbers of breeding animals throughout the planning horizon” from DEIS IV-21. The Forest violates the mandate to support analysis with supporting scientific or objective data in order to provide a detailed statement according to NEPA by assuming that its preferred alternative will maintain viable populations of wildlife species rather than analyzing whether this is so. It assumes that “the habitat areas identified for threatened, endangered, and selected wildlife species, in conjunction with existing reserved land and a network of expanded riparian management areas, are expected to provide a well-distributed array of breeding territories of these...” at DEIS IV-21. This statement is circular; because of its circularity, this vast assumption creates internal contradictions in the DEIS.

226

Response: The comment from DEIS IV-21 was taken out of context; the sentence previous to the above quote states “since few wildlife species occur on a single forest, viability (conservation) assessments should cover provinces, regions, or states.” The habitat areas in the Plan are based on regional assessments, models, and recovery plans; these are based on currently available data. The final documents have incorporated the FSEIS ROD and tier to the viability assessments performed in the development of FSEIS and the FSEIS ROD.

Comment 11: The DEIS fails to consider possible violation of the NFMA’s requirement to maintain sustainable soil productivity. It admits that: “direct disturbance of soils from off-highway vehicle use on open areas would result in some erosion and impairment of productivity, regardless of preventive erosion methods” at DEIS IV-140.

226

Response: All of the vehicle use on the Forest, including off-highway vehicle use, would occur on the Forest’s transportation system. As there would be no OHV use in open areas of the Forest, this statement has been removed from the EIS. The effects of OHV use on soil would be the same as those for other for road-related effects.

Comment 12: The DEIS fails to evaluate compliance with the Clean Water Act, the California Porter-Cologne Act, the Endangered Species Act, the Wild and Scenic Rivers Act, and other applicable laws.

226 247

Response: The EIS examines the effect of compliance with the above laws as well as dozens of others but does not cite them in the analysis. The intent of the EIS and Forest Plan is to prepare an environmental analysis, not a legal analysis.

Comment 13: The DEIS fails to consider possible violations of NFMA’s requirement that visual quality must be protected. The DEIS states at IV-140 “in the foreground, and in some cases the middleground distance, viewers may find the alteration to be excessive in terms of their own expectations.” More importantly, the DEIS presents predictions only of aggregate VQO effects rather than effects specific to particular areas. Such predictions provide no assurance as to the maintenance of visual quality in specific settings, and the NFMA visual quality requirement was not created to protect average visual quality by allowing its degradation in one place to be balanced by its protection elsewhere. Rather, it was intended to protect visual quality on all National Forest lands.

226

Response: The visual quality analysis in Chapter 4 of the EIS is programmatic in nature; site-specific visual quality will be addressed at the project level. With the management strategy proposed in the Forest Plan, natural disturbances with have a greater effect on the visual quality of the Forest than our management activities. Each management area is assigned a visual quality objective; projects within those management areas are expected to meet the assigned VQO.

Comment 14: The Forest violates the mandate to support analysis with supporting scientific or objective data in order to provide a detailed statement according to NEPA by assuming that its preferred alternative will maintain viable populations of wildlife species rather than analyzing whether this is so. It assumes that “the habitat areas identified for threatened, endangered, and selected wildlife species, in conjunction with existing reserved land and a network of expanded riparian management areas, are expected to provide a well-distributed array of breeding territories of these...” at DEIS IV-21. The DEIS thus, despite the lengthy discussion following this assumption, sweeps under the

rug the very complexities which it must consider. Because of this circularity, this vast assumption creates internal contradictions in the DEIS. Other statements in the DEIS regarding viability thresholds of species populations, habitat diversity standards, and habitat for the fisher and marten contradict this assumption.

226

Response: The habitat areas in the plan are based on a number of scientific assessments, including the FEMAT report, SAT, the Scientific Panel on Late-Successional Forest Ecosystems, and agency reports such as the recovery plans for the bald eagle and peregrine falcon, and conservation assessments. The final Plan tiers to the President's Plan, including the viability assessments in the FSEIS. The alternatives assume varying levels of risk regarding the contribution to viability of a number of species, including the provision of suitable habitat.

Comment 15: The plans should provide for an increase in the populations of goshawks over time by managing for optimum habitat. NFMA requires the Forest Service to use the best available data in the preparation of its plans. In order to comply with NFMA, new survey data for goshawks must be compiled before planning decisions are made. The monitoring of the goshawk population is outdated on all the Forests, and the information is inadequate to make specific management decisions to avoid a decline in the population of the goshawk.

227

Response: New standards and guidelines for goshawk management have been developed using the best available data and have been incorporated into the final Plan. These guidelines may be superseded by the adoption of a Conservation Strategy for Northern Goshawk and modified in response to new information. In addition, the Forest is currently monitoring historic nest sites.

Comment 16: To achieve NFMA, Clean Water Act, and Endangered Species Act compliance, it will be necessary to manage entire watersheds (all watersheds) such that departures from natural sediment and water regimes and vegetation dynamics are very small, localized, and short-lived. Furthermore, because 1) even the best-conceived plans will fail in some instances, and 2) we already suffer from an extensive, irreversible legacy of past damage, it is necessary for the stabilization and recovery of sensitive species to establish a network of minimally-disturbed watershed

refugia preventing and minimizing disturbances or stresses of human origin.

324

Response: The general provisions of the final Plan, and the Aquatic Conservation Strategy in particular, accomplish these objectives.

Comment 17: The draft Forest Plan should adopt the recommendations of the Scientific Analysis Team (SAT) Report. The recommendations by the SAT are the best management guidance from the Forest Service's own scientists. The draft Forest Plan must either adopt them verbatim or specifically explain why the best scientific information was not used in the draft Forest Plan.

208

Response: Many of the recommendations from the SAT Report were reassessed and incorporated into the FSEIS ROD, which provides direction for the Forest Plan. The FSEIS analyzed the recommendations of the SAT Report and FEMAT, and addressed why some recommendations were not adopted. The Six Rivers Forest Plan tiers to the FSEIS ROD and the analysis performed in the development of both the FSEIS and the ROD.

Comment 18: The discussion of silvicultural strategies was difficult to locate; one section of the DEIS stated that they were discussed in DEIS Appendix F; but we eventually found the discussion in Appendix B as part of the modeling and analysis process. It was difficult to locate this and other information in the document.

49

Response: The FEIS has been modified to eliminate incorrect references and provide a more detailed table of contents and an index.

Comment 19: Some of the tables in Appendix E of the draft Plan misrepresent figures or omit information such as the timeframe for projections.

48

Response: These have been corrected in the final Plan.

Comment 20: Alta California Alliance believes that data and findings in both the draft Plan and the EIS have weaknesses that "involve a sizable component of the planning area," "substantially affect the output of goods

or services,” and “could set a precedent for future decisions.”

17

Response: The weaknesses alleged in this comment are not believed to be present in the documents. The Forest has complied with all existing laws, has used scientific data and analyses, and has tiered to other environmental documents as required.

Smith River National Recreation Area (NRA)

Comment 1: The Forest should implement the NRA legislated harvest levels that were promised to our community.

8

Response: The Act establishing the Smith River NRA did not legislate a specific harvest level. Rather, the Act established management areas and determined the type of timber harvest activity that would be allowed in different management areas. The Forest is required to comply with laws such as the Endangered Species Act; provisions for threatened and endangered species have reduced the number of acres available for timber harvest below that estimated in the Act and in the NRA Management Plan.

Comment 2: In the NRA the Forest should coordinate recreational management of trails with Redwood National Park and state parks to ensure that the more restrictive policies of the parks are not ignored by visitors who pass out of NRA lands into park lands. In addition, the Forest should continue and strengthen its cooperation with the parks to provide interpretation for visitors.

21

Response: The Forest is coordinating recreational management in the NRA, including trails, interpretive services, and other activities such as campfire programs.

Comment 3: The nomenclature for RNAs and SIAs in the NRA Management Plan (included as Appendix A of the Forest Plan) should be corrected to reflect the true designation and management direction of these areas, and to bring the Plan in accordance with the EIS.

138

Response: The Forest has included an Addendum to the NRA Management Plan (see Appendix A of the Plan) which corrects this error.

Comment 4: Section 8 of the Smith River NRA Act authorizes and directs the Secretary of Agriculture to issue supplementary regulations regarding mineral development within the NRA. Consequently, the NRA Management Plan provides for the issuance of such supplementary mineral regulations. To date, the Secretary has failed to promulgate these supplementary regulations. Until they have been promulgated, it is our belief that an adequate Forest Plan cannot be formulated.

169

Response: Supplementary regulations regarding mineral development within the NRA are currently being developed by the Forest Service. Until these regulations are promulgated, minerals management within the NRA will comply with all applicable laws and regulations; the Forest Plan and EIS have been formulated within the scope of these laws and regulations.

Comment 5: Page 16 of the NRA Management Plan omits minerals development as an element of the management emphasis section. This is a critical omission, especially in the North Fork Management Area.

169

Response: The entire Smith River NRA has been withdrawn from minerals development, subject to valid existing rights. Minerals development would be allowed on claims that are found to have valid existing rights, but it is not a management emphasis specified in the Smith River NRA Act for any of the management areas within the NRA, including the North Fork.

Comment 6: The Smith River cannot be managed effectively unless there is a commitment by all government agencies (including the Six Rivers and Siskiyou National Forests, CDF&G, and others) to protect the Smith River with the highest standards allowed by law. Particular areas of concern include coordinating with the Siskiyou National Forest for management of the North Fork Smith and coordination with CDFG. Since the Forest Service is the major land manager, it must take the lead to ensure that the highest standards of environmental protection are adhered to by all agencies. The current piecemeal management approach and management proposed in the draft Forest Plan is unacceptable, is not ecosystem management, and

will lead to further deterioration of the Smith River ecosystem, especially its anadromous fisheries and diverse forests.

208

Response: The Forest has been coordinating with the Siskiyou National Forest and with other government agencies, including CDFG, USFWS, and BLM, in the management of the Smith River. The Six Rivers National Forest will be taking the lead role in the development of a river basin assessment/watershed analysis for the Smith River in 1995, and will coordinate with other involved agencies to identify and address issues and concerns for the management of the Smith River. The entire Smith River is within the Klamath Province, including the portion of the North Fork within the Siskiyou National Forest in Oregon. This designation will also provide a framework for coordinated management for the Smith River.

Comment 7: The Plan states that the Smith River NRA Management Plan was approved in August 1992 and is included in the document for reference only. Earlier in 1992, I had expressed interest in the NRA management planning process and was told it would be part of the Forest Plan. Please clarify. Was there a NEPA process for the NRA Management Plan? Were alternatives developed? Was there disclosure of the effects of such allocations as OHV use in the North Fork Smith roadless area and on TES species and Port-Orford-cedar?

224

Response: An earlier version of the NRA Management Plan was used in the development of the NRA Act. The Act made some changes to the Plan, and stated that the Plan would be revised to comply with the specifications in the Act. The Plan was revised and finalized in August, 1992. As the NRA Management Plan was developed as part of the Act, it did not go through the NEPA process. However, there was a great deal of public involvement that led to the establishment of the NRA.

Comment 8: The inclusion of a congressionally mandated recreation area with its functioning and mandated OHV system into a land allocation (North Fork Special Interest Area) that is clearly designed to eliminate the OHV use is just plain wrong and must be dropped from the final Plan.

230

Response: The Smith River NRA Act established the land allocation to which you refer, the North Fork Smith Special Interest Area. The Act does not mandate the establishment of an OHV system; rather, it states that the use of OHVs will be permitted only on designated routes. The Act did not designate specific routes, although there are routes with historical OHV use in the North Fork area. To protect uninfected drainages within the North Fork area from infection from the Port-Orford-cedar root fungus disease, roads within the area will be gated during wet periods; permits will be issued for access during dry periods. One road will be permanently closed to prevent the introduction of the Port-Orford-cedar root fungus disease to uninfested drainages that also contain and number of rare plant communities related to Port-Orford-cedar.

Definition of Terms

Comment 1: The terms "ancient forest" and "old-growth" are used interchangeably throughout both documents. These terms do not mean the same thing; they should be defined separately and the relation of one term to the other should be explained.

48

Response: The term "ancient forest" has been removed from the documents.

Comment 2: Stream classes should be defined in both documents. I assume the classifications follow state forest practice rules, but they should be stated as this is a very critical issue.

96

Response: Riparian reserves are designated for perennial, intermittent, and ephemeral streams. These terms are defined in the glossary.

Comment 3: Various terms such as "primitive," "semi-primitive," "riparian," "watershed," and "research natural areas" are not adequately defined and are extremely vague in the draft documents.

140

Response: The terms "primitive" and "semi-primitive" refer to recreation opportunity spectrum (ROS) classes, and are defined in both the glossary and in Appendix E of the FEIS. The terms "riparian", "watershed" and "research natural area" are defined in the glossary.

Comment 4: Why was the glossary excluded from the draft Forest Plan and placed as an appendix only in the DEIS, especially when complex unfamiliar terms such as “seral,” “cumulative,” and “anadromous” appear throughout both documents?

200

Response: The EIS and Plan are intended to be read as combined documents; these terms are defined in the glossary.

Comment 5: The use of the term “regulated” to mean areas to be managed for timber is confusing, because the word implies that there will be no control of activities in “unregulated” areas such as riparian reserves.

270

Response: The term "regulated" refers to managing the sustainable flow or yield of timber from activities, rather than the control of activities. The term “unregulated” means that the flow of timber is not managed and is generally irregular. Standards and guidelines and management area direction control management activities in areas such as riparian reserves. See Chapter 4 of the final Plan.

Comment 6: The following are recommendations for specific definitions: a) a standard is a principle requiring a specific level of attainment, a rule to measure against, while a guideline is an indication or outline of policy or conduct; and b) FEMAT defined the matrix as everything outside reserved. The area of the matrix available to contribute to the PSQ shall only be the CAS forest land.

325

Response: As for the definition of standards and guidelines, policy and case law have held the two concepts to be equal and they are treated as such in the final Forest Plan and EIS. Although FEMAT used the term PSQ, the final Plan uses ASQ as mandated by NFMA and Forest Service regulations. Only CAS lands contribute to the ASQ under NFMA.

Monitoring

Comment 1: Provide funding for independent monitoring to ensure that plans are properly implemented. Issues of trust also argue for monitoring to be independent of the Forest Service.

35 72 196 219 325

Response: Monitoring may be implemented through a variety of techniques, including service contracts and cooperative efforts with other organizations.

Comment 2: No method was cited in the monitoring plan to address the preservation of biological diversity.

138

Response: Biological diversity monitoring elements are specified as part of the FSEIS ROD. Additional elements are being developed by the Regional Ecosystem Office.

Comment 3: Monitoring must become a principal activity on the Forest in order to provide the information needed for ecosystem management.

196

Response: The Forest will perform monitoring at different scales for complete tracking of issues and activities requiring monitoring.

Comment 4: Information from monitoring is useless unless it is acted upon. The draft Plan fails to describe methods to be used and what results would trigger a change in management.

196

Response: Chapter 5 of the final Plan discusses the methods to be used in monitoring. The monitoring plan identifies the thresholds of concerns for monitoring elements; exceeding any of these thresholds would trigger a change in management.

Comment 5: Resource information is invariably collected by sampling selected parts of a population to infer conditions of the entire population. A single sample can provide a valuable present-time picture of the population (resource). Unfortunately, it provides little, if any information about changing conditions. Monitoring can be thought of as sampling through time; each successive sample gives feedback on the condition, that is, the health of the resource.

210

Response: The Forest plans to perform the type of monitoring you mention - sampling through time - to determine trends in forest conditions, and to track the movement from existing to desired conditions.

Comment 6: The mysteries of our forests will never be unravelled until we make a commitment to learn their precise conditions, now and through time. All too often forest scientists have devised advanced, intelligent sampling schemes which are ignored after these scientists have departed. Six Rivers, for instance, long ago kept timber permanent plots. This data is now missing though, so the time and expense which went into them have been wasted. An appropriate monitoring program should allow for data from all presently valued resources. It should leave room for resources which will become valued in the future.

210

Response: The Forest has made significant investments in the collection of data. The data from the permanent timber plots is not missing; the ecology and silviculture programs are working together to revisit these plots and to add to the previously collected data for these plots in order to tie the data to more recent ecological mapping efforts and to improve growth, yield and mortality projections.

Comment 7: The Forest Service must be monitoring now, and have all details spelled out.

263

Response: The Forest Service does have a monitoring program and is performing monitoring presently. Chapter 5 of the Forest Plan contains the details of the Forest Plan monitoring program. Additional monitoring programs are associated with projects and research studies.

Comment 8: It is obvious that the Forest is placing a high emphasis on monitoring and evaluation. Tying specific compliance and effectiveness monitoring tasks to each Management Area and to specific projects ensures there is a mechanism in place to measure attainment. Including it as an overhead costs will ensure that the funding for each monitoring effort is secure, which has been a problem in the past. We would be happy to participate in the compliance monitoring review team.

270

Response: Thank you for your support of the monitoring plan. We would be happy to have you participate in the compliance monitoring review team.

Comment 9: We recognize that effectiveness monitoring is very important and that in many cases it is the only means to determine the effects of management activities on threatened, endangered, and candidate species. Therefore, we recommend that effectiveness monitoring be funded in the same manner as implementation monitoring (as an overhead cost).

289

Response: For specific projects, effectiveness monitoring will be funded as an overhead cost. Effectiveness monitoring that is not project-related will be prioritized and funded as discussed in Chapter 5 of the final Plan.

Comment 10: The Forest Service routinely places monitoring last in its Forest Plans, perhaps indicative of its perceived importance or chronology of implementation. Ecosystem management requires that monitoring come first, not last. We can no longer afford to find out after a project is completed that a watershed has been hemorrhaging for decades and its aquatic monitoring is expensive: historical records are compiled, new field data is collected, all must be analyzed and interpreted. But most important, acquired knowledge must be acted on if recovery of aquatic ecosystems is to become reality, rather than remain wishful thinking.

324

Response: Monitoring is an important aspect of the adaptive management approach the Forest is proposing in the final Plan. Information from monitoring of past and current management practices will be used in making management decisions or revising management activities to achieve desired conditions.

Comment 11: The EIS and Plan should discuss and provide for adequate monitoring and evaluation of specific key elements of the Plan. Specifically, how will the growth projections and the yield tables themselves be evaluated to see if growth and yield projections are in line with actual results on the ground? FORPLAN does not give the Forest Service the ability to know where to locate cutting units. Location and priority of management activities shall be identified by a watershed-by-watershed assessment conducted on the ground. How will the schedule of products be derived from the FORPLAN model? I have little confidence that the models and tables constructed from data and information are adequate to give enough direction to Forests to be

able to realize timber outputs and comply with sustained yield requirements under the law.

325

Response: The Plan itself does not schedule where or when individual projects occur. The decision of where projects occur is part of plan implementation.

Comment 12: Could the monitoring and evaluation formula provided in the draft Forest Plan on page I-2 to evaluate USFS management on the Six Rivers National Forest include an evaluation of “intensive forest management,” regeneration cutting,” and “committed timber sales” and their influence on reforestation, including plantation development, herbicide use, fire prevention, soil productivity, soil stability, erosion hazards, water quality, and forest productive capacity, all of which could affect future forest inventories over time?

200

Response: The monitoring plan in Chapter 5 of the final Plan includes the elements that you mention.

Comment 13: The scarcity of funds has severely limited monitoring in the past, and is clearly insufficient for the intensity of monitoring proposed in the Plans. Thus, without a drastic shift in funding priorities, the Plans may never lead to effective adaptive management.

221

Response: Monitoring is built into program budgets, and all projects should contain appropriate levels of monitoring funds in their costs or they should not be undertaken.

Standards and Guidelines

Comment 1: Some standards and guidelines use the word “should” in place of a forceful expression such as “required” or “will.” Each of the “should” statements needs to be strengthened to provide better resource protection.

141 224

Response: The intent of all standards and guidelines must be met. Where intent allows some flexibility, it is indicated by the language used. If a project does not meet the intent of a standard and guideline, there are three choices of action: amend the Forest Plan, amend the project, or abandon the project.

Comment 2: I recommend that the Forest include the elements of sustainability stated by the Institute of Sustainable Forestry in Redway, California. These elements address the maintenance of forest health and the rehabilitation of ecosystems.

175

Response: Many of the elements of sustainability are included as standards and guidelines in Chapter 4 of the final Plan. See the Biological Diversity, Native Plant, Aquatic and Riparian Resource, Geology, Soil and Watershed, and Rural Development sections of Chapter 4.

Comment 3: There are no standards and guidelines or discussions addressing the maintenance of biological diversity which is one of the three major driving issues of the planning process.

224 225

Response: Biological diversity standards and guidelines and discussions have been added to Chapter 4 of the final Plan.

Comment 4: In order to describe standards and guidelines for ecosystem management, it may be a good idea to provide for the development of individual project standards and guidelines during project NEPA analysis. Site-specific conditions could be better accounted for and practices designed specifically for the conditions at hand.

325

Response: The Forest Plan is a programmatic document, and is not intended to provide the sole direction for site-specific activities. The environmental analysis for specific projects does include the development of additional standards and guidelines beyond those contained in the Forest Plan; these standards and guidelines are tailored to site-specific conditions and proposed management activities.

Data and Analysis

Comment 1: The FORPLAN model apparently has no capacity to handle minerals and is therefore inadequate to analyze the Six Rivers National Forest.

169

Response: FORPLAN and other models are only tools that are used to assess outputs, activities, and

consequences, and are used along with professional judgement. Minerals management was included in the analyses of outputs and activities.

Comment 2: Cumulative impact assessment must be carried out for all Federal activities at the Forest Plan level, and for all Federal and non-Federal activities at the project stage. Also, where biological corridors run through adjacent timber sales, the cumulative impacts of the adjacent timber sales and roads must be assessed in one document. Given the frequent checkerboarding of State, private, and Federal lands, the cumulative effects of Federal and non-federal activities in northern California can also be substantial. EPA encourages the Forest Service to use the Forest Plan to assess the cumulative impacts of all Federal and non-federal activities and establish procedures for assuring non-federal activities are considered in regard to species viability, riparian habitat, watershed conditions, etc.

174

Response: Chapter 4 of the FEIS does contain cumulative impact assessments for Federal activities, and includes estimates of impacts from non-Federal activities as well. The FEIS also tiers to the FSEIS and the FSEIS ROD, which contain assessments of Federal and non-Federal actions within the range of the northern spotted owl. NEPA documents must discuss the direct and indirect effects of connected actions such as timber harvest and road construction. Unlike many other Forests in the Pacific Northwest, the Six Rivers does not have frequent “checkerboarding” of Federal and non-Federal lands.

Comment 3: Make plans scientifically credible and legally defensible; not based on presumptuous timber computer models.

195

Response: The FORPLAN model which projects timber growth and yield over time is only one of many models and analysis techniques used in the development of the EIS; refer to Chapter 4 and Appendix B of the FEIS. FORPLAN uses Forest data and incorporates information regarding the growth and mortality of vegetation. The FORPLAN model, used in conjunction with other models and professional judgement, is the best available for Forest-wide land allocations and analyses.

Comment 4: It is foolish to rely on FORPLAN to do more than it was designed to do. It is not a poorly written program; it is, in fact, very powerful in

competent hands. But it is, as its creators have stated, incapable of handling spatial complexity and thus can never properly plan the allocation of a forest’s resources. We must accept the fact that such a model will never exist.

210

Response: FORPLAN is only one of many models and analyses used in the development of the EIS. The Forest also used spatial disaggregation models and GIS information to determine whether the proposed schedule of outputs and activities was possible. Forest management will use the Plan’s projections as the starting point or framework for scheduling and allocating resources, rather than the sole source of information. The annual report will discuss the progress the Forest is making on plan implementation; if there are large discrepancies between projected and actual levels of outputs and activities, the Plan will be amended or management activities will be altered.

Comment 5: Until very recently accurate resource information has not been a matter of great concern to the Forest Service. Due to a variety of reasons, the agency apparently now recognizes the need to understand the complex cause-and-effect interactions of forest resources. It has embraced ecosystem management towards that end. If its aim is true, site-specific (geographically centered) information will surely result. Nothing else will suffice. Direct measurements (e.g. steel tape) are invariably more accurate than indirect measurements (remote sensing), but typically prohibitive due to their expense. By using a combination of the various direct and indirect measurement tools available, a multi-stage database can be designed in which each successive level of accuracy corrects the more extensive level underlying it. By fine-tuning the inaccuracies of simple/inexpensive sampling methods with the more complex/precise/expensive sampling methods, numerous populations can be confidently quantified across extensive tracts of land. There is no reason current facilities cannot be integrated into a tightly functioning database.

210

Response: Geographically centered information at the Forest-wide scale is used in the Forest Plan. This information is statistically valid for this application. Site-specific information would be obtained for project-level analysis as appropriate for the proposed actions, and would be included in the Forest’s corporate database to provide further detail/accuracy to the Forest-level data.

The Forest is also gathering soils, geology, and vegetation data over large areas using a combination of site visits and aerial photo interpretation. As the Forest gathers more direct, site-level information, older Forest-wide data will be replaced.

Comment 6: It would be helpful if the final EIS contained a discussion of the accuracy rating and date of collection of the spatial information that is provided.

225

Response: Appendix B of the FEIS contains a discussion of the spatial information used in the formulation of alternatives and analysis of effects.

Comment 7: Collaborative efforts must be established to analyze existing data. More cooperative efforts must be made by state and federal agencies, and local governments to use existing analytical tools to model fire at regional levels across ownership boundaries. More in-depth analysis should be done to predict the changes in suppression capabilities under projected personnel reductions by the Forest Service and private industry. These models should be improved and integrated with other spatial information to allow their use in evaluating the effects of fire on forest structure. Efforts to compile data, develop data standards, and establish Geographic Information Systems should be identified and integrated. A collaborative effort would lead to substantive, rigorous and constructive comments that could significantly improve the Plans' likelihood of contributing to the economic development of northwestern California.

221

Response: The Forest will be developing a Fire Management Action Plan during the next few years. We would be happy collaborate on data collection and analysis efforts as we develop this plan.

Maps

Comment 1: Key watersheds should be identified on the Plan maps in order to see how proposed land allocations mesh with the concept of refugia.

23

Response: A map of watersheds contained within the Forest, including key watersheds, is included in the final Plan map packet.

Comment 2: Why are there two separate types of maps used in these Forest planning documents without integrating the two mapping systems? The 7-1/2 minute quad maps are not displayed on the colorized alternative maps provided in the draft EIS. Can the Forest planning documents show more geographic features such as soils, geology, site histories and information from completed cumulative impacts?

200

Response: The wild and scenic river boundaries are shown on 7-1/2 minute quad maps in Appendix J of the final Plan, but are also included on the resource maps, which are at the same scale as the management area maps for each alternative. The management area maps do show some geographic features; landscape analysis and project level maps/documents will provide more detailed information on features such as soils, geology, and site histories.

Comment 3: The small scale of the alternative and river corridor maps made it difficult to impossible to analyze the land management allocations. Forest Plan maps relating to stream classes, fish distribution, vegetation types, geology, distribution of mature and old-growth forests and Port-Orford-cedar, presence of *Phytophthora lateralis*, and location and boundaries of roadless areas are essential to inform the public. These maps were missing from the DEIS and should be included in the final Plan or supplemental SEIS. They should be at the same scale so that they can be overlaid with land allocation maps including those of land allocations in the FSEIS ROD.

224 225

Response: The maps are of a small scale and are intended to show information necessary for making decisions on land allocations and management direction. Maps of roadless areas and the presence of *Phytophthora lateralis* have been added to the final documents; maps of stream classes, fish distribution, vegetation types, geology, etc. are included in the planning records.

Comment 4: The maps do very little to detail any of the text. It is impossible to see the existing routes or facilities, impossible to determine OHV routes, hiking trails, etc., impossible to compare the ROS classes with the affected areas, or to determine where any RNA or SIA areas are and so forth.

230

Response: See the response to comment 3. Maps showing recreational information are available at the Forest for a nominal charge. A map of ROS classes has been added to the final documents. RNAs are detailed on the management area maps. Some SIAs are located within more restrictive management areas such as LSRs; these do not show on the management area maps. Many of the SIAs are within the Smith River NRA and are shown on the maps included in the NRA Management Plan. Maps of all of the RNAs and SIAs are included in the planning records.

Comment 5: The lack of VQO and ROS maps in the otherwise excellent map package places the readers and reviewers at a real disadvantage.

1

Response: VQO and ROS maps have been added to the final documents.

Ecosystem Management

Comment 1: There was no consensus among FEMAT scientists that silvicultural prescriptions and legacy retention will, in fact, allow management for both timber and ecosystem functions on the same piece of ground. Strategies for maintaining and restoring these forested landscapes are based on lots of assumptions, and the FEMAT report is replete with acknowledgements that we lack information on not only the life histories and habitat needs of many species and groups, but about how forest ecosystems work. We need to use caution when trying to replicate complex systems created by a unique array of biological and physical factors which we do not understand. The old philosophies of “can-do” management continue in this Plan, albeit an innovative and welcome plan that sets a new direction for the Six Rivers National Forest.

23

Response: The management strategy outlined in the FSEIS ROD and the final Plan provides a cautious approach towards managing for late-successional and old-growth forests. LSRs are reserved from scheduled timber harvesting; the only silvicultural prescriptions allowed would be to improve habitat for late-successional dependent species, and these prescriptions would only be allowed in stands less than 80 years of age which are not yet functional habitat. An adaptive management approach would be used to test the assumption that such treatments can improve habitat.

By managing only in stands that are not functional habitat, there is little risk of degrading habitat. An adaptive management approach will also be used in matrix and AMA areas available for timber harvest. As these areas comprise only 9 percent of the Forest, we will be able to test assumptions and try new approaches on a small portion of the landbase while learning about the complex interactions of the Forest’s ecosystems.

Comment 2: Embarking on a program of legacy retention and ecosystem management to hasten restoration of functioning habitat must not provide the Forest Service with a mandate to the continued destruction of existing old forests, regardless of whether they meet the classic definition of “old-growth.” Natural regeneration and successional pathways, orchestrated by the land’s inherent potential and disturbance patterns, are preferable to manipulation. A mosaic of seral stages, vegetative types, internal stand conditions, and ecosystems across the landscape is true diversity and we should not be hung-up on creating old-growth on every forest acre. We need a natural range of variability molded by physical and biological factors, including fire, disease, bugs, and other stochastic events.

23

Response: The Forest has developed a recommended management range (RMR) for vegetation, which is a subset of the historical range of variability (HRV). The RMR reflects current climatic conditions and disturbance regimes, and the Forest will strive to achieve the distribution of seral stages contained in the RMR.

Comment 3: The shift from commodity management to ecosystem management will not be easy, but the public and science demand it and the course charted can simply not be altered by the agency or any political/economic interests.

23

Response: The Forest is excited about the shift to ecosystem management, and has begun efforts such as watershed and landscape analyses, watershed restoration, marbled murrelet habitat distribution studies, and HRV analyses. The Forest Plan outlines the ecosystem management strategy for the next decade.

Comment 4: I understand the intent of ecosystem management as proposed by this Plan and Option 9. Instead of managing for individual species, the entire landscape should be managed to maintain ecosystem functions and I support that completely. What bothers

me is the notion that we know how to do that within a framework of manipulation rather than a philosophy of natural processes maintaining and, in time, restoring a functioning landscape. The proposal is to “accelerate” development of late-successional conditions and “improve” the quality of wildlife habitat through silvicultural prescriptions which yield a volume that, in many cases, is not revealed in the ASQ simply because such logging will not be part of the scheduled program.

23

Response: The final Plan includes an estimate of the volume that will be harvested from non-scheduled areas. See also the response to comments 2 and 3.

Comment 5: The final Plan should provide the framework for developing and implementing ecosystem management; comments mentioned the following aspects of implementing ecosystem planning: a process for prioritizing and scheduling ecosystem planning; goals and objectives; descriptions of desired conditions, and alternative methods of achieving desired conditions; data gathering and monitoring; standards and guidelines with timelines and quantifiable goals; and definitions of ecosystem management and forest health.

47 48 196 202 211 221 225 325

Response: The final Plan does provide the framework for developing and implementing ecosystem management, including a process for prioritizing and scheduling ecosystem planning such as watershed analysis; goals and objectives; desired conditions; monitoring, standards and guidelines, and definitions of ecosystem management and forest health.

Comment 6: In order to maintain the long-term health, sustainable outputs, and the integrity of the forest ecosystem, the entire forest land base should be considered. The mission of the Forest Service is still to provide for multi-uses. For ecosystem management to be successful it must be practiced on the broadest possible land base possible. All acres must be considered, not just those areas that are remaining once single or exclusive uses have been zoned out of the management base.

213

Response: There is much debate over how best to manage for forest health and perpetuate late-successional forest ecosystems. Some scientists advocate active management while others prefer to rely only on natural processes. The alternatives considered in the FEIS are

based on different management strategies including both long rotations and networks of reserves with the objective of protecting late-successional forest ecosystems and the species associated with them. In these reserves, “natural” conditions, patterns, and processes are to be allowed to operate with a minimum of human intervention. Regulated, sustainable timber yields are planned only from suitable lands within the matrix and the Hayfork AMA. Standards and guidelines for reserved areas allow some management to maintain long-term forest health and integrity of the forest ecosystem.

Comment 7: Although the Six Rivers Plan has made steps towards ecosystem management, the Plan fails to establish benchmarks for ecosystem integrity and health. In the absence of these benchmarks, it is unclear if the desired future conditions of the Plan are consistent with ecosystem integrity. The impacts of the preferred alternatives of all four northern California Forests on the integrity of the ecosystems of northern California remain, therefore, unanalyzed.

221

Response: The Forest has begun to identify “environmental indicators,” which would be used to monitor whether the Forest is achieving desired conditions. An example is the establishment of a recommended management range for the distribution of seral stages for different vegetation series and zones across the Forest. As we gather more data and perform landscape analyses, we will be able to identify more environmental indicators to track the movement from existing to desired conditions.

Comment 8: The Six Rivers National Forest used a vocabulary similar but not as developed as that of the Klamath National Forest. The Forest recognized the need to mimic natural processes and disturbance rates, and similarly established desired future condition statements for management areas. The avowed strategy of the preferred alternative is to use active adaptive management to test different methods of achieving ecosystem management.

221

Response: Thank you for your support. We have added desired condition statements for many management areas, expanded discussions of biological diversity and disturbance regimes, and further developed management strategies that use an ecosystem approach in the final Plan.

Comment 9: It is not clear how the Six Rivers National Forest will “maintain biodiversity and viable populations of all native and desirable non-native plant and animal species” (one of the driving issues of the EIS). FEMAT evaluated the viability of over 1,000 plant and animal species closely related to late-successional forest ecosystems. The Six Rivers National Forest also contains other types of important habitat such as those found on serpentine/peridotite soils adding to the 1,000 species, yet there is no analysis or MIS for vascular plants, fungus, bryophytes, lichens, arthropods, mollusks, and aquatic insects.

224

Response: The Forest Plan tiers to the FSEIS and the FSEIS ROD which contained discussions and viability assessments for the species you mention. The FSEIS ROD and final Plan contain survey and manage standards and guidelines for a number of species that would provide additional protection. The Wildlife Resource Management and Sensitive Plant Management standards and guidelines in Plan Chapter 4 contain measures for the maintenance of habitat for threatened, endangered, and sensitive species across the Forest.

Comment 10: The Plan does not take into account the dynamic nature of forest ecosystems. The Plan’s reserve system assumes that fire and other natural disturbances will not have a significant impact on current and future old-growth forests. This assumption appears to be little more than wishful thinking, especially with respect to forest reserves in highly fire-prone areas of the region. A more realistic approach would be to increase the number and size of reserves in order to ensure sufficient old-growth habitat to maintain ecosystems and the viability of plant and animal species. Proposed fire management in reserves is misguided. Thinning, burning, and other fuel-reduction techniques would lead to a direct reduction in old-growth habitat quality by eliminating multi-storied canopy conditions. Construction of fuelbreaks would increase habitat fragmentation and pose increased threat to species that require forest interior habitat. Moreover, the use of chainsaws and other equipment for purposes of fire reduction could actually increase the risk of severe fire.

227

Response: The Plan recognizes that fire and other natural disturbances will affect current and future old-growth forests. Standards and guidelines to reduce the risk of large-scale catastrophic disturbance address these concerns. Appendix B8 of the FSEIS, Fire Management

Standards and Guidelines contains direction regarding fire and fuels management in reserves, and the final Plan tiers to this direction. To be more consistent with other ecosystem management objectives, cleared fuelbreaks were de-emphasized in favor of areas of reduced fuels. Risk from hazard fuel reduction operations will be mitigated during project implementation.

Comment 11: The Department of Interior wishes to encourage any attempts to manage Forests on the ecosystem level. The change in priorities and values is welcomed.

289

Response: Thank you for your support. We look forward to working with you on the ecosystem level in the future.

Comment 12: Ecosystem management should be an integrated system of management tools and practices from across resource disciplines. Standards and guidelines should be integrated by ecosystem goals and a specific desired future condition, not by resource program. I cannot see from the way that these draft Plans are organized and presented that the ecosystem will be cared for while products and services are produced.

325

Response: Desired conditions are stated for management areas rather than by resource area to provide integrated management rather than resource-specific management. The overall forest goals are ecosystem goals, and these drive the management actions on the Forest.

Alternatives

Comment 1: The addendum included at the beginning of the DEIS states that “the President’s Plan is within the range of alternatives considered in the DEIS”. That statement is erroneous. Although we can find ASQ figures that bracket the 20 mmbf and CAS figures that bracket the 95,800 acre figure, we cannot find them in the same alternative. There is no alternative which can be shown to bracket both the ASQ and the CAS figures of the Clinton Plan. Thus, the Clinton proposal is not within the range of alternatives considered in the EIS as it claims to be. Either it must be redone or another alternative within the appropriate limits must be developed in full for comparison.

48

Response: An alternative does not have to bracket both the ASQ and CAS acre figures of other alternatives to be considered within the range of those alternatives. Each alternative in the DEIS was developed as a different management strategy to respond to the driving issues. The preferred alternative as modified by the President’s Plan is one strategy of responding to those issues.

Comment 2: Although the documents speak to desired future condition, there is no alternative that addresses the concept properly. The draft Plan, page IV-2, describes what the Forest will look like in 10 and 50 years. Although that section is titled “The Desired Future Condition of the Forest,” it is more accurately a projection of what will happen given the chosen management direction. Proper application of the concept of desired future condition would describe the condition and then develop a range of alternatives, any one of which would result in that condition. This has not been done. Therefore, the claim to be managing for a desired future condition is hollow. Other alternatives which would also develop this condition must be prepared.

48

Response: The desired future condition of an area and the management goals and direction for the area go hand-in-hand. Desired condition statements for each management area have been added to the final Plan. These statements, combined with the section titled “Desired Future Condition of the Forest,” drive the management of the Forest under the final Plan. The alternatives in the DEIS were developed to respond to the driving issues; implementation of the alternatives

does not need to result in the same desired future condition.

Comment 3: As a general comment, we will simply observe that all of the alternatives are deficient because they fail to consider adequately mining and processing.

169

Response: The EIS and Plan recognize that the potential for large scale or significant numbers of mining operations on the Forest is low, based on activities over the past, the areas withdrawn from mineral entry, and the geology of the Forest. Alternatives for specific mining operations would be analyzed in project-level NEPA analyses.

Comment 4: As the alternatives section “is the heart of the environmental impact statement” (40 CFR 1502.14) we recommend that the EIS describe how the President’s Plan will be implemented at the Forest level. The EIS should include specific information regarding what will be required on the Six Rivers National Forest in regard to management area direction, land allocations (for example, specific boundaries of administratively withdrawn areas), standards and guidelines, and key watershed delineations and guidelines.

174

Response: The direction from the President’s Plan (FSEIS ROD) has been fully incorporated into the alternatives section of the FEIS, the management direction in the final Plan, and the land allocation maps for the alternatives.

Comment 5: We suggest that the environmentally preferable alternative be clearly identified. In the DEIS, it appears that Alternative E may be such an alternative. We believe it is important to recognize the role disease, pests, fire, and natural processes have in a dynamic forest ecosystem. The EIS should demonstrate how such concepts can be incorporated and used in the preferred alternative.

174

Response: The environmentally preferable alternative is identified in the Record of Decision (ROD) accompanying the final EIS and Plan. The concepts regarding the role of disease, pests, fire, and natural processes in dynamic forest ecosystems have been incorporated into the preferred alternative in the final EIS and Plan.

Comment 6: The Six Rivers DEIS does not include a full range of alternatives as required by the National Environmental Policy Act (NEPA). Rather than a “no action” alternative which calls for logging as usual, the DEIS should include a custodial management alternative that would provide for the protection and enhancement of “one of the most beautiful and diverse watersheds in the world” (Plan Appendix A, page 4). All current alternatives are based on commodity outputs: mmbf, WFUDs, RVDs, AUMs, pounds of fish flesh. The Six Rivers should prepare and circulate a revised draft with a full range of alternatives.

224

Response: A number of benchmark analyses were performed as part of the DEIS and FEIS. One of these is minimum level management. This benchmark produces no marketable outputs and provides custodial management. The alternatives considered in detail are not based on commodity outputs; each alternative has different goals and direction that result in different management strategies to respond to the driving issues. Outputs are the result of those different management strategies and provide a way to compare the alternatives.

Comment 7: It is clear that the “President’s Plan takes precedence” (DEIS Addendum page 2) and as such it sets a baseline for the management direction of the Six Rivers National Forest as if it were the current management situation. Several of the alternatives supplied in this document (CUR and MKT) are in effect not alternatives as they could not be accepted as a preferred alternative under the President’s Plan. Therefore the range of alternatives in this document is inadequate.

230

Response: The FSEIS ROD states “Amendments of Forest or District Plans that would modify the standards and guidelines or land use allocations established by this Record of Decision will be coordinated through the Regional Interagency Executive Committee and the Regional Ecosystem Office.... Although decisions concerning implementation or modification of these standards and guidelines are subject to review by these interagency groups, the Memorandum of Understanding for Forest Ecosystem Management acknowledges the line authorities of individual agencies” (page 58). Furthermore, 40 CFR 1502.14 states that agencies shall include “reasonable alternatives not within the jurisdiction of the lead agency.”

Any alternative considered could be selected for implementation, but would have to either be made consistent with the direction in the FSEIS ROD or be coordinated through the Regional Interagency Executive Committee and the Regional Ecosystem Office. The disclosure of alternatives that do not exactly match the direction in the President’s Plan broadens, rather than narrows, the range of alternatives considered.

The President’s Plan only affects portions of the Forest Plan alternatives as it only makes changes to portions of underlying Forest Plans. The portions of the alternatives which are not covered by the FSEIS ROD could be combined with the management requirements in the FSEIS ROD (as described and analyzed in the FEIS preferred alternative) to make whole implementable alternatives.

Comment 8: This document would have benefited from listing each alternative’s average annual outputs and activities for easy cross-reference.

270

Response: Chapter 2 of the FEIS contains a number of tables displaying the outputs and activities of each alternative. Table II-14 displays the average annual outputs and activities for all alternatives for easy cross-reference.

Comment 9: The CUR alternative contains some elements that perhaps demonstrate why a change in land management approach by the USFS was necessary: the second highest totals of road construction and acres of timber harvest; and no commitment to restore areas contributing to low water quality.

270

Response: The CUR alternative displayed the current management situation at the time of the development of the plan. The analysis of environmental consequences showed that a change in management strategy was needed to respond to the growing public concern regarding late-successional forest ecosystems and the decline of anadromous fish stocks.

Comment 10: We strongly oppose the draft Plan and will only support it when it obtains a reasonable harvest level of timber.

8

Response: The alternatives in the EIS were developed to comply with existing laws and regulations. The timber harvest levels have been reduced from historical levels to meet the requirements of these laws and regulations, such as the Endangered Species Act.

Comment 11: As the Mayor of a community largely dependent upon the wood products industry, I am writing to you to strongly object to the preferred alternative in the DEIS. The preferred alternative is a preservation plan rather than an ecosystem management plan since 83 percent of the National Forest will be managed like Redwood National Park. The Plan did not adequately address the amount of land in reserved areas in the redwood region, or the fact that California's Forest Practice Act includes the most stringent harvesting regulations in the nation.

51

Response: The Forest Plan and the FSEIS ROD are based on the best data and scientific information currently available, and incorporates the principles of ecosystem management. The Plan is not a preservation plan; many of the areas reserved from timber harvesting allow other management activities to meet the goals and desired conditions of specific management areas. California's Forest Practices Act, and the amount of land in reserves on non-Forest Service land were considered as part of the overall management strategy in the President's Plan.

Comment 12: The preferred alternative would result in economic disaster for North Coast communities, and particularly Fortuna, since most of our citizens are employed either directly or indirectly by the wood products industry. The preferred alternative would also put an added burden on our safety net programs such as unemployment and aid to families with dependent children.

51

Response: The preferred alternative harvest level is greatly reduced from historic levels, and will have an impact on local employment directly and indirectly related to the wood products industry. Harvest levels have been rapidly dropping over the last five years, and many of the economic effects have already been felt by North Coast communities. The economic and social consequences of the alternatives are analyzed in FEIS Chapter 4, and the preferred alternative includes a rural community assistance program to assist local communities with economic diversification and development.

Comment 13: The preferred alternative indicates that there will be more recreational and tourism opportunities. Past examples show that this is not the case. For example, a gain of 1.6 million visitors by 1983 was predicted when Redwood National Park was created. In 1992, 338,000 visitors visited the Park. A recent article by the Smithsonian Magazine pointed out that the average visitor spends less than 50 minutes in the Park. To put this in perspective, Redwood National Park cost more than \$1.4 million to increase the number of visitors by 388,000.

51

Response: The economic analysis shows that the loss of revenue generated by timber harvesting will not be compensated by the increase in recreation and tourism during the next decade. The projected growth in recreation is much more modest under the preferred alternative than that projected as a result of the creation of Redwood National Park.

Comment 14: The DFG applauds the changes in forest planning which have occurred since the 1987 Draft LMP.

8

Response: Thank you. The draft and final Plans provide an innovative approach to forest management and have incorporated the latest science.

Comment 15: The Del Norte county Board of Supervisors voted unanimously to support the Six Rivers National Forest EIS preferred alternative (PRF). The PRF alternative was supported for the following reasons: it allows for the management of the Forest based on the Smith River NRA Management Plan; it proposes the rehabilitation of 50 percent of the developed recreation sites during the first decade, while providing sufficient habitat to contribute to the recovery of the old-growth dependent species; and no new wilderness areas are planned (the need for privately owned tax generating lands is very important to this County). By providing jobs, recreational opportunities and cash-flow generation, this alternative will best serve the North Coast and its citizens. We urge your support of the preferred alternative.

53

Response: Thank you for your support.

Comment 16: It is anticipated that the PRF alternative would generate 1,537 jobs within the area, equaling some \$42.5 million in personal income, and decreasing the overall road mileage by 2.6 percent. The average annual timber sales are anticipated at 43.5 mbf with 1,560 acres regenerated in the first decade. These statistics point directly to the current need to generate jobs within our counties, while providing for the future of our forests and wilderness areas.

53

Response: As a result of the direction provided in the FSEIS ROD, the timber harvest level has dropped from 43.5 to 15.5 mmbf; in effect, the number of jobs generated in the area and the amount of personal income have both been reduced. The preferred alternative includes a rural community assistance program to assist local communities with economic diversification and development.

Comment 17: Of the three draft Forest Management Plans, I found yours to be the most enlightened. Mainly due to the fact that the Plan will reduce the density of roads, largely eliminate clearcutting and replace it with a variety of options.

252

Response: The Plan will indeed reduce roads, largely eliminate clearcutting, and replace it with a variety of options. However, the other three plans will also reduce road construction and clearcutting.

Comment 18: We largely concur with the preferred alternative, with a few exceptions. From a water quality standpoint, it is the least damaging while still allowing production of wood products. We believe the most important provisions are that it: ensures that water quality, along with fisheries and wildlife, would be the primary value of the riparian reserves; has the least amount of total road miles and the most roads obliterated; provides the highest protection to riparian areas; and commits to restoration of all areas that fail to meet State water quality objectives. It is encouraging to see the evolution of the agency's approach: from a commodity-based approach where water quality is another output to be mitigated for, to a landscape and watershed-based approach where water quality is a natural result of good land management.

270

Response: Thank you for your support. The final Plan enhances riparian and water quality protection through wider riparian reserves and the requirement for watershed analysis prior to most management activities in key watersheds, and in non-key watersheds when altering riparian reserve boundaries.

Comment 19: I support the preferred alternative because it: protects anadromous fisheries habitat by prohibiting timber harvest in riparian reserves; protects the wilderness attributes of 102,065 acres in 10 roadless areas; provides seven special interest areas; would regenerate 1,560 acres in the first decade and decrease to 800 acres by the fifth decade, and regenerated stands would retain legacy components; would obliterate more roads than constructed in the next 20 years; will protect the values of designated wild and scenic rivers with the proposed boundaries; will create a multi-storied, closed canopy forest environment that will protect biological diversity and protect habitat for a number of TES species; and will provide a 180-year rotation for conifer forests and a 100-year rotation for hardwood forests.

4

Response: Thank you for your support. As a result of the direction in the FSEIS ROD, the wilderness attributes of 95 percent of the roadless areas will be retained. Fewer acres would be regenerated annually, and stands would retain legacy components. Also, the rotation lengths for conifer and hardwood forests are replaced by a management strategy that mimics disturbance regimes such as fire.

Comment 20: I support the preferred alternative, as modified to conform with the President's Plan Option 9. The preferred alternative presents a more responsible attempt at maintaining biological diversity at all levels while fulfilling current resource needs.

138 152

Response: Thank you for your support. The preferred alternative has been modified to incorporate the management direction from the FSEIS ROD, which was based on Option 9. We have also added biological diversity standards and guidelines.

Comment 21: I strongly support the old growth reserve (OGR) alternative, instead of the preferred alternative your staff has chosen. Reasons for supporting the OGR alternative are: it would result in the lowest potential for erosion and sedimentation in streams and lowest potential for effects to water quality; it maintains the

greatest amount of roadless areas in a condition likely to retain their wilderness attributes; and it has a higher likelihood than PRF of providing sufficient suitable habitat to contribute to the viability of all Forest sensitive species. All in all, the cost of the added forest health long-term as provided by choosing OGR over PRF is minimal. But the irreplaceable values of soil retention, endangered wildlife and fish habitat, and wilderness availability are collectively enormous. For the future, please make OGR the preferred alternative.

11 15

Response: The preferred alternative has been modified between the draft and final Plans; the modifications have resulted in a preferred alternative that: has the lowest potential for erosion and sedimentation in streams and the lowest potential for effects to water quality; retains the greatest amount of roadless areas in a condition likely to retain their wilderness attributes; and has a higher likelihood of providing sufficient suitable habitat to contribute to the viability of all Forest sensitive species.

Comment 22: After much deliberation I am writing to say of all the alternatives I feel the best for the Forest and its varied species would be to implement the OGR alternative. The only one that comes close to it is the ECR alternative; however, I feel that the OGR alternative would be the best.

144

Response: See the response to comment 21.

Comment 23: If I had to choose among the existing alternatives, I would choose the OGR alternative. Reasons cited for not choosing the preferred alternative are: the number of miles of road construction; the future of Port-Orford-cedar is not adequately addressed; Blue Creek is not designated as a wild river; sensitive species are not being managed to prevent listing as endangered species; and grazing issues are not adequately addressed.

212

Response: The preferred alternative has been modified and has addressed many of the comments in your letter: the miles of road construction have been reduced from an average of 20 to 2.5 miles annually; standards and guidelines have been added to help prevent the spread of Port-Orford-cedar root fungus disease; Blue Creek has been determined to have potential outstandingly remarkable values and is eligible for inclusion into the Wild and Scenic Rivers System; the Forest Plan's

ecosystem management approach will hopefully prevent the listing of a number of sensitive species; and grazing standards and guidelines have been added.

Comment 24: My preferred alternative is the OGR alternative. The following reasons are cited: it minimizes human impacts to the environment; it has the greatest potential to maintain ecological viability; it has the largest number of reserves and fewest miles of road construction.

D 167

Response: See the response to comment 21.

Comment 25: I believe the OGR alternative will be the best to pursue. This plan will allow for a healing time from all the hyper-cutting that has gone on during the last 20 years. Far too much irreparable damage, and this OGR alternative which will hamper loss with what's left of our planet's legacy, will address and turn around all the devastation. The OGR alternative is best!

251

Response: See the response to comment 21.

Comment 26: The Yurok Tribe prefers the OGR alternative, with Option 9, due to the fact that it provides the best water quality and habitat protection. The OGR alternative appears to have the least negative impact on the Klamath River fisheries and is the Tribe's preferred alternative.

267

Response: The modifications to the preferred alternative between the draft and final EIS and Plan have improved its rating regarding water quality and habitat protection. In the FEIS, the preferred alternative provides better water quality and habitat protection than the OGR alternative.

Comment 27: Friends of the River supports adoption of the environmentally preferable alternative for each Forest Plan, including alternative OGR.

274

Response: The preferred alternative, with the modifications made between the draft and final EIS and Plans, is the environmentally preferable alternative.

Comment 28: My support is for the OGR alternative (with a modification) for the following reasons: (1) The CUR alternative is not acceptable as it is too much like business as usual without giving sufficient emphasis on preservation of old-growth forests and the recovery of TES species such as the marbled murrelet and others. (2) The preferred alternative appears to offer more old growth and species protection but is very much like the CUR alternative. This becomes apparent when looking at the maps. Clearcutting is allowed under certain circumstances. Surely clearcutting must be stopped as no one but a lumber baron favors this approach any more. It is too destructive. (3) The MKT alternative is clearly so destructive to our natural heritage that it must not be considered. Short-term job and economic gains weighed against the long-term loss to biodiversity, quality of life in this country, etc., rule out this alternative. (4) The ECR alternative is a noble goal, but, in my estimation, would be a prescription for failure. The idea that the Forest could be managed so that timber stand replacement could occur at a rate similar to natural replacement, when natural replacement could mean 300 years, is fantasy. No long-term policy except out and out permanent protection will withstand political, scientific, and bureaucratic opinions and theories.

14

Response: The preferred alternative has been modified in the final EIS and Plan. The land allocations and reserve system are more like the OGR than the CUR alternative. The management strategy for the matrix lands is similar to that of the ECR alternative in which timber stand replacement would occur at a rate similar to natural replacement. Many recent scientific articles and papers suggest that this is the surest way to assure the maintenance of ecosystem components, structure, and processes. Clearcutting is an option in all alternatives, although the PRF and OGR alternative would have much lower levels of clearcutting than other alternatives.

Comment 29: We urge that the OGR alternative be selected to eliminate entry into roadless areas and reduce the amount of large-scale experimentation in Adaptive Management Areas.

9

Response: Under the direction from the President's Plan, 95 percent of the roadless areas will remain roadless under the preferred alternative. The experimentation in the Hayfork AMA will be designed to maintain high quality late-successional and riparian habitat while providing some commodities to local economies. We

believe that the preferred alternative provides the best mix of protection, outputs and activities.

Comment 30: We endorse the market products alternative (MKT). Reasons cited are: the low timber harvest level in the PRF alternative, the loss of timber jobs, and the effects of those losses on local communities.

51

Response: See the response to comments 11, 12, and 13.

Comment 31: OHMVR does not support the Forest's choice of Alternative B as the preferred alternative. Should the DEIS alternatives be retained and not withdrawn, OHMVR would support alternative D (MKT) with the following modifications: (1) rehabilitate approximately 50 percent of developed sites during the first decade to respond to changing user needs and accessibility requirements instead of the 25 percent currently mandated by Alternative D; and (2) construct an OHV staging area during the first decade, as proposed in Alternatives B and C.

223

Response: A main reason for selecting Alternative B as the preferred alternative is that it provides a higher viability rating for species dependent on late-successional forest ecosystems, and it maintains ecosystem components, structure, and processes. The MKT alternative has lower viability ratings for late-successional dependent species, and does not do as good of a job of maintaining ecosystem components, structure, and processes.

Comment 32: The only proposal even halfway satisfactory to me is the one that provides the most timber harvest, grazing area and water development.

266

Response: See the response to comments 11, 12 and 13.

Comment 33: The MKT alternative has many of the same shortcomings as the CUR alternative: the highest mileage of roads built and least amount of roads obliterated; no commitment to restore areas contributing to low water quality. However, MKT claims to have the most fish habitat and watershed improvement acres. Is this because funding is tied to K-V dollars resulting from timber harvesting? Because roads provide access to suitable areas? Or a commitment to restore the damage

to fisheries while putting additional pressure on such resources?

270

Response: The MKT alternative has the same amount of fish habitat improvements as other alternatives, but it does have the most acres of watershed improvement. This is because the MKT alternative has the highest levels of timber harvesting and road construction.

Comment 34: I want to come out strongly in favor of the ECR alternative. Being a forester whose livelihood depends largely on continuing timber management, I am less than enthusiastic of the low timber harvest volume this alternative offers; I nevertheless find several reasons to support it: (1) the way it tends to mimic natural processes and distribution of habitats. I feel this will lead to the Forest being a healthy and diverse landbase over the long-term, to a degree that none of the other alternatives offer. (2) It allows for management on most of the landbase. I feel that biodiversity and forest health can best be served by enlightened management. The Forest that Caucasians took control of here in the last century was for centuries extensively managed by Native Americans for many uses, primarily through extensive cultural burning. Mimicking this process (or in some cases, duplicating it through prescribed fire) will allow the Forest to return to its pre-contact condition better than the other alternatives. (3) This alternative would benefit more wildlife species than the others, by providing a better variety of habitats. (4) This alternative comes the closest to the adaptive management strategy of managing for many resources across most of the landbase, rather than setting some areas aside and intensively managing others. This strategy tends to employ more persons in land management activities such as stream rehabilitation, ecosystem restoration, and small group selection silviculture, than the other alternatives. (5) Over the long run this alternative will provide more recreation alternatives than the others. It will also serve as counterpoint to the intensive timber management being practiced by the large timber companies that border much of the Forest. Being a diverse and healthy ecosystem in itself, the Six Rivers National Forest can provide cover and habitat for wildlife and plants to restock cut-over ground on adjacent lands. All in all, I believe that the ECR alternative offers more of what the local people want most from the National Forest in their backyard. Even though you have already picked your preferred alternative, please reconsider the ECR alternative when the decision has to be made, and make the best decision for long-term ecosystem health disregarding short-term political pressures.

12

Response: The preferred alternative has been modified between the draft and final EIS and Plan; the management strategy for the alternative is similar to that of the ECR alternative in mimicking natural processes and distribution of habitats. A main goal of the Forest Plan is to maintain biological diversity and forest health; although many areas of the Forest are reserved from regulated timber harvesting, there are provisions for vegetation management in order to achieve desired conditions, reduce the risk of catastrophic losses from fire, infestation or other disturbances, and maintain stand components and structure. By maintaining ecosystem components, structure, and processes, this alternative will benefit more wildlife species than other alternatives. The PRF alternative proposes an active adaptive management strategy. Restoration and other land management activities should provide some jobs, although management-related employment levels would be less than historic levels. The Hayfork Adaptive Management Area was designated to test new approaches to forest management to maintain ecosystems while providing outputs and employment for local publics; lessons learned from the AMA, as well as through partnership projects, would be applied elsewhere on the Forest.

Multiple Use

Comment 1: We believe that the Forest Service should not be involved in providing jobs and outputs but protecting the Forest and ensuring Forest integrity in perpetuity.

47 84

Response: A basic mandate of the Forest Service is to manage Forest lands for a variety of uses on a sustained basis to ensure a continued supply of goods and services to the American people in perpetuity. A main focus of the final Plan is maintaining healthy, functioning forest ecosystems. Providing jobs is not the primary focus of the Forest; however, the provision of jobs generated by harvesting, watershed restoration, recreation, and other management activities is an added benefit of these activities.

Comment 2: I now firmly believe that the best use of the land by and for its people is sustainable use. My bias is for conservation of the forest, fisheries, and recreation resources under your jurisdiction. Conservation to me is the management of the resource in a fully sustainable and improving manner.

147

Response: The laws and regulations governing the Forest Service mandate that Forests be managed in a sustainable manner. One of the main goals of the Forest Plan is to maintain and restore healthy, functioning forest ecosystems.

Comment 3: Some of our “lands of multiple use” should be given to uses other than logging, which has been the primary use for too many years. We need some forest left for wildlife, biodiversity, recreation (as in recreation of the spirit), and - where not destructive - cattle grazing.

198

Response: The alternatives in the FEIS were developed to provide different mixes of goods and services for all the resources you mention in a sustainable manner. Under the land allocations in the final Plan, about 91 percent of the Forest would be reserved from commercial timber harvesting; these lands include late-successional reserves to provide for late-successional forests and the species associated with them, wilderness, parts of the Smith River NRA, and riparian reserves to provide for riparian and aquatic-dependent species.

Comment 4: Reduce the Six Rivers’ timber sale program to truly sustainable levels, with significant old-growth stands eliminated from timber planning altogether, and maximum protection for riparian corridors from the harmful effects of logging.

E 52

Response: The alternatives considered in detail in the FEIS were developed to provide for late-successional forests and the species associated with them, and to produce a predictable and sustainable level of timber harvest. The preferred alternative includes late-successional and riparian reserves to protect late-successional forest and riparian ecosystems. The timber harvest levels proposed in the Plan are greatly reduced from historic levels and are far below the annual mortality rate on the Forest.

Comment 5: The Department (of Interior) is pleased by the stated priorities to develop and enhance habitat for old-growth wildlife. We cannot help but wonder if this in fact will be possible under the constraints of a 43.5 mmbf annual cut. What sort of evidence indicates that these goals are compatible? Or, will old-growth be sacrificed to meet the timber goal?

289

Response: The interdisciplinary team used spreadsheets, GIS mapping, and models, including FORPLAN, to determine the sustainable level of timber harvest that would also meet the objectives of maintaining habitat for late-successional and old-growth dependent species. FEIS Chapter 4 and Appendix B contain more information regarding the analyses performed to estimate levels of goods and services and assess environmental consequences. The level of timber harvest in the preferred alternative has dropped from 43.5 mmbf to 15.5 mmbf between the draft and final Plans. The main reason for this reduction was the establishment of additional late-successional and riparian reserves for a number of wildlife, aquatic, and riparian species.

Comment 6: It is time for the management of the USFS to take steps to increase the sale of timber instead of reacting to every “unfounded” outcry from the misinformed environmentalists. Probably the two most recent glaring examples of the mismanagement are: (A) the enactment of and enforcement of Option 9 provisions before Option 9 is even adopted; and, (b) the inability to sell the legislated amount of timber in the Smith River NRA.

8

Response: The final EIS and Plan were developed to comply with existing laws and regulations. The FSEIS selected Option 9 as its preferred alternative; the FSEIS ROD was signed in April, 1994. The Forest Plan incorporates the direction from the ROD into its management direction. The level of timber harvested in the Smith River NRA is subject to existing laws and regulations such as the Endangered Species Act; these laws may prevent the attainment of the harvest levels stated in the NRA Management Plan.

Comment 7: The draft Forest Plan is and will remain deficient until the management direction is changed from preservation to pro-active vegetation management.

139

Response: The draft and final Forest Plan both propose an active adaptive management strategy that uses pro-active vegetation management to maintain healthy forests. The final Plan, through the direction in the FSEIS ROD, has added standards and guidelines for vegetation management in reserved areas such as late-successional reserves to reduce the risk of catastrophic fire and other large-scale natural disturbances.

Comment 8: The Forest Service has a job of managing our California National Forests such as the Klamath, Shasta-Trinity, Mendocino, and Six Rivers National Forests in a manner that is most beneficial to all U.S. citizens, not just those who happen to be in the lumber industry. Leaving alone those Forests mentioned above is not a waste of resources or power. It is allowing nature to exist as it should, for generations of people to come in centuries ahead, without destroying it for temporary gain.

22 238

Response: As mentioned in the response to comment 4, the timber harvest levels proposed in the Plan are greatly reduced from historic levels, and are far below the annual mortality rate on the Forest. The preferred alternative was selected because it is thought to provide the best mix of goods and services to serve the public over the long-term. Leaving the Forests alone may increase the risk of catastrophic losses on the Forest; an aim of management is to reduce the risk of these losses.

Comment 9: While I understand that reductions in logging and grazing may have serious short-term economic consequences for local communities, the levels of these activities allowed by the draft Plans are clearly unsustainable. In their present condition these Forests have tremendous recreational value and great long-term potential to enrich local economies through tourism as well as sustainable forestry and ranching; it does not make sense to extract so much timber and allow so much road-building and overgrazing in the short-term that the Forests can ultimately support neither commercial enterprises nor recreation. Yet that will be the inevitable result if these plans are implemented in their current form.

303

Response: The proposed levels of timber harvest and grazing in the Forest Plan are greatly reduced from historic levels. Local communities are feeling the effects of these reductions, and rural community assistance programs are attempting to mitigate these serious impacts. The Forest's interdisciplinary team used a number of models and analyses to ensure that the levels are sustainable. The final Plan proposes a 50 percent increase in recreational facilities on the Forest, and the Forest is working with other agencies and tourism boards to promote the recreational resources on the Forest.

Comment 10: I am writing to you to preserve fully those wonderful public lands. Please do not rush into a decision that will fail to protect them.

D 4 185

Response: The Forest is not rushing into a decision; the final Plan is the result of 17 years of planning efforts; in that time, forest science has greatly evolved and we have incorporated the latest science into our Plan. As Forests are dynamic ecosystems, it is difficult to preserve them in a static state; the Forest lands will be managed to maintain healthy ecosystems that are in a state of change.

Comment 11: There is no adaptation to modern public concern for preserving forests-for averting the crisis of extinction on our ancient forests. There is no awareness of the unique resource offered by our too-few remaining roadless areas.

202

Response: President Clinton assembled the Forest Conference in April, 1993, to address the public concern regarding old-growth ecosystems and the levels of timber harvest on Federal lands in the Pacific Northwest. This meeting led to the development of the FSEIS ROD. The final Plan incorporates the direction from the FSEIS ROD and integrates the latest thinking in forest science. All remaining roadless areas in key watersheds will remain roadless under the final Plan to protect remaining high quality habitats.

Comment 12: I feel this EIS puts too much emphasis on logging and road building. In the final Plan I hope you place the Forest off-limits to all logging (including salvage).

243

Response: The alternatives in the FEIS were developed to provide a broad program of resource management. The levels of logging and road construction are much lower than historic levels; in fact, the level of timber harvest is far below the annual mortality rate on the Forest, and miles of road closures and decommissioning will far exceed miles of road construction. Timber harvesting will occur on only a small portion of the Forest lands, and salvage will be used to attain the objectives of the Plan.

Implementation

Comment 1: I am concerned that the small, but critical details of this plan (e.g. monitoring programs) will be successfully implemented. The success of this Forest Plan is entirely dependent on the degree to which the tasks are institutionalized, incorporating hard targets and appropriate performance standards.

138

Response: The Forest will prepare an annual accomplishment report that details how well we are implementing the Forest Plan. The report will include information regarding whether we are: meeting proposed levels of outputs and activities, performing the monitoring called for in the Plan; and receiving and spending the budget proposed in the Plan. The Forest intends to implement the Plan as proposed, subject to receiving an adequate budget.

Comment 2: The President's Plan calls for the formation of numerous committees and working groups for the forest planning process. We recommend that the EIS explain this process so that other agencies, citizen groups and other members of the public can understand the planning process and determine where they can participate. Also, EPA recommends that the EIS clarify the stages and decision points where NEPA documents will be drafted. For example, will the Forest Service be drafting an environmental assessment or environmental impact statement for decisions on adjusting riparian reserves (upward or downward) under the President's Plan?

174

Response: Attachment A to the FSEIS ROD contains two sections discussing public involvement in the planning process: Section D discusses Adaptive Management Areas, including public involvement; and Section E discusses implementation of the FSEIS ROD, including interagency coordination and public involvement. Chapter 5 of the Forest Plan contains a discussion of implementation, including the type of public involvement expected at various planning levels. The NEPA documents prepared for projects are triggered by a process described in the Environmental Coordination Handbook, FSH 1909.15. These are adjusted to meet the changing regulatory framework and are subject to Federal rule-making processes. The adjustment of riparian reserves will be done at the project level, and will be a part of the NEPA documentation for the project.

Comment 3: We propose that: 1) National Forests be required each year to analyze their ability to comply with Plan monitoring and standard and guideline requirements based on funding and staff availability; 2) Forests specify where resources will be allocated and which portions of the Plan will be implemented; 3) Forests also disclose the monitoring requirements that have and have not been met during the preceding year; 4) this analysis should be available for public review; and 5) monitoring shortfalls must be addressed before funding and staff time can be allocated to commodity production or other potentially destructive activities such as recreation developments. Where monitoring cannot or has not been performed, no disturbance-creating activities should take place.

219 225

Response: The Forest will complete an annual report on Forest Plan implementation. This would include a statement of monitoring progress and the program budget emphasis. A requirement that all monitoring should be completed prior to any other activities would be counterproductive to the Forest Service mission and to achieving Forest Plan goals and objectives. The needs for monitoring identified in project environmental documents will also be part of the Forest's overall monitoring.

Comment 4: The Six Rivers National Forest should commit to an annual budgetary analysis of their ability to comply with standards and guidelines and monitoring requirements. Public input into Plan development is meaningless unless the Plan is implemented. Public disclosure of the Forest's progress in Plan implementation is critical. Ecosystem management projects must be budgeted and funded in full before being carried out, and the method for prioritizing timber management and fuels reduction projects must be spelled out.

225 289 325

Response: See the response to comment 3.

Other

Comment 1: Greater opportunities for basic research would seem to be an outcome of the Plan.

16

Response: The Forest is and will continue to coordinate with the Pacific Southwest Research Station (PSW) to perform research needed to test the assumptions of the Plan.

Comment 2: The three driving issues, I believe, reflect superficial thinking. If a Forest is provided with a fertile (remineralized) soil, sufficient water, and a reasonably stable climate it will grow its own healthy trees. We only have to stand back and watch. Thus the three driving issues ought to be: 1. soil; 2. water; and 3. climate.

175

Response: The driving issues of the plan were those issues identified through the scoping process that shaped differences in the alternatives in the EIS. Soil, water, and climate are ecosystem elements, and are a component of biological diversity, which is addressed in issue 1.

Comment 3: I believe it will be foolhardy in the extreme to disregard the climate issue, despite disagreement about global warming. There is virtually unanimous agreement that the climate is becoming more and more unstable. The solution to this problem, here, whether the instability leads to warming or an ice age, is to take very good care of our remaining forests: to preserve them, to enhance them and to plant more trees. Not only would I address this issue, I would put it at the top of the list of issues. It is the umbrella issue upon which biodiversity, timber harvest, and riparian areas depend.

175

Response: It is beyond the scope of the Forest Plan to address the issue of climate change at the global, national, or regional level. With 91 percent of the Forest reserved from timber harvest, the main influence on the landscape of the Forest will be natural processes rather than our management.

Comment 4: Protect eastside forests as well as the westside forests.

195

Response: The Six Rivers National Forest is not an eastside forest; management of eastside forests is beyond the scope of the Forest Plan.

Comment 5: There were a number of comments addressing the management of other National Forest lands and the headwaters forest area. These included: pine bark beetle infestation on the Lake Tahoe Basin Management Unit; the Klamath, Shasta-Trinity, and Mendocino National Forest Land Management Plans; fisher habitat management in the headwaters forest area; and logging on National Forests adjacent to Yellowstone National Park.

176 214 219 241 254 271

Response: These issues are beyond the scope of this Forest Plan; comments regarding the Forest Plans for the adjacent Forests were forwarded for their review.

Comment 6: The Forest Plan should contain measures to protect the Forest.

177 250 296

Response: As forests change constantly and are subject to diverse forms of disturbance, the protection of the Forest is difficult. All known factors relating to the Forest have been considered at an appropriate scale and intensity. The alternatives in the EIS proposed various strategies for managing the Forest. The Forest Plan has multiple measures to ensure the Forest's contribution to biological diversity.

Comment 7: Include recommendations for the management of non-federal lands as necessary to ensure Forest ecosystem integrity and species viability.

227

Response: It is beyond the scope of the Forest Plan to provide direction for non-federal lands. The analyses in the EIS include estimates of the effects of activities on non-federal lands; and further estimates will be included at the landscape, watershed, and site-specific levels. The Forest is seeking ways to coordinate management with adjacent landowners.

Comment 8: All genetic "improvements" should be left to nature, who invented genetics. Last to be considered of all such "improvements" should be cloning which combines and amplifies all the worst features of monocropping. A cursory review of our 1930s dust

bowl disaster will serve as a reminder of the effects of monocropping.

175

Response: The Forest has no plans for genetic “improvements” such as cloning.

Comment 9: The flexible language in the EIS and Plan regarding allowable silvicultural activities in various management areas provides Forest Service managers with lots of room for discretion. Implicit is the “trust us” philosophy. While I have a great deal of respect for an excellent resource staff in the Forest Service and recognize a new direction not only within this Forest but from Chief Thomas, I have serious concerns because: 1) our knowledge is limited, we’ve never done this; 2) there is an entrenched “can-do” management philosophy within a significant group of Forest Service people; 3) political/economic pressures can influence local management decisions; and 4) the Forest Service bureaucracy has a difficult time modifying policy that has become institutionalized.

23

Response: Each management area has a specific set of standards and guidelines for the activities allowed in the area. The standards and guidelines do leave some flexibility for site-specific conditions, but provide very clear direction. For example, although some silvicultural treatments are allowed in late-successional reserves, they are only allowed to improve habitat in stands which are less than 80 years in age and not considered “functional” habitat for species dependent on late-successional forest ecosystems. All treatments would need to be approved by an oversight committee. The Forest is excited about using an ecosystem approach to forest management, and we feel that we are making great strides in this direction.

Comment 10: If the draft Forest Plan’s goals and objectives are to “reflect the capability and suitability to support various management activities,” then how does historic and recent management of the forests affect current or proposed management alternatives? The evaluation of each forest management alternative described in the draft Forest Plan and draft EIS should include an analysis of “intensive forest management,” “regeneration cutting,” and “committed timber sales.”

200

Response: The Forest has analyzed the distribution of vegetation across landscapes, and the effects of historic

and recent management. The Biological Diversity section of FEIS Chapter 4 describes the historic range of variability for different vegetation series across the Forest, compares the range to current conditions (including the effects of harvest activities), and determines whether the management proposed in each of the alternatives would maintain vegetation within the historic range of variability. This section also analyzes the effects of different harvest methods, including regeneration cutting.

Comment 11: The Wilderness Society must conclude that the Plan sacrifices many important resources in order to maximize the amount of timber that would be cut. For example, it would allow salvage and sanitation logging to degrade wildlife and cultural values. Water quality and fisheries would also be unacceptably degraded by the great amount of logging and roadbuilding. In fact, the level of road building envisioned by the Plan is excessive and could cause unacceptable environmental damage.

227

Response: The Forest is in no way sacrificing resources to maximize the amount of timber that would be cut. Standards and guidelines for wildlife, cultural and heritage resources, water quality and fisheries ensure resource protection. The level of timber harvest was determined based on the ecological capability of the Forest, and is well below historic harvest levels; 91 percent of the Forest would be reserved from timber harvest activities. Road construction would be limited to an average of 2.5 miles of road annually, while 25 miles of road would be decommissioned annually. The Forest road network would decrease over time.

Comment 12: The layer upon layer of management areas and their associated prescriptions, assumptions, emphases, etc. produces confusion to the reader and lends itself to an on the ground “catch-22” in that proposed trail or facility development for a politically incorrect use could not possibly be built as there is somewhere within this maze of bureaucratic gobble-de-gook a reason for not doing so.

230

Response: The management areas are not layered as described, but some guidance is overlapping. This is routine in land management and a rule of reason will be used for overlapping standards and guidelines. Where an unreasonable conflict is identified at the site level, it may be resolved through a Forest Plan amendment or the proposal will be dropped or modified; see Chapter 5 of the Forest Plan.

PHYSICAL ENVIRONMENT

Geology

No comments specifically related to the geology texts were received.

Soils

Comment 1: Rather than being regularly removed from the soil with the harvesting of the tree crop, nutrients need to be returned to the soil by means of remineralization.

175

Response: Losses in nutrients from tree removal is generally not a significant problem in the Pacific Northwest with the relative long rotations and high fertility. Some notable exceptions have been in sandy soils with short rotations and whole tree harvesting. Most of the nutrients in a tree are concentrated in the limbs and leaves; only a small amount is in the bole. The limbs and leaves are generally left in the woods. Also, the final Plan bases rotation lengths on historic disturbance cycles which make for relatively long rotations. To prevent losses in soil productivity we are implementing Regional soil productivity standards and guidelines (see Chapter 4 of the final Plan).

Comment 2: The DEIS states on page IV-49 regarding soils: "sufficient soil organic matter will be maintained to prevent significant short or long-term nutrient cycle deficits..." certainly. Do we know how much that should be? What does nature tell us? Nature, of course, says all organic matter should be recycled. Thus logging should be kept to a very few trees - only those whose absence obtains other benefits.

175

Response: We have added a standard and guideline requiring in the upper 12 inches of soil that at least 85 percent of the total soil organic matter be maintained. This would allow for some displacement of road landings and skid trails.

Comment 3: On page IV-140, the DEIS states that "Direct disturbance of soils from off-highway vehicle use on open areas would result in some erosion and impairment of productivity, regardless of preventive erosion control methods." There are no open OHV areas on the Forest. OHV use is only allowed on designated

routes. OHMVR recommends that this statement be removed. If the intent was to discuss erosion from designated OHV routes, and not OHV open areas, OHMVR recommends that it be rewritten to reflect this.

223

Response: You are correct; that statement has been deleted from the document.

Comment 4: We recommend that the Six Rivers National Forest drop Management Area 11 and remove this unsuitable land from timber base.

224

Response: All lands in Management Area 11 (Special Regeneration) have been removed from the timber base in the final EIS and Plan until a site-specific analysis has been performed. If, after this analysis, some lands are determined to be regenerable, they will be returned to the suitable land base and managed using the standards and guidelines in Management Area 11.

Comment 5: Prescribed burning should be prohibited in National Forests because of the: (1) air pollution this causes and because of the pollutants; (2) carbon dioxide (to which I could find no reference) is a major factor in climate destabilization; (3) burning is harmful to the soil and plants because it creates an impervious layer beneath the surface increasing water runoff, flooding, etc.; (4) burning results in an inorganic ash in contrast to a living biomass which, as it decays, provides nutrients in the form most readily taken up by plants; (5) burning dries the soil and lowers the water table. The apparent need for low-intensity burning, certainly preferable to high-intensity burning, can also be eliminated if logging debris is chipped and returned to the land from which it came. This organic material will then suppress the growth of undesirable plants while feeding the desirable ones, reduce soil evaporation, and enable the soil to maintain a more even temperature. Thus a liability is converted to a real asset.

175

Response: The Six Rivers National Forest falls within the intermediate to dry climatic area. This indicates that fire has been the dominant forest disturbance factor. Prescribed burning has multiple objectives, including site preparation for tree planting, hazard reduction, wildlife habitat improvement, and promoting biological diversity. Burning under the correct climatic and vegetative conditions can mimic previous, low-intensity wildfires

and restore fire to its natural role in the ecosystem. All efforts are taken to prevent accidental ignition from equipment.

Comment 6: The text on DEIS page III-123 states that “about 84 percent of the Forest’s soils are rated as capable of growing trees for industrial wood (a minimum growth rate of 20 cubic feet of wood fiber per year).” The draft LMP Table E-IV indicates that the percentage is closer to 72 percent. The 84 percent statistic comes from the 1986 draft EIS and Plan, and that raises questions regarding DLMP Table E-IV. Since there was no inventory made between the time the two drafts were prepared, why is there such a major difference in the tabulations of soil productivity? This discrepancy needs to be addressed. Among other things, there needs to be an explanation of why productivity changed from one plan to another without any change in the data base.

48

Response: This inconsistency has been corrected.

Comment 7: While the draft LMP states that overall the miles of open road on the Forest will be reduced by closure of most new roads and some existing roads, soil disturbance and drainage alterations will still occur from the initial construction, non-maintenance of closed roads, and any obliteration that might occur.

23

Response: You are correct. Under the final Plan, 2.5 miles of road will be constructed and 25 miles of road will be decommissioned annually. The decommissioning may result in some short-term increases in sediment; however, long-term sedimentation will decrease greatly as a result.

Comment 8: The single greatest danger our forests face is the movement of soils from slopes into waterways. This bodes ill for the future of water quality (“we all live downstream”); for the very existence of local anadromous fisheries, which are currently being decimated; and even for the ability of the forest floor to nourish succeeding generations of trees.

15

Response: Prevention of these potential impacts are discussed in Chapter 4 of the FEIS, and standards and guidelines are included in Plan Chapter 4. BMPs are one of the primary methods of preventing erosion; they are listed in Plan Appendix M.

Water

Comment 1: Leave all watersheds completely intact.

D 195

Response: Of the 958,470 acres on the Forest 858,000 acres have been reserved or otherwise removed from timber management. The remaining 9 percent will be managed at greatly reduced yields with the goal of maintaining the “natural” disturbance regime. For more information refer to the description of the preferred alternative in the final EIS, Chapter 2 .

Comment 2: The single greatest danger our forests face is the movement of soils from slopes into waterways. This bodes ill for the future of water quality (“we all live downstream”); for the very existence of local anadromous fisheries, which are currently being decimated; and even for the ability of the forest floor to nourish succeeding generations of trees.

15

Response: Prevention of these potential impacts are discussed in Chapter 4 of the FEIS, and standards and guidelines are included in Plan Chapter 4. BMPs are one of the primary methods of preventing erosion; they are listed in Plan Appendix M.

Comment 3: The Trinity River has already been seriously depleted by the requirements of the Central Valley Project, with consequences that can be observed in the Klamath, already heavily dammed and damaged. To interfere further with the water that remains is foolhardy and in fact suicidal.

175

Response: Paired watershed studies in the Pacific Northwest have shown that water flows increase after logging. The largest percentage increases in stream flows from timber harvest have been shown to occur during the summer months, but the largest volume increases occur in fall and early winter. There is also an increase in springs and seeps following logging. This is due to the reduction in evapotranspiration taking place.

Comment 4: Add Ikes, Pearch, Boise, and Red Cap creek watersheds to the forest reserves (President's Plan or otherwise) and make them off-limits to road construction and timber harvesting.

271

Response: Eighty-three percent of these four watersheds are allocated to areas that do not have programmed timber harvests in the final Plan. Over all, more than 90 percent of the Forest is allocated to areas without programmed timber harvests. The system of reserves was established in the FSEIS ROD to protect plant and wildlife species that use this habitat. The Plan also provides for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies. The portion of the above watersheds that allows for regulated timber yields (17 percent of the watersheds) would be managed to reflect the ecological system that would occur naturally. See the description of the preferred alternative in the final EIS, Chapter 2, for more information.

Comment 5: The Mad River provides much of the water for the municipal needs of a growing Humboldt Bay area, so this supply must not be tampered with.

271

Response: The water quality of Mad River will be protected by implementing the aquatic conservation strategy. See response to comment 2.

Comment 6: Cutting timber in the Blue Creek watershed would risk the viability of a number of species.

208

Response: Most of Blue Creek is in a late seral reserve in the preferred alternative; it does not have any programmed timber harvests. Refer to management area standards and guidelines for the Special Habitat Management Area in the final Plan for more information.

Comment 7: Is Wilson Creek being opened up to logging? If so, what kind of management is being proposed to keep the creek flowing cleanly for the fish and the residents drawing water from the creek?

211

Response: Approximately 40 percent of Wilson Creek is allocated to management areas that have regulated

timber harvest. Best management practices and the aquatic conservation strategy would be implemented to protect the fish and water quality. Best management practices and the aquatic conservation strategy are described in the water sections of the final EIS (Chapter 4) and the Plan. One of the key measures is designating riparian reserves or stream buffers ranging from 150 to 400 feet on each side of a stream.

Comment 8: Aquatic and riparian ecosystems are reflections of the basins which feed them, and buffers will not be sufficient if activities in the watersheds alter the natural sediment and water regimes and vegetational pathways. We must focus on the condition of all watersheds, not just those considered to be "key" because of the presence of fish. Everything that carries coarse woody debris, sediment, and water can be affected by activities and, in turn, can affect something downstream.

23

Response: One of the major changes between draft and final has been incorporating riparian reserve scenario 1 to all watersheds. The riparian reserves, because they now encompass 42 percent of the Forest, go a long way toward maintaining natural sediment and water regimes and vegetation pathways. Watershed analysis focuses on maintaining natural sediment and water regimes and vegetation pathways and is required in key watersheds, non key watersheds containing inventoried roadless areas and riparian reserves. These areas make up about 70 percent of the Forest. Because most projects inside and outside of key watersheds would involve riparian reserves, the majority of our basins will require watershed analysis even in the short term. Our intent is to conduct watershed analysis on all our watersheds; key watersheds have first priority under the Plan.

Comment 9: Deliberate and careful establishment of an extensive, non-extractive network of large watershed reserves appears to be the only way for the Forest Service to rationally and legally compensate for historic and off-Forest cumulative effects and also manage for timber extraction in the face of huge uncertainties in predicting biophysical responses to management activities.

23 227

Response: More than 90 percent of the Forest is allocated to management areas that are reserved from timber management in the preferred Alternative in the FEIS.

Comment 10: In addition to the key watersheds identified in the draft Forest Plan, the “Gang of Four” report included Tish Tang and Mill Creeks on the Trinity River and Boise Creek on the Klamath River. These should be added in the final Plan.

23

Response: Tish Tang and Mill Creeks were dropped because only a small portion occurs on National Forest System land. The portions that are on the Forest are in late successional reserves. Boise Creek was dropped and Camp Creek added because Boise Creek has only a winter steelhead population while Camp Creek is important for salmon and both summer and winter steelhead. In all, the Forest added more key watersheds than were dropped. All of the Smith, Camp Creek, Pilot Creek, and the North Fork Eel watersheds were added; about 70 percent of the Forest is within key watersheds.

Comment 11: Until watershed analysis has occurred on key watersheds, these watersheds will not be included in the timber base for calculating the ASQ/PSQ. Probable sale contributions calculated from these watersheds will be non-interchangeable. Adaptive management areas will be considered in the same manner.

325

Response: The final Plan treats the key watersheds as a non-interchangeable component. That is, if the timber cannot be harvested in the key watersheds, it will not be made up elsewhere. Each component has its own PSQ.

Comment 12: What will be the watershed units and where are their specific locations in each of the National Forests that are to be part of watershed analysis called for under the President’s Plan?

325

Response: Those on the Six Rivers NF are identified in Plan Appendix P (Table P-2).

Comment 13: Watershed analysis from a silvicultural point of view needs to include the number of acres by seral stage, the mapped locations of all seral stages and their acreage, and an assessment of the watershed’s historical pattern and acreage of seral stages, including the average patch size for each seral stage. Watershed analysis should be done on-the-ground and conclusions drawn from on-the-ground data and assessments rather than from just using a modeling approach. The height of a site potential tree shall be determined based upon the

average site of capable forest land along streams by Ranger District.

325

Response: This is what is intended for watershed analysis. For more information on watershed analysis see “A Federal Agency Guide for Pilot Watershed Analysis.”

Comment 14: Watershed analysis needs to be expanded to accurately forecast cumulative effects of widely scattered projects over time within a watershed, such as the South Fork Trinity river.

196

Response: This is the goal of watershed analysis: to obtain a better understanding of the processes and interactions occurring within a watershed and use this information to make better management decisions for the individual watershed system. With our current level of knowledge, we can determine the processes occurring within watersheds and gain an understanding of how our management may affect them. But we do not currently have the ability to accurately forecast effects because there are so many unknowns, and these systems are highly complex. For more information on watershed analysis see “A Federal Agency Guide for Pilot Watershed Analysis.”

Comment 15: The Forest Service plans to rely on the use of best management practices (BMPs) to protect the watersheds. These BMPs, however, are not a proven system for assuring compliance with water quality law.

247 270

Response: BMPs are recognized by both the Federal government and the State of California as the best way to comply with the Clean Water Act. However, the alternatives and project planning would rely on more than just BMPs to assure protection of watersheds. The final Plan incorporates and implements the aquatic conservation strategy developed under FEMAT and included in the FSEIS ROD.

Comment 16: Implementation of BMPs does not constitute compliance with water quality standards. In the event that a Forest project, with or without appropriate BMPs, creates a water quality problem or causes a standards violation, the State and Regional Boards retain the authority to carry out their responsibilities for management of environmental

quality. The FEIS should identify procedures for instituting corrective measures should BMPs be determined to be failing to protect water quality.

174

Response: We have added a list of best management practices to address your comment. They can be found in Appendix M of the final Plan.

Comment 17: The monitoring purposes on Plan pages H-3 to H-4 all appear to rely on BMPs that are specifically not stated and will be applied for each project. It is not clear how often BMPs will be evaluated and how the results of the BMP effectiveness program will be reported to the public. Are there any water resources that would be monitored unrelated to BMPs? Would temperature changes at sites not measured for fisheries purposes be monitored for long-term trends?

141 174

Response: See the response to comment 16.

Comment 18: For the threshold of concern/variability items on Plan pages H-3 to H-4 (items 4-6), how would the "predicted ranges" be calculated for adverse cumulative effects of minimum stream flows, conditions of stream flow, and rates of landslides? Those ranges would need to be agreed to and clearly displayed before any measurements are made for comparison.

141

Response: You have a good point. At the current time, we do not have the data to determine a predicted range for these processes. We dropped the phrase "outside the predicted range." We will work towards quantifying these ranges of variability in natural systems during this planning period. These ranges are needed to better understand the effects of our management.

Comment 19: It is not clear how often and over what scale managed lands would be monitored for new landslides. To be an effective tool for land managers, areas of high potential for mass soil movements may need to be monitored annually after each wet season, and other areas may only need attention every three to five years.

141

Response: It is true that different areas would warrant different intensities of monitoring for landsliding. In

general, "areas of high potential for" landslides have been or will be excluded from management disturbances such as timber harvesting. Areas that have not been or are not excluded would be the highest priority for monitoring after major slide-producing storms or wet seasons. However, monitoring would not be warranted after every wet season, based on prior experience in how landslides respond. Ultimately, the intensity and frequency of landslide monitoring will be determined during project or landscape analyses, as explained in Chapter 5 of the final Plan, as the potential for sliding is site-specific.

Comment 20: Monitoring will have to take on a greater role to ensure that watersheds are indeed recovering, or are maintaining a full complement of aquatic animals in expected or desired abundances.

324

Response: Some of this will be accomplished through our monitoring and some through research.

Comment 21: The Forest Service seems determined to violate the Federal and State anti-degradation requirements by degrading water quality up to certain thresholds, whose importance is uncertain, and to adopt a policy which plainly invites water quality degradation on repeated site-specific bases throughout the Forest. In addition, the Forest Service's plan of riparian protection further threatens water quality.

247

Response: We have greatly increase the amount of land reserved to protect water quality between the draft and final Plans. Riparian reserves have been increased from approximately 14 percent of the Forest to 43 percent of the Forest. The total landbase available for timber management has decreased to about 9 percent of the Forest. We have increased Forest road standards; for example, roads now need to be designed to handle a 100-year flood event. See the Riparian Reserve Management Area direction and the Aquatic and Riparian Resource Management Direction in Plan Chapter 4 for more information.

Comment 22: The DEIS fails to consider compliance with the California Porter-Cologne Act and the Federal Clean Water Act. The California North Coast Regional Water Quality Control Board adopted a water quality control plan pursuant to the above Acts. This basin plan requires specific, quantitative levels of temperature, turbidity, dissolved solids, and other water quality

measures in each of the river reaches affected by activities on the Forest. Also, both the Clean Water Act and the Porter-Cologne Act require the maintenance of current water quality conditions as a minimum level of protection.

247

Response: As explained above, we have greatly increased the protective measures for water quality. The levels of temperature, turbidity, dissolved solids, and other water quality measures by stream reach is not determined at the Forest Plan level; if legally required, these would be determined at the project level.

Comment 23: Cumulative watershed effects (CWEs) on streams in the four northern Forests are not evaluated in the draft plans. All streams, including the smallest ones, are steep and unstable. Logged streambanks are subject to heavy runoff during flood periods. Fish habitat is destroyed by scouring during winter storms. Sediment smothers spawning grounds, causing significant decline of anadromous fisheries. Inventory and evaluate CWEs on all streams and develop stream habitat protection measures on basis of the findings.

24

Response: Forest planning involves at least two steps. The Forest Plan is a programmatic document which develops the direction used for watershed analysis and site specific project planning. It is during project planning when each individual stream is inventoried and evaluated for CWEs. Then site specific stream habitat protection measures can be identified. At this Forest Plan level we look at the larger scale.

Comment 24: The draft Plans discussed riparian goals, but there is no discussion of how restoration is to be accomplished. The riparian management direction section of Plan Chapter 4 should include a discussion of priorities, methodologies, timetables, and budget estimates for restoration. The EIS should explain the watershed improvement needs (WIN) inventory and discuss how it would be used under the President's Plan. Standards and guidelines in the Forest Plan should include scheduling watershed improvement projects based on the WIN and specified priorities (Plan p. IV-29,49).

174

Response: The Forest Plan is a programmatic document and does not recommend specific projects.

Methodologies, timetables, etc. will be determined during project planning based on site-specific needs. The budget for riparian restoration is included in the Forest Plan budget, but is not broken out as a line item.

Comment 25: The preferred alternative proposes to create non-typical old-growth habitat. The increase in Forest density and the changed forest species will likely consume significantly more water. What impacts have and will occur due to the decreased stream flows?

139

Response: For the next 10 years of this planning period, increased water consumption and decreased stream flows will not be significant. Currently there are fewer old-growth stands and more openings (except at the southern end of the Forest) than would occur under natural conditions. It will take at least 20 to 30 years before any potential effect would occur. We will manage the amount of openings across the Forest to within the historic range of variability over time.

Comment 26: Forest regulation should be on a separate watershed basis. Stands to be cut first shall be the average stands, especially those stands needing to be rehabilitated to realize their productivity potential and to restore desired ecosystem function and processes.

325

Response: Forest regulation in the final Plan is Forest-wide. Key and non-key watersheds are treated as non-interchangeable components of the allowable sale quantity. For example, if we find that the harvest level is too high in key watersheds and needs to be reduced, we cannot compensate for the loss in volume in non-key watersheds. Watershed analysis will act as a feedback mechanism for Forest-wide planning to adjust the Forest-wide allowable sale quantity. The priority for harvesting will be based on achieving desired conditions and maintaining ecosystem process and function over time.

Comment 27: Of all the values on the Forest, the quantity and quality of water are surely the most adversely affected by timber harvesting. The impact of logging upon climate, soil, water, and wildlife have consequences for the entire planet. Without water there is no forest. The surest way to create a desert is to systematically and repeatedly remove vegetation.

175

Response: Removal of trees does increase soil surface temperatures which may dry out the top 6 inches of soil, but because the evapotranspiration is reduced the soil profile remains wetter, springs produce more water, and intermittent streams flow longer into the summer months. Tree roots pull water from deep in the soil profile, and their leaves or needles provide a large surface area for evapotranspiration. Without the trees, only water near the soil surface can evaporate, and the surface area for evaporation is not nearly as great as in a forested area. Thus tree removal increases water availability for the remaining plants and for streamflow. This effect can be seen after a large fire, when springs and seeps appear in even the smallest depressions where they did not exist before. Paired watershed studies in the Pacific Northwest have shown that water flows increase after logging. The largest percentage increases in stream flows from timber harvest have been shown to occur during the summer months, but the largest volume increases occur in fall and early winter. There has been one exception to this, though. This was on the Bull Run watershed, which supplies water to Portland, where they found that fog drip created from the trees was enough to offset the evapotranspiration from the trees.

Comment 28: While the draft Forest Plan states that overall miles of open road on the Forest will be reduced by the closure of most new roads and some existing roads, soil disturbance and drainage alterations will still occur from initial construction, non-maintained closed roads, and any decommissioning that might occur.

23

Response: The amount of erosion and sedimentation would be expected to decrease over time as a result of road closure and decommissioning. Studies have shown that erosion dramatically decreases after a road is closed. Exceptions may occur if the road drainage facilities fail. Before closure we either pull the drainage structures or take other steps to insure that they would not fail. Road decommissioning may increase sedimentation for a short time after the work is completed, but over the long term erosion from the decommissioning would decrease.

Comment 29: While the draft Forest Plan does include some general standards and guidelines for road management, the DEIS contains little information regarding how adverse effects on beneficial uses will be measured or assessed. The EIS should include more specific information on how impacts from road construction (especially stream crossings) will be measured in regard to turbidity and suspended sediments.

174

Response: See Forest Plan Appendix H for a description of the monitoring programs. In addition to what is covered in Appendix H, the Forest has implemented a paired watershed study to determine the effects of road building and timber harvest on water quality. The results of this study should be available within a year or two.

Comment 30: Work with State and local agencies to upgrade septic systems and to appropriately place new homes/structures. Do not permit development within the floodplain, and provide a 100 foot minimum setback for new homes. Homes constructed near streams and the tops of banks create degraded wildlife and fishery conditions.

229

Response: The Forest Service complies with Federal and State laws and regulations and local ordinances when constructing and reconstructing facilities on National Forest System (NFS) land. Special use permits authorizing privately-owned improvements on NFS lands also require compliance with these laws, regulations, and ordinances.

Comment 31: The management of our National Forest should be focused on developing water storage facilities.

266

Response: Developing water storage facilities is the responsibility of the Army Corps of Engineers.

Comment 32: On the last sentence of page 5, remove the word "improvement." Less disturbance reduces the potential for impacts to water quality and fish habitat. It does not "improve" either. Also, on Page S-5 in the watershed section, add "miles of road" twice in the first sentence for clarification.

96

Response: The changes have been made.

Air

Comment 1: The EIS should provide a detailed discussion of the status of air quality planning for the area, indicate if there is an approved air quality implementation plan, describe potential impacts to air quality, and discuss how the action would meet conformity requirements of the Clean Air Act.

174

Response: The State of California does not have an approved air quality implementation plan so a conformity determination can not be completed at this time. The Forest coordinates with the North Coast Unified and the Siskiyou County Air Quality Management Districts during project implementation. They are contacted before each burn is ignited to determine if it is a permissible to burn on that day. Their determination is based on the cumulative activities proposed for that day for their respective areas of control.

Comment 2: The EIS should identify prevention of significant deterioration Class I Areas which receive special protection for particulates, sulfuric oxide, and nitrous oxide.

174

Response: These areas are identified in FEIS Chapter 3, Air.

Comment 3: The EIS should more fully discuss particulate matter (PM10) that could be produced by direct emissions from prescribed burning, construction, and vehicles and the EIS should develop general Forest wide measures to mitigate these measures. Mentions of

total suspended particulates should be replaced by discussions of particulate matter, in particular, PM 10, and estimates of historical and future particulate levels should be made.

174

Response: Discussion of air quality in FEIS Chapter 3 and the monitoring section of the Plan have been changed to include a discussion of PM10. Estimates of PM10 have also been included, showing past and potential future trends.

Comment 4: Air quality regulations may impede prescribed burning critical to achieving desired forest conditions and to minimizing wildfire risks. Cooperative research, analysis and management efforts with the Air Resources Board and local Air Quality Management Districts may be needed to identify acceptable management practices and efficient permitting processes.

221

Response: Cooperative research and analysis is being initiated with the local Air Quality Management District to determine levels of PM10 produced from various prescribed burns. Also, treatment alternatives beside burning will be investigated where possible to mitigate air quality concerns.

BIOLOGICAL ENVIRONMENT

Biological Diversity

Comment 1: Remove the word “overmature” from the documents where it is used to describe vegetation. The use of the word suggests a bias, and it should be replaced with another word.

96 175

Response: The documents have been revised to describe vegetation in terms of successional stages.

Comment 2: The management of the Forest should focus on maintaining biodiversity, and a healthy productive forest.

20 195 266

Response: The alternatives were designed to respond in different ways to the driving issue of how the Forest will maintain biodiversity. The preferred alternative proposes to maintain biodiversity and a healthy productive forest by managing to mimic natural/historic disturbance regimes and provide habitat needs for a wide range of plant and animal species. Sections on biological diversity have been added to the final EIS and Plan to reflect this focus and clarify how the Forest proposes to maintain biodiversity and forest health.

Comment 3: While the DEIS provides a good discussion of the plant communities present on the Forest, it does not specifically discuss the question of native plant communities or the replacement of native by non-native vegetation. It would be helpful if the following information would be included in the FEIS: 1.) native plant species and community abundance and trend in managed ecosystems including rangelands, timber harvest areas, and riparian zones; and 2.) non-native abundance and trend in managed areas. The analysis should identify those plant species and communities that are expected to be the most difficult to manage sustainably during the life of the Plan.

225

Response: As a part of the ecology program, vegetation is classified, Forest-wide, to the series, sub-series, and plant association level. The latter is the most closely related assemblage to the plant community level. The foundation of the classification is the collection of plot data throughout different vegetative series. Data collected includes species composition (native and non-

native) and abundance. Species composition and cover abundance, as well as environmental variables, guide the classification of the plant associations. The bias in the past has been to sample in older seral stages; however, over the last year, data gathering efforts were focused in rangelands, and this year sampling will expand to include riparian/wetland habitats. Harvested areas have also been sampled in the same method; however, the plot number is smaller. Classification is an important first step and basically serves as baseline for measuring future trends. Established plots are well marked and documented on maps and in a GIS database. These plots can be revisited to discern trends.

The Forest is just beginning to respond to the issue of non-native displacement of native plants. Our response to date has been in the realm of revegetation utilizing native plant material for revegetation or non-persistent non-natives if the former is not available (see the Native Plant Material Use section of Plan Chapter 4) and attempt to collect local seed for Forest projects. Additionally, during NEPA, the analysis must assess the potential for non-native introductions as a consequence of project implementation. These responses attempt to reduce the potential for non-native introduction. Assessment of trends is qualitative at best. In the near future, landscape analyses such as watershed analysis will incorporate an assessment of existing conditions in watersheds with subsequent mapping of non-native composition and extent.

Comment 4: The Lassics area is so botanically unique that there must be no more road-building, logging, grazing, off-road vehicle use, or mining in the areas, plus there should be a focus on rehabilitation of the greater area with native species.

271

Response: The Lassics is a Botanical Area; direction regarding the management of the Lassics can be found in the Special Interest Area (SIA) section of Plan Chapter 4. Standards and guidelines for SIAs prohibit timber harvesting. The issue of grazing within the Botanical Area will be analyzed as part of range project decision and project-level documentation; range-related resource impacts will be addressed and mitigated as appropriate. Recreational vehicles are allowed on system roads within the area, unless it is determined that access or the road itself is contributing to resource damage; cross-country travel is illegal. The Lassics will be evaluated for withdrawal from mineral entry. Any revegetation project within the Lassics would utilize stock/seed obtained from the Lassics Botanical Area whenever

possible. Revegetation of the greater area outside the Lassics would also use native species when possible. See also the Native Plant Material Use standards and guidelines.

Comment 5: A minimum of 20 percent of each vegetation type should be provided in each late seral stage (4A, 4BC, 4C+) to attempt to provide adequate late seral habitat and avoid further extinctions.

225

Response: Analyses of natural disturbance rates for some vegetation series show that it is not possible to maintain 20 percent of the series in each late seral stage because of frequent fire and other disturbances (See FEIS Table III-18). The preferred alternative proposes to maintain a certain percent of each vegetation series in each seral stage in order to reflect natural disturbance rates for each vegetation series. Under the preferred alternative, the total amount of late successional vegetation will increase over time on the Forest. See the Biological Diversity section of FEIS Chapters 3 and 4 and the vegetation standards and guidelines in the final Plan for more information.

Comment 6: The Forest should establish control plots in each vegetation and soil type within each managed watershed, in both riparian and upland areas. The purpose of the control areas would be to provide examples of potential species distributions, stand structure, seral stage, size and age class as well as ecosystem processes, functions, and interrelationships in the absence of management. Control areas would provide information essential to the accurate evaluation of the effects of standards and guidelines and of activities such as botanical special products collection, salvage harvest, and grazing. They can also act as refugia for some disturbance intolerant species.

225

Response: The Forest ecology program establishes permanent plots in various vegetation series Forest-wide. We are now at the point of classifying the vegetation. We are just beginning the process, and it will be refined as we complete watershed analyses and other landscape analyses. Data collected as a part of the ecology program is similar to your suggestions. Not all of these plots will be in reserved areas; however, plots in reserved areas could serve as controls for management effectiveness evaluations. In addition, RNAs (Research Natural Areas) and SIAs can function to some degree as blueprints for naturally functioning systems.

Comment 7: The Forest should set desired future condition and biological diversity goals, with timelines, for all watersheds. Desired future condition goals should be set with input from groups and individuals who use or are concerned with the Forest. Monitor biological diversity within managed watersheds to ensure that goals are met.

225

Response: Through the processes of watershed analysis and other landscape analyses, the Forest will work with the public to define desired conditions for specific landscapes across the Forest. For some ecosystem processes and functions, the watershed scale is too small for defining desired conditions, such as the desired condition for vegetation types that extend beyond a single watershed. In this case, the desired conditions would be determined at the appropriate scale, and the watershed analysis would tier to higher scale analysis. Biological diversity monitoring elements have been added to the monitoring plan; the scale at which these elements will be monitored will vary according to ecological boundaries.

Comment 8: Maintain a bank of local seeds and cuttings from a range of ecosystems in each Forest to be used for revegetation. As an early part of all project planning, develop and maintain a viable supply of local native plant materials, including shrubs and grasses, for post-project revegetation and site rehabilitation. This should follow a similar protocol to that used for developing materials for post-timber harvest replanting.

225

Response: A protocol for the use of native plants has been added to the final Plan. For revegetation projects, prescriptions will be reviewed by both District silviculturists and the Forest botanist to ensure planting material is appropriate for a particular site. Once the prescription is outlined, collection contracts will be developed to ensure material is collected from, at minimum, the correct seed zone and elevation. If locally collected natives are not available, alternatives such as (a) postponing the revegetation until the material is collected, (b) utilizing site preparation techniques, (c) utilizing non-persistent non-natives, and (d) relying on natural seed-in will be used. A component of the revegetation effort will be the development of a database to track where seed is available, where seed has been collected, and where seed or stock has been planted.

This will facilitate the monitoring of revegetation activities. See the Native Plant Material Use section of Plan Chapter 4 for more information.

Comment 9: Use local natives when seeding, planting, or revegetating areas disturbed during project implementation (including road obliteration, road cut stabilization, post-fire rehabilitation, post-harvest planting and management, and erosion control) or by natural events such as wildfire. If it is not possible to use native species for revegetation, use species that are not invasive, alleopathic, or likely to significantly compete with native species for nutrients, water or space.

225

Response: This has been incorporated into the Native Plant Material Use section of Plan Chapter 4.

Comment 10: Avoid the use of post-wildfire seeding. Give preference to natural revegetation processes. Use seed-free mulch where necessary for erosion control or watershed protection.

225

Response: The Native Plant Material Use standards and guidelines provide this direction; natural regeneration will be encouraged whenever possible. When natural regeneration is not possible within desired time frames, sterile mulch will be used for soil protection. Seeding would be used only when seed source and soil conditions were not suitable for natural regeneration.

Comment 11: The Forest botanist and/or ecologist, in consultation with an appropriately trained revegetation specialist, should determine the varieties, planting, or seeding rate and methods to be used in revegetation projects to ensure that species are native to the project area.

225

Response: This direction is provided in the Native Plant Material Use, Special Interest Area, and Research Natural Area sections of Plan Chapter 4.

Comment 12: Monitor watershed analysis biological diversity parameters following project implementation.

225

Response: See the response to comment 7.

Comment 13: Locate resource extraction and other potentially damaging or disturbance-promoting activities, including high intensity recreation, away from areas identified in watershed analyses as containing high species richness or large numbers of uncommon species, particularly in late seral or other sensitive or unique associations.

225

Response: Each management area has sets of management direction and standards and guidelines that are designed to maintain the features of the management area. Watershed analysis and other landscape analyses will identify unique/uncommon habitat and species occurring in an area and would provide management recommendations to minimize impacts on them. Project-level NEPA analyses will identify specific restrictions and mitigations, and tier to the results of higher scale analyses.

Comment 14: Emphasize management activities that promote the increase of desirable native plant species and communities, particularly those that currently have low population levels or limited distributions. Examples include rest rotation grazing systems, revegetation with native plant species, and controlled burning in appropriate areas.

225

Response: Native Plant Material Use standards and guidelines have been added for revegetation with native plant species, and the Fire/Fuels direction has been modified to include controlled burning for plant management.

Comment 15: Prescribed burning will be avoided during the winter months, early and peak growing season. Burning should only occur when the landscape naturally burns. EAs for prescribed burns should specifically discuss effects to native plant communities, long-term vegetative health and vigor, biological diversity needs, and the effects of thinning and of frequency and seasonality of burning on soil productivity and on sensitive and other native plant and animal communities in accordance with NFMA.

225

Response: Several decades of aggressive fire suppression has resulted in unnaturally high amounts of debris and understory vegetation in the forest. This, in combination with a lengthy drought, prohibits us from

burning during the “normal” times of year when wildfires typically occur. Our goal is to burn under weather conditions that result in low to moderate fire intensities. These burns will reduce the fuel loadings to more natural levels, so that in the future we may be able to re-treat these areas during the times of year when wildfires occurred historically.

EAs should discuss the short and long-term effects of burning on the ecosystem, but much of this is presently unknown. Burning monitoring plots are being used to better document the effects on vegetation and soils, and adaptive management will be used to incorporate these results into our burn plans.

Comment 16: Monitor the effectiveness of all revegetation projects on soil cover, erosion rate, water quality, etc. Monitoring should compare planted or seeded areas to similar control areas undergoing natural revegetation. The Forest botanist will design the monitoring protocol. Monitoring results will be reported annually.

225

Response: Hydrology and botany will take a joint role in monitoring the effectiveness of revegetation projects. Administrative studies will be implemented on a small scale to determine the most effective plant material and horticultural techniques. A database should be developed to better track revegetation projects. Monitoring results will be included in the Forest’s annual report on the implementation of the Forest Plan.

Comment 17: Defer grazing in burned areas for three years following wild or controlled fire in chaparral. Grazing in other burned areas will be allowed only when a team including the Forest botanist and/or ecologist determines that grazing will not accelerate erosion or adversely affect sensitive species.

225

Response: The chaparral component is minor on the forest and is of minor interest to grazing cattle. Wildfires or prescribed burns over extensive areas that are subject to livestock use will be evaluated by a botanist and soils specialist before grazing is allowed, to determine if there is a concern. If there is an erosion or botanical concern, management techniques would be used to deter grazing, as much as possible, until the area has recovered.

Comment 18: Implement management actions in a manner that complements ecological processes and the natural variability of the Forest. The composition, structure, and function within the ecosystem shall be managed in a manner to promote long-term sustainability.

225

Response: Standards and guidelines have been added to address ecosystem composition, structure, and function as elements of maintaining biodiversity and promoting long-term sustainability. See the Biological Diversity section of Plan Chapter 4.

Comment 19: The preferred alternative proposes to create non-typical old-growth habitat. If this happens, will slow-growing hardwoods be crowded out by faster-growing conifers? Does a mono-species forest foster the necessary diversity that most species are dependent upon?

139

Response: The standards and guidelines in the final Plan provide for maintaining hardwoods within stands when they are a natural component of the stand. The overall direction for vegetation management is to provide a multi-species forest reflective of the species found in the various vegetation types.

Comment 20: The alternative in the FEIS should incorporate an ecosystem approach to Forest planning, including those areas outside established reserves. The FEIS should describe how late seral and old-growth stands outside reserves will be managed and maintained for biological diversity, whether they will be part of the 180-year rotation, whether they will be thinned, or whether there will be efforts to manage these stands in their natural state.

174

Response: The 180-year rotation in the draft Plan has been replaced with a management strategy that mimics historic disturbance rates and patterns. These rates vary across the Forest according to climate, proximity to the coast, and other ecological factors. Standards and guidelines have been added to the final Plan outlining the recommended management variability of seral stages for different vegetation types across the Forest. Vegetation management will strive to achieve this distribution of seral stages for each vegetation type. Generally, younger (early and mid-mature) stands on the

Forest will be thinned to create desired stand structure, but late mature and old-growth stands would not be thinned.

Comment 21: It is unclear whether standard and guideline 14-4 and 14-5 will achieve the draft Plan's goals of reducing forest fragmentation. Placing regeneration harvests next to old-growth stands will result in greater edge effects. Perhaps the intent of these S&Gs is to locate regeneration harvest at the edge of an old-growth stand, rather than in the middle of one; however, locating regeneration harvest away from old-growth stands is preferable, and stands with no interior old-growth habitat should be the location of timber harvest. Second, it is likely that many of the small fragments of late successional and old-growth forest will be necessary to maintain some components of biological diversity across the landscape. Prioritizing small stands of late successional forest for regeneration may, in some cases, deplete necessary biological refugia. S&G 14-5 acknowledges that small old-growth stands may be biologically important. However, it is not yet clear where these stands are located, what criteria will be utilized to determine their relative biological importance, and which stands will be maintained.

225

Response: The fragmentation standards and guidelines have been modified in the final Plan. Although we may harvest some small fragments of late-successional and old-growth forest during the life of the plan, these stands are not the top priority for regeneration. The final Plan outlines recommended management ranges for the desired distribution of seral stages among different vegetation types, and vegetation management will strive to achieve these distributions.

Comment 22: No monitoring plan or Forest-wide standards and guidelines are presented for biological diversity; this is a critical aspect of forest management, and should be added to the final Plan.

225

Response: Biological diversity standards and guidelines and monitoring elements have been added to the final Plan; see Plan Chapters 4 and 5.

Comment 23: The preferred alternative fails to recognize that trees grow, get old and die, or that stands of trees develop structural characteristics based on patterns of disturbance. If you are going to eliminate the historic disturbance patterns and refuse to replace them

with mechanical disturbance, you must be prepared to suffer the consequences of establishing climax conditions about which we know very little. Without continual recruitment of replacement trees, you will lose your old growth in an unplanned haphazard pattern that will serve to thwart maintenance of a desired condition that you seem to desire. You could establish a vegetation management regime that would assure a continued major old-growth component and at the same time provide more stable economic contributions to the area and a healthier forest.

48

Response: The management strategy for the preferred alternative has been modified between the draft and final Plans to reflect this thinking. Vegetation management would mimic these disturbance rates and patterns through silvicultural and fuels treatment methods; this would include reserved areas such as Late-Successional Reserves as well as matrix lands.

Comment 24: The chief ecological problem for the region is the fragmentation of forest ecosystems.

217

Response: The management strategy for the preferred alternative includes large blocks of reserves (approximately 91 percent of the Forest would be in reserves), and management of matrix lands outside reserves to mimic the processes, structure, and components of natural ecosystems. Landscape analyses would look at ecosystems on different scales, and standards and guidelines are provided to minimize fragmentation.

Comment 25: Protect and do not log any more old-growth. Reasons cited include: it will take hundreds of years to rehabilitate damage to old-growth forest communities; old-growth stands provide fire protection; old-growth is needed for future generations; old-growth ecosystems provide a unique and irreplaceable habitat; and old-growth may contain some vital function that we do not know of yet and that can not otherwise be provided.

D	20	22	61	84	137	165	166
175	182	256	311	312			

Response: Under the final Plan, approximately 91 percent of the Forest will be reserved from timber harvest activities. We have added vegetation management standards and guidelines to maintain a

distribution of old-growth in different vegetation types that is within a recommended subset of the historic range of variability.

Comment 26: There were a number of comments requesting that specific areas of old-growth be protected from logging and salvage, including; Ikes, Pearch, Boise, and Red Cap Creek watersheds; the section of Forest from the mouth of the Salmon river and 8 miles east/south to Horse Linto Creek (a corridor); Tish Tang Creek; Pilot Creek; and Orleans "B."

C 82 211 271

Response: See the response to comment 25.

Comment 27: If logged at all, old-growth should be logged selectively, and such trees should be sold at much higher prices than younger trees.

175

Response: Standards and guidelines for vegetation management include the retention of the oldest, largest trees on at least 15 percent of the area of a stand. Market values will determine the price of timber; old-growth trees generally have a higher value than younger trees.

Genetics

No comments specifically related to genetics were received.

Sensitive Plant Species

Comment 1: Plants can be early and sensitive indicators of ecosystem function. Consider adding plant management indicator species to monitoring programs for the various forest ecosystems. This is allowed by the Forest Service manual.

225

Response: The Forest has begun to establish ecology plots throughout the various forest types. The data collected at the plots includes information on all layers of vegetation, which is used to classify vegetation into ecological units. This effort is time consuming and costly, but it will produce keys to the plant associations of the forest. Classification is a "first cut" or a baseline of sorts; once it is completed, ecology plots can be revisited for monitoring. The forest will start inventorying non-vascular plants such as fungi and lichens next year. Non-vasculars could prove to be valuable as indicators of forest health.

Comment 2: Encourage full ecological diversity by eliminating or severely curtailing logging and road building from National Forest System lands to allow reclamation of lands by natural succession. Do not plan any logging for areas of known or potential habitat of any sensitive plant or animal species.

20

Response: Logging and road building will be reduced greatly from levels over the past 30 years. The National Environmental Policy Act (NEPA) requires the Forest to conduct an environmental analysis and public review for proposed logging. The analysis includes a survey for sensitive plant species and disclosure of the effects a timber sale might have on sensitive plant occurrences. Adverse effects may be mitigated by avoiding sensitive plant areas or modifying the silvicultural prescription, or the decision maker may make an informed decision to log in sensitive areas.

Comment 3: Revise the Forest sensitive plant list to include plants from the 1994 California Native Plant Society (CNPS) "Inventory of Rare and Endangered

Vascular Plants of California,” categories 1B and 2, that either are thought to occur within the Forest boundaries or which may occur on a small portion of the Forest at the limit of their range. Survey to determine the occurrence of such species and evaluate them as candidates for the Forest and Region 5 sensitive list.

225

Response: The sensitive plant list in the final Plan includes the plants on the most recent CNPS 1B list known or suspected to occur on the Forest. Certain CNPS list 2 plants are also on the list; inclusion is based on recommendations by the local CNPS chapter, degree of endangerment, the opinions of botanists on adjacent Forests as to rarity and endangerment, and documentation of occurrences within Forest boundaries. List 2 plants that were not considered threatened by management activities and/or were not known to occur on Six Rivers were not added to the Forest list. If those CNPS List 2 plants that were not added to the list are discovered inadvertently during plant surveys, locations will be recorded and populations reports completed. If plants are located during project-level surveys, mention will be made of the discovery in the environmental document. Surveys to specifically locate these non-listed plants will be dependent upon additional funding.

Comment 4: Conduct surveys for federal category 2 candidate species; determine status and distribution; develop standards and guidelines for their protection.

289

Response: Recently identified additions to the federal C2 candidate species are included in the Forest sensitive plant list in the final Plan. Surveys and monitoring are conducted on a periodic basis for the existing C2 species. Priorities for surveys and monitoring will be established in species management guides. Surveys may also be conducted as part of watershed analysis or botanical area mapping.

Comment 5: Review and update the Forest sensitive plant list at least annually in coordination with the FWS and other knowledgeable entities.

289

Response: The sensitive plant list goes through a major revision about every 3-5 years, similar to revision of the CNPS inventory. When new information becomes available, additions or deletions can be made “mid-cycle.” Information on rare taxa does not change so rapidly that an annual update is necessary.

Comment 6: The description of the current situation in relation to Threatened, Endangered, and Sensitive (TES) plants in DEIS Chapter 3 emphasizes the negative aspects of road construction and illegal vehicle use in relation to TES plants while downplaying or failing to address the aspects of other activities such as cross country off-road travel by foot, horseback, or mountain bike; camping, picnicking, livestock grazing, tethering horses; and recreational driving through the Forest to view scenery. The discussion does not recognize that roads are constructed only after environmental review that includes mitigations to minimize impacts to TES plants.

230

Response: The complete text identifies various uses that might adversely affect sensitive plant occurrences, including those illegal uses that result from human behavior. Environmental review prior to road construction does provide mitigations to minimize impacts on sensitive plants, but it may not ensure full protection against unauthorized uses once access is provided. Illegal OHV use (cross-country travel) has been documented in the Forest.

Comment 7: The discussion of Port-Orford-cedar root disease (*Phytophthora lateralis*) in DEIS Chapter 3 is centered on vehicles as the only cause and effect of the spread of this fungus. The mention of seasonal closures as a preventive measure does not include data that tells the reader whether closures are effective. It does not identify other possible modes of transmission or any measures taken to prevent transmission by other modes.

230

Response: The relationship of vehicle use to Port-Orford-cedar root disease has been clarified in the final EIS. The effectiveness of seasonal closures to prevent the disease needs more monitoring, and techniques for preventing its spread need more assessment. Standards and guidelines in the final Plan addresses these needs.

Comment 8: Recognize that management activities may not be the most pressing problem related to TES plants, except as a means to determine recreational uses. Set priorities to develop management guides in response to a proven impact which is occurring at the moment using standard threshold criteria. Do not prioritize development of management guides to improve recreational opportunities of one user group over another user group at the expense of plant communities.

230

Response: The final EIS clarifies that the underlying premise in prioritizing plan development is conservation of the plants, plant communities, and habitats.

Comment 9: Expand sensitive plant standards and guidelines to include more detail and specific timelines. Make a firm commitment to developing species management guides more rapidly. Consider the use of habitat conservation guides specifically targeted to management activities on an interim basis. Specific standards and guidelines were suggested:

1. Projects will be managed to maintain or increase sensitive and endemic plant populations and communities as well as to improve their habitat.

Measures will include:

- a. Analysis of the probable effects of all projects on sensitive and forest endemic plants and plant communities and their known or potential habitat as part of the environmental analysis process.
- b. Consult the CNPS inventory of rare and endangered vascular plants of California and CDFG Natural Diversity Database during project analysis for potential sensitive species and community locations, sensitive plant species habitat types, and potential management conflicts.
- c. Perform floristic surveys for all project planning areas and areas subject to secondary impacts in management watersheds, irrespective of presence or absence of known sensitive plant populations or habitat in the area, to ensure that unrecorded sensitive populations and species are not lost by management.
- d. Avoid activities which adversely impact sensitive plant populations or communities.
- e. The Forest shall monitor the effects of past and current management and mitigation measures on sensitive and endemic plants. Report status and trend of sensitive plant populations and communities in managed areas every year. If monitoring shows a decline in viability, relative to an appropriate control, unmanaged population, for two consecutive years, a conservation strategy and/or management guide for the species and/or habitat will be developed and management adjusted within one year.

2. Conservation strategies will be produced for all sensitive plants during this planning cycle. Habitat guides, rather than single species guides, should be prepared for associations of co-occurring species in the same habitat. They will be produced on a schedule of at

least two sensitive plant species or habitat conservation strategies per year. Species will be prioritized for conservation strategy development based on vulnerability to damage by management. Conservation strategies should:

- a. Identify management activities which conflict with each species and its habitat.
- b. State which management activities are permitted and prohibited in the sensitive species habitat and why.
- c. Record the habitat requirements, known populations and potential habitat for the species.
- d. Describe the current status and trend of the species.
- e. Describe gaps in current knowledge of the species that should be filled to improve management.
- f. Describe appropriate mitigation measures, if available, for minimizing management impacts to the species, with advantages and disadvantages of each.
- g. Describe permitted responses to unplanned emergencies such as wildlife to reduce impacts on habitat.
- h. Be signed by Forest Supervisor.
- i. Be incorporated by reference into Forest Plan upon completion.

In the interim, while guides are in development, map record and protect habitat for sensitive and endemic plant species. Conservation strategy development should be a prerequisite to potentially harmful management activities in sensitive plant habitat, such as mining, logging, OHV access, prescribed burning, recreation development, etc.

3. Provide reports of new and existing sensitive plant populations to the CDFG Natural Diversity Database and the CNPS inventory annually (Shasta-Trinity Botany Standards and guidelines).

4. Coordinate sensitive plant inventory and protection efforts with the CDFG, USFWS, TNC, CNPS and other concerned agencies and groups (Shasta-Trinity Botany standards and guidelines).

5. Every species noted in the field will be investigated to the extent necessary to ensure that it is not a sensitive species (see FSH 2609.25 Sec. 1.11C.2).

225

Response: The final Plan emphasizes habitat management guides, beginning with mapping plant communities, rare plant occurrences and sites in need of

restoration within Botanical Areas. Development of species or habitat management guides will be prioritized with the following criteria in mind: degree of rarity, degree of threat, and availability of existing data to support such a document. Adhering to any timeline and accomplishing surveys and management guides depends upon the priorities established by the Forest, which in turn guide the level and extent of funding to any project. Under NEPA regulations, all projects require analysis of potential environmental impacts to Sensitive plants. Biological assessments/evaluations are written for TES species prior to project implementation (FSM 2760.5); therefore separate standards and guidelines are not needed. The final Plan addresses priorities and levels of monitoring intensity; priorities and intensity will also be addressed in species and habitat management guides.

Comment 10: The proposed monitoring program should be expanded to adequately protect the Forest's sensitive plant species: monitor more than 20 percent of long term monitoring sites, especially for high impact activities; monitor a representative sample of all project areas rather than specific sites; monitoring must be flexible; monitoring should be a direct responsibility and expense associated with management for OHV and other high impact activities; the threshold of concern is vaguely worded and may be too lenient to be effective; address the discrepancy between the budgets for monitoring wildlife and sensitive plants.

138 225

Response: The monitoring section of the final Plan has been modified. Priority will likely be placed on those species considered threatened by existing or pending management activities; however, control plots/areas must also be established when appropriate to discern trends regardless of management activities. Projects of a large scale or with significant development will be funded by the entity proposing the project.

Wildlife

Comment 1: Maintain diversity and eliminate or curtail logging and road construction so that natural succession can reclaim land and the loss of sensitive species can be prevented.

20 23 59 195 225 273 290

Response: The final EIS and Plan incorporate the direction provided by the FSEIS ROD, which establishes large late successional reserves and an interconnecting riparian reserve network over much of the Forest. These reserves are expected to ensure historic succession processes and maintain sufficient habitat for sensitive species. The preferred alternative will manage the forest matrix and the Hayfork Adaptive Management Area within their "historic range of variability" and is expected to contribute to the maintenance of diversity and the prevention of species loss while providing timber outputs.

Comment 2: Use real, unbiased scientific data coupled with realistic and reasonable regulations that take into account the needs of the human species.

230

Response: The Forest has acquired and reviewed most of the literature cited by our respondents, and tiers to the FSEIS ROD and supporting SAT and FEMAT reports as two of the most comprehensive scientific evaluations addressing Forest ecosystems and the risk associated with different intensities of management. The needs of the human species are provided for within the limits of our compliance with existing laws.

Comment 3: There were a number of editorial requests to correct discrepancies and inaccurate statements, provide clarifications, and include additional citations that support statements made in EIS and Plan.

23 26 48 223 226 230 289

Response: The final EIS and Plan have incorporated the appropriate corrections, clarifications, and citations.

Comment 4: Are the proposed habitat capability models adequate, including their reliance on California WHR database?

24 289

Response: The habitat capability models (HCMs) provide a means to show the parameters used to evaluate how the Forest would provide for selected wildlife species at the Forest level. The FSEIS ROD and the related SAT and FEMAT reports have provided a more comprehensive risk assessment that covers most of these species across major portions of three states. The HCMs were developed from the most current research available. They need to be validated for our respective areas, as a part of the implementation of the Forest Plan; additional research would be conducted to validate the models and provide essential information on how selected species respond to our management.

Comment 5: How much low elevation old forest is provided in Forest wilderness?

23

Response: While our wilderness areas are primarily located at higher elevations, some low elevation old forest occurs in the North Fork Wilderness area and in wild river corridors.

Comment 6: How will critical habitat and reserves be managed? Are these reserves adequate to protect threatened, endangered and other sensitive species?

D 35 72 182 219 227 290

Response: Late successional reserves (LSRs) will be managed according to the FSEIS ROD standards and guidelines, which have been incorporated into the Forest Plan standards and guidelines, and the conservation recommendations provided by the USFWS in their biological opinions. Currently, almost all of the USFWS-designated critical habitat for the northern spotted owl and draft critical habitat for the marbled murrelet falls within these LSRs. Any management of designated critical habitat that occurs outside the LSRs will require consultation with the USFWS, until the designated critical habitat for the northern spotted owl has been revised, or draft critical habitat for the marbled murrelet has been finalized. We expect that the currently designated and proposed critical habitat will be modified to match the late successional reserve allocations in the FSEIS ROD.

Comment 7: Do the final EIS and Plan adequately address viability, and does the risk assessment include cumulative impacts of both federal and non-federal actions? Does the analysis include population estimates

for selected sensitive species, including population thresholds versus abundance?

24 219 225 226 227

Response: The final Plan is based on and incorporates the management direction contained in the FSEIS ROD. The land allocations and standards and guidelines were developed using the assessments performed during the development of the FSEIS and associated ROD, and the supporting documents include a discussion of cumulative affects, including non-federal actions (FSEIS Appendix J-3). Chapter 3 of the EIS provides projections of the number of breeding pairs of selected wildlife species the Forest might support based on the capability of existing habitat. Chapter 4 of the EIS provides a risk assessment for selected species based on the different management strategies for each alternative. Under the preferred alternative, both the large amount of Forest land in reserves and the management of the matrix should provide sufficient habitat for most species to maintain species populations above threshold levels.

Comment 8: Are the Forest standards and guidelines adequate to protect wildlife and ensure survival of these species?

225 227 233 289

Response: With the incorporation of the FSEIS ROD standards and guidelines, there is a high likelihood that Forest wildlife will be protected. As we implement the Plan, monitor our actions, and conduct research on the effect of our management on selected species (or species groups/assemblages), the standards and guidelines will be modified to ensure adequate protection; if necessary, new guidelines will be developed.

Comment 9: Is the monitoring plan for TES and other wildlife species adequate to ensure well-distributed viable populations of all species?

24 289

Response: This question is addressed in Chapter 5 and Appendices G and H of the final Plan. There are a number of monitoring elements aimed at ensuring well-distributed viable populations of all species on a sample basis. The Forest monitoring plan also includes monitoring elements from the framework for monitoring outlined in section E of the FSEIS ROD. An interagency team is further developing these monitoring elements to address implementation of the FSEIS ROD.



Comment 10: Are the standards and guidelines and the management direction for roads and road closures adequate? Do they provide opportunities for OHV use? There is a concern that minimizing open road densities and eliminating and closing roads unfairly restricts valid OHV use.

223 230

Response: The Forest has limited resources/funds for road and trail maintenance. As a result our maintenance efforts focus on primary and secondary roads that are essential to public use, and avoids investing in roads in areas that would create other resource conflicts. Road closures for wildlife are not targeting OHVs or any other user group; they seek to limit or control vehicle access into areas occupied by breeding T&E wildlife species, which could be adversely affected by human activity in the vicinity of nest sites. We also seek to reduce access in other areas to protect some wildlife species from poaching, their habitat from damage, or reduce the risk of unplanned fires. Some routes may be closed to protect resources such as sensitive wildlife or plant species. As the Forest evaluates access throughout the forest, and balances public access with declining budgets and human resources, we expect to reduce open road densities (miles of road per square mile) in some areas. The Forest will continue to seek public involvement on all road closures, and will maintain essential roads in areas where other sensitive resources can be protected, consistent with our laws, regulations, and management direction.

Comment 11: Are the biodiversity/timber management prescriptions and management direction adequate to ensure that wildlife habitat is maintained for late successional and prey species? This includes concerns that unmanaged forests will result in increased fuels and a reduction in prey species.

23 48 223 271

Response: The reserves were established to ensure that adequate late successional habitat is maintained for these species and their prey. The Forest will manage matrix lands and the Hayfork Adaptive Management Area using the adaptive management process to determine how to manage the forest to maintain functional habitat for late successional wildlife species, and to mimic natural disturbances to create and maintain near natural forest ecosystems. The Forest also proposes to utilize prescribed fire to the extent feasible to restore this natural process within its appropriate fire cycles, and reduce fuel hazards in critical areas.

Comment 12: How will the Forest provide and maintain connectivity between reserves to facilitate movement/migration and reduce or eliminate fragmentation?

23 108 174 186 195 224 225 227
230 271 325 345

Response: The extensive riparian reserve network, in conjunction with the known spotted owl activity centers, are expected to provide dispersal habitat in the matrix and AMA between reserves. In addition, biodiversity standards and guidelines have been added to reduce fragmentation across forest landscapes. Where contiguous forest may be needed to provide connectivity between watersheds, managed travel or movement corridors would be identified at saddles and other selected locations across ridgelines. This question is further addressed in Chapter 4 of the EIS.

Comment 13: Are threatened and endangered wildlife species adequately protected in the final Plan? Does the Forest comply with ESA and all applicable recovery plans?

195 206 208 212 229 247 289

Response: The Forest’s Special Habitat Management Area is designed to protect essential habitat for the Forest’s threatened and endangered (T&E) wildlife species, including the northern spotted owl, marbled murrelet, bald eagle, and peregrine falcon. This management area includes the late successional reserves from the FSEIS ROD as well as nest protection zones for the eagle and falcon. The Forest has and will continue to consult with the USFWS both informally and formally as needed to ensure all T&E species are adequately protected and the Forest is contributing to their recovery. In addition, the Forest will continue to comply with the applicable recovery plans. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 14: Is the management direction, including standards and guidelines, for peregrine falcon adequate to protect habitat and provide for its recovery?

230 289

Response: The Forest currently protects habitat for all active and highly suspected nest sites, and provides additional protection within the primary disturbance zone in the Special Habitat management area. The Forest provides habitat for 14 territories to ensure our

recovery target of 7 breeding pairs is met. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 15: Is the management direction, including standards and guidelines, for the bald eagle adequate to protect habitat and provide for its recovery?

289

Response: The final Plan protects habitat for all four active nest sites and two potential winter roost sites, and provides additional protection within the primary disturbance zone in the Special Habitat management area. The Forest provides habitat for four active territories and two winter roosts to ensure our recovery target of four habitat areas is met. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 16: Is the management direction, including standards and guidelines, for marbled murrelet adequate to protect habitat and provide for its recovery?

271 289

Response: The final Plan protects all contiguous existing and recruitment habitat within a 0.5 mile radius of occupied sites and provides additional protection through surveys prior to any activities. In addition, all LS/OG1 and LS/OG2 areas within the marbled murrelet near zone (an area that extends inland from the coast between 25-35 miles in the vicinity of the Forest) are protected as late successional reserves to contribute to the recovery of the marbled murrelet. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 17: Is the management direction, including standards and guidelines, for the northern spotted owl adequate to protect habitat and provide for its recovery?

227 289 325

Response: The final Plan protects most designated critical habitat for the owl in large late-successional reserves. In addition, 100 acres of the best northern spotted owl habitat is retained for all known (as of January 1, 1994) spotted owl activity centers outside reserves. The Forest provides suitable habitat for an estimated 270 spotted owl territories to contribute to the recovery of the species. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 18: Is the management direction, including standards and guidelines, for fisher and marten adequate to protect habitat and prevent their listing?

82 227 271

Response: The final Plan protects most of the suitable habitat for the marten and fisher in large late successional and other reserves, and provides additional protection within the Pilot Creek area as a Managed Habitat management area. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 19: Is the management direction, including standards and guidelines, for endemic salamander adequate to protect habitat and prevent its listing?

20 324

Response: The final Plan incorporates the direction from the FSEIS ROD for the Del Norte salamander. In addition, both late-successional and riparian reserves provide protection for most salamander habitat. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 20: Is the management direction, including standards and guidelines, for the northern goshawk adequate to protect habitat and provide for its recovery? Is it consistent with neighboring Forests?

227 289

Response: The final Plan protects most of the suitable habitat for the northern goshawk in large late successional and other reserves, and provides additional protection through standards and guidelines which would protect active or occupied nest territories in the Forest matrix and Hayfork Adaptive Management Area. The Forest provides habitat in a number of large reserves to contribute to a well-distributed population. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 21: Is the management direction, including standards and guidelines, for the golden eagle adequate to protect habitat and provide for its recovery?

289

Response: The final Plan protects some of the suitable habitat for the golden eagle in large late successional and other reserves, and provides additional protection



through standards and guidelines which protect active or occupied nest sites. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 22: Is the management direction, including standards and guidelines, for the management indicator species adequate to protect habitat and provide well-distributed populations?

24 224

Response: The final Plan uses a combination of standards and guidelines and land allocations, including late successional and riparian reserves, to protect habitat for all late successional-dependent management indicator species (MIS). Habitat for MIS species using earlier successional stages will eventually be maintained at levels which occurred historically. The Forest Plan is moving away from a single-species approach towards a multi-species ecosystem approach that would manage the Forest to maintain “near natural or historic” levels of habitat and special habitat components. This question is further addressed in Chapters 3 and 4 of the final EIS and Chapters 4 and 5 of the final Plan.

Comment 23: How much timber will be generated from the Special Habitat Management Area, and what situations are envisioned that would require timber harvest?

23

Response: Management of designated wildlife habitat areas will require additional site specific evaluations and consultations with the USFWS, which makes it difficult to predict this unregulated component. In the final Plan, the purpose of any silvicultural treatments within late successional reserves is to benefit the creation and maintenance of late-successional forest condition. A management assessment would eventually be prepared for each large late successional reserve (or group of smaller late successional reserves) before habitat manipulation activities are designed and implemented.

Riparian Zones

Comment 1: The Plan should provide stronger protection for ephemeral and intermittent streams, as they are critical to the protection of water quality and aquatic resources.

24 62 96 227 288

Response: The final Plan calls for a minimum protection zone of 100 foot slope distance or the height of 1 site-potential tree, whichever is greater. Depending upon habitat needs, this riparian zone may be increased or decreased, based on specific information gained through watershed analysis and project planning.

Comment 2: The Plan must include a riparian conservation strategy that provides sufficient protection to the continuum of riparian areas, including wetlands and seeps.

225

Response: The Final Plan includes specific riparian reserves for small wetlands and seeps. The reserve is the same as required for intermittent streams (minimum of 100 feet or one site-potential tree height).

Comment 3: The restoration of riparian areas should not occur until the root causes, such as clearcutting and salvage harvest of live trees, are solved.

288

Response: Timber harvest within the riparian reserve is specifically prohibited in the preferred alternative. Salvage could only occur when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected. Site-specific restoration of riparian areas can be effective irrespective of the original cause of degradation.

Comment 4: The Plan should be consistent with the SAT report, including full-SAT buffers, to provide adequate protection for riparian ecosystems.

A	B	23	52	62	63	96	108
180	193	196	208	217	225	227	243
256	263	270	274	288	324		

Response: Riparian management direction in the Final Plan is consistent with FSEIS ROD. The FSEIS on

which the ROD is based incorporates information from the SAT and FEMAT reports.

Comment 5: A 300' horizontal distance should be included in the riparian reserves around the side channels of Class I and II streams.

208 225 324

Response: Current management direction for Class I and II streams is a riparian reserve of 300 feet slope distance or two site-potential tree heights, from the edge of the active channel (FSEIS ROD). Any side-channels would be included in the active channel. Side-channels are most likely to occur when the stream has a floodplain. The entire 100-year floodplain is designated as a riparian reserve.

Comment 6: Two or three site-potential tree heights should be used in determining the greatest distance for riparian reserves adjacent to wetlands, bogs, ponds, springs, fens, seeps, etc.

23 208 225 324

Response: The standard of 1 site-potential tree height for riparian reserves around wetlands of less than 1 acre is interim. This standard may be increased, or decreased, dependent upon criteria developed during watershed analysis of a specific watershed. The interim width is specified in the FSEIS ROD.

Comment 7: The words "whichever distance is greater" should follow the prescribed distance for riparian reserves, as in the SAT report.

63 208 225 324

Response: This wording is used in the Final Plan.

Comment 8: Streams bearing amphibians should be automatically designated as Class I or II streams independent of fish presence.

23 208 225 324

Response: The purpose of designating streams by class is to provide essential habitat to aquatic/riparian dependent species. At present only fish-bearing and non-fish-bearing perennial streams are designated as Class I or II. The specific habitat needs of selected amphibians will be determined on a watershed basis, as an essential component of watershed analysis. The Aquatic Conservation Strategy specifically calls for habitat to

support well-distributed populations of vertebrate riparian-dependent species.

Comment 9: The riparian reserves should be based on horizontal distance, as in the SAT report.

324

Response: The rationale for determining riparian reserves using slope distance rather than horizontal distance was based primarily upon the fact that site-potential trees would fall and be categorized by slope, not map, distance.

Comment 10: Although the addendum says the President's Plan will take preference, it is unclear whether the Clinton Plan takes precedence over the draft Plan's riparian management zones.

96

Response: The final Plan has incorporated the management direction and the standards and guidelines from the FSEIS ROD for riparian reserves. See the Riparian Reserve Management Area section of Plan Chapter 4.

Comment 11: The documents should clearly describe the characteristics of ephemeral streams that would qualify them for protection.

96

Response: Ephemeral streams must have two attributes in order to be included in the riparian reserves: (1) a well-defined stream channel; and (2) annual evidence of scour or deposition.

Comment 12: The SAT report's recommendations for protection of sensitive uplands and headwaters including intermittent streams may be inadequate to protect water quality and riparian microsite conditions, including moisture and air temperature, that cause small seeps and springs to provide suitable habitat to a host of riparian-dependent species including amphibians and rare plants. The Plan should be strengthened to provide adequate protection in these areas.

225 324

Response: The riparian reserves established for seeps and springs are interim until specific micro-climatic habitat needs are analyzed for individual watersheds during the watershed analysis process.

Comment 13: Create a 100 foot buffer for the protection of stream habitats within the Six Rivers National Forest bounding private parcels, especially in the Smith River drainage.

229

Response: Perennial stream habitat is currently protected by a zone equal to one site-potential tree, which in most cases exceeds the 100 foot buffer you mention.

Comment 14: Proposed standards and guidelines are almost certain to fail because they do not focus on the linkages between up-slope and upstream management and downstream responses of riparian and in-channel stream habitat and aquatic biota. Buffers cannot compensate for downstream-propagating, systemic damage from sedimentation derived from upslope or headwater disturbance.

227 324

Response: It is true that the riparian standards and guidelines focus on preservation of riparian zones, but the overall Aquatic Conservation Strategy requires that all watersheds be restored to the sediment regime in which the aquatic ecosystem evolved. Watershed restoration is to be an integral part of the program to restore fish habitat. Specific operational constraints upon ground disturbing activities are included in the standards and guidelines. Areas susceptible to erosion will be identified in the watershed analysis process.

Comment 15: The draft Plan riparian reserves fail to include landslide prone areas or inner gorge slopes as described by the SAT report for Class III and IV streams. This is a serious omission because the majority of sediment in most basins is generated in these smaller and more numerous headwater tributaries.

23 208 225 227 324

Response: The Plan has specific direction to include riparian reserves for the inner gorge along intermittent streams. Unstable and potentially unstable areas also require a reserved protection zone

Comment 16: Neither the FEMAT, SAT, or draft Plan definitions with regard to inner gorge are adequate. The definition should include both the convex slope break at the top of the inner gorge and the slump-earthflow landforms that extend to the gently-sloping terrain above.

23 324

Response: The inclusion of the slope above the inner gorge within the riparian reserve is determined by assessment of the potential instability of specific sites during project planning. The watershed analysis done prior to project planning will identify land-types within the watershed that are especially unstable, and therefore “red-flagged” for detailed analysis.

Comment 17: The riparian reserve for inner gorge should include at least an additional 200-300 foot no harvest, no road construction buffer zone above the slope break to reduce groundwater and surface flow impacts and maintain vegetative stability.

23 208 225 324

Response: See response to comment 16.

Comment 18: Any terrain adjacent to and above inner gorge slopes that shows signs of deep-seated mass failure landforms should be protected from logging and road construction.

208 225 324

Response: See response to comment 16.

Comment 19: The Plan should add high risk (in addition to extremely high risk) landslide hazard areas to the riparian reserves.

324

Response: Watershed analysis will identify critical hillslope, riparian, and channel processes that must be evaluated in order to delineate riparian reserves. In addition any unstable and potentially unstable areas are to be protected within a riparian reserve (See standards and guidelines for Riparian Reserve widths).

Comment 20: It is unclear whether riparian protection applies to the 20 percent of the Forest that is rated as having “very high” erosion potential (DEIS p. III-123). As the Forest Service evidently did not consider fragile lands to be a serious issue in the 4 northern Forests, it seems likely that substantial amounts of these lands remain vulnerable to disturbance by timber management activities.

227

Response: Surface erosion potential is routinely assessed at the project planning level. The yield of sediment to streams from surface erosion on the Forest

has been assessed as minor, in comparison to that contributed from landslides. Therefore, only inner gorge, unstable and potentially unstable lands are included in riparian reserves.

Comment 21: The draft Plan fails to identify an adequate network of key watersheds, and they permit ecologically harmful activities in key watersheds. Current conditions require watershed refugia where management is focused exclusively on preventing human-caused disturbances or stresses.

227 324

Response: Key watersheds are well distributed on the Forest and comprise 72 percent of the Forest. These watersheds are not designated to be withheld from all management activities, but fish habitat is the primary resource value. Key watersheds have the highest priority for both watershed analysis and restoration work. Timber harvest can only occur if Aquatic Conservation Strategy objectives are met.

Comment 22: The draft Plan would be improved by the designation of key watersheds in which protection of riparian and aquatic-dependent plant and animal communities should be a primary objective.

225 324

Response: Key watersheds are an overlay of all allocations of Forest lands. The riparian reserves, which constrain activities in riparian areas, apply over the entire Forest. These reserves are designated with consideration for all aquatic-dependent species.

Comment 23: There should be a prohibition of road construction and timber harvesting in key watersheds. This is essential to protecting outstanding anadromous fisheries and water quality of existing and proposed wild and scenic rivers.

35 224 274

Response: See response to comment 21.

Comment 24: A vigorous program of watershed-level management to protect and restore stocks at risk should be the cornerstone of any conservation strategies taken by the Forest for salmonids. The Forest Plan must commit to a system of refugia for aquatic and riparian species, develop criteria for designation of refugia based on existing and potential habitat quality for species, and remove refugia from timber harvesting and road

construction. The only activities that should be allowed are restoration projects that focus heavily on the decommissioning of roads, control of sediment sources, and tree planting.

23

Response: See response to comment 21.

Comment 25: The Final Plans should prohibit timber harvest along all riparian and landslide-prone areas, including Class IV streams, wetlands, inner gorge and high and extreme landslide hazard areas.

22 23 24 72 96 108 198 208
225 227 288 290 324

Response: These areas are currently protected from timber harvest by meeting the criteria for designation as Riparian Reserves.

Comment 26: The salvage of “damaged” timber from RMZ 1 is not justified. The ability to salvage damaged timber from areas otherwise reserved from harvest encourages arson during down economies.

96

Response: Salvage of timber in a riparian reserve can only be done when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected. The controlling factor is not sale of salvaged logs, but rather whether the salvage will be beneficial to the aquatic system.

Comment 27: Replace the draft Plan standards and guidelines for road management within riparian reserves with the SAT standards and guidelines, including those for hazard tree removal, road management planning and monitoring, road construction, fish passage and other road-related activities.

23 208 225 324

Response: The road management standards and guidelines in the SAT report were expanded in the FSEIS ROD and are incorporated into the Final Plan.

Comment 28: The proposed mileage of road removal in the PRF alternative of the draft Plan does not demonstrate a strong commitment to riparian protection.

21

Response: The preferred alternative proposes to decrease the total number of miles of road on the Forest by 9 percent over the next decade, and by 17 percent over the next 5 decades. Road removal is only one aspect of riparian protection; see the Aquatic Conservation Strategy in the Forest-wide section of Plan Chapter 4 for the full strategy for riparian protection.

Comment 29: Cattle should be severely restricted from riparian reserves so they can't damage riparian areas.

18 175

Response: All riparian zone protection measures and standards and guidelines are to be met in grazing allotments. If grazing practices do not meet the objectives of the Aquatic Conservation Strategy, they will be modified or eliminated as needed.

Comment 30: Although impacts to a site from cattle may be difficult to assess, similar non-impacted streams may serve as comparisons/controls for species composition, habitat quality and quantity, presence or absence of fish, and relative abundance.

141

Response: Riparian Reserve conditions will be monitored in grazing allotments. Non-grazed watersheds in the same soil and vegetative characteristics may not exist, given the more than 100-years of grazing in portions of the Forest. In such a case, the current habitat conditions would be assessed using individual parameters such as degraded banks and lack of riparian vegetation.

Comment 31: How will range management be adjusted to meet the aquatic conservation strategy objectives?

174

Response: See response to comment 29 and 30.

Comment 32: The FEIS should show an analysis of how riparian objectives will be met while maintaining current AUM production, and the effects of implementing new riparian standards on AUM availability and distribution among range ecosystem types. There is concern that the increased emphasis on riparian protection may expose upland and secondary rangelands to significantly increased impacts if no reduction in AUMs is planned.

225

Response: Allotments on the Forest are not fully utilized and have not been overgrazed historically. Grazing standards and guidelines in riparian reserves specify that grazing must not prevent attainment of aquatic conservation strategy objectives. If negatively impacted areas are identified, steps will be taken to reduce or eliminate impacts to an acceptable level.

Comment 33: The Six Rivers National Forest has consistently allowed overgrazing in sensitive areas with resultant destruction of native plant habitat and degradation of riparian corridors.

E

Response: Riparian areas contribute a relatively small amount of forage for livestock. See the response to comment 32.

Comment 34: Standard and guideline #1 under recreation management refers specifically to OHV trails within riparian reserves, while standard and guideline #3 applies to other trails within riparian reserves. Standard and guideline #3 is much more lenient than #1 and as such is predetermining that the impacts are solely determined by the type of use. All user groups should be treated equally; therefore, #1 and #3 should be combined to pertain to all trails regardless of user type.

230

Response: References to specific types of use are omitted in the standards and guidelines in the Final Plan.

Comment 35: There is concern about the assumption that human recreation and specifically motorized recreation activities are incompatible with riparian areas. Riparian management should not include the wholesale exclusion of major recreational uses and/or segments of the public to the benefit of other user groups. Motorized access for scenic viewing and OHV access to riparian areas should be added to the list of groups who desire water-related recreational opportunities.

230

Response: Standards and guidelines in the Final Plan require that recreation facilities and practices in Riparian Reserves do not retard or prevent attainment of Aquatic Conservation Strategy objectives. The recreation sections of FEIS Chapter 3 identify the wide variety of water-related recreation uses people desire.

Comment 36: Based on GIS analysis of our salmon data and Forest Service data on Option 9, we estimate that 3.4 million acres of land within the salmon's existing range are located outside of reserved and would be subject to logging and road building. Moreover, only 30 percent of the non-reserved land containing salmon habitat is inside key watersheds; the remainder would be subject to extensive land-use disturbance without the safeguards provided in key watersheds.

227

Response: Approximately 72 percent of the Six Rivers is within Key Watersheds; this is the highest of the 17 National Forests within the range of the northern spotted owl. Only 9 percent of the Forest is within matrix lands or the Hayfork AMA; and much of these matrix lands, such as the Upper Mad River basin, do not contain salmon habitat. A relatively small portion of the Forest is available for timber harvesting; and riparian reserves will apply throughout the matrix to maintain habitat for aquatic and riparian-dependent species.

Comment 37: Thinning and salvage activities in Late-Successional Reserves would be detrimental to watershed and restoration efforts. A key element of the Aquatic Conservation Strategy is to restore watersheds by closing and decommissioning unnecessary logging roads. But proposed management activities in forest reserves would require continued or even greater road access, making watershed restoration difficult or impossible in reserves.

227

Response: Late-Successional Reserves were located within Key Watersheds as much as possible. Therefore, road densities will be reduced within those LSRs within Key Watersheds. The Final Plan proposes the construction of an average 2.5 miles of road annually, while decommissioning an average 25 miles of road annually. Road densities Forest-wide will be reduced. Riparian Reserves apply within Late-Successional Reserves, providing protection to meet Aquatic Conservation Strategy objectives.

Comment 38: Watershed analysis is no substitute for protection. Previous Forest Service efforts offer scant hope that watershed analysis will result in protection of aquatic ecosystems: on the contrary, the agency has tended to use watershed analysis to justify logging watersheds that are in relatively good condition. An

ecosystem-oriented approach should protect the remaining high quality habitat and protect further degradation of other stream habitats.

227

Response: The designation of Key watersheds was based on two criteria: some were selected because they had high quality conditions and could serve as anchors for the potential recovery of depressed stocks. Others were selected because they had lower quality habitat and had a high potential for restoration for future high quality habitat; these watersheds have the highest priority for restoration on the Forest. Watershed analysis and other landscape-level analyses are not a substitute for protection; watershed analysis will discuss the past and present conditions in the watershed and provide management considerations for future activities within the watershed in order provide an ecosystem approach.

Comment 39: The final LRMP should provide protection for specific areas of the Forest important to fisheries and water quality, including: Hardscrabble Creek in its entirety for riparian and water quality standards; Blue Creek for its fisheries and Port-Orford-cedar stands; Tish Tang a Tang Creek; and the Horse Linto/Tish Tang/Ladder compartments S/SE of the Hoopa Indian Reservation. The Smith River and the Van Duzen watersheds should be designated as Key Watersheds.

1 224 227 229 243

Response: Hardscrabble Creek, Smith River, Blue Creek, and Horse Linto Creeks are designated for management as Key Watersheds under the preferred alternative, in which fish habitat and water quality receive first priority in consideration of management activities. The Van Duzen and Tish Tang a Tang are not designated as Key Watersheds. However, the majority of the Tish Tang a Tang and Van Duzen watersheds are in either the Trinity Alps wilderness or Late-Successional Reserves, and both of these areas are reserved from timber harvesting; even without Key Watershed status, riparian reserves and water quality standards and guidelines provide protection for aquatic and riparian habitat and the species dependent on that habitat.

Fisheries

Comment 1: The use of pounds of fish harvested commercially and WFUDS for sport fishing are inappropriate measures for the success of a fisheries program. The Forest should drop this approach and focus on its mandate under NFMA to maintain aquatic diversity and viable well-distributed populations of fish and other aquatic and riparian associated species throughout their range on the Forest.

23 224

Response: The emphasis in the Forest Plan for fisheries has been changed to reflect the wide-spread concern for the current low levels of anadromous fish populations in Northern California. We agree that it is unrealistic to project optimum fishery outputs, by assuming a population level that would fully occupy the habitat. The mission of the Forest Service is to provide the best possible quality habitat irrespective of varying population levels.

Comment 2: Predicting an increase in fish production based on fish habitat improvement projects is optimistic, and has not worked in the past. Habitat improvement work is questionable and may be detrimental. As the Forest moves into ecosystem management, it should focus on watershed restoration projects such as road decommissioning and upgrading, tree planting, and control of sediment sources to benefit fisheries habitat.

23 224

Response: See response to comment 1.

Comment 3: While a variety of factors (including dams, over fishing, poaching, agriculture, and hatcheries) share responsibility for the dire condition of anadromous fish in California, the degradation of spawning and rearing habitat quality on Federal lands is clearly a major cause of the crisis.

227

Response: See response to comment 1.

Comment 4: The Forest should provide special protection of at-risk stocks, including protection of spawning habitat and headwaters areas.

E 211 219 288 290

Response: The Forest has begun a program of protection and improvement of watersheds containing habitat essential to stocks of anadromous fish considered to be at some degree of risk for extinction. This Key Watershed program encompasses 70 percent of the Forest. In these watersheds all management activities are secondary to the fish habitat considerations and objectives. No activity will be implemented in a Key Watershed until watershed analysis and NEPA documentation is completed.

Comment 5: The Forest Service, through the FEMAT report, the SAT report, and the PACFISH strategy, has acknowledged that numerous stocks of pacific salmon are at risk of extinction throughout the four northern Forests. To stray from the best science in ecosystem management at this time may leave these Forest Plans open to legal challenge.

324

Response: See response to comment 4.

Comment 6: The Preferred Alternative proposes to create non-typical old growth habitat. This will cause an increase in decomposing biomass on the forest floor and will likely alter the quality of the water discharged into the streams. Will aquatic or other life forms be affected?

139

Response: The forested streams in Northern California are dependent upon organic detritus for the basic nutrient input into the aquatic ecosystem. An increase of detritus in the form of decaying leaves, small wood, etc., increases the food supply for aquatic animals.

Comment 7: While it is beyond the ability of the Forest to affect the ocean environment in which anadromous fish live, what steps are being taken to protect the summer steelhead and anadromous fish that spawn on Forest land? Would restricting sport and commercial fishing during the summer have a beneficial effect on fish populations?

289

Response: Protection of individual populations of fish, such as summer steelhead, is within the authority of the California Department of Fish and Game. The Forest has the authority to restrict access that may aid in protection of low level populations from poaching or over-harvest.

Comment 8: The Forest is not taking steps to protect other species like prickly sculpin, coast range sculpin, Pacific lamprey, stickleback, Sacramento sucker, or speckled dace. These are all species that are important to the protection of the aquatic diversity of the Forest as well as the integrity of the aquatic diversity of the State of California.

208

Response: Non-salmonid species of fish on the Forest, such as sculpin, suckers, and dace, are assumed to benefit from the habitat protection and improvement afforded salmonids. Aquatic diversity will be assured by a healthy aquatic ecosystem.

Comment 9: Anadromous fishery resources are almost entirely dependent on upstream watersheds in the Pacific northwest for their perpetuation. Fisheries are valuable to local economies as well as anglers.

256

Response: Dependency on upstream watersheds and the value of fisheries are identified in the EIS and Plan.

Comment 10: To assess specific population of fish within key watersheds, more than just index reaches should be monitored for spawners. There have not been good correlations between peak counts (or total estimates) of spawners and subsequent juvenile production. Simply counting spawners is not adequate to take the pulse of any particular fish population. The monitoring guidelines state that “counts of outmigrating young provide a more specific indication of spawning and rearing habitat productivity than counts of resident fish or returning adults.” For species like chinook that typically do not spend a year rearing in streams, numbers of emigrating salmon provide a good indicator of productivity of spawning habitat. For species like steelhead that usually rear for one or more years in fresh water, emigrant numbers reflect productivity of both spawning and rearing habitats. In addition, marked recapture studies of emigrants along lower ends of rivers would allow estimates of basin-wide and perhaps even estuarine production.

141

Response: Populations of anadromous fish are inherently highly variable because of the reliance upon a variety of habitats, extending though several years from the spawning gravel to the ocean and back to the natal stream. Anadromous fish are also subject to varying

rates of harvest throughout their adult life. Quantitative thresholds for individual stream populations must consider the trends of the larger river population. Salmon populations can be effectively monitored with spawning surveys given the relatively short fall and early winter spawning season. Steelhead spawn on the Forest from mid-winter through late spring and can best be assessed by monitoring out-migrants from natal streams. The Forest plans to greatly expand the out-migrant sampling program.

Monitoring thresholds for individual components of fish habitat are easier to quantify, but even these are arbitrary unless we know the range of natural variability within the subject watershed. The threshold levels on the Forest are established at relatively low levels in order to give early notice of incipient habitat problems. A 20 percent increase in fine sediment may be within the range of natural variability, but this threshold alerts the Forest to begin detailed assessment of natural and man-caused sediment sources in the watershed. The Forest fisheries monitoring effort will always be a sample of the entire resource, and must be operated within existing funding constraints. Diversity of the aquatic ecosystem will be monitored with surveys of aquatic insects and the herpetofauna (amphibians and reptiles).

Comment 11: The eight fisheries monitoring purposes in Appendix H of the draft Plan appear to be comprehensive for anadromous populations of fish, but the accompanying thresholds of concern do not appear adequate to answer each stated monitoring purpose. For example, monitoring purpose 2 refers to evaluating changes in numbers or composition of spawning populations of anadromous fish, but it is not clear that a three year decline in spawners at only index reaches of some streams will be an adequate measure of population declines. There is also no mention of monitoring resident populations of fish, which may be most affected by habitat changes, since those fish do not leave the streams during their lives.

141

Response: See response to comment 10.

Comment 12: Anadromous salmonids have a high fidelity to natal streams and even to specific sections of their home streams. It is important to monitor all of the important habitats used by each identified fish stock at risk, in order not to base management decisions upon incomplete data. In addition, monitoring index sites only one in every three years would yield insufficient information on rapidly declining fish populations and

aquatic habitats. According to Table V-1, the Effectiveness Monitoring Program, there will be annual fish counts on approximately 40 miles of representative stream reaches and field surveys of approximately 70 miles of fish habitat conditions in sample riparian corridors. Will enough sites be monitored each year to adequately assess the populations of fish stocks at risk?

141

Response: See response to comment 10.

Comment 13: It appears that specific quantitative thresholds of concerns were selected arbitrarily. For example, regarding residual pool depth, the draft Plan sets a 20 percent change in residual pool depth or volume over three years as a threshold of concern. What basis exists to judge whether a decline in 20 percent, or 15 percent, or 25 percent is meaningful to fish?

Note: letter states that a recent publication, "Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska" has excellent discussions of most of the monitoring items in the draft Plan.

141

Response: See response to comment 10.

Comment 14: The Monitoring Plan sets a threshold of concern for anadromous population trends which would allow as much as 20 percent annual decline in measured numbers of spawning adults for three years before the threshold is reached. There are several concerns with this approach. First, a 20 percent decline in numbers, compounded over three years, would leave more than half (51 percent) of the original population. Second, the natural variation in numbers of spawners may easily be more than 20 percent (plus or minus) between years. Third, only measuring numbers of spawners may not be a suitable method to assess fish populations (see Comment 10). The threshold also appears to conflict with the stated threshold of concern in the riparian section "fish counts are below 85 percent of desired levels for sampled species." Which threshold of concern is correct?

141

Response: See response to comment 10.

Comment 15: Monitoring Item 5, levels of fine sediment, would allow an increase of less than 20 percent in fine sediments in index streams. It is not stated

whether this refers to suspended or bedload sediment, but the reference to total particle size distribution suggests bedload. What levels would be allowed, or even measured, at non-index streams? Many streambeds have background levels of fine sediments that are near the maximum tolerable for spawning (about 15 to 30 percent by volume). What effects would there be from allowing an increase of nearly 20 percent more fine sediments on streams with an existing high level?

141

Response: See response to comment 10.

Comment 16: Monitoring Item 7, habitat diversity, would allow an overall decline of less than 10 percent. Presumably, this refers to some index of diversity for macro-invertebrates or perhaps fish. Would an overall change of 10 percent be detectable, or even meaningful, if it could be detected? The monitoring guidelines have a detailed discussion of diversity indices for both fish and macro-invertebrates. It is not clear that there is simply one diversity index that would be meaningful by itself.

141

Response: See response to comment 10.

Comment 17: The three thresholds for large woody material (LWM) appear confusing. The desired future conditions are not stated for this parameter for various streams, but there is some research information for defining LWM levels in various sizes and channel types for fish streams. It would be best to define the desired future condition for this parameter for each stream, based on site-specific characteristics of channel order and channel type. Regarding the thresholds in the draft Plan, a more realistic time period to look for the desired future condition is the number of years after an extreme flood. Also, would a 10 percent decline in LWM at a specific site even be detectable?

141

Response: See response to comment 10.

Comment 18: Landslides and extreme floods are major determinants of pool conditions in the high energy streams located on the Forest. Will the monitoring of pool conditions at index reaches be adequate to evaluate effects of all major landslides upon pool habitats throughout the Forest?

141

Response: See response to comment 10.

Comment 19: There is a great lack of information on many fish stocks in Northern California. It is important to ensure that enough index streams reaches are selected to include at least essential habitats for all of the fish stocks at risk on the Forest. Channel types should include both Rosgen C and B types.

141

Response: See response to comment 10.

Comment 20: The Monitoring Plan is inadequate to provide annual quantitative information about adult salmon populations, many of which may be headed for extinction. There should be no commitment of resources until adult populations and trends are known at the basin and watershed scales.

141 208

Response: See response to comment 10.

Comment 21: The Forest Service and California Department of Fish and Game should jointly collect statistically valid data about anadromous fish populations. This includes all races and life histories of chum salmon (Mill Creek), chinook salmon, steelhead trout, and cutthroat trout. If there is not annual collection of scientifically credible data about the size of each run year, there should be no annual harvest of these fish. Anything less jeopardizes the long-term productivity of specific fish stocks.

208

Response: See response to comment 10.

Comment 22: A common flaw in the way monitoring is being applied is that the current degraded conditions are often used as the “baseline” upon which further degradation is measured. With respect to anadromous fish, habitat conditions and wild populations that existed in 1940 should be the baseline. Any significant catchment which reflects 1940 conditions should be a key watershed, and no risky projects should be allowed. These undamaged streams and accompanying biota are the baseline conditions which should be compared to “managed” areas to determine if desired conditions are being met.

324

Response: Fish habitat conditions in past years, such as 1940, can only be speculated upon. Present conditions are much more readily assessed in terms of the relation to optimal or desired conditions for individual habitat components, such as stream shade canopy or in-stream cover. Insofar as risk of management activities to fish habitat, 90 percent of the Forest is currently designated as key watershed for anadromous fish.

Comment 23: Artificial stocking should only be allowed after the most rigorous review by agency and independent biologists.

23

Response: In the Trinity and Klamath river basins hatchery production of anadromous fish is limited to mitigation levels for habitat lost above dams and is under the authority of the California Department of Fish and Game. The Forest is supportive of and cooperates with small-scale hatchery supplementation using native stocks of chinook salmon. Any such projects are authorized only after thorough analysis of several biological criteria, which protect the native stock.

SOCIAL AND ECONOMIC ENVIRONMENT

Social

Comment 1: Make plans to help the world weather crisis.

166

Response: Global warming is discussed at the national level in the USDA Resource Planning Act (RPA) Assessment and Program and Resource Conservation Act Appraisal. The Chief of the USDA Forest Service has directed that NEPA disclosure documents at the Regional, Forest, or project level are not appropriate means for addressing this issue at this time due to significant scientific uncertainties.

Comment 2: Design new industries that will furnish substitute jobs, profits, and building materials in time to spare our virgin forest.

166

Response: This issue is beyond the scope of Forest level planning. The Forest Service is involved at the national level in research and development of alternative uses for wood products and building materials. The Forest's vegetation was manipulated by Native Americans and settlers before the Forest was established and is not considered a "virgin" forest.

Comment 3: The Plan identifies only two social issues: amount of timber harvest and protection of cultural resources. Recreation, and its availability in all forms, should also be identified as a social issue.

230

Response: The final EIS and Plan discuss the social aspect of all issues. Issues relating to forest access, recreation, and its availability are discussed in Recreation Program Management and Transportation and Facilities Management sections of the FEIS.

Comment 4: The drastic reductions of the land base available, the variety of land forms available, and the ability to access the public lands of Six Rivers National Forest constitutes a social impact which must be explored for the consequences and cumulative impacts.

230

Response: Impacts of the reductions in the forest's "available" (open to regulated timber harvest) land base and transportation system road network that will occur through implementation of the FSEIS ROD and its standards and guidelines are addressed in Chapter 4 of the final EIS.

Comment 5: The term statement "Environmental Priority people have no inherent conflict with utilitarian functions on National Forest Lands" inaccurately portrays extreme environmentalists.

230

Response: The statement did identify exceptions to the position it stated. The final EIS clarifies the range of positions within the social groups and the basic premises in relation to the social analysis.

Comment 6: The "Environmental Press" exaggerates impacts of recreational use. Man can co-exist with nature.

230

Response: Man's coexistence with nature is one of the premises of the Social section of the final EIS. Reporting on impacts of recreational uses is discussed in the Recreation Program Management section of the final EIS.

Comment 7: The EIS should discuss the "wise use" movement and identify it as a fourth trend affecting social conditions.

230

Response: A fourth trend is included in the final EIS to identify development of the "wise use" movement and the increased awareness of user groups in conservation and recreation.

Comment 8: The social groups were identified or separated by a perception of their environmental awareness level. "Amenity Emphasis" group should be changed to "Wise Use."

230

Response: The groups were identified by common behaviors, values, and other binding likenesses. The term "Wise Use" describes a conservation and use belief, but does not describe other factors of the social group as well as the term "Amenity Emphasis."

Comment 9: The social environment analysis is inadequate because there is no group designated as “Miners.” This group has existed in the area since the 1850s. Being a miner is as much a way of life as being an “Environmental Priority” person.

169

Response: The final EIS uses the term “Commodity Dependent” in place of “Timber Dependent;” this section includes miners and addresses their lifestyles.

Comment 10: The description of the “Amenity Emphasis” group is misleading and distressing when it says, “if it in some way conflicts with the availability of favored amenities.” People in this group are just as concerned for the environment as any other group.

230

Response: The description of the “Amenity Emphasis” group is based on interviews, contacts, and past and present public involvement input; it is accurate when the quoted phrase is used in context with the complete description. The final EIS identifies the recent trend of this group, in many cases, to take on a “wise-use” conservation attitude. The “Environmental Priority” description has also been revised.

Comment 11: The EIS should state that “Amenity Emphasis” group members value conditions which allow for motorized access for scenic viewing and OHV opportunities as recreational opportunities.

230

Response: The final EIS includes these activities.

Comment 12: A reduction of annual timber PSQ to 20 million board feet is in direct conflict with long-standing federal regulations to “facilitate the stabilization of local communities and opportunities for employment”.

230

Response: The reduced PSQ is a result of decisions made at the Department level as documented in the FSEIS ROD and are beyond the forest planning level. The social and economic impacts of the reduced PSQ are addressed in Chapter 4 of the final EIS.

Comment 13: The Forest has a duty to give consideration to communities and opportunities for employment within those communities.

8

Response: Consideration for communities must be framed within existing laws, regulations, and policy. The Forest is making an effort to consider the local communities’ economic base and employment opportunities. See Plan Chapter 4 for economic and social mitigations.

Comment 14: In these times of economic instability the fact is that rural economic development can be greatly enhanced through other resources such as fish and fishing. If in fact we are somewhere in between the \$4.5 and the \$45 million generated for fish on the Forest, either figure is a great wealth of economic stability for the local economies.

230

Response: Management of key watersheds and riparian reserves under the FSEIS ROD will have some effect on the fisheries. Also of concern is the possible listing by the U.S. Fish and Wildlife Service of several stocks of Pacific salmonids. These further social impacts are analyzed and addressed in Chapter 4 of the final EIS.

Economic

Comment 1: This plan provides for a very aggressive and broad mix of restoration and habitat improvement measures. At the same time it severely limits revenue producing activities like timber and mining. What is the cost of this plan and, more important, who will pay? Revenues generated from sale of commodity output, especially timber, is still the best way to provide funding for restoration or no-revenue generating projects. If access to the forest is mostly limited to those three percent who wish to hike and backpack how will the cost be fairly borne by them instead of the rest of us? We do not want to pay taxes to maintain the forest without equal access!

170 213

Response: Table II-17 “Average Economic Effects by Alternative” (EIS Chapter 2) presents a summary of costs and benefits for each alternative. The cost of the plan would be paid for by a combination of Forest receipts and taxpayer dollars. Timber receipts comprise approximately 99 percent of total Forest receipts. Forest receipts are generally divided three ways: 1) monies distributed to counties as 25 percent funds, 2) monies retained by the Forest Service as KV funds for reforestation and other resource work, and 3) monies returned to the U.S. Treasury. The revenues returned to the Treasury, combined with other Federal revenues and taxpayer dollars can then be distributed to Federal agencies through the budget appropriations process.

Comment 2: “Below-cost sales” should be a thing of the past. These subsidies (like low grazing fees and water allotments to agri-business) are simply welfare for the wealthy.

198

Response: Historically, the Six Rivers National Forest has not had a below-cost timber sale program. Revenues generated from the sale of timber on the Forest have, on average, been two to three times greater than the costs associated with preparing and administering timber sales (EIS Chapter 3, Economic Environment). None of the alternatives presented in the draft or final EIS would result in a below cost timber sale program. Table IV-18 “Average Annual Timber Outputs and Value” (EIS Chapter 4) displays the revenues and costs related to timber outputs by decade for each alternative.

Comment 3: We see no discussion of how the reductions in the Clinton plan will affect production cost

relationships. This is a critical item that must not be overlooked.

48

Response: The Final Environmental Impact Statement and Forest Plan are consistent with the FSEIS ROD. Management activities and outputs were remodeled to reflect the reductions in commodity outputs and the methods to obtain these outputs. Production cost relationships are built into the costs and benefits used in the economic modeling and will not change. Refer to EIS Appendix B for a discussion on economic modeling.

Comment 4: The largest contributor to present net value (PNV) is timber, followed by range use, recreation, and special use fees. No mineral revenues are forecast. This economic efficiency analysis is inadequate because it is supposed to consider the in-ground value of minerals but obviously did not.

169

Response: Mineral revenues are included in “payments to the Forest for special uses of National Forest land.” The PNV of the Forest minerals program is presented in Table IV-25 “PNV and its Primary Components” (EIS Chapter 4). The economic analysis for Forest mineral resources was based on actual extraction values. In-ground mineral values were not considered in the analysis because the Forest has no basis for determining these values at this time. There are no existing or proposed operating plans on the Forest from which in-ground mineral values can be derived.

Comment 5: This review is inadequate as it does not consider future economic impacts. The data end with 1990. Great dislocations have occurred since that time in timber, which this plan will further aggravate. Pelican Bay prison has had an opposite effect. Mining is not considered at all. An EIS is inadequate if the economic impact of the proposed action is not analyzed.

169

Response: The economic analysis is modeled over a 150 year period. Costs and benefits for forest programs and economic impacts to local communities are presented for the first 50 years. Present net value is calculated and presented for the entire 150 year analysis period. The results of these analyses can be found in Chapters II and IV. The analysis uses 1989 as a base year and all costs and benefits are expressed in terms of 1989 dollars, as per Regional direction (Completion of Forest Land

Management Plans, Sept. 21, 1990). Under this direction, the base year, 1989, represents a three year average of costs, values, employment and income, and other economic indicators between 1988 and 1990. This serves as a basis of comparison between the economic effects of previous management direction and that proposed in the alternatives, as well as a way to compare the alternatives themselves. The alternatives, by design, already incorporate the changes that have occurred in forest programs and the local economies since 1990. Minerals are addressed in the analysis (refer to response to comment 4).

Comment 6: "Recreation use of the Forest by local residents has little effect on the local economy" can be shown not to be the case. It is doubtful that any local sporting goods store, vehicle sales, boat sales, trailer sales, gas stations, and other recreation related business would agree with your assumption.

230

Response: Recreational use of the Forest by local residents does have a positive impact on recreational related businesses within the local communities. However, as stated in Chapter 3, Economic Environment, it represents a redistribution of monies already in the local economy from non-recreational to recreational consumer goods and services, rather than an infusion of new monies to the local economy from non-resident users.

Comment 7: The economies of the affected area are also affected by the availability of recreational opportunities. Developed recreation sites that provide for access to both motorized and non-motorized recreation opportunities do affect the surrounding communities' economic and social well being. The conflict over which types of recreation provide benefits to the local economy is well documented. The assumption driving the "President's Plan," that there is an increasing demand for non-motorized recreation and that such recreation will cause economic benefits to the surrounding communities, is pure political correctness without supportive data. A user group (wilderness) that comprises in general 1-3 percent of each Forest's recreational visitors would have to increase in numbers very dramatically to be able to produce the increases in use needed to provide private sector jobs.

230

Response: The Forest recreation program is designed to be balanced to meet user demand and does not vary

significantly among alternatives. Projected use of developed, dispersed, and hunting opportunities, which could be either motorized or non-motorized, is approximately 30 times greater than that of strictly non-motorized use (wilderness). EIS chapter 2, Tables II-3, II-5, II-7, II-9, and II-11 present the estimated demand for these four categories of recreation. All categories were assigned benefit values in order to estimate economic benefits to local communities (EIS, Appendix B, Table B-3). The benefits to be realized from strictly non-motorized recreation represent only 2 percent of the total estimated economic benefit of the Forest recreation program.

Comment 8: Increasing wilderness designations is costly in terms of dollars spent by the wilderness visitor versus the dollars spent by the more numerous multiple-use visitors. Protecting and enhancing motorized access is one of the few ways to provide economic activity for local communities that are being hard-hit by the loss of timber jobs from reduced logging on public lands. OHV recreation is now documented to generate over 3 billion dollars in economic activity in California alone and provides over 43,000 direct employment jobs.

230 259

Response: OHV use has been recognized as a valid recreational opportunity, and the alternatives provide for different levels of use. In all alternatives, there are adequate opportunities to meet the existing and projected demand as there are for all recreational uses on the Forest. The contribution of recreation is included in the income, employment, benefit, and cost effects shown in EIS Chapters II and IV.

Comment 9: Will revenues from increased commercial fishing over the span of the plan mitigate to some degree the economic effects resulting from reductions in timber harvesting?

289

Response: Current population levels of salmon derived from the Forest are so low that commercial harvest is minimal; therefore, we cannot reasonably estimate revenues attributable to the Forest. We have not estimated economic benefits, even during the 50 year planning horizon, because of our inability to predict when salmon populations may recover sufficiently to allow commercial exploitation.

Comment 10: To put a few hundred timber jobs ahead of the long-term health of almost a million acres of the

citizens' forestland would be extremely short-sighted and morally incomprehensible. Choosing PRF over OGR does exactly that. OGR supplies only 277 fewer jobs in the first decade than PRF! (And that's without taking into consideration the many non-logging jobs in the forest currently being created by Option 9 moneys and imaginative holistic forestry proposals.)

15 184

Response: The preferred alternative (PRF) was selected as the best mix of both commodity and non-commodity outputs allowing for a balance between community stability and resource protection and enhancement. In its final form, PRF is consistent with the FSEIS ROD and will provide even fewer timber related jobs than the OGR alternative. Non-logging jobs are incorporated into the employment projections for each alternative. Projections include direct and indirect jobs generated by range, fisheries, and recreation, as well as jobs generated through forest expenditures within the primary zone of influence. Many of the jobs generated through Forest expenditures are related to contracts including, but not limited to, reforestation, restoration and rehabilitation, and construction projects.

Comment 11: What do we do now to continue employment and profits? For every wood products job lost, we will also lose a service or retail sector job. In Humboldt County, this could mean the loss of 4,500 banking, real estate, and health care jobs. In other words, Preferred Alternative transfers productive wood products industry employees into our growing unemployment lines. These productive employees will also lose their health insurance.

51 166

Response: Effects on individuals, social groups, and communities are recognized in the EIS (Chapters 2, 3, and 4, Social and Economic sections). The alternatives analyzed in this EIS were formed in response to public comments on the 1987 draft, public issues, and legislative and policy changes affecting land use allocations. One alternative (PRF) was developed with direct input from a coalition of individuals representing local groups (EIS, Appendix F, The Coalition Group Members and Their Recommendations). As demonstrated in EIS Chapter 2, Management Requirements and Constraints for All Alternatives, the space for making decisions was very limited after providing for all the environmental laws and regulations. All alternatives would use a rural community assistance

program to assist local communities with economic diversification and development.

Comment 12: Given the reality of reduced budgets, the best opportunity to produce healthy forests is to focus activities on watershed restoration, fuels reduction, and brush control projects. This work will concurrently provide jobs for displaced timber workers and will help to keep the economies of our local communities healthy.

E 196

Response: Watershed restoration, fuels reduction, and brush control projects are incorporated in the alternatives (EIS, Chapter 2, Description of the Alternatives). Employment generated by these projects is included in the total employment projections. The amount of this type of work on the Forest would, however, be subject to funding levels. Refer to Appendix H, Budgets and Their Relationship to the Forest Plan, for a discussion on how budget levels could affect Plan implementation.

Comment 13: There is a concern that recent reductions in Forest Service staffing levels may make it difficult to achieve even these reduced timber sale goals in a timely manner. It is, therefore, likely that if the President's forest plan is accepted in March, the timber sale program would not be fully implemented until some time in 1995.

206

Response: Full implementation of the timber sale program may not occur until 1995 or later.

Comment 14: The DEIS shows that only \$12,133 in receipts were realized from the 1990 grazing program and that SRNF proposes to spend at least \$15,000 annually to monitor the program, which may not be adequate. We question the continuation of this damaging resource allocation. Grazing can adversely impact recreation, water quality, T&E species, and other Forest resources and values. It would be helpful if the final EIS evaluated the cost-effectiveness of continuing grazing in light of its adverse impacts on other resources.

225

Response: Grazing is one of the multiple uses of the National Forests as defined under the Multiple-Use Sustained-Yield Act of 1960. There is no data available to evaluate the cost-effectiveness of the range program in connection with its impacts on other resources.

Comment 15: The citizens of the U.S. should not subsidize extraction. In a sense, all Americans benefit from subsidized timber as it leads to lower housing costs. Housing is seen as one of the greatest multipliers of economic activity as it promotes so many ancillary industries. However, private timber land owners must compete with this subsidized timber from federal lands, driving their income down and, concomitantly, their ability to use less harmful and more expensive harvesting techniques or provide wildlife protection corridors and buffers. The cost of extraction should reflect the actual cost to the taxpayer, which will in all probability mirror the extraction costs of the private timber land owner.

67

Response: The base year (1989) timber values used in the economic analysis were based on actual forest receipts between 1989-1990 and escalated by 35 percent to reflect the estimated increase in timber prices as a result of increasing land allocations from timber to non-timber resources. The costs of extraction, whether by conventional means (tractor or cable) or non-conventional methods (helicopter), were then subtracted from the gross value of the timber to arrive at a net value the Forest would receive. For each alternative, a weighted average net value per MBF was developed given the mix of extraction methods assigned to the alternative. Trend factors were then applied to these values each decade to reflect a real increase in timber prices over time. Private timber land owners would receive a higher price per MBF if they bore the costs of extraction, or a lower price if the purchaser agreed to cover the costs of extraction, as in Forest Service timber sales.

Comment 16: Restricting timber production to only 43.5 MMBF a year in the entire Forest and adding additional areas for mineral withdrawal is not in the best interests of the economy of this area.

68

Response: The preferred alternative (PRF) was selected as the best mix of both commodity and non-commodity outputs allowing for a balance between community stability and resource protection and enhancement.

Comment 17: All logs should be sold at fair market value; all logging expenses, such as road maintenance and removal where necessary, should be born by the logger.

175

Response: Before timber or logs are sold in a commercial offering, an appraisal is done to estimate the fair market value of the timber or logs being offered for sale. The sale is then advertised at a rate that encourages sufficient competition to ensure that the sale results in values that are fair to both the government and the purchaser. The purchaser is responsible for the removal of the timber or logs and for maintaining Forest roads commensurate with their use.

Comment 18: The reduction in available timber supply from public lands has already been blamed for significant increases in timber and lumber prices. In the last two years, the price of Douglas-fir logs has doubled.

206

Response: Refer to EIS Appendix J, Regional Timber Supply-Demand Situation in California.

Comment 19: The DEIS discusses the increase in population during the next decade in Humboldt County and adjoining areas - not to mention the increase in population throughout California. The draft did not relate economic needs of the public in conjunction with land management strategies. American consumers have demonstrated considerable demands for wood products. The draft has not considered these "public needs" in relation to forest product outputs. Where will the building products needed to house the increased population come from if the National Forests of the west do not provide their share of the raw material base? Other building products such as steel, aluminum, concrete block, and plastic have been all named as possible substitutes. However, these products all require far more energy to produce and none of them are renewable as is the case with wood products. Lumber products also provide the added benefit to the overall environment in that they store carbon.

213 216

Response: Timber harvests on the Forest have comprised 3 to 19 percent of the total harvest within Humboldt, Del Norte, and Trinity counties since the 1950s (EIS, Chapter 3, Economic Environment). The Forest contribution would range from 1 to 8.6 percent under the alternatives presented in this EIS (Chapter 4, Economics). Refer to EIS Appendix J, Regional Timber Supply-Demand Situation in California, for the relationship of North Coast timber supplies to the situation in California. The impact of Six Rivers National Forest harvest levels on the West Coast or National supply-demand situation is beyond the scope of this analysis. Refer to the FSEIS for a discussion of the

timber supply situation at the West Coast or National level.

Comment 20: While I understand that reductions in logging and grazing may have serious short-term economic consequences for local communities, the levels of these activities allowed by the draft plan is clearly unsustainable.

220

Response: The alternatives presented in this EIS were developed by an interdisciplinary team representing all resources on the Forest. Each alternative must meet specific minimum management requirements and constraints designed to ensure sustainability of Forest resources. A complete description of these management requirements is contained in EIS Chapter 2, Alternatives Considered in Detail.

Comment 21: The American people have relied on our National Forests for lumber for many years. With the decline in the harvest on the National Forest the cost of lumber has soared to unbelievable prices. Men have been put out of work, the counties have received less funding, and construction costs have raised outrageously.

266

Response: Refer to EIS Appendix J, Regional Timber Supply-Demand Situation in California, for the relationship of North Coast timber supplies to the situation in California. There would be a reduction in 25 percent funds distributed to the counties in all but one alternative. Refer to the EIS, Chapter 4, Economics, for the discussion of the effect the alternatives would have on the 25 percent fund distributed to counties within the Forest's primary zone of influence.

Comment 22: Nearly all of the roads built on National Forest lands were constructed with public monies; either through the timber sale process by way of purchaser credit or from appropriated funds. How do you justify abandoning the investments made in these facilities? What are the dollar amounts of these investments that are to be abandoned? What are the amounts that will be required from appropriated funds for the maintenance of the roads/trails that survive?

13

Response: Lack of maintenance dollars and watershed restoration needs are the two primary reasons for closing and/or removing roads from the Forest transportation

system. Refer to the EIS, Chapter 2, Tables II-3, II-5, II-7, II-9, and II-11 for the miles of road proposed for decommissioning by decade for each alternative. The amount of "abandoned" investment can be estimated at \$25,000 per mile. It is difficult to calculate the actual amount without knowing exactly which roads would be closed. Average annual road maintenance costs would range from \$390 to \$450 per mile, for an estimated total of \$1.2 million per year to adequately maintain the Forest road system.

Comment 23: It is unfair that the citizens of the United States subsidize recreation for the local residents. If the Treasury is to accept lower receipts due to recreation set-asides, those that use those set-asides should be required to contribute. I now use the western U.S. for free and feel I should pay above and beyond that which people who never tread a path or camp pay. The economic analysis does not explore this revenue source. The Forest Service should explore a means of collecting a fair share without creating a back-country police-state or city/D.C. bureaucracy.

67

Response: The ability to charge user fees other than at developed campsites is beyond the scope of this analysis. The authority to make this decision rests at the National level and not with the Forest. The Forest does periodically review and revise user fees at developed campgrounds. Forest fees are compared to the market value of other federal and private recreational user fees within the state, and to the cost of maintaining recreational facilities and programs. User fees are adjusted to take these factors into account. Given the potential variability in market values and costs, it would be difficult to predict the change in fees over time for this broad scale level of analysis.

Comment 24: In its present condition the Forest has tremendous recreational value and great long-term potential to enrich local economies through tourism as well as sustainable forestry and ranching. It does not make sense to extract so much timber and allow so much road building and overgrazing in the short-term that the Forest can ultimately support neither commercial enterprises nor recreation.

220

Response: See response to economics comment 20.

Comment 25: The cumulative impacts of massive alterations in use patterns and massive restrictions on

vehicle use and access are not adequately addressed in the DEIS and should be discussed as they relate to the economies and social setting of the affected sphere of influence.

221 230

Response: Refer to EIS, Chapter 4, Social and Economic Environments for a discussion of cumulative impacts. See also responses to comments 5 through 8, 11, 19, and 22.

Comment 26: It appears unlikely that given the loss of timber revenues the federal government will continue to subsidize National Forest forestry for the decades needed to achieve true ecosystem management. Unless the Forests can convert into revenue the non-timber values that are driving forest policy, the move to ecosystem management will always be at risk.

221

Response: The final EIS and Forest Plan designate land allocations and establish the framework for management activities through the application of standards and guidelines. The success of this aspect of the Forest Plan is not dependent on the level of funding acquired. The Final EIS and Forest Plan provide the basis for decision-making to propose budgets and allocate funds, but cannot guarantee funding. The Forest budget is a function of Congressional appropriations, and is outside the scope of these documents.

Comment 27: There was inadequate consideration of the potential impacts to state and local governments resulting from actions proposed in the final EIS and Forest Plan.

221

Response: The final EIS considered the role the Forest has in the economy of locally-affected counties. The Forest assessed the effects in terms of economic efficiency, shared receipts with counties, employment, and National Forest budget levels. These discussions are found in Chapter 4, Appendix I, and Appendix J of the final EIS.

NATIVE AMERICAN TRUST RESPONSIBILITY

Comment 1: The Tribe has objections to the proposed plan as no discussion with Tribe relating to draft plan formulations.

264

Response: The current draft Plan was based on public comments from the 1987 public scoping process, which included input from tribal groups and individuals. The Forest is now working with Tribe at the Environmental Analysis and project level planning stage.

Comment 2: It is clear that part of the trust responsibility of the federal government towards Tribes is to insure preservation of a viable, historically productive salmon and steelhead fishery. Any Forest activities that impact water quality, fish habitat, wildlife habitat, cultural sites and/or gathering activities are of grave concern to the tribe.

267

Response: All Forest activities require compliance with various Acts, including the National Environmental Quality Act (NEPA) and the National Historic Preservation Act. NEPA requires public involvement and an analysis of a proposed activity's effects on a wide array of natural and cultural resources. The National Historic Preservation Act specifically requires an assessment of an undertaking's effect on heritage resource values. See Forest Plan, Standards and Guidelines, Chapter 4, Heritage Resource Management.

Comment 3: Situations throughout document where federally recognized Indian Tribes should be included along with private, state, and federal entities; for example, Tribes should be included in the list of cooperators on development of OHV use and draft Plan.

207

Response: This has been done in the final document.

Comment 4: These documents tend to imply that cultural resources protection is limited to NACUAs and project related surveys. Tribal involvement should be included in all resource categories.

207

Response: Projects related to all resource areas are subject to compliance with Section 106 of the National Historic Preservation Act. All resource areas would have to comply with the standards and guidelines stated in the Forest Plan, Chapter 4, Heritage Resources. Rather than place a standard and guideline for Tribal involvement in all resource areas, the standards and guidelines in the Native American Trust Responsibility section of Chapter 4 provide direction for Tribal involvement in both policy making and project-level planning.

Comment 5: In the management of special forest products, a reference to the federal government's trust responsibility to Indian Tribes and the recognition that formal consultation will occur prior to the initial evaluation of any proposed forest product program should be included in the Forest Plan standards and guidelines.

207

Response: The Native American Trust Responsibility standards and guidelines provide for consultation in policy making and project level planning. We have revised the Special Forest Products section in the final Plan; these standards and guidelines include consultations with Tribal Governments for the management of traditional plant materials.

Comment 6: In the use of the Small Tracts Act within tribal territory, transfer of ownership to tribal trust status should be evaluated before transfer of additional land into Forest Service holdings is considered.

207

Response: The Small Tracts Act does not provide for transfer of ownership to tribal trust status when the federal government acquires land through interchange or exchange. This subject is outside the scope of Forest-level planning.

Comment 7: A reference to the federal government's trust responsibilities to Indian tribes and formal consultation should occur prior to initial evaluation of any proposed recreation program. This reference should be included in the Forest Plan Standards and Guidelines.

207

Response: See the response to comment 15.

Comment 8: In order to fully recognize the religious and culturally significant areas of the Karuk, the Forest working with the Tribe should protect all culturally significant areas; specifically, the Amekyaram, Panamnik, Savorum, and Onion Mountain areas.

207

Response: The Forest Plan, Goals, Direction, and Standard and Guidelines, Chapter 4, Heritage Resources, highlights the Forest Service legal requirements and Forest commitment to identify, evaluate and protect significant heritage resource values. Three of the four areas identified by the commenter are within eligible National Register of Historic Places Districts or are eligible as a property.

Comment 9: Technology transfer, Tribal member employment along with Tribal participation in forest planning and management, needs to be articulated in the Forest Plan.

207

Response: Standards and guidelines have been added to the Native American Trust Responsibility section of the final Plan to reflect your concerns.

RESOURCE MANAGEMENT PROGRAMS

Research Natural Areas

Comment 1: Research Natural Areas (RNA) sections should include discussions on range management since several of the areas include grazing allotments. The impacts of grazing on represented vegetation have not been determined. Research and monitoring should be implemented to determine compatibility of grazing with the target vegetation instead of complete removal of grazing. Competent research will require exclusion of grazing from at least a portion of each affected area.

138

Response: The final EIS and Plan address range issues pertaining to RNAs.

Comment 2: The Plan should protect recreation activities and trails that existed prior to designation of RNAs.

230

Response: RNAs were established as representatives of certain target vegetation types, such as Jeffrey pine type or black cottonwood, or other target elements such as habitat for rare amphibians. Activities within the RNA are restricted to those related to research, education or necessary restoration. Pre-existing uses of the surface resources must be consistent with RNA objectives to continue.

Comment 3: Most RNAs are “de-facto” wilderness designations which benefit only one segment of the recreation public. The management prescription allows some motorized vehicle use but not OHVs. Routes could be closed to the general public and available for administrative use only. It is unclear which of the proposed RNAs will actually be designated under each alternative.

230

Response: RNAs are established to maintain examples of diversity on National Forest System lands and to meet the needs of research scientists and academicians and Forest Service managers to manage for biological diversity. Candidate RNAs are generally intact areas which have not come under significant human-related disturbance such as logging. RNAs are selected for their target elements and must meet certain criteria. Some of the target elements are limited in their distribution, and/or there are not many areas left on the Forest where the target element has not been impacted by human activity. Multiple-use management does not require layering multiple uses on top of one another

on the same piece of land; all areas of the forest will not meet all demands. If activities are compatible with the area designation then they are appropriate to continue. The final EIS identifies which interest groups are likely to use RNAs. Existing roads are open to OHVs unless it is determined that access is causing resource damage. If access or the roads themselves conflict with maintaining RNA values, mitigations will be applied to reduce conflicts.

Comment 4: Fire should be available as a necessary management tool for some vegetation in RNAs, including the Craigs Creek RNA.

138 152

Response: Prescribed fire is discussed in the final EIS and Plan as a management tool in RNAs.

Comment 5: The following standards and guidelines should be incorporated into the final Plan.

1. Complete selection and designation of RNAs to meet the Regional RNA community type targets during this planning cycle (next 10 years).
2. Develop a minimum of one BSIA (Botanical Special Interest Area) and one RNA management plan per year once BSIA's and RNAs are established. Management plans should include desired plant community (seral stage, species composition, trend) permitted and prohibited activities, and steps to achieve desired plant community characteristics. BSIA management plans should also address approaches to enhancing the educational values of BSIA's (interpretive signs, nature trails, brochures, etc.) following FSM direction.
3. Mining, grazing and timber and special products harvest will be prohibited in RNAs.
4. OHV use will be prohibited where possible or restricted to existing access roads. Emphasize rerouting OHV roads away from sensitive areas.
5. Critical issues identified in the area management plan (grazing effects, fuel condition, OHV use, plant species composition, ecosystem health and trend, biological diversity parameters, relationship to management objectives, etc.) will be monitored and reported on a schedule identified in the plan.
6. Pest and fire control will only be allowed in RNAs if identified in the management plan as being essential to maintain the area's unique features.
7. Periodically review area boundaries and increase area size as necessary to ensure that area goals are being met.
8. Periodically review management plan effectiveness and adjust plan as necessary to ensure that area goals are being met.

9. Locate high intensity recreation developments away from special areas to minimize recreation-associated damage.

225

Response: New candidate RNAs are likely to be identified over the next planning cycle. The timing to complete management plans for RNAs and SIAs is dependent on availability of funding. Management plans are likely to be developed for SIAs within the next year and could serve as templates for RNA plans. RNA plans would address the specific items mentioned in part 2 of the comment, as well as management, threats, restoration needs, monitoring, and a budget. Plans would be periodically evaluated and updated to incorporate new information.

The final Plan addresses range and special forest product issues. Timber removal may be appropriate in some circumstances. The Forest Service cannot prohibit mining; it can recommend withdrawal from mineral entry to BLM. High intensity recreation developments are not consistent with RNA objectives. Recreational access will be addressed on an area-by-area basis.

Insect and disease control would occur when pest is not indigenous to the area, as with Port-Orford-cedar root disease. Fire control would occur only if a fire originating outside an RNA would put its integrity at risk. This has been clarified in the final Plan.

High intensity recreational development is not compatible with RNA and SIA management direction. Activities which might cause adverse effects on RNAs or SIAs would be assessed to determine whether they are inconsistent with the objectives for which the areas were established.

Comment 6: OHV use should be prohibited in RNAs to prevent adverse impacts on botanical and other resources, including soil disturbance, acceleration of erosion, and spreading *Phytophthora lateralis* root rot in Port-Orford-cedar (POC).

225

Response: Recreational access to RNAs will be addressed on an area-by-area basis to assess the effects on the integrity of the RNA. Existing roads will be evaluated, especially in light of POC protection. New guidelines for POC management should strengthen the effort towards protection.

Special Interest Areas

Comment 1: The DEIS presents a mitigation for recreation management in Alternatives B and C: “The presence of law enforcement officials could deter illegal and inappropriate use of botanical areas” that differs from that in Alternatives A, D, and E: “Designate which roads are open (or closed) to OHVs and ensure law enforcement.” Explain this difference and whether the level of law enforcement that is implied for Alternatives A, D, and E is to be applied generally to all users in a special interest area (SIA) or specifically targeted at OHV users.

223

Response: Alternatives B and C would be expected to generate more recreation use than the other alternatives and require different law enforcement strategies. Law enforcement is to be applied to all users on NFS lands.

Comment 2: Botanical areas are proposed by university faculty, Native Plant Society, and other botanists, who do not represent a cross section of the public. OHV groups and manufacturers of OHV vehicles should be allowed to pick out representative areas of various terrain and skill levels to set aside as reserved for OHV use.

230

Response: SIAs are established to recognize various types of natural resources rather than to provide for specific types of use, such as OHV use. Botanical areas are established for the purpose of conserving rare and unique plants and plant communities; it is appropriate to solicit information about botanic resources from the botanical community.

Comment 3: The proposed SIAs are the same for all alternatives and represent loss of OHV opportunities and vehicular access. Other restrictions resulting from the direction in Option 9 mean a change in recreation emphasis and use patterns that will have cumulative and significant impacts to other resources. These effects should be addressed.

230

Response: SIAs in the Smith River NRA were established by the NRA Act and Management Plan. The issues surrounding SIAs were not used to weigh the relative merits of the various alternatives. The potential effects of management activities will be addressed

through the project-level NEPA process used to develop management strategies for the SIAs.

Comment 4: The proposed North Fork Smith River Botanical Area contains the only real OHV trail system in the Forest. It appears that designation of this area, with management direction to focus recreation use on education and interpretation, is intended to stop OHV use, rather than to preserve plant species, because some user groups and individuals object to OHV use and/or believe some OHV users might act illegally. This does not recognize existing uses or that current management for OHV use is dictated by the SRNRA Act. Motorized access should be mandated in the Plan. This area should not be designated as a botanical SIA.

230

Response: This area was designated as a botanical SIA by the Smith River NRA Act and Management Plan. The Smith River NRA Management Plan (Forest Plan, Appendix A) provides for the designation of OHV routes and facilities within some of the NRA's management areas. OHV routes will be designated where appropriate by decisions resulting from public involvement and project-level NEPA analysis.

Comment 5: Recreation Standard and Guideline 5 for SIAs provides for evaluation of OHV access on an area specific basis. There is overwhelming evidence statewide linking OHV use with degradation or wholesale destruction of natural vegetation, soils, and other natural values. Stronger language is warranted in this section restricting organized OHV use within SIAs. The stated objective of management in botanical areas is "naturalness." In no way can the OHV riding trail network proposed within the Smith River Botanical Area be considered compatible with the stated management objective. Clarification of the demonstrated conflict between SIA management and organized OHV use is needed at the Forest Plan level or higher.

138

Response: Impacts from OHV use are related to such site-specific factors as type of use, terrain, soil type, and resource vulnerability which cannot be identified at the Forest Plan level. Management strategies for SIAs, as for other specialized areas, will be developed through the project-level NEPA process considering resource factors related to the specific area being considered.

Comment 6: The discussions of SIAs singles out OHV and vehicular use and impacts and does not discuss other

types of travel, such as horse, hiking, and mountain biking, in relation to plants. These discussions do not provide factual evidence; for example, of differences between mountain bike use and OHV use. The information is biased toward restricting vehicular uses and eliminating OHV uses from the Forest. Examples are: discussing potential conflict from illegal OHV use but not discussing harm from "legal" cross country foot and horse travel; discussing continuous travel along a particular route but not mentioning that roads and trails are designed to mitigate the problem. It does not mention the possibility of opening roads or providing looped trail systems to enhance user enjoyment or providing any type of cross country use.

230

Response: The final EIS discusses impacts from a variety of travel and recreation uses. Standards and guidelines in the final Plan provide for considering existing roads and trails as multiple-use routes.

Comment 7: Effectiveness monitoring indicates that 10 and 5 sample sites will be surveyed each year in RNAs and SIAs, respectively, presumed chosen randomly, in order to evaluate protection of intrinsic values. This number of sample sites is too low to detect anything other than gross recreational-related or catastrophic disturbance. Detection of longer term effects that lead to loss of values is of somewhat greater importance, since they are often insidious and normally impact larger areas of habitat. Examples of these impacts include progressive small-scale impacts by recreation or OHVs. Monitoring should incorporate long term fixed plots sampled, perhaps, every few years in addition to the random plots sampled annually. Areas that include especially transitory vegetation (for example, knobcone pine forest in Craigs Creek) perhaps should have their own monitoring program.

138 152

Response: Monitoring is conducted on the Forest to meet various objectives. Emphasis has been placed upon pre- and post-project monitoring, with obvious neglect of long-term monitoring. Recently, PSW Research Station in Berkeley sponsored a workshop on monitoring plant communities in natural areas. The workshop emphasized both short-term and long-term monitoring depending on the objective. Implementation of the protocol (protocol is in keeping with that developed by the California Native Plant Society) is underway in some RNAs across Region 5. There is interest on the Forest to implement the protocol in SIAs; however, to date, there

has been little financial support for sampling design development and implementation at the Forest level as well as little support for long-term endeavors.

Comment 8: If OHV use is allowed within SIAs, those areas should receive greater emphasis in monitoring, which should be funded from OHV-generated funds, not funds intended for general monitoring.

138

Response: Monitoring in RNAs and SIAs will be prioritized, in part, by potential resource impacts. Monitoring funds would be requested from the entity proposing the project or use within an RNA or SIA.

Comment 9: We ask that the following standards and guidelines be incorporated into the final Plan.

1. Develop a minimum of one botanical SIA management plan per year once BSIA's are established. Management plans should include desired plant community (seral stage, species composition, trend), permitted and prohibited activities, and steps to achieve desired plant community characteristics and address approaches to enhancing the educational values of BSIA's' interpretive signs, nature trails, brochures, and others, following FSM direction.
2. Mining, grazing, and timber and special product harvest will be prohibited in BSIA's.
3. OHV use will be prohibited where possible or restricted to existing access roads. Emphasize rerouting OHV roads away from sensitive areas.
4. Critical issues identified in the area management plan (grazing effects, fuel condition, OHV use, plant species composition, ecosystem health and trend, biological diversity parameters, relationship to management objectives, and others) will be monitored and reported on a schedule identified in the plan.
5. Pest and fire control will only be allowed in BSIA's if identified in the management plan as being essential to maintain the BSIA's unique features.
6. Periodically review area boundaries and increase area size as necessary to ensure that area goals are being met.
7. Periodically review management plan effectiveness and adjust plan as necessary to ensure that area goals are being met.
8. Locate high intensity recreation developments away from SIAs to minimize recreation-associated damage.

225

Response: Issues related to fire, grazing, special forest products, recreation, and pests are addressed in the standards and guidelines for SIAs. NEPA analysis will be conducted prior to any project implementation. The Implementation Plans list in Plan Chapter 5 states that SIA management strategies will begin in 1996 and will be completed by the year 2002. Priority of completion will depend on the quality of the botanical attributes in an area, degree of threat to the botanical values, interpretive opportunities, and current use. To date Horse Mountain and Lassics Botanical Area have been mapped. The mapping effort (plant associations, seral stages, rare plant occurrences, and areas in need of restoration) serves as the foundation for developing subsequent management plans. As discussed in the standards and guidelines, management strategies will incorporate a monitoring plan and schedule.

Comment 10: The last sentence of Standard and Guideline 5 for Facilities and Roads in SIAs states: "Existing trails (old roads, jeep trails) within the areas may be designated for foot travel where possible and appropriate." A case-by-case evaluation under NEPA as to the need for such designation must be made, rather than this prescription.

230

Response: Such designation would be part of the decision resulting from project-level NEPA analysis.

Comment 11: The Recreation standards and guides for the Horse Mountain and Lassics botanical SIAs that allow for no OHV use off designated routes should be removed.

230

Response: These standards and guidelines are not included in the final Plan.

Comment 12: Recreation Standard and Guideline 5 for SIAs should read "New OHV routes will be evaluated on a case by case basis" or removed altogether.

230

Response: The standard and guideline is reworded in the final Plan.

Comment 13: Recreation Standard and Guideline 2 for SIAs appears to be directed at the OHV user groups. Motocross events do not occur on Forest Service managed lands. Endurance rides and events could be for

bicycles, horses, and runners. The Sierra Club organizes large events into remote wilderness areas. Every event, regardless of user group, must be evaluated with the same set of criteria. This standard and guideline should be removed.

230

Response: The standard and guideline is reworded in the final Plan.

Comment 14: Facilities and Roads Standard and Guideline 2 under SIAs states: “Opportunities exist to manage portions of the areas as semi-primitive non-motorized to avoid resource conflicts. Such opportunities will be identified on a case by case basis.” Is it consistent with NEPA to include an ROS map in the Plan and then alter that map on a case by case basis?

230

Response: If resource damage occurs as a result of access or the roads themselves, mitigations could include gating or decommissioning of roads. This is consistent with NEPA.

Comment 15: The DEIS should identify what studies were used to determine the resource conflicts and impacts in SIAs of OHVs, ATVs, and mountain bikes and their relationship to each other: what conflicts are shared, which are more severe, and how these conflicts differ from areas outside SIAs; relative impacts of vehicular and non-OHV activities on and off designated routes; documented occurrences of “illegal” off route travel for the past five years, and for each occurrence, what the documented impacts were, what type of vehicle was involved, and what action was taken to prevent similar occurrences from happening? Impacts from OHVs on properly designed and maintained OHV routes in SIAs should be minimal and should fall within acceptable limits.

223

Response: The text identifies sources used to identify general resource conflicts and impacts. The specific data requested by the commenter is more appropriately used to support discussions in project-level NEPA analysis.

Comment 16: Chapter 2 of the DEIS states that SIAs are managed to maintain their unique botanical and geological values for public use and enjoyment and, specifically, that botanical areas are managed for educational and recreational use while protecting

important botanical resources.” Chapter 4 of the DEIS includes a mitigation for SIAs to “Obliterate or gate roads constructed for timber access near the Botanical Area to deter use by recreationists. Locate level 3 collector roads for recreational purposes so as not to increase the potential for access into botanical areas.” This statement is highly inflammatory, may be in direct conflict with Forest Service policy and law, and should be removed.

223

Response: Roads may be obliterated or gated for a variety of reasons after project-level NEPA analysis.

Comment 17: The public involvement and NEPA processes must be followed prior to the closure or obliteration of any road or trail in a special interest area. When any roads or trails are closed, loss of the original route should be compensated for on comparable terrain at a comparable skill level. These recommendations should be included in all alternatives.

223

Response: See response to comment 16. Project-level NEPA analysis should consider alternatives for a variety of public interests.

Comment 18: Chapter 4 of the DEIS states that “OHV use in the Horse Mountain Botanical Area has the potential to introduce Port-Orford-cedar root disease into uninfected tributaries supporting Port-Orford-cedar stands.” It must be noted that any vehicle use has the potential to introduce Port-Orford-cedar root disease and that this is not a OHV specific problem. This whole paragraph should be replaced with one addressing vehicle use in general and the spread of Port-Orford-cedar root disease.

223

Response: The final EIS was reworded as suggested.

Comment 19: Chapter 4 of the DEIS discusses the potential of OHV use in botanical areas to affect the visitor’s experience, and specifically of unmanaged OHV use to increase the potential for user conflict between hikers and vehicles. This issue is of forest-wide significance, not limited to SIAs. It is adequately addressed on a forest-wide basis and does not need amplification in the SIA section. Discussion should be removed from all SIA text. OHVs provide an opportunity to increase visitation to and appreciation of these unique areas. All routes and trails (both motorized

and non-motorized) in SIAs should be evaluated for impacts, and where significant documented impacts exist, the routes and trails should be maintained or reconstructed to reduce the impacts to acceptable levels. A strong interpretive program targeting all visitors should be developed to address the significance of the SIA, the sensitive nature of the environment, and proper trail etiquette.

223

Response: The discussion relative to the Horse Mountain and Lassics botanical areas has been carried forward in the final EIS.

Comment 20: The DEIS states that the designated OHV routes in the Smith River NRA's North Fork Smith Roadless Area (Management Area 1) will impact roadless character and have the potential to impact sensitive plant habitat and populations and spread Port-Orford-cedar root disease. The serpentine/peridotite soils found in the North Fork Smith Roadless Area are sensitive to disturbance and not easily revegetated. In this characteristic they are similar to the desert which the landscape resembles.

224

Response: The preferred alternative would permanently close some of the roads in the North Fork Smith Botanical Area and gate other roads; access would be allowed only during dry periods and would be managed on a permit system to protect the sensitive plant species and drainages with uninfected Port-Orford-cedar stands.

Comment 21: The draft Plan states that OHV use is restricted to designated routes within botanical SIAs. Because of the difficulty in controlling OHV use, and the documented adverse impacts that OHVs have on botanical and other resources, including soil disturbance, acceleration of erosion, and as vectors for Port-Orford-cedar root disease, it seems that the most logical approach would be to prohibit all OHV use within the botanical SIAs. This is particularly true for those that contain Port-Orford-cedar.

225

Response: Access to and into botanical SIAs, whether for research, monitoring, photography, hiking, or other recreational or management purposes, depends on the use of vehicles which are capable of traveling off paved roads. Prohibiting all OHV use would make the areas unavailable for these purposes.

Comment 22: We are opposed to most SIAs, which we consider to be "de facto" wilderness designations which benefit only one segment of the recreation public. The declining land base for multiple use recreation is exacerbated by the creation of another category of land withdrawal. Is there truly a need for an example of Jeffrey pine woodland outside of those lands already withdrawn? The dedication of many of these areas appears to be for the sole purpose of reducing recreation opportunities.

230

Response: Management of the Forest under multiple use concepts provides for a variety of needs Forest-wide but cannot provide for meeting all needs in all locations. The opportunity to view a unique Jeffrey pine woodland or other unique resource may provide a recreation experience to some Forest users that is comparable to opportunities provided others to hike, ride horseback, fish, swim, drive a road or trail, or cross country ski.

Comment 23: Our concerns for botanical SIAs and RNAs also apply to National Natural Landmarks.

230

Response: Designation of National Natural Landmarks (NNL) elevates recognition of the uniqueness of an area to the national level. Most of the proposed NNLs overlap other proposed or existing designations and would not change the way they are managed.

Comment 24: Table III-6 on page III-19 of the DEIS when compared to the land allocations per management area does not allow the reader to determine which alternative accepts or rejects the proposed SIAs. In a phone conversation with the Forest it was stated that all alternatives include all the proposed SIAs, and that the 330 acres quoted in the management prescription detail is for only those areas that are not in a more restrictive management area. This ambiguity, coupled with the fact that the maps accompanying this document are practically unusable as a reference source, shows a need to clarify this problem. CORVA suggests that the ranges of alternatives does not address this issue in that all alternatives accept all SIAs as proposed, and requests that maps and data be supplied that would allow the reader to determine where these areas are and how they may affect existing recreational opportunities.

230

Response: There are seven proposed SIAs; four of these are within the Smith River NRA, and were designated as a part of the NRA Act. As these SIAs were established as part of the NRA, the management of these areas does not vary by alternative. Maps of the SIAs within the NRA are included in the NRA Management Plan, which is Appendix A of the Forest Plan. The Bluff Creek Geologic Area and the Horse Mountain and Lassics Botanical Areas are the remaining SIAs outside the NRA. The management of these SIAs does vary by alternative; however, most of these areas fall within more restrictive management areas such as special habitat management areas (Horse Mountain and Lassics) or riparian reserves (Bluff Creek). The alternative maps are based on the hierarchy of management areas, and therefore show only the portion of the SIAs that fall outside more restrictive management areas.

Comment 25: We feel that permitting OHV and equestrian use in botanical/ecological areas is inconsistent with the goals of Special Interest Areas and would not meet the objective of conservation of the full complement of species in the area. Such use should therefore not be considered.

152

Response: The goals and management direction for Special Interest Areas state that such activities may occur when they do not harm the values for which the area was designated.

Humboldt Nursery

No comments specifically related to the Humboldt Nursery were received.

Law Enforcement

No comments specifically related to law enforcement were received.

Heritage Resource Management

Comment 1: The Six Rivers National Forest fails to meet the Section 106 requirements of the National Historic Preservation Act.

24

Response: The standards and guidelines for Heritage Resources in Chapter 4 of the Forest Plan specifically address the Forest's Section 106 compliance responsibilities of inventory, evaluation, and consultation with the State Historic Preservation Officer and Advisory Council on Historic Preservation.

Comment 2: There is ample evidence that traditional inventory methods fail to locate prehistoric sites and those sites not found are severely disturbed by timber activities.

24

Response: The Forest utilizes an intensive survey strategy for all undertakings with the potential to impact heritage resource values. This survey strategy is professionally accepted and meets all requirements for consultation with the State Historic Preservation Officer and Advisory Council on Historic Preservation. The Forest also conducts intensive prefield research and consults with Native American tribes as appropriate as part of our inventory process. Refer to DEIS, Chapter 3, Heritage Resource Management.

Comment 3: "Flag-and-avoid" practice fails to protect sites and avoids evaluating sites as part of compliance with the National Historic Preservation Act.

24

Response: The "Flag-and-avoid" practice is a long-standing, professionally accepted method for protecting

heritage resource values. The Forest has evaluated approximately 50 percent of the heritage resource sites inventoried to date.

Comment 4: Renegotiate the illegal no-effect Memorandum-of-Understanding with the California State Historic Preservation Officer.

24

Response: There has been no litigation which has determined that the “No Effect” Memorandums of Understanding (MOUs) with the California State Historic Preservation Officer are illegal, although the Advisory Council on Historic Preservation has rendered an opinion that the MOUs are legally deficient. The Six Rivers, Mendocino, and Tahoe National Forests are presently working with the California State Historic Preservation Officer and Advisory Council on Historic Preservation to enter into a programmatic agreement which would replace the “No Effect” MOUs.

Comment 5: In the absence of a comprehensive research design or contextual plan, the Forest is not able to focus on identification and evaluation of historic properties that would answer or test research questions.

24

Response: The Forest realizes the importance of integrating heritage resources into ecosystem management under the FSEIS ROD. To date, one contextual history of heritage resources and the environment has been prepared for the Pilot Creek Watershed. The document “An Environmental and Cultural History of the Pilot Creek Watershed” by Thomas S. Keter, is a very well documented contextual history for the Pilot Creek Watershed. The document also provides important research questions to guide future inventory efforts. The Forest is now working on the Grouse Creek Watershed.

Comment 6: The academic community is not involved in archaeological planning and field operations.

24

Response: The Forest Heritage Resources Program has a very close working relationship with Humboldt State University (HSU). The Forest has provided internships for students from the History Department. We are presently conducting on-going archaeological excavations with the archaeological field class. We are assisting one student in a thesis project for a Master’s

degree which will answer important research questions for the Forest relative to trade networks associated with obsidian.

Comment 7: Forest monitoring for Heritage Resources is poorly financed and shows a minimal effort.

24

Response: The Forest has not received adequate financing to properly monitor all activities associated with heritage resources. Our monitoring efforts are presently aimed at those sites and values being impacted by illegal artifact collectors. We are presently expending approximately \$15,000 to \$20,000 a year on Archaeological Resources Protection Act monitoring of heritage resources. The plan contains monitoring elements for the protection of heritage resources.

Comment 8: Concern that the Forest focuses on project linked inventories, while we have a responsibility to inventory all lands for heritage resource sites and values.

24

Response: It is true that in the past the Forest has focused on project oriented inventories. It is changing, and the Forest is now conducting heritage resource inventories and evaluations to respond to heritage resource issues and questions. For instance, last year the Forest completed an inventory of Pappas Flat on the Smith River NRA. The “Mus-yeh-sait-neh Village and Cultural Landscape Property” was identified and formally listed on the National Register of Historic Places. As more monies become available we hope to inventory all public lands as required by EO 11593.

Comment 9: The Forest has neglected to analyze livestock impacts on cultural resources and failed to mitigate these impacts.

24

Response: The Forest analyzes the impacts of livestock activities on heritage resource values through the Section 106 compliance process for the National Historic Preservation Act. See Forest Plan, Standards and Guidelines, Heritage Resources, Chapter 4.

Comment 10: In the Forest Plan, Chapter IV, do not list specific names of NACUAs in order to reduce availability of information and protect areas.

252

Response: We attempt to not provide the information for the specific location of sensitive heritage resource sites and values. The names of the NACUAs have already appeared in at least six public planning documents and maps dating back to 1975.

Comment 11: No “Outstanding Remarkable Features” were identified in the assessment for Blue Creek for Wild and Scenic Rivers. Blue Creek is within the eligible Helkau National Register of Historic Places District which is associated with Native American spiritual values.

271

Response: The eligibility of Blue Creek has been reanalyzed in the FEIS Appendix D.

Comment 12: Forest Service inventories are primarily focused on archaeological sites. The Tribe should be more involved or conduct inventories as some resources can best be identified by Tribe.

207

Response: Forest-wide standard and guideline 12-4 highlights how Native American cultural values and concerns will be incorporated in project level inventories during the early stages of environmental planning. Also, the Forest does not focus on identifying archaeological sites. See responses to comments 5 and 8.

Transportation and Facilities Management

Comment 1: Some tables, figures, and text presenting road data are inconsistent.

23 96 223

Response: This has been corrected in the final EIS and Plan.

Comment 2: Forest-wide Standards and Guidelines for facilities should include providing minimum impact roads in order to protect water quality.

96

Response: Standards and guidelines in the final Plan, which incorporate standards and guidelines from the FSEIS ROD, are designed to protect water quality.

Comment 3: The Forest should have a road management plan that identifies which roads should be retained on the Forest Transportation System and which should be decommissioned. The plan should include an implementation schedule for road maintenance, upgrading, and reconstruction. The implementation schedule should reflect a commitment to restoring ecosystem functions.

23

Response: Road decommissioning will be considered during watershed analysis and during project level NEPA analysis. The existing Forest Development Transportation Plan identifies which roads are to be retained on the Forest Transportation System; it is updated annually. Plan Chapter 5 provides for development of a transportation management strategy to assess the transportation system and use and schedule projects based on anticipated needs.

Comment 4: Upgrade roads and eliminate roads that are unnecessary and/or have high potential for adverse impacts to streams.

23 21 72

Response: These factors will be considered during watershed and landscape level analysis, as well as during project level NEPA analysis.

Comment 5: Obliterate more miles of road from the Transportation System to protect and enhance various resources and values: water quality, aquatic resources, fisheries, wildlife, and Port-Orford-cedar distribution.

96 224 227

Response: Management objectives of the selected alternative will determine where roads are needed as the alternative is implemented at the project level.

Comment 6: Redirect road management program from road building to closing, decommissioning, and obliterating greater numbers of roads.

227

Response: See response to comment 5.

Comment 7: Define the following types of road facilities; describe how they relate to the transportation system and how they will be treated: permanent, temporary, abandoned, local, short spurs, skid trails, secondary haul routes, inventoried, uninventoried. Identify the miles of permanent, temporary and abandoned roads; highway, other paved road, gravel surface, logging haul roads.

96 21

Response: Some of the terms are defined in the EIS; all are defined in the Forest Service directives system. Mileage records are not maintained as described; information on specific roads is available in the Supervisor's Office.

Comment 8: Provide public access and charge fees for all users except foot travelers. Charge nominal fees for all parking spaces provided.

175

Response: The Forest Service is not a public road agency whose mandate is to provide public roads, but it does maintain roads that allows all members of the public to access National Forest System lands for use and enjoyment of the resources on them. Congress requires the collection of fees for some uses; general public use of federal roads is not one of the fee uses.

Comment 9: Include CalTrans in the following aspects of forest transportation system planning: establishing and updating development and management plans; (re)constructing forest roads and highways that will

impact traffic on the state highway system; projects that will impact bridges, large culverts, airfields, and helispots; identifying safety concerns at intersections of state highways and forest roads. Obtain CalTrans encroachment permits for forest roads that intersect state highway right-of-way.

232

Response: A 1989 Memorandum of Understanding between the California Department of Transportation and Pacific Southwest Region Forest Service establishes procedures for coordinating activities related to State highways across NFS land. The NEPA and public involvement processes provide additional opportunities for cooperation and collaboration.

Comment 10: Existing access trails and routes for all uses, including recreation, should be retained. Where displacement is unavoidable and recreation use warrants, replace lost sections with new trails and routes to protect the integrity of the system and maintain the quality of recreation experiences.

230

Response: See response to comment 5.

Comment 11: We don't believe that an old road with proper maintenance of the water drainage system causes significant damage to the forest ecosystem.

170

Response: Properly designed and maintained roads have minimal impact to the forest ecosystem.

Comment 12: The Six Rivers proposes to develop 410 miles of road during the next 10 years, almost half of 900 miles proposed for the four northern California forests.

227

Response: The final Plan estimates 25 miles of road construction and 250 miles of road decommissioning on the Six Rivers during the first decade.

Comment 13: No more road-building should take place on the forest; no new roads should be constructed. Commenters identified the following reasons for their position: access to accelerate development of late successional characteristics or timber harvest is not defensible; more roads would make it easier to destroy the last old (200+ years) trees; roads cause too many

negative impacts; roads are the greatest threat to aquatic resources; roading an area can result in a 100-fold increase in landslides; roads shouldn't be constructed at taxpayer expense to benefit logging companies; don't encroach further in roadless areas; already too many miles of road; natural succession should be allowed to reclaim lands.

D E 20 22 23 65 72 84
 151 175 182 193 195 212 227 271

Response: See response to comment 5. Roads are constructed to meet specific resource management needs after project level NEPA analysis which considers the factors identified above.

Comment 14: Use cattle guards to control the movement of cattle, rather than gates. Cattle guards do a better job of controlling human and livestock access than gates. Gates can be easily and unlawfully locked shut, blocking access to public lands.

223

Response: Determinations relating to livestock control methods depend on a variety of factors, including the ownership of lands underlying a road, considered during project level NEPA analysis.

Comment 15: Gate or barricade closed roads to prevent OHV use and/or protect resources.

96 213

Response: These decisions are made after project level NEPA analysis.

Comment 16: Maintain or obliterate roads to prevent road failure and protect the resources. Closed roads are less likely to receive proper maintenance. Closing roads without maintaining culverts and other drainage structures does not protect riparian and aquatic resources, including water quality. Stream crossings should be completely excavated and frequent, deep cross-drains excavated across roadbeds that will serve no purpose until the next rotation. Use of closed roads by off-road vehicle users can compromise erosion control structures.

21 96

Response: See response to comment 15.

Comment 17: Keep roads and trails open unless there are unmitigable resource damage concerns that would

justify closure, and then the closure must be accompanied by obliteration and restoration of the closed route. Closure alone is unacceptable, since any resource damage will continue while at the same time public access is denied, a lose-lose situation. It is much preferable to mitigate resource concerns while continuing to provide access, the win-win scenario.

259

Response: See response to comment 15. Constraints on the commenter's win-win scenario depend on funding the Forest receives to manage the transportation system.

Comment 18: We are concerned about the number and miles of roads that are not on the Forest inventory. Will these roads be gated, closed, or obliterated? These roads have been historically used by our members and many others.

170

Response: FEIS Chapter 3 identifies that the need for uninventoried roads will be reviewed and decisions made at the project level through the NEPA process.

Comment 19: Close some existing roads.

E

Response: See response to comment 5.

Comment 20: Remove unstable, environmentally damaging, or "problem" roads; rehabilitate most logging roads.

72 175 212 182

Response: See response to comments 4 and 5.

Comment 21: I support removal of all non-necessary roads, followed by complete restoration to original contours. If funding is insufficient for complete restoration, roads should be inventoried to determine where highest potential for adverse impacts to streams lies and those areas stabilized. The Forest should commit at least to stabilization near stream crossings and other riparian areas.

21

Response: See response to comments 4 and 5.

Comment 22: Air and water pollution from asbestos aggregate surfacing roads is unaddressed.

1. Provide latest data on ARB and Forest research on water and air pollution hazards from asbestos pollution.
2. Chart the miles of roads surfaced with serpentine aggregate. Specify the particular roads.
3. Indicate the extent of compliance with the 5 percent asbestos content in road surface aggregate.
4. Chart the results of testing of quarries that contain rock of greater than 5 percent asbestos content and the decisions to close down these quarries.
5. Describe the action taken to close down and eliminate stockpiles of aggregate containing more than 5 percent asbestos.
6. Explain measures to avoid and/or stabilize serpentine formations traversed by trails, roads, drinking water sources and causing air and water pollution. What measures are taken to stabilize existing road surface with 5 percent serpentine gravel?
7. Define regulations controlling OHV: motorcycle, and other dust producing off-road vehicular traffic in serpentine formations.
8. Assess hazards of asbestos pollution to at-risk groups including employees, residential leaseholders, campground visitors.

24

Response: FEIS Chapter 3, Minerals, identifies that the amount of asbestos released during activities associated with rocks containing it is below hazardous levels. Roads constructed in areas with high levels of serpentine soils are being surfaced with aggregate base.

Comment 23: Discuss how the investment in existing roads will be maintained, without maintenance by or maintenance deposits from timber purchasers, in terms of alternate funding, equipment availability, and related concerns.

48

Response: Roads surplus to Forest management needs will be decommissioned; other roads will be closed. Open roads will be maintained with appropriated funds and road maintenance deposits from commercial haul.

Comment 24: Discuss the effects of obliterating inventoried and uninventoried roads and maintaining roads at lower levels on the following:

1. Access to the National Forest by its stockholders (taxpayers) for recreation, hunting, fishing, firewood gathering, mushroom picking, sight-seeing, Christmas tree cutting, and other activities which are lawful pursuits under the laws by which the National Forests were established.
2. Environmental degradation caused by the disturbance of restoring a road compared to leaving the road in place.
3. Management practices such as sanitation/salvage and thinning to enhance or maintain timber stand health and growth.
4. Ability to fight forest fires, conduct rescues, and maintain the Forest.
5. Cost to the taxpayers to obliterate and restore roads.
6. Cost to the North Coast economy of reducing public (tourist) access to the forest.

13 170 221

Response: General effects of change in road miles are discussed in various sections of FEIS Chapter 4, such as Transportation and Facilities Management, Fire and Fuels Management, Recreation Program Management. Many of the effects of change are specific to small areas and small portions of the road system; these effects will be discussed in project-level NEPA analysis, which will include opportunity for public involvement and comment.

Comment 25: Do not use federal funds to obliterate roads that taxpayers paid to construct.

170 213

Response: Many of the roads that will be decommissioned were constructed by timber purchasers, rather than with funds appropriated by Congress. Decommissioning would be a one-time expense that would reduce long-term taxpayer expenditures for road maintenance and reconstruction.

Comment 26: Do not decommission roads by obliterating them.

213

Response: How to decommission specific roads will be determined through project level NEPA analysis.

Comment 27: Issue 18 seems to be derived from the point of view of the environmental community. Where is the corresponding "issue" of "has the Forest considered opening now closed or gated roads so as to

enhance the recreational opportunities that exist for the majority of the Forest users?"

230

Response: Roads needed to enhance recreation opportunities would be identified during project level NEPA analysis.

Comment 28: "The Forest in 10 years" segment indicates that the use of roads is the problem, rather than the fact that they are there. Deleting open roads simply to reduce the number of miles available to the vehicular recreation enthusiast — but not to hiking and horse traffic — without documented need is just what the extreme environmental community wishes. Use balance and fair evaluation of need; don't just count number of miles.

230

Response: Decommissioning and closing roads will be done after project level NEPA analysis that considers all resource needs and uses and available road management funding.

Comment 29: The NEPA process should be closely followed prior to closing or obliterating any level one road or seasonally closing any level two road: 1) the potential for general recreation use of that road be evaluated; 2) the road be evaluated for inclusion in the designated OHV route system; 3) public notice be given and public hearings be held prior to any closure; and 4) the above information be taken into account prior to closing any road. Loss of OHV recreation potential should be fully mitigated for any roads that are closed. Full mitigation includes the replacement of the original route on comparable terrain at a comparable skill level. These recommendations should be included in all alternatives.

223

Response: Level 1 roads were determined during initial project analysis to be needed for the duration of the project, after which they would be closed; further NEPA analysis is neither appropriate nor required. The response to comment 28 pertains to other roads. Roads may be closed for short periods of time in emergency situations, such as extreme fire conditions or to protect public safety, without public involvement.

Comment 30: For a significant number of persons with disabilities, OHV's (primarily four wheel drive vehicles) provide their only access to the nation's public lands. Fewer miles of road and OHV routes would mean that persons with disabilities would have less access to hunting, fishing, camping and scenic enjoyment. Address how fewer miles of road and OHV access will negatively impact persons with disabilities and how the impacts will be mitigated.

The ADA (Americans with Disabilities Act) should be referenced in the DEIS and all alternatives be developed to ensure full compliance with the ADA. Any loss of access to the public lands by persons with disabilities due to road closures and OHV routes should be fully mitigated by opening new OHV routes of comparable difficulty and offering equal amenities and resource values.

223

Response: Both the ADA and the 1973 Rehabilitation Act require that individuals with disabilities not be subject to discrimination solely by reason of their disabilities. Fewer miles of access roads and OHV routes would generally have the same effects on individuals with and without disabilities insofar as access to opportunities is concerned. Alternatives, effects, and mitigations relating to specific roads and routes will be developed during project level NEPA analysis.

Fire and Fuels Management

Comment 1: The Forest should develop fire management plans that recognize fire as a vital component of natural landscape disturbances. Plans should address the use of prescribed burning and sensitive areas.

23 139 152 221

Response: A fire management plan will be developed over the next two years; it will address historical conditions and fire considerations in ecosystem management, including alternative strategies for fuels management and suppression activities across the entire Forest.

Comment 2: True ecosystem management requires the restoration of fire in appropriate areas and under appropriate conditions.

23 24 196 325

Response: Fire has been a major ecological player, to varying degrees, within the Six Rivers National Forest. Watershed analysis and our fire management plan will provide information for the decision of where and under what conditions to reintroduce fire into the landscape.

Comment 3: There should be an increase in vegetation manipulation and fuel treatment activities to return the forest to more natural conditions. These actions would benefit wildlife habitat and hazard reduction.

48 196 206 213

Response: Planned fuel treatment activities will be in the range of 3000-5000 acres per year, as reflected in the final EIS. This is probably much fewer acres than was burned naturally throughout the forest, but high fuel loadings, air quality restrictions, projected staffing levels, and the urban wildland intermix situation restrict us from taking a more aggressive approach to fuel management.

Comment 4: Prescribed burning should be prohibited in National Forests because of impacts to air quality, soils, plants, and the quality of old growth habitat. Fire reduction equipment could also increase the risk of severe fire.

175 227

Response: The Six Rivers National Forest falls within the intermediate to dry climatic area. This indicates that fire has been the dominant forest disturbance factor.

Prescribing burning has multiple objectives, including site preparation for tree planting, hazard reduction, wildlife habitat improvement, and promoting biological diversity. Burning under the correct climatic and vegetative conditions can mimic previous low intensity wildfires and restore fire to its natural role in the ecosystem. All efforts are taken to prevent accidental ignitions from equipment.

Comment 5: The need for prescribed burning could be eliminated if logging debris is chipped and left onsite. This organic material will suppress the growth of undesirable plants while feeding the desirable ones, reduce soil evaporation, and enable the soil to maintain a more even temperature.

175

Response: Leaving chips onsite rearranges the fuel source, but it does not eliminate the wildfire hazard. Chips also act as a nutrient sink and prevent the movement of nutrients and water to the underlying soil. This would suppress both undesirable and desirable plants.

Comment 6: Site preparation practices should include the biomass harvest of slash to reduce the amount and intensity of broadcast burning.

325

Response: The biomass market has still not developed in the communities in and around the Six Rivers National Forest. Travel times and distances typically prevent biomass harvesting from being economical.

Comment 7: The LMP does not include a strategy for fire as a force of nature in wilderness.

23

Response: Specific fire management plans for wildernesses within the Six Rivers National Forest have recognized the importance of fires in the ecosystem and have allowed for prescribed natural fires to occur. Further explanation has been added in the final EIS, Chapter 3.

Comment 8: Motorized equipment should not be used for fire suppression within designated wilderness areas.

224

Response: Motorized equipment will be used in wilderness areas only when absolutely necessary to

protect life and property as approved by the Forest Supervisor or the Regional Forester (for bulldozers).

Comment 9: Compared to a clear or select cut, thinnings leave a high fuel load. But I don't understand how taking out trees (even small ones) results in an increase in fuel loadings.

5

Response: As compared to regeneration harvests, the fuel loading would be less in thinnings. But until adequate fuel treatment takes place or fuel decay occurs, the fire hazard is high in thinned areas.

Comment 10: Monitoring of fire effects on vegetation should be initiated in areas included in prescribed burn plans.

152

Response: Post-burn evaluations, which address the achievement of burn objectives, are a requirement for every burn. In addition, fire monitoring plots have been initiated in several varied burn areas.

Comment 11: The Plans may significantly affect the incidence and severity of fire, and the fire protection capabilities within the region.

221

Response: The focus of the fuels and fire management programs in the preferred alternative is to return fire to its natural role in the ecosystem, with the long-term goal of reducing the severity and extent of detrimental wildfires. This will take several decades to accomplish and in the meantime, some wildfires could still be severe and large in size.

Comment 12: The loss of timber revenues will reduce the funds available to remediate fire hazards created by previous harvests, the recent drought and associated insect kills. The decline in harvest will reduce the private sector heavy equipment capacity that has historically been used under contract during fire season.

221

Response: A shift is occurring on the Six Rivers National Forest from timber-related fuels treatments towards larger area, landscape-level hazard or resource-related fuels treatments. These funds do not depend on timber revenues, and would come from either fire or other resource funding.

We expect that the availability of private sector heavy equipment will decline with the reduction in timber harvest. This could result in delayed equipment arrival times and possible increases in fire size or damage.

Comment 13: Changes in suppression strategies on National Forest land will affect CDF's operations. First, when CDF responds under mutual aid it will face the additional challenge of adapting its tactics to fit the modified suppression prescriptions on certain areas on the Forests. Beyond that, the modified suppression strategy will change the level of protection on private inholdings which are state responsibility but protected by the Forest. Private landowner desires for full suppression and the equal protection policy of the Board of Forestry may conflict with the service provided by the Forests.

221

Response: Modified suppression strategies will be based on site-specific analysis, including possible effects on adjacent landowners.

Comment 14: The Plans do not specify how they can be altered in the event of large catastrophic fires. Thus the Plans are severely limited as adaptive management tools in a region where catastrophic fires are certain to occur.

221

Response: If large catastrophic fires occur on the Forest and significantly alter the physical conditions of the Forest, the Plan would be changed through the amendment or revision process. See the Amendment and Revision section of Forest Plan Chapter 5 for more information.

Comment 15: Budget reductions may shift costs for fire protection to state and local governments. An imbalance may result in mutual aid relationships as CDF responds to more incidents on federal lands due to reduced Forest Service staffing and resources.

221

Response: Budget reductions may indeed hamper the ability of the Forest to respond to fires and potentially result in larger wildfires. The Forest is developing a Fire Management Action Plan, and will address this issue as part of the Plan.

Energy Resources Management

Comment 1: What precautions are in place to insure against over-collection of biomass? While biomass may be a cleaner source of energy production than oil or coal, its ecological use may preclude extensive removal. What measures will ensure that the biological service that biomass provides to the Forest are met?

289

Response: The harvest rates in the Final Plan were determined by analyzing the present ecological condition of the Forest, and determining what types of management activities were needed to improve ecological conditions to meet desired conditions. The Forest has incorporated standards and guidelines to ensure the retention of green trees, snags, and down logs when stands are regenerated. Some intermediate treatments such as thinnings will be designed to accelerate the development of late-successional and old-growth characteristics, which provide for many biological needs. By retaining these structural attributes, we will provide habitat for a number of plant and wildlife species, and replenish soil nutrients.

Lands Program Management

Comment 1: Acquire priority private properties to improve wild, scenic and recreational aspects as a section of the management proposal. This might include portions of the People's property by purchase or boundary adjustment. This should include private parcel on river side of the South Fork and Junction of Douglas Park Drive and South Fork Road. The Christensen school house which had both Native Americans' and pioneer families' children enrolled is there. The area should be enhanced for swimmers parking, recreation and parking along the bridge (a hazard and deterrent to scenic viewing up South Fork from this point).

229

Response: The final Plan and EIS include a land adjustment strategy that identifies general areas where the Forest has an interest in acquiring private lands and exchanging out of federal lands. It also identifies priorities for adjustment. All land adjustments are dependent on having a private land owner who is willing to exchange or sell lands. The United States does not usually acquire private lands that are encumbered with improvements unless the improvements can be used for Forest Service administrative purposes.

Comment 2: I support the exchange of private lands for Forest lands to provide access to the South Fork of the Trinity River and the North Fork of the Smith.

21

Response: See response to comment 1. Acquisition of lands to provide access to both the South Fork of the Trinity River and the North Fork of the Smith River have been identified as a high priority.

Comment 3: We are also against "Commercial Use Fees" imposed by the USDA -Forest Service. Our understanding is that trucks with trailers will be charged an additional fee on all Forest Service roads. No "Permit Fees" should be levied at all! This is basically unconstitutional. It is our American Individual right to use the "Wilderness Areas" free of charge, it is our land that we as taxpayers & the public may use at our convenience, we have already paid numerous times.

140

Response: Congress, in the Federal Land Policy and Management Act of 1976, declares it the policy of the United States to receive fair market value for the use of the public lands and their resources unless otherwise provided for by statute. The Forest Service currently recovers a share of its investment in roads that are used to haul commercial products from private lands, and it collects for or requires maintenance by commercial haulers from federal and private lands. The Forest Plan does not propose imposing additional fees on all Forest Service roads.

Minerals Management

Comment 1: All mining should be eliminated from National Forest lands and wilderness.

D 22 84

Response: Mining is a legitimate use of National Forest System lands except where lands are withdrawn or otherwise excluded from mineral entry. Mining may also occur on lands withdrawn from mineral entry when the claims were valid at the time of withdrawal.

Comment 2: The Forest should request the Department of Interior to withdraw recreation and scenic segments of the Smith River from mineral entry. Other sensitive areas (botanical, Research Natural Areas, riparian reserves) should be considered for withdrawal.

224

Response: All of the Smith River National Recreation Area is withdrawn from mineral entry, subject to valid existing rights. Other sensitive areas throughout the Forest will be considered for recommendation for withdrawal as NEPA analysis is done for management implementation or specific projects.

Comment 3: The management of the National Forest should focus on encouraging mining operations.

266

Response: National Forest System policy and direction is to encourage mining on National Forest System lands that are not withdrawn from mineral entry. The Final EIS and Plan reflect this direction.

Comment 4: Do not permit dredging in the Smith River or its tributaries.

229

Response: Dredging may be authorized on the Smith River and its tributaries on mining claims with valid existing rights and, on properly recorded mining claims that were in existence when the NRA was designated, until a field investigation has been conducted. The Forest Service does not have statutory or regulatory authority to allow dredging as a recreation activity on lands withdrawn from mineral entry.

Comment 5: Claims in areas withdrawn from mineral entry should be validated when the areas are designated or otherwise withdrawn.

224

Response: Validation of existing rights requires a record verification, field examination, data analysis, and written report completed by a certified mineral examiner. The workload involved requires that validation of numerous claims be conducted over a period of time.

Comment 6: The DEIS and Plan should discuss the water quality impacts from projected mining activities.

174

Response: The Six Rivers National Forest is not a big mineral producer, and few mining activities are projected on the Forest. Impacts on water quality from proposed activities will be assessed in project level NEPA analysis.

Comment 7: The DEIS should discuss the impacts of the Presidents Plan on mineral entry and leasing on the Forest and identify any Late Successional Reserves or Riparian Reserves withdrawn from mineral entry or leasing.

174

Response: The FSEIS ROD does not withdraw any lands from mineral entry. Operations within late successional and riparian reserves may require more mitigations than in the past to minimize detrimental effects to late successional habitat and meet aquatic conservation strategy objectives. The Forest contains no known leasable minerals.

Comment 8: Mineral development potential is identified differently in the DEIS from the “official” determination.

271

Response: The commenter does not identify what “official” source differs from the DEIS. The terms used in the EIS are defined in the Minerals Management section.

Comment 9: The DEIS’ identification of the mineral development potential in the NRA as low fails to recognize the existence of valid existing rights.

169

Response: The mineral development potential for the NRA is identified as low based on the best information available to the Forest Service. No claims in the NRA have been determined to have valid existing rights since the NRA was designated in 1990. Chapter 3 of the final EIS contains current information on claims in the NRA.

Comment 10: The DEIS fails to discuss minerals management goals for the NRA; how claims with valid existing rights will be managed; and the Cal Nickel proposal for Gasquet Mountain in light of Cal Nickel’s valid existing rights, which it intends to exercise.

169

Response: CalNickel is the only entity currently holding a large number of claims in the NRA; no claims have been determined to have valid existing rights. Claims in the NRA with valid existing rights would be managed according to law, regulation, direction in Forest Service manuals and handbooks, and standards and guidelines in Chapter 4 of the Forest Plan.

Comment 11: The DEIS and Plan do not recognize the strategic and economic value of the nickel and cobalt ore reserves at Gasquet Mountain and the viability of developing the laterite deposits there.

169

Response: The EIS and Plan recognize that there may be minerals in the NRA that the nation might value as strategic minerals. The EIS and Plan also recognize that Congress withdrew the lands in the NRA from mineral entry and prohibited mineral development, subject to valid existing rights. The Forest has no data on the current economic value of ores at Gasquet Mountain. The viability of developing laterite deposits at Gasquet

Mountain would depend on several factors, including the number of claims determined to have valid existing rights.

Comment 12: The economic consequences and mitigations common to all alternatives is inadequate because it does not discuss mining.

169

Response: The EIS and Plan recognize that the potential for large scale or significant numbers of mining operations on the Forest is low, based on activities over the past, the areas withdrawn from mineral entry, and the geology of the Forest. Economic consequences and mitigations for specific operations would be analyzed in project level NEPA analysis.

Comment 13: Minerals monitoring should emphasize mineral activities within SIAs, RNAs, and other management areas, and should be charged to minerals allocation rather than general management area monitoring. The Plan should discuss monitoring of mining or processing, provide for validation monitoring, and provide for a larger effectiveness monitoring budget.

138 169

Response: Project monitoring needs will be determined through project-level NEPA analysis, considering these factors, and funded by minerals budget. Monitoring needs associated with minerals activities are expected to be low, given the historically low number of active operations on the Forest.

Comment 14: Random observation may not be adequate for monitoring non-compliance with operating plans, and the EIS should establish monitoring systems for mining.

174

Response: See response to comment 13.

Comment 15: Small scale mining operations should be assessed for cumulative impacts in the proper NEPA documentation.

174

Response: Cumulative impacts of mining operations will be addressed during project level NEPA analysis.

Range Management

Comment 1: Livestock grazing should be eliminated from the forest.

D 22 35 84 182 286 290

Response: We can meet resource objectives outlined in the Forest Plan while permitting the grazing of livestock on the Forest.

Comment 2: The grazing fees should be increased.

175 266

Response: Grazing fees are under the authority of Congress or the President through the Secretaries of Interior and Agriculture, and are outside the scope of the Forest Plan.

Comment 3: Eliminate all livestock grazing from wilderness.

84

Response: The Wilderness Act authorizes the grazing of livestock in wilderness areas where grazing was permitted prior to wilderness designation.

Comment 4: Permittees should pay private landowners for unauthorized use of their property.

175

Response: The Forest Service is not responsible for the intrusion of livestock upon private lands (FSM 2230.6).

Comment 5: The land should be managed extremely conservatively until the Forest Service can collect ecological data. The ability to support the proposed AUMs should be evaluated for effects of livestock on sensitive plants and riparian areas, taking into consideration staffing and budget constraints.

175 225

Response: Livestock are utilizing less than 65 percent of the forage identified as being available to them. The numbers of livestock will not significantly increase until data is collected and analyzed.

Comment 6: The use of animal damage control to protect livestock on public lands is inappropriate. These livestock generate private profit which would not be

ensured by elimination of wildlife, which are public trust resources.

23

Response: Animal damage control is authorized on a case-by-case basis and is not performed indiscriminately. It is Forest Service policy (FSM 2650) to follow methods recommended by the Fish and Wildlife Service, state APHIS-ADC Office, or the involved state agency.

Comment 7: The problems created by grazing (including water quality, native plants, and wilderness values) should be taken seriously.

212

Response: We will continue to adjust to changing public values and resource problems as they are identified.

Comment 8: The DEIS does not specify how many acres are within existing allotments.

225

Response: Gross acres are identified in the final EIS.

Comment 9: The DEIS does not evaluate the condition of the allotments.

225

Response: Previous condition and trend data was collected primarily on annual grasslands. Because these annual grasslands are composed almost entirely of introduced species, condition and trend data are no longer considered valid. Data will be collected on other vegetation types to determine condition and trend.

Comment 10: Conflicts occur frequently between grazing and recreation, water quality, and native and sensitive plant habitat. The EIS should discuss these potential grazing conflicts and mitigation measures more extensively.

82 225

Response: Conflicts between activities, such as recreation and grazing, are considered on a case-by-case basis rather than at the forest plan level. The potential impacts of grazing on water quality and sensitive plants are discussed in the final EIS.

Comment 11: Since the demand for additional grazing is low, the Forest has an excellent opportunity to utilize range improvement techniques such as removing riparian land from allotments and encouraging ranchers to move their herds as much as possible to avoid overgrazing.

289

Response: If permittees are not able to successfully manage their livestock so that riparian standards and guidelines are not exceeded, livestock will no longer be allowed in the area.

Comment 12: NEPA analysis of the grazing program is required by both Regional policy and federal law. Historically, the grazing program has often not received this required NEPA scrutiny. The final EIS and Plan should contain a history of NEPA analyses for allotments, a list of allotments experiencing resource damage, and the following information for each allotment: AUMs; grazing management program (season of use, grazing system, etc.); year of AMP; year of last complete formal range analysis, including range suitability and capability analysis; current range conditions and trend; carrying capacity and methods used to determine it; annual percent forage utilization expressed on a range type basis and the type of plant communities commonly grazed; soil type(s); and known sensitive, threatened, and endangered plant species populations.

82 225

Response: None of the allotment management plans (AMPs) have been developed under NEPA guidelines. Some of the specific information is included in the final EIS and Plan; the remainder is not appropriate for the document. Allotment-specific information can be obtained by requesting copies of specific allotment management plans.

Comment 13: Field sampling should emphasize critical areas located within allotments, such as SIAs and RNAs.

138

Response: Range-related data will be gathered in key areas and areas identified as having special concerns as part of analysis for rangeland project decisions and/or management areas such as SIAs and RNAs.

Comment 14: Utilization should be defined on a percentage forage production basis for all applicable

ecologically defined units. The final EIS should contain data on forage production in various vegetation types, including shrub.

225

Response: The final Plan identifies utilization standards based on percent utilization by weight and allowing the use of stubble height standards where applicable.

Comment 15: The Plan should contain uniform, comprehensive forest-wide range management standards and guidelines to provide a clear management framework that permittees, the public, and Forest Service personnel can easily find and follow.

225

Response: Additional standards and guidelines are included in the final Plan.

Comment 16: The following standards and guidelines should be incorporated into the final Plan:

1. All allotments will be managed in compliance with FSM 2200 and 2212.03, NEPA, NFMA, the Multiple-Use Sustained-Yield Act (MUSY), Regional policy on riparian TE&S species, and other applicable environmental law.
2. All allotments will be managed to meet the objectives of the draft management direction for the four northern forest riparian ecosystems and the Aquatic Conservation Strategy goals of Alternative 9 of the Final Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (US Forest Service, 1993).

225

Response: The Plan requires compliance with laws, regulation, and Forest Service directives. Standards and guidelines in the FSEIS ROD have been incorporated into the final Plan.

Comment 17: The following standards and guidelines should be incorporated into the final Plan:

1. Manage rangelands so that forage and other values and uses can be sustainably produced over the long term (FSM 2210).
2. Manage the Forest to encourage native plant community re-establishment, using fire, timed

grazing systems, or other systems (for example, Menke, 1992). Emphasize the retirement of type conversions where feasible. The EA for each AMP should also consider this (FSM 2212.03 6).

3. Perform annual monitoring for riparian conditions, vegetation cover, soil compaction, plant species composition, utilization, trampling, and other key range attributes (FSM 2214.1 and 2214.2) for all allotments. Monitoring results will be documented and reported annually (FSM 2214.1).
4. Inventory all allotments for rangeland in satisfactory, fair, and unsatisfactory condition within one year.
5. Following NFMA direction, recovery plans will be developed for range that is in unsatisfactory or fair condition or does not meet soil, riparian, sensitive species or other applicable standards and guidelines or forest goals within one year of documentation. These areas should show stable upward trend within two years. If a stable positive trend is not documented within 2 years then use shall be reduced or stopped.
6. An annual operating plan will be developed for each allotment that describes condition, trend, actions to be taken, allowed AUMs, livestock distribution rules, sensitive species requirements, and incorporates these Forest-wide standards and guidelines. Compliance will be monitored and reported annually.
7. Maximum forage utilization standards will be developed and followed in accordance with FSM direction. In the interim, while forage utilization standards are being developed, utilization guidelines similar to those from the Klamath NF LRMP will be used. After utilization standards have been met each year, animals will be removed from each allotment.
8. In accordance with FSM 2211.6, standards and guidelines will be developed to specify maximum acceptable disturbance levels for stream banks and vegetation components in grazed riparian areas.
9. All allotments will be in satisfactory or better condition with stable trend or show upward trend in soils, vegetation, and riparian condition within 10 years.
10. Vegetative reference plots will be placed in riparian and upland areas of each watershed to demonstrate potential vegetation conditions and species composition as riparian area management direction specifies.
11. New water developments and salt licks should be located at least 1/4 miles away from riparian areas, highly erodible areas, and sensitive plant populations. Old water developments and salt licks

- should be moved away from such areas as AMPs are revised.
12. Defer grazing in burn areas for three years following wild or controlled fire in chaparral. Grazing in other burned areas will be allowed only when a team including the Forest botanist and/or ecologist determines that grazing will not accelerate erosion or adversely affect sensitive species.
 13. Allotment management plans should be revised for all allotments within the next 10 years, with a minimum of 3 plans revised per year. All AMPs:
 - a. Shall incorporate standards and guidelines.
 - b. Shall reevaluate the suitability and capability of the allotment for range use and forage production.
 - c. Shall be revised on a schedule based on ecological criteria such as need for riparian rehabilitation, threats to sensitive plants, etc., in accordance with FSM 2211.6.
 - d. Shall include extensive monitoring by permittee(s) and permittees shall provide reports of range condition midway and at the close of the grazing period. Permittees may be required to use forms to document soil condition, percent cover, etc. Permittees may be required to photograph representative reference riparian and upland sites to document range condition. The same representative sites will be photographed each time.
 - e. Shall use range suitability guidelines from the Toiyabe NF to rate the grazing suitability of each allotment.
 - f. Shall set proper use criteria based on the limiting factor for each allotment. The limiting factor may be soil condition, trampling, forage utilization, riparian condition. Two standards are to be observed when identifying limiting factors for use criteria: 1) Soil and vegetation are basic resources. Downtrends in condition must immediately be addressed by management changes; and 2) After requirements for soil and vegetation resources have been provided, other resources, such as livestock grazing, wildlife, and aesthetics can be considered.
 - g. Shall set sustainable trampling, soil compaction, and soil cover standards.
 - h. Shall prescribe long-term trend studies to determine if use criteria are sustainable.
 - i. Shall be developed with full NEPA analysis.
 14. No supplemental nutritional sources such as protein supplements shall be placed in allotments.
- standards and guidelines. Additional clarification is offered for specific proposals.
1. This is Forest management direction.
 2. In areas where the potential and desired plant community is native plants, management tools will be used to obtain this goal. The annual grasslands are not recognized as having the potential to revert back to native species. No type conversions are planned.
 3. Monitoring will be performed at different levels of intensity and under varying frequencies depending upon funding and information desired.
 4. Rangelands will be inventoried for satisfactory and unsatisfactory ecological condition with the exception of annual grasslands. The time frame for achieving this objective depends on available funding.
 5. Strategies for improving rangeland in unsatisfactory condition will be developed. In general, condition and trend will be monitored once every three years in key areas. More frequent monitoring may be required in certain areas.
 6. Forest Service direction currently provides for annual operating plans
 7. Utilization standards have been added to the final Plan.
 8. Included in the final Plan.
 9. Our objective is to have all rangelands (with the exception of annual grasslands) in satisfactory ecological condition, but we realize that objective will depend to some extent on available funding. A standard and guide was added to the final Plan to define satisfactory and unsatisfactory ecological condition.
 10. Enclosures will continue to be used, and new ones will be constructed as appropriate.
 11. Salt and water developments will continue to be used as management tools. See Range standards and guidelines in the final Plan. Water developments will be evaluated on a case-by-case basis, but will not always be 1/4 mile from special areas. Many of our water developments are directly adjacent to riparian areas that are fenced.
 12. The chaparral component is a minor one on the forest and would not be of interest to grazing cattle. Wildfires or prescribed burns over extensive areas that are subject to livestock use will be evaluated by a botanist and soils specialist before grazing is allowed, to determine if there is a concern. If there is an erosion or botanical concern, management techniques would be used to deter grazing, as much as possible, until the area has recovered.

225

Response: The Plan requires compliance with the laws, regulations, and Forest Service policy and direction that cover the objectives of many of these suggested

13. Livestock grazing will be analyzed using the NEPA process. A schedule has been developed for the completion of AMPs. Scheduling may change as priorities change. The completion of allotment planning is dependent on the availability of data and personnel. The amount of livestock use will be based on the best data available and may be adjusted based on monitoring and adherence to standards and guidelines.

14. Protein supplements, in themselves are not directly or indirectly capable of harming resources.

Comment 18: The threshold of concern implies that 20 percent of allotments must show a downward trend before action is taken. This is unacceptable. No National Forest should tolerate any downward trend in its rangelands. The Forest should commit to a goal of managing so that all rangelands are in good condition with a stable or upward trend.

82 225

Response: All key grazing areas will be managed for satisfactory ecological condition, with the exception of annual grasslands. The wording was changed to reflect this.

Comment 19: There is no monitoring program or specific standard and guideline direction in the DLRMP to address potential impacts to upland ranges. In fact, the monitoring program singles out primary rangelands, which are generally riparian and meadow areas, for monitoring.

225

Response: Primary range on the Six Rivers is annual grasslands, not riparian areas. Standards and guidelines for annual grasslands and other rangelands are included in the final Plan.

Comment 20: It is imperative that measurable, state of the art range standards and guidelines be developed. We request additional study and development of specific guidelines so that stronger protection can be afforded to sensitive, threatened and endangered aquatic species in areas where commercial grazing takes place.

302

Response: Additional standards and guidelines are in the final Plan.

Comment 21: The update to the allotment management plans should include assessment of need to modify allotments that include SIAs, RNAs, or other management areas, based on available science and the management direction for those areas.

138

Response: This assessment will be done as part of the NEPA analysis associated with issuing rangeland project decisions.

Comment 22: Scheduling the future revision of allotment management plans is a good one. Although the progress of the revision schedule is dependent on the funding, we hope the task will still be performed in a timely manner.

270

Response: Rangeland project decisions will continually be evaluated for priorities and timeliness.

Comment 23: The Forest neglected to analyze livestock impacts on cultural resources and mitigations of these impacts.

24

Response: The Forest analyzes the impacts of livestock activities on heritage resource values through the Section 106 compliance process for the National Historic Preservation Act. See Forest Plan, Standards and Guidelines, Heritage Resource Management, Chapter 4.

Comment 25: There exists an inherent conflict between livestock grazing and the management of native vegetation. Some level of grazing may be desirable in some vegetation types, but no research has been conducted.

152

Response: Standards and guidelines provide for proper use of rangelands. Grazing can be a benefit on some rangeland, depending upon types and management objectives.

Recreation Program Management

Comment 1: The DEIS is inconsistent in acknowledging that driving for pleasure is the major recreational use of the National Forest and projecting an increase in recreation use while proposing to decrease open road miles.

48

Response: The EIS recognizes that overall Forest road miles will decrease (primarily deadend logging spur roads), and the uses which specific road segments accommodate will change as roads are obliterated, closed, and/or maintained to different standards. The intensity of use will increase as more people seek recreation opportunities on the Forest. Recreation use at campgrounds and day use areas is expected to increase. Campgrounds currently are used to about 30 percent capacity. Marketing should attract more users from outside the local area. Upgrading some facilities with showers, flush toilets, and access for individuals with and without disabilities will draw a more varied clientele.

Comment 2: The Plan does not adequately address recreational pursuits. It should identify that National Forest Lands are public lands set aside so that people who don't own large tracts of forest can have a place to go for recreation. Recreation of all kinds is a legitimate use of the forest and should be of primary consideration in this document.

170 266

Response: Recreation needs and opportunities are addressed in the Forest Plan, Chapter 4, under Forest Management Goals, Desired Future Condition, Forest Management Objectives; in the direction for various management areas; and in the Forest-wide standards and guidelines. The goals include offering a wide range of recreational opportunities, expanding opportunities, and implementing recreation strategies. A significant part of the Forest's recreation program will be implemented through the Smith River National Recreation Area Management Plan, Appendix A in the Forest Plan. The final Plan better describes the recreational opportunities of the Forest.

Comment 3: The two percent figure for site rehabilitation under the CUR alternative seems low. Table IV-41 appears to contain an error in ROS acres, and Table IV-45 is either missing or mislabeled.

223

Response: The errors were corrected in the FEIS.

Comment 5: Restrict mountain bikes to roads and approved logging road loops.

229

Response: Mountain bike use is a legitimate use of National Forest System lands that will be managed to include use of designated routes and prohibit use cross country and on trails inside wilderness and RNAs. Standards and guidelines were added to the final Plan to address mountain bike use.

Comment 6: The "President's Plan" contains no direction or discussion about the various forms of recreation. It established key watersheds, specifying road densities by miles of closed roads without local input or determination of public need or desire.

230

Response: The FSEIS and FSEIS ROD did not address recreation, but focused on biological resources on a regional scale. The Forest Plan and accompanying EIS discuss recreation and transportation management at the Forest level. See response to comment 2.

Comment 7: The introduction to the Recreation section in the DEIS is not clear as to how much area is currently developed.

230

Response: The text is clarified in the final EIS.

Comment 8: The Recreation section of the DEIS includes negative public perceptions of OHV use, needs some clarification, and fails to recognize the fact that all uses are dependent to some degree on vehicle access.

230

Response: The EIS appropriately identifies the range of feelings about OHV use that was expressed as public input. The final EIS was modified to clarify some points and acknowledge that all Forest users depend on some degree of vehicle access.

Comment 9: The Six Rivers Plan develops recreational activities, which will be the major growth area in the local economy, more strongly than other plans.

252

Response: Thank you.

Comment 10: Lists and maps of primitive campsites should be available for all Ranger Districts.

252

Response: These are available and will be updated periodically to improve customer and interpretive services, as stated in the final EIS and Plan.

Comment 11: The DEIS uses potential conflict between hiker and vehicle users to justify not proposing adequate motorized recreation opportunities.

230

Response: The final EIS recognizes the potential for increased recreation use to create conflict among a variety of user groups.

Comment 12: The DEIS does not recognize the cumulative effects to recreation that will be caused by alterations in patterns of use and restrictions on vehicle use and access.

230

Response: The EIS identifies no known cumulative effects of any alternatives related to recreation.

Comment 13: The Plan should provide for development of OHV loop trail systems and should allow OHV use on existing trails by permit where appropriate.

230

Response: Final Plan Chapter 4 states that OHV implementation strategies will be developed on an area-by-area basis to address concerns such as these.

Comment 14: The standard and guideline (13-14) pertaining to restricting OHV use by Forest order is too broad.

230

Response: This standard and guideline was modified in the final plan.

Comment 15: The Forest should work with other governmental/regulatory agencies (State Parks, National Redwood Park) to recognize, map, and restore the

Native American trail that was used by the Jedediah Smith party in 1826.

229

Response: An existing interagency trails committee facilitates agencies working together where trails cross boundaries of lands managed by different agencies. Individual trail projects will be identified through project-level planning.

Comment 16: SRNRA should coordinate recreational signing (standards and guidelines 13-1 and 13-6) with the National Park Service to fully inform visitors crossing agencies jurisdictions.

289

Response: The Interagency Trails Committee Memorandum of Understanding provides for coordinating such signing efforts. Standard and guideline 13-6 has been modified in the final Plan.

Comment 17: Build foot and horse trails throughout the non-wilderness portions of the Forest to more evenly distribute recreationists and protect designated wilderness from overuse.

E 291

Response: Most of the new trails to be built over the next decade would be located outside the wilderness areas.

Comment 18: The Plan should put more emphasis on developing trails for a variety of recreation user groups, especially single track trails which have minimal resource impacts and are sorely need. Trail bikes, mountain bikes, equestrians, and hikers are all fast growing user groups. More emphasis should be placed on satisfying this growing need while at the same time maximizing recreation opportunities to enhance local economies.

289

Response: Approximately 16 miles of new trails will be built over the next decade. These will be multi-purpose trails.

Comment 19: How are the Recreational Opportunity Spectrum (ROS) classes determined, where are they going to be, and how do they vary among alternatives?

140

Response: This information is found in the EIS: Chapter 3, Recreation; Glossary; Chapter 2, Alternatives; Chapter 4, Recreation; and Appendix E.

Comment 20: The summer time use in the Trinity River is handled well with the new facilities constructed last summer.

173

Response: Thank you.

Comment 21: The DEIS fails to mention the Americans with Disabilities Act of 1991 (ADA) or to provide significant emphasis to ensure that the forest meets the requirements of the ADA. All alternatives should provide for 50 percent rehabilitation of developed sites during the first decade.

223

Response: The 1990 Americans with Disabilities Act is discussed in the final EIS and Plan. The alternatives provide a range of development for the decision maker to choose from as required by NEPA.

Comment 22: Permit and use fees should be required of equestrian wilderness users.

84

Response: The use of permits is a management tool to limit or distribute use in wilderness to mitigate or prevent resource damage. The present level of use in the Forest's wildernesses does not indicate that permits should be required for all wilderness use at the Forest Plan level; permits could be considered at the wilderness management implementation level.

Comment 23: Access to the South Fork of the Trinity River at the site known as "low bridge" should be a high priority. This is a popular put-in and take-out for canoeists, kayakers, and rafting companies.

135

Response: Site specific access is outside the scope of the Forest Plan and will be addressed in river or area analyses and/or site specific NEPA analysis.

Comment 24: The Plan should clarify the differences between livestock and equestrian or recreational stock.

140

Response: The final Plan clarifies the differences.

Comment 25: There is a strong discrimination against the U.S. Constitution and our individual rights as Americans to use the Wilderness Area under the U.S. National Disabilities Act of July 26, 1990, the Roads and Trails Act of October 13, 1964, the National Historic Preservation Act of October 15, 1966, the National Trails System Act of October 2, 1968, and the National Trails System Improvements Act of 1988.

140

Response: The Americans with Disabilities Act of 1990 (ADA) states that nothing in the Wilderness Act is to be construed as prohibiting the use of a wheelchair in a wilderness area by an individual whose disability requires use of a wheelchair and that no agency is required to provide any form of special treatment or accommodation, or to construct any facilities or modify any conditions of lands within a wilderness area to facilitate such use. Language regarding the ADA and wheelchair access has been added to the Wilderness Management Area direction in the final Plan.

Comment 26: In general, I commend the Forest for its access to the rivers and the facilities provided at the access points. The parking appears to be adequate and with the construction of new restroom facilities along the Main Fork of the Trinity River between Pigeon Point and Cedar Flat, the restroom facilities are also adequate.

21

Response: Thank you.

Comment 27: Access to various streams, including the South Fork of the Trinity and the North Fork of the Smith rivers, should be provided by either constructing trails or acquiring appropriate sites through land exchange.

21 173

Response: Site specific access is outside the scope of the Forest Plan and will be addressed in river or area analyses and/or site specific NEPA analysis.

Comment 28: The Forest Plan should contain provisions to eliminate or phase out off-road vehicle recreation.

D 20 35 72 84 175 290 291

Response: National policy states that motorized recreation, which includes OHV, is a legitimate use of public lands. The Forest will manage OHV use consistent with and under mandate of Executive Order 11644 and National and Regional motorized recreation policy.

Comment 29: Issue 25 asks how much of the Forest will be open to off-highway vehicles. The text does not answer the question. The actual size of the OHV trail network under all five alternatives cannot be determined.

23 223

Response: Standards and guidelines provide that non-street legal vehicle travel is restricted to level 2 roads. The size of the network would vary as the road and trail system miles change in the alternatives.

Comment 30: What is meant by expanding OHV use by “creating partnerships with user groups” (Draft Plan IV-54, 55)? OHV use, even on designated roads, has the potential to result in resource damage, particularly if off-the-road use occurs. Enforcement is critical and, where use opportunities are abused, the areas should be closed.

23

Response: The text has been clarified in the final Plan.

Comment 31: Restrict ORV use to established roads and designated routes and prohibit their entry into roadless areas.

24

Response: See response to Comment 28.

Comment 32: The types of vehicle that we use to access the Forest require high clearance roads to provide a challenge. There are provisions in the Plan for trails and main roads but not for high clearance roads. There are 7,000 registered OHVs in Humboldt County alone. These users, combined with those from out of the area, constitute a majority of the users of the forest lands. This plan does not adequately address their legitimate need for access.

170

Response: More than 98 percent of the OHV opportunities in the forest revolve around more primitive (level 2) roads, which are not maintained for passenger car use. These roads, which are termed “high clearance routes,” are open to OHV use (both street legal and

“Greensticker”) by Regional policy and provide for hundreds of miles of quality motorized recreation opportunities. As Forest road maintenance funding shrinks, more of the higher standard roads may be reclassified to level 2 status, which could compensate somewhat for closures of level 2 roads that involve dead end routes built to access timber sales.

Comment 33: All motorized vehicle use should be restricted to established roads. Off-road use causes soil erosion and permanent soil disturbance, introduces diseases, and disturbs wildlife.

182

Response: See response to comment 29. Current information indicates that properly managed OHV use is no more detrimental to the forest than other forms of recreation including hiking, mountain bicycle, and equestrian use.

Comment 34: The DEIS states that: “California is the leading state for off-highway vehicle (OHV) use. One in every eight of the nation’s motorcycles and all-terrain vehicles were registered in California during 1988. While the demand has been steadily increasing for OHV use opportunities, the supply of designated OHV routes on the Forest has declined. There are no OHV staging areas or facilities designed to accommodate their use. Opportunities exist to use non-system roads, designate specific Forest roads, and to construct new routes to provide a system of OHV routes” (DEIS page III-117). We agree with this statement in concept but note that a significant portion of the OHV use is not mentioned. We recommend that four wheel drive vehicles, two wheel drive OHV type vehicles, and regular passenger vehicles that are driven off highway also be mentioned in this statement and be considered in all analysis that is relative to OHV recreational use. In a 1990 scientifically defensible study, the California Department of Transportation found that 14.7 percent of the households surveyed in California drive at least one of their vehicles off-road. (“A Study to Determine Fuel Tax Attributable to Off-Highway and Street Licensed Vehicles Used for Recreation Off-Highway”, Tyler and Associates for the California Department of Transportation, Corte Madera, 1990).

223

Response: Language that reflects current use figures as obtained from the State is included in the final EIS.

Comment 35: The total amount of OHV trails and designated routes, the amount to be maintained, and the amount to be constructed/reconstructed are not listed anywhere in the plan. These figures are presented in the DEIS for non-motorized trails and are presented by alternative and by decade for five decades.

223

Response: Forest roads and trails may be used by various types of vehicles for various reasons, including those used by OHVs for recreation. Mileages have not been calculated by separate types of use.

Comment 36: The effects of the President's Option 9 on OHV recreation and recreation in general were not addressed. For each alternative, and taking into account the effects of Option 9:

- 1) What is the total OHV route mileage by decade for five decades?
- 2) How many OHV route miles will be maintained by decade for five decades?
- 3) How many OHV route miles will be constructed or reconstructed by decade for five decades?
- 4) When will the OHV implementation schedule and updated OHV route inventory be produced?
- 5) What kind of OHV recreational opportunities are going to be provided?

223

Response: See response to comment 35 in relation to route miles. Development of implementation schedules and recreation opportunities depend on availability of funding. The final EIS and Plan describe some OHV recreation opportunities that could be developed.

Comment 37: The DEIS states that "Driving for pleasure and viewing scenery accounts for the greatest amount of recreational use on the Forest," but Table III-20 fails to mention either OHV use or driving for pleasure. These categories should be included in Table III-20.

223

Response: These uses are included in the "other" use category.

Comment 38: The DEIS states on page IV-23 that "Uses with the greatest potential for disturbance are OHVs, 4-wheel drive vehicles driven off road into sensitive areas such as meadows and lake shores, campgrounds, and popular beach spots along river;

poaching; and excessive river recreation." As it is written, this sentence implies that driving an OHV or a four wheel drive vehicle in a campground or a popular beach spot along a river creates a situation with the greatest potential for the disturbance of wildlife. This sentence should be rewritten to indicate that campgrounds and popular beach areas along rivers by themselves create this potential.

223

Response: This has been rewritten in the final EIS.

Comment 39: The DEIS states that "Staging areas with facilities to accommodate OHV use would be constructed during the first decade" for Alternatives B and C, but makes no mention of staging areas for the other alternatives. Please explain:

- 1) Why OHV staging facilities are only included in Alternatives B and C.
- 2) How many OHV staging facilities are planned?
- 3) Where are these facilities planned?

We recommend that the construction of new OHV staging areas be included in all alternatives.

223

Response: Information has been added in the final EIS.

Comment 40: The DEIS states that part of the increase in cost of the recreation program under all alternatives would be due to additional funding for the Smith River NRA and funding from the State Green Sticker program that has not been available in the past. Green Sticker funds are allocated on an annual basis with the approval of the Off-Highway Motor Vehicle Recreation Commission, the state legislature, and the governor as part of the State's budget process. Future Green Sticker funds are dependent upon this process and are not guaranteed.

223

Response: This is clarified in the final EIS.

Comment 41: All forest roads should be open to OHV use, unless posted closed. This approach will reduce the number of signs and sign maintenance costs as well as providing a positive approach to OHV recreation.

223

Response: Motorized recreation routes that are part of the level 2 (not maintained for passenger car use) road network have already been designated as open by Regional Policy and do not have to be signed open. They do have to be signed or gated closed if unavailable for public use. The Forest will continue to use a balanced, easily discernible mix of signing to inform the user of emphasized routes.

Comment 42: The DEIS states that, for all alternatives, designated OHV routes would increase, they would consist primarily of maintenance level 2 roads, no open areas of OHV use would be provided, and OHV use would be controlled by restricting such use to designated routes. The DEIS also states that an OHV implementation schedule would be developed and that an updated OHV route inventory will define an OHV system with specific existing routes mapped and designated. Total Forest road miles, as presented in DEIS Tables II-5 and II-7, shrink by 210 miles in Alternative B and 190 in Alternative C. We question how OHV routes could increase in Alternatives B and C when overall forest road mileage would shrink.

223

Response: See response to comment 1. In addition, as the Forest's road maintenance funding decreases, some of our higher standard roads, that are currently unavailable for use by "greensticker" motorized vehicles, may be moved into our maintenance level 2 category (high clearance roads not maintained for passenger car use), and would then be available for OHV use. Likewise, a number of our lowest standard roads could be obliterated, thus showing a net loss of total forest road miles. This loss is not purely indicative of lost OHV opportunities, but rather a loss of total forest road miles, many of which are legally unavailable to OHV use now.

Comment 43: Recreation goals for OHVs are for construction of OHV staging areas, trails and trailheads (Plan P. IV-56). Are these actions planned for the North Fork Smith roadless areas? If so are they planned in the foreseeable future?

224

Response: The boundaries of the North Fork Smith Roadless Area have been drawn around the existing historic mining road network. Within the North Fork

Botanical Area, some roads would be permanently closed and others gated with use by permit only to protect the sensitive plant species and drainages not yet infected by the Port-Orford-cedar root fungus disease. The Forest has no plans at this time for new construction of trails, trailheads, or staging areas within the released roadless area.

Comment 44: The use of OHVs is not consistent with the goals of the North Fork Management Area, the Smith River NRA, Special Interest Areas, and botanic resources. How is the Forest proposing to limit use to dry season?

224

Response: Roads within the North Fork Botanical Area with the highest risk of spreading *Phytophthora lateralis* to uninfected drainages will be permanently closed in the preferred alternative. Motorized travel on other roads where infection has not occurred will be limited through the use of road closures during wet periods (such as the gates at either end of the High Plateau mining road network) and user education, both of which are already successfully in place. Access during dry periods will be managed through a permit system. Port-Orford-cedar risk assessment plans must be completed for any activity that has the potential to spread the disease.

Comment 45: Recreation, specifically OHV recreation, is a vital and valid existing right on public lands. In actuality, most recreation on public lands is dependent on motorized access and the use of developed recreation facilities. Those segments of the recreation public who profess to have no need for motorized recreational access in reality use such access to enjoy their chosen form of recreation, even to the point of developed parking and sanitation facilities. Hypocrisy exists in that this need for motorized access and developed recreational facilities ends at the point of their access to recreational needs.

230

Response: The EIS and Forest Plan recognize that most recreation use of public lands depends to some extent on motorized access and developed facilities.

Comment 46: The resolution to Issue 26 (Draft Plan, Chapter 2) does not identify what “use type” the trails will be. It is deceptive to believe that the quoted number will benefit all user groups, when that is surely not the case. It appears that the bulk of the issues stated are driven by the environmental versus conservation/recreation communities. The environmental health of the Forest cannot be protected by purposefully neglecting the multiple uses that occur and the issues surrounding needs for and benefits of these types of use.

230

Response: Chapter 2 provides a summary of issue resolutions rather than detailed information. Each facility or service provided on the Forest is not intended to serve all user groups.

Comment 47: Implement innovative restrictions on off-road vehicle use.

E

Response: See response to comment 28.

Comment 48: The Plan indicates that hundreds of miles of roads will be closed unless they are fulfilling their original purpose. Many roads were originally built for timber harvesting, and while the emphasis is shifting away from resource extraction, these roads are now a valuable recreation asset.

259

Response: See responses to comments 1, 42, and 44.

Roadless and Wilderness Area Management

Comment 1: Roadless and wilderness areas are distinct and separate subjects under the law, and combining them supports the view that any “roadless” area should be designated wilderness. The two should be discussed in two distinct sections.

230

Response: These sections were combined because many of the original roadless areas were designated as wilderness, and other roadless areas were released from wilderness under the 1984 California Wilderness Act; we combined the sections to help the reader track the original roadless areas and what has happened to them. There was no intent to support the view that roadless areas should be designated as wilderness.

Comment 2: Congress did not prohibit the Forest Service from considering released roadless areas for wilderness designation. Further, the length of time since the passage of the California Wilderness Act and NFMA raises the issue of whether the Forest is now obliged to reconsider wilderness dedication. The Forest has the legal right to consider a wilderness alternative for any roadless area it chooses and the Forest Plan should honestly concede this point.

24

Response: We have revised the language in the final Plan regarding the consideration of released roadless areas for wilderness. The decision of whether to recommend roadless areas for additional wilderness is indeed the Forest’s choice. As present and projected wilderness use is below maximum capacity, the Forest decided not to recommend additional roadless areas for wilderness designation.

Comment 3: Roadless areas not designated as wilderness under the California Wilderness Act were released for multiple-use management and should be so managed.

230

Response: The released roadless areas would be managed under a variety of multiple use strategies in the FEIS alternatives. See Chapter 4 of the FEIS for a discussion of the management strategies for roadless areas under each of the alternatives. Under most alternatives, the roadless areas would have no specific

management direction other than the direction for the management areas they fall within. Depending on which management area they fall within, some of these roadless areas could have multiple use management. In all alternatives, over half of these areas are in reserved areas such as research natural areas or various allocations that provide habitat for threatened, endangered, and sensitive species. Under the preferred alternative, all remaining roadless areas in key watersheds would remain roadless, as directed by the FSEIS ROD. These areas would have a semi-primitive non-motorized designation under the ROS system.

Comment 4: Protect wilderness from continued destruction.

244 311 313

Response: The final Plan contains management direction to preserve wilderness according to the 1964 Wilderness Act so that natural processes are the primary influence on wilderness and impacts from humans are minimally evident. Standards and guidelines for the different wildernesses establish limits of acceptable change to minimize the degradation of the wilderness resource. See the wilderness management area direction in chapter 4 of the final Plan.

Comment 5: Large buffer zones should be established around all designated wilderness for eventual inclusion in wildernesses and to prevent wildernesses from becoming “biological islands.”

250 291

Response: The Forest Service Manual states that Wilderness will not have buffers. The management strategy for the preferred alternative combines a system of reserves (91 percent of the Forest would be within reserved areas) with management strategies that maintain connectivity. There is little risk of wilderness becoming biological islands under this management strategy. For more information, see the Biological Diversity section of FEIS Chapter 4.

Comment 6: Issue Statement 29: “provide quality wilderness:” What is your definition of quality wilderness?

18

Response: Quality wilderness is wilderness that meets the goals of the 1964 Wilderness Act. According to the Act, natural conditions will be protected and preserved

so that the wilderness (1) generally appears to have been affected primarily by the forces of nature, with the imprint of mans’ work substantially unnoticeable, and (2) has outstanding opportunities for solitude or primitive and unconfined recreation.

Comment 7: An EIS should be required for the first project entry into roadless areas.

24

Response: FSH 1909.15, Chapter 20, 20.6, Classes of Actions Requiring EISs includes “Class 3: Proposals that would substantially alter the undeveloped character of an inventoried roadless area of 5,000 acres or more.” Proposals for areas smaller in size would require an EIS if the environmental effects were found to be significant.

Comment 8: The EIS should describe the process which will be used to determine whether EAs or EISs will be required for road construction and timber harvest in previously designated roadless areas. The EIS should indicate the management prescriptions for roadless areas on the Forest under the President’s plan. Examples are no new road construction in roadless areas in key watersheds in order to protect high quality habitats, and watershed analysis in non-key watersheds which contain roadless areas before any management activities could occur. The EIS should discuss how these restrictions would affect forest management and should include a map outlining the juxtaposition of roadless areas with reserves and matrix areas. The impact of new roads and forest management activities on water quality should be assessed as specifically as possible.

174

Response: See response to comment 7 for the process which is used to determine whether an EA or EIS is required in previously designated roadless areas. Chapter 4 of the FEIS discusses the management prescriptions under each of the alternatives for the remaining roadless areas, including whether new roads would be allowed or watershed analysis would be required. The map packet accompanying the FEIS and final Plan contains a map of the original and the remaining roadless areas, and can be overlaid with the management area maps to help the reader understand the juxtaposition of roadless areas with different management areas and prescriptions. The impacts of new roads on water quality are discussed in the Water section of FEIS Chapter 4.

Comment 9: Wilderness is to generally appear to have been affected primarily by the “forces of nature.” The LMP does not include a strategy for fire as a force of nature in wilderness. Recognition is made that fire has a natural ecological role, but this seems to be overlaid by a need to reduce “risk and consequences,” including containment and control by using motorized equipment. The Forest Service needs to develop a fire program for the entire Forest which integrates fire as a natural process in wilderness.

23

Response: We are continually learning more about the important role of fire in forest ecosystems, and have modified the Fire and Fuels Management standards and guidelines to reflect recent changes in our management strategy (see Chapter 4 of the final Plan). The Forest will develop a fire management action strategy that addresses your concerns (see Chapter 5 of the final Plan). The action plan will balance the integration of fire as a natural process and the need for suppression to protect lives and property.

Comment 10: Artificial stocking of fish in wilderness is inappropriate and should be stopped; the Forest Service and the Department of Fish and Game should not be providing fish for recreation or food in waters that do not naturally produce fish.

23

Response: The Forest Service and the Department of Fish and Game are currently reviewing the policy of fish stocking, and a high priority is the issue of stocking in wilderness. The Forest will follow the direction that is being developed.

Comment 11: Remove all structures and garbage from wilderness areas.

84

Response: Structures covered by the pre-existing use clause in the 1964 Wilderness Act will be allowed to remain. The “pack it in, pack it out” concept is part of the wilderness experience and the Forest does not have the personnel or funding to provide a garbage service.

Comment 12: Almost all of the roadless areas designated under the Six Rivers Plan are already protected in the Congressionally established Smith River National Recreation Area. Descriptions of roadless areas and their management is inadequate, limited to a

table of percentage prescription allocations for each roadless area. No spatial analysis of roadless areas was done. The Six Rivers Plan sets aside 20 percent of its roadless acres as “wildlife dedicated,” which allows management for specific late seral wildlife habitat purposes only.

227

Response: Many roadless areas are outside the Smith River NRA. FEIS Appendix C contains a thorough description of the roadless areas, and Chapter 4 of the FEIS discusses the management prescriptions under each alternative for the remaining roadless areas. A map of the original and remaining roadless areas has been added to the map packet to help provide better spatial understanding of the roadless areas and their management under each alternative, and the percentage figures have been changed to acres in the final EIS. Under the preferred alternative, roadless areas fall into a number of management areas with different direction and standards and guidelines. In addition, each roadless area has a ROS designation for the types of recreational use allowed.

Comment 13: The DEIS fails to adequately analyze the effects of logging, road-building and otherwise developing released roadless areas, particularly in terms of ecological criteria. It fails to discuss effects of these activities on wildlife, fisheries, plants, and recreational opportunities that depend on the preservation of these wildlands.

272

Response: Chapter 4 of the FEIS displays the environmental consequences of management under each of the alternatives in terms of the types of management that would be allowed in the remaining released roadless areas. Roadless areas fall into a number of management areas, and the effects of allowable activities within these management areas are discussed on a Forest-wide basis in Chapter 4 in each of the sections you mention (Wildlife, Fisheries, Sensitive Plants, etc.).

Comment 14: Stocking wilderness lakes by aircraft should be prohibited, or all motorized uses that were established prior to wilderness designation should be allowed.

230

Response: The current stocking of wilderness lakes by aircraft is one of the motorized uses allowed in wilderness. However, the issue of stocking wilderness

lakes by any means is currently under review. See response to comment 10.

Comment 15: Sanitation uses should never occur within 100 feet of a water source in wilderness.

230

Response: The Forest discourages sanitation uses within 100 feet of water sources in wilderness, but does not have the means to enforce this type of restriction. The Forest will continue with public education efforts to alert users to the damage caused by such use.

Comment 16: Trail systems all should afford users with different degrees of ability the same degree of opportunities.

230

Response: The Forest provides a wide range of trails both inside and outside wilderness. The wilderness standards and guidelines for recreation state that “trails shall be managed to maintain a balanced spectrum of travel opportunities according to difficulty, mode of travel, distance, and type of destination.”

Comment 17: All groups which publish schedules of events and run organized events on public lands should be required to obtain licenses and/or permits.

230

Response: Groups may sponsor activities or functions that are considered recreational outings or events, rather than commercial outfitting and guiding; outings and events may not require licenses and permits.

Comment 18: The standard/guideline that provides that public education will be emphasized in dealing with visitor violations in wilderness is preferential. Wilderness rule violators should be issued citations, just as illegal motorized vehicle users are throughout the forest.

230

Response: Patrols in wildernesses will certainly issue citations for visitor violations; however, as the Forest does not have the means to patrol wildernesses and issue citations for all violations, we must emphasize public education, rather than patrols, to correct visitor violations.

Comment 19: The word “discourage” should be replaced with “eliminate” in relation to the use of soap in streams in wilderness. This type of impact must be eliminated or the area closed.

230

Response: Because it is very difficult to enforce this type of restriction in wilderness, the Forest emphasizes public education and informational programs to change such behavior by wilderness users.

Comment 20: The concept that use creates impacts, impacts are acceptable, and the recreational needs of the specific user group dictate that the use continues should be applied equally to all users of this Forest.

230

Response: The concept of “limits of acceptable change” used in wilderness management is not intended to let the extent of user impacts dictate continued use or impacts. This concept is intended to minimize impacts in wilderness by establishing objectives for those areas that receive more use, and consequently more impacts. Limits of acceptable change does not differentiate between users, but concentrates on impacts that may be acceptable and not acceptable regardless of who or what caused the impacts. The policy of the Forest is to allow recreational activities if they do not have adverse impacts on other resources, to mitigate adverse impacts if possible, and to restrict use in some areas if adverse impacts cannot be reasonably mitigated.

Comment 21: Fees should not be charged for wilderness use.

E

Response: This is outside the authority of the Forest Service. Congress establishes use fees, and the Forest follows Congressional direction.

Comment 22: Maximum group size allowed in wilderness should be 12 individuals and 8 livestock.

E

Response: The Forest is currently following Regional Guidelines which specify a maximum of 25 individuals in one group. We have added a standard and guideline to consider the establishment of maximum levels of use (including party size) when developing or revising wilderness management direction. The number of livestock allowed will be established through the range

project decision process (see the Range Management standards and guidelines in Chapter 4 of the final Plan).

Comment 23: Use of automatic weapons in wilderness should be outlawed and patrolled.

E

Response: The lawful use of firearms within designated wildernesses is not specifically prohibited, so long as the use is consistent with applicable Federal, State, and local laws and regulations regarding firearms and firearm use.

Comment 24: Trash dumps should be identified and removed from campsites in wilderness.

E

Response: The “pack it in, pack it out” concept is part of the wilderness experience. The Forest does not have the funding or personnel to regularly remove trash from campsites in wilderness areas. When possible, trails crews do remove trash and unauthorized structures from these campsites.

Comment 25: Standards and guidelines for the North Fork Wilderness would provide for year around access and facilities for the recreational needs of the wilderness visitor. We support these standards and guidelines for improved access to this area and for similar opportunities for access to all user groups throughout the Forest.

230

Response: Year-round access can be provided to the North Fork Wilderness because it is a low-elevation wilderness. Access roads to the other wildernesses on the Forest receive much more snow, and cannot be maintained year-round.

Comment 26: Motorized equipment should not be used for fire suppression within designated wilderness.

224

Response: The Forest will attempt to use low-impact methods of fire suppression within wilderness whenever possible. When these methods are not effective, the use of motorized equipment may be authorized, but would require Forest Supervisor or Regional Forester approval, depending on the type of equipment to be used.

Comment 27: All existing roadless areas should be recommended as wilderness for sensitive watershed, botanical, wildlife and recreation needs.

A D 84 182 198 217 219 263
272

Response: While RPA and other reports show an increased demand for wilderness recreation use nationwide, current and projected future use on the Forest is relatively low. Currently 123,150 acres, about 13 percent of the total Forest, is within designated wilderness. Due to the low demand relative to the available supply, no additions to the wilderness system were recommended for this planning period in any alternative. In all alternatives, land allocations and associated standards and guidelines provide for watershed, botanical, and wildlife needs as discussed in various sections of Chapter 4 of the FEIS. The existing wilderness system is an integral part of these ecosystem management strategies.

Comment 28: Congress did not prohibit the Forest Service from considering “released” roadless areas for wilderness designation. The California Wilderness Act of 1984 states that “...the Department of Agriculture shall not be required to review the wilderness option prior to the revision of the plan...” Therefore, the USFS has the legal right to consider a wilderness alternative for any roadless area it chooses, and we ask that the FLRMP honestly concede this point.

Response: See the response to comment 2.

Comment 29: Provide the strongest possible protection for the Board Camp, South Fork Mountain, and Horse Linto Creek roadless areas.

52 252

Response: Only one of these three areas, Orleans “C,” still qualifies as roadless under the guidelines used to originally designate the areas under the RARE II study. In the preferred alternative, over 99 percent of Orleans “C,” the Horse Linto Creek roadless area, would be in reserves. Most of Board Camp (78 percent) would also be in reserved areas, and the entire area would have a semi-primitive non-motorized designation under the ROS system. Just over half of Pilot Creek, the South Fork Mountain roadless area, would be in reserves. Much of the rest of Pilot Creek would be in a managed habitat management area to maintain and enhance habitat for the marten, fisher, and other species dependent on late-successional and old-growth habitat. Pilot Creek is

also located within the Hayfork Adaptive Management Area which was designated to test innovative approaches to forest management.

Comment 30: All unroaded, undeveloped land on the forest, including semi-primitive non-motorized areas, should be managed in a manner so as not to degrade their suitability for future wilderness designation by Congress: protected from all logging, road building, mining, grazing, and motorized vehicle use. Protection would greatly enhance the protection of wildlife habitat, species diversity, and the Forest itself compared to nonrestricted resource exploitation.

A E 20 22 23 24 182 193
290 291 313

Response: There are no areas of the Forest available for nonrestricted resource exploitation. Management areas have specific direction and standards and guidelines regarding logging, road building, mining, grazing, and other uses. There are currently 10 roadless areas that still qualify as roadless under the guidelines used to originally designate these areas under the RARE II study; over 95 percent of these areas would be in reserves under the preferred alternative. The combination of land allocations plus the ecosystem management approach of the preferred alternative is expected to adequately provide for wildlife habitat and species diversity.

Comment 31: Roadless areas have taken on new importance in the light of the emerging science. These areas are not only critical in protecting water quality, but are also the islands of naturally functioning ecosystems that provide an anchor of biological diversity. Moreover, they are models for learning how to restore damaged ecosystems. Roadless areas, as well as other significant stands of old growth, should be protected rather than used for experiments in new forestry.

196

Response: The FSEIS ROD directs that all remaining roadless areas in key watersheds will remain roadless to protect remaining high quality habitats. In addition, the ROD directs that watershed analysis must be conducted in all roadless areas in both key and non-key watersheds prior to any management activities within the roadless area. This direction has been incorporated into the preferred alternative. Under the management strategy for the preferred alternative, over 95 percent of the remaining roadless areas would be in management areas that are reserved from timber harvest activities.

Comment 32: All roadless areas not currently in the Clinton plan’s proposed late successional reserves should be added to this reserve system because of their exceptional values as refugia for aquatic and terrestrial diversity and as intact landscapes. We do not agree with the statement that the “irretrievable loss [of wilderness characteristics] will occur only upon project implementation and not as a direct effect of the Forest Plan allocations.”

224

Response: Under the preferred alternative, over 95 percent of the remaining roadless areas would be in reserves. All remaining roadless areas in both key and non-key watersheds would have watershed analysis conducted prior to management activities within the roadless areas. For those areas with land allocations permitting timber harvest and other activities, land allocation alone does not constitute an irretrievable loss of wilderness characteristics; only after development activities occur would the area lose its wilderness characteristics.

Comment 33: In light of the amount of information and analysis needed before sustainable management decisions can be made, all current roadless areas should remain roadless until the biological diversity data needs identified by the California Native Plant Society are addressed.

225

Response: As discussed in the responses to comments 31 and 32, over 95 percent of the roadless areas would be in reserves under the preferred alternative. Watershed analysis would be required in all remaining roadless areas in both key and non-key watersheds to address biological diversity and other issues. The biological diversity and native plant material use standards and guidelines in Chapter 4 of the final Plan address many of your concerns.

Comment 34: The Plan proposes excessive levels of development in roadless areas that will have negative environmental impacts much beyond those identified in the FEMAT and DSEIS, will be inconsistent with the goals and recommendations of Option 9, and will obstruct the implementation of Option 9. The FEMAT identifies the importance of roadless areas for the protection of aquatic systems and states that, “No new roads will be constructed in roadless areas in key watersheds...” (FEMAT V-51). Roadless areas are the last vestiges of primitive, undisturbed natural

ecosystems, and should be preserved as a control in this grand experiment in human management of the landscape. Roadless areas also provide an important reservoir for biological diversity (Klamath DEIS, 3-77).

227

Response: The direction from the FSEIS ROD has been fully incorporated into the preferred alternative in the final EIS and Plan.

Comment 35: Six Rivers is the most constrained (forest) by Option 9, as virtually all of its roadless areas are in Tier 1 key watersheds, yet the Six Rivers plan does not mention the Salt Creek Roadless area (Rare II-05252), which is within a Tier 1 key watershed and should be protected from all roadbuilding. The area is designated as “wildlife managed,” a prescription which allows roadbuilding and logging and which would not preserve its wilderness character.

227

Response: Salt Creek has been modified by past roading and logging, and no longer qualifies as roadless under the guidelines used to originally designate the areas under the RARE II study. The area has a number of management area allocations, and approximately 56 percent of the area would be in reserves. See Appendix C of the FEIS for a description of the area and a listing of the management area allocations for the area.

Comment 36: Pilot Creek, Board Camp, Cow Creek, and Underwood roadless areas are all in the Hayfork Adaptive Management Area (AMA) under Option 9. Option 9 gives the Forests the authority to plan for adaptive management areas within their borders (FEMAT, III-27). When planning for the AMA, the Forest should preserve roadless areas as controls against which the AMA can be evaluated.

227

Response: The Forest, together with the Shasta-Trinity National Forest and the Bureau of Land Management, will develop a plan for the management of the Hayfork AMA, including the areas you have mentioned. Until this plan is developed, the Forest Plan provides the direction for the management of these areas.

Comment 37: The EIS should preserve future wilderness opportunities by reallocating all roadless areas to semi-primitive, non-motorized, or backcountry designations. The Plan should protect and enhance

natural biological diversity by prohibiting new road construction in roadless areas.

227

Response: Future wilderness opportunities will be retained in over 95 percent of the remaining roadless areas. Many of these areas are located within key watersheds. As there would be no further roading of these areas under the preferred alternative, they have a semi-primitive non-motorized designation under the ROS system. See the roadless area and ROS maps, and Chapter 4 of the FEIS for more information.

Comment 38: Roadless areas are very important because of the recreation, aesthetic, and spiritual resources they provide, in addition to their ecological value. As more of the natural landscape is developed, the demand and need for more wilderness will increase. To meet the growing demand for wilderness and primitive recreation, the Plan should place more roadless acres into the semi-primitive, non-motorized classification. Congress granted the Forests the flexibility to manage roadless areas as de facto wilderness areas in the 1984 California Wilderness Act and instructed the agency to reevaluate roadless areas for potential wilderness designation at subsequent rounds of forest planning. Increasing the amount of lands designated as semi-primitive, non-motorized will help meet recreation and spiritual demand for wilderness areas while preserving future management options, including potential wilderness designation, and will protect their important ecological values.

227

Response: See the response to comments 2 and 37.

Comment 39: My overriding concern is with Orleans Mountain “B” and portions of “C” roadless areas, which are part of the largest ancient forest stand remaining in northern California, downstream from the mouth of the Salmon River in the Klamath and Six Rivers National Forests. There are timber sales planned for the Orleans Mountain “B” area in 1994. These roadless areas are not in a forest reserve under Option 9. Pearch Creek drainage should be protected since it provides most of the water for the town of Orleans. The middle Boise Creek parcel is important. The Red Cap Creek watershed should be protected, even though it has been heavily logged, because it is an important anadromous fisheries stream, and it is adjacent to the Trinity Alps Wilderness.

271

Response: Over 79 percent of Orleans “B” and 99 percent of Orleans “C” would be protected under the preferred alternative. Red Cap Creek is a key watershed, and watershed analysis would be required prior to management activities within the watershed. As a key watershed, a focus of management activities in the Red Cap watershed would be the maintenance and enhancement of habitat for anadromous fisheries.

Comment 40: Please allow no more road-building and logging in the Cow and Underwood roadless areas which are key steppingstones and can be marginal core habitat depending on the species.

271

Response: Under the preferred alternative, most of the Cow Creek and Underwood areas would be reserved from logging. The portions of these areas that are still roadless would have a semi-primitive non-motorized designation under the ROS system. The system of reserves and standards and guidelines for the preferred alternative are expected to provide adequate habitat for late-successional and old-growth dependent species.

Comment 41: The plan makes no effort to preserve entire roadless areas intact for future wilderness designation; instead it would divide and shrink the pristine sections of roadless areas, limiting future wilderness suitability. The Forest should allocate all roadless areas to semi-primitive, non-motorized or backcountry designations to avoid fragmentation and protect them for future wilderness designation.

227

Response: Under the preferred alternative, over 95 percent of the remaining roadless areas would be managed in a manner that would retain or only slightly alter their wilderness attributes. As many of these areas are within key watersheds which prohibit further roading of roadless areas, they would have a semi-primitive non-motorized designation in the ROS system. See the roadless and ROS maps as well as the Roadless and Wilderness section of FEIS chapter 4 for more information.

Comment 42: To consider wilderness designations adequate given the striking population increases in the state is both naive and short-sighted. It is the responsibility of the government to look to the future.

84

Response: Although the population of the state is increasing, and wilderness use nationally is expected to rise, the wildernesses within the Forest are remote from major populations and have low use relative to maximum capacity. See response to comment 2.

Comment 43: Wilderness designation is the best means available to us to preserve habitat continuity and I urge you to see that as much acreage as possible in these ancient forests be protected.

186

Response: The late-successional reserves that were designated as a part of the FSEIS ROD are designed to provide late-successional and old-growth habitat for a wide range of species. The management direction and standards and guidelines for these reserves are aimed at maintaining and enhancing habitat over time. The provisions for stand management in late-successional reserves is expected to better provide habitat than wilderness and other areas which do not allow such stand management.

Comment 44: The Forest Service should recommend to Congress that the North Fork Management Area of the NRA be designated as the southern-most addition to the Kalmiopsis Wilderness and as part of the larger Work Heritage site or National Natural Landmark encompassing the Josephine peridotite shield.

224

Response: The management emphasis for the North Fork Management Area of the NRA is on back-country and whitewater recreation, while recognizing the unique botanical communities, outstanding whitewater, and historic values. Access to the North Fork Management Area for recreational and interpretive opportunities would be severely restricted if the area were to be included in the Kalmiopsis Wilderness.

Comment 45: Not 1 acre is recommended for wilderness designation. Changes due to Option 9 will protect no additional acres.

227

Response: See response to comment 2.

Comment 46: Grazing, livestock facilities, and the use of motorized vehicles for grazing allotments are totally incompatible with wilderness. The Forest should have a

strong policy of retiring allotments and controlling non-compatible facilities and vehicles for existing allotments.

16 23

Response: Pre-existing grazing rights are provided for by the 1964 Wilderness Act and will continue to be permitted subject to reasonable regulations as long as environmental damage is not occurring. The Forest will review the impacts of grazing both inside and outside wilderness as part of the range project decision process.

Comment 47: The DEIS states that AUMs are underutilized for the entire Forest, and that there are impacts from existing grazing in wildernesses. The EIS should discuss possible mitigation of these impacts by shifting grazing from wilderness to the underutilized non-wilderness areas.

174

Response: The DEIS states that there are impacts from grazing in riparian areas not wilderness; there are currently no known impacts from overgrazing in designated wilderness on the Forest. Livestock use within designated wilderness will be consistent with wilderness values. The shifting of grazing from one allotment to another to reduce impacts will be analyzed at the project level through the range project decision process. As many permittees have property adjoining their allotments on Forest land, it is not always feasible to transfer grazing from one allotment to another. See the Range Management standards and guidelines in Chapter 4 of the Plan for more information.

Comment 48: Phase out grazing permits entirely as they come up for renewal: carefully evaluate grazing permits adjacent to wilderness for their hidden impacts on the wilderness, and phase them out where those impacts are significant.

E

Response: See the response to comment 46.

Comment 49: Quickly phase out grazing on all National Forest land and remove cattle from designated wildernesses including, but not limited to, Snow Mountain and Yolla Bolly-Middle Eel Wildernesses.

291

Response: Grazing is a permitted use on National Forest System lands. The 1964 Wilderness Act provided for

continuation of pre-existing grazing rights in wilderness; grazing will continue to be permitted subject to reasonable regulations as long as environmental damage is not occurring.

Comment 50: The increasing impact of grazing in wildernesses has been quite noticeable over the past 5 years. Reduce pressure on the backcountry by eliminating overgrazing in wilderness and reducing the extent of logging in non-wilderness areas.

303

Response: The Forest has developed utilization standards and guidelines that protect all rangelands, not just those within designated wilderness, from overgrazing. See the Range section in Chapter 4 of the Final Plan for more information. Under the preferred alternative, logging would be limited to a small portion (9 percent) of the Forest, called the matrix.

Comment 51: An extensive system of trails outside wilderness should be established and maintained to ease human pressure on wilderness.

84

Response: The Forest has recognized the need to provide a broader spectrum of trails outside wilderness; most of the trails to be constructed the next decade will be outside wilderness.

Comment 52: The Forest Service would abandon numerous roadless area classifications and current roads. These areas and abandoned roads should be turned into trails. There are experienced volunteers who would donate money, time, and physical labor to assist in achieving this objective.

140

Response: When decommissioning roads, the Forest will analyze opportunities for turning them into trails. We appreciate your offer for assistance and hope to establish partnerships to complete such work in the future.

Comment 53: The FEMAT report identified decommissioning of unneeded, neglected, and high-impact roads to be an urgent and significant restoration need in the National Forests because of the magnitude of impacts that roads have on aquatic ecosystems. The "Gang of Four" report calls for roadless areas to be left unroaded and for upgrading or removing "problem"

roads. The Forest's proposed timber harvest and road construction in roadless areas and unmanaged stands seems inconsistent with its proposal to ensure biodiversity, protect riparian areas, and maintain and reestablish late-successional stage forests. Continued construction of roads is neither ecologically nor financially justified, regardless of the intent to reduce the number of miles of open road.

23

Response: Under the preferred alternative there would be no new road construction in remaining roadless areas in key watersheds, and watershed analysis would be required in all roadless areas prior to resource management. The Forest would construct only 2.5 miles of road annually, which is well below the level in the DEIS (18.5 miles of road annually). Over 95 percent of the Forest's remaining roadless areas would be managed in a manner that would retain or only slightly alter their wilderness attributes. Although management could be allowed in a small portion of the remaining roadless areas, the Forest's overall management strategy, including a large reserve system, watershed analysis and restoration, and the protection of late-successional reserves, is expected to maintain biodiversity, protect riparian areas, and maintain and enhance late-successional stage forests.

Comment 54: Build no new roads, especially near wilderness and in roadless areas.

E 227

Response: The Forest will be constructing only 2.5 miles of road annually during the next two decades; most of these will be small spur roads to reach project sites. Under the preferred alternative there would be no new road construction in remaining roadless areas; and road construction near wilderness would be primarily for the purpose of recreational access to wilderness.

Comment 55: Roads adjacent to wilderness that do not lead to trail access should be closed.

E

Response: The preferred alternative proposes an aggressive road decommissioning program over the next two decades. Roads which are no longer needed and are contributing to resource problems would be obliterated; other roads would be gated to prohibit use except for emergency situations such as wildfire suppression. As the Forest's wilderness areas are within or adjacent to

key watersheds, road densities adjacent to wilderness areas would decrease.

Comment 56: The Mendocino National Forest should administer the Yolla Bolly-Middle Eel wilderness and coordinate activities within it for other forests.

E

Response: The Yolla Bolly-Middle Eel (YBME) Wilderness lies within three Forests: the Mendocino, the Six Rivers, and the Shasta-Trinity. The Mendocino has coordinated the development of the programmatic direction contained in the final Plan and the Wilderness Implementation Schedule for the YBME Wilderness. The Mendocino is the lead Forest for the administration of the Yolla Bolly-Middle Eel Wilderness. Under current laws and regulations, the Six Rivers will administer the portion of the YBME Wilderness within its boundaries; however, we will closely coordinate activities with the Mendocino and Shasta-Trinity National Forests.

Comment 57: The Devil's Punchbowl in the Siskiyou Wilderness showed signs of extreme over-use with 17-18 campfire rings, signs of use by 6-7 groups, and a 6 foot long soap scum slick at the outlet creek. It would be crowded with more than 2 groups there at the same time. If this difficult-to-reach place in one of the remotest wilderness areas in the state is overused, the demand is there for more wilderness.

252

Response: The Devil's Punchbowl has one of the highest concentrations of use in the Siskiyou Wilderness; it is used by day hikers, backpackers, and anglers. The Punchbowl area is within Opportunity Class 3, and provides a semi-primitive rather than a pristine setting. Although this area is over-used, most of the Siskiyou Wilderness and the other wildernesses on the Forest receive very light use with low impacts. As the existing wilderness capacity on the Forest exceeds present and expected future demands, the Forest will concentrate on redirecting the use to minimize impacts on the wilderness.

Comment 58: We cannot support entry into roadless areas by our government in any way, shape, or form, with the exception of light prescribed burning to reduce fuel hazards.

9

Response: See the response to comment 30.

Wild and Scenic Rivers

Comment 1: Management direction for the wild river management area provides for the possibility of motorized travel on water. Shouldn't motorized travel be excluded from wild rivers as from wilderness?

23

Response: Motorized travel on water will generally be excluded on wild river corridors; however, use may be allowed on a case-by-case basis if it does not adversely affect the wild classification of the segment. Examples of such use would be for search and rescue operations or firefighting efforts. Site-specific environmental analyses will evaluate impacts of the use of motorized travel on water within wild river corridors through the NEPA process.

Comment 2: Do not allow motorized recreation activities in the Smith River. Such activities cause noise, disturb fishing, and damage recreational tranquility. Do not allow water rafting without motors. Manage the river as much as possible for traditional recreational wild river uses.

229

Response: The wild and scenic river designations for the Smith River provide for a full spectrum of recreational activities, including motorized recreation and rafting. The wild segments of the Smith River will be managed for traditional wild river recreational uses (see response to comment 1). See the management area direction for wild, scenic, and recreational river segments in chapter 4 of the final Plan, as well as the Smith River NRA Plan, for specific direction.

Comment 3: Logging and road building should be prohibited in all roadless areas and key watersheds associated with eligible and recommended wild and scenic rivers to reduce cumulative watershed impacts on streams which support "at-risk" fish stocks.

274

Response: The FSEIS ROD directs that there will be no road construction in roadless areas in all key watersheds, regardless of wild and scenic river status. In addition, management in all key watersheds (regardless of wild and scenic river status) will emphasize the maintenance and enhancement of habitat for at-risk fish stocks and other riparian and aquatic dependent species. This

direction has been incorporated into Chapter 4 of the final Plan under the Aquatic and Riparian Resource Management section.

Comment 4: The preferred alternative threatens to violate the Wild and Scenic River Act in many areas: impairing scenic beauty, solitude, high water quality, and other outstanding natural amenities of the designated and candidate wild and scenic rivers segments. The DEIS does not address these impacts.

247

Response: The outstandingly remarkable values of all the designated wild and scenic rivers will be protected through the designation of corridor boundaries, programmatic standards and guidelines included in the final Plan, and additional management direction and standards and guidelines in the individual wild and scenic river management plans. Plans have already been developed for the Smith River and the Lower South Fork Trinity River; plans for the remaining rivers will be developed by 1997. Rivers which have been determined eligible, but do not yet have a suitability study, will have a 1/4 mile corridor width for protection until the suitability study is complete and final corridor boundaries have been designated.

Comment 5: The DEIS does not adequately assess the environmental consequences of any of the alternatives on the wild and scenic rivers in the Forest: it does not include a detailed analysis of reasonably foreseeable impacts as required by NEPA.

274

Response: The environmental consequences of the alternatives on the wild and scenic rivers has been further evaluated in the FEIS.

Comment 6: The draft Forest Plan identifies wild and scenic river management corridors. What additional information or decisions would be included in individual wild and scenic river management plans for designated segments other than the Smith and South Fork Trinity rivers?

289

Response: Individual wild and scenic river management plans would provide additional management direction, standards and guidelines, and a monitoring plan outlining which management activities can occur within the corridors and providing implementation direction.

Comment 7: The Forest failed to comply with Regional direction requiring a “comprehensive, Forest-wide assessment” of all potential wild and scenic rivers, despite previous public comments. Eligibility and suitability studies were limited to rivers identified in the Nationwide Rivers Inventory and rivers nominated by the public. As FEMAT key watershed findings underscore, there are other streams which may be eligible for wild and scenic status. Consider potential outstanding values besides fisheries, such as those identified in the 1983 Nationwide Rivers Inventory: recreation, scenic, wildlife, archaeological and cultural values for the Klamath River; and scenic, recreational, archaeological, historic, and cultural values for the Trinity River. Excluding rivers/segments because their outstanding remarkable characteristics are “better represented” by other wild and scenic rivers is not following the spirit of the National Wild and Scenic Rivers Act.

18 274

Response: The Forest has completed a comprehensive Forest-wide eligibility study, and has identified three additional segments for possible inclusion in the Wild and Scenic Rivers System (See FEIS Appendix D). A suitability study will be performed for these segments after the Forest Plan is complete. The Forest considered a wide range of potential outstandingly remarkable values, including those you have listed. The Klamath and Trinity Rivers are presently included in the Wild and Scenic Rivers System.

Comment 8: Recreational and scenic river corridors should be withdrawn from the timber base. Salvage, other logging, and new road construction should not occur within these river corridors.

224

Response: The majority of these corridors is included in the riparian reserve management area which has been removed from the timber base. Salvage and other logging would be allowed only to attain aquatic conservation strategy objectives. Road construction methods would need to meet the requirements outlined in the riparian reserve management area direction (see Chapter 4 of the final Plan). Outside the riparian reserves, management direction for salvage, logging, and new road construction within the corridors is provided in the final Plan and in the individual Wild and Scenic River management plans to protect the outstandingly remarkable values of these segments.

Comment 9: It is now well known that intermittent and ephemeral streams are very important to watershed systems. These portions of tributaries need to be included in the goals for wild and scenic rivers, treating “wild” portions with complete preservation and striving for and attaining no degradation of water quality.

219

Response: All intermittent streams, and ephemeral streams meeting specific criteria, are protected through the system of riparian reserves that permeates the Forest. These reserves have been designated to protect water quality and maintain and enhance habitat for riparian and aquatic dependent species. The protection and maintenance of water quality is more directly addressed through riparian reserves and other components of the aquatic conservation strategy than through inclusion in the Wild and Scenic Rivers System.

Comment 10: The draft Forest Plan does not provide management direction for the wild, scenic, and recreational river management areas that is sufficiently detailed to assure protection of free flowing character and outstanding values. It does not mention specific mandates of the Wild and Scenic Rivers Act, such as protecting outstanding values or, in wild segments, prohibiting federally licensed hydro projects. It ignores the federal guidelines mandate to provide “special emphasis” to scenic quality outside the river corridor boundary, such as VQO retention of middle ground areas. (See Klamath LMP for specific examples of detailed prescriptions.)

274

Response: Language has been added to the management direction and standards and guidelines for the wild, scenic, and recreational river management areas to address your concerns. The Forest has not ignored the mandates of the Wild and Scenic Rivers Act; the Forest Plan tiers to and will comply with this and other Federal Acts, policies, and mandates.

Comment 11: What are the “outstandingly remarkable values” (ORVs) for which the Smith River was named to the National Wild and Scenic River System? Is there a National Wild and Scenic Management Plan for the Smith River? What role does the Smith River National Recreation Area play in the management of the river and the protection and enhancement of its ORVs?

224

Response: The Smith River was named to the National Wild and Scenic Rivers System for its outstandingly remarkable recreation and anadromous fisheries values. The Smith River National Recreation Area Management Plan provides the management direction for the wild and scenic rivers within the NRA.

Comment 12: The DEIS and draft Plan do not resolve Issue 35, wild and scenic river boundaries. The South Fork Trinity Wild and Scenic River Management Plan cannot be considered to be final since it is currently under appeal. A key appeal issue is whether the proposed corridor boundaries are sufficient to protect the river's outstanding anadromous fisheries given that the South Fork watershed is beyond threshold in terms of cumulative watershed impacts.

274

Response: The Chief of the Forest Service upheld the South Fork Trinity Wild and Scenic River Management Plan against these appeals. This decision was made in November, 1994.

Comment 13: The DEIS proposes river corridor boundaries for existing rivers as required by section 3(d)(2) of the Act but provides no narrative to support the proposed boundaries of the lower Trinity and Klamath rivers and makes no commitment to completing management plans for them. Lack of wide corridors and management plans has resulted in the decline of outstanding anadromous fisheries. Wide corridors should be established on these segments. Wide corridors and protective management plans are essential to reduce cumulative watershed impacts and meet the Act's mandate to protect outstanding values.

274

Response: The segments you mention on the Trinity and Klamath rivers were included in the Wild and Scenic Rivers System because of their outstandingly remarkable anadromous fisheries values. The corridor widths for these segments were developed to correspond with the riparian reserves for the segments, which were designated to protect riparian and aquatic habitat and reduce cumulative watershed impacts. The Forest will begin work on the management plans for these segments after the completion of the Forest Plan; we expect to complete these plans in 1996 or 1997. See the implementation section of Chapter 5 of the final Plan.

Comment 14: The draft documents do not recognize many watershed-specific outstandingly remarkable

features: the Klamath/Siskiyou [region], as the most biologically diverse conifer forest in the world, qualifies the whole region as "outstandingly remarkable;" all the inventoried streams provide habitat for anadromous salmonids and could, therefore, be considered to possess an outstandingly remarkable fisheries feature; Option 9 designates over two million acres of land in the Klamath province as tier one key watersheds, which are designed as refugia "...specifically selected for directly contributing to conservation of habitat for at-risk anadromous salmonids, bull trout, and resident fish species;" the free flowing nature of the streams; and other ecological, recreational, and aesthetic values.

23 227 271

Response: There are over 299 miles of wild and scenic rivers in the Smith River National Recreational area; these segments were designated for their outstandingly remarkable recreation and anadromous fisheries values. The entire National Recreation Area was established to protect the biological diversity of the Smith River basin. See response to comment 16 as to why all streams providing habitat for anadromous salmonids are not automatically included in the Wild and Scenic Rivers System.

Comment 15: Existing "recreational" segments were designated in 1981 on the basis of 1970 "National Wild and Scenic Rivers: Guidelines for Eligibility, Classification and Management of River Areas." Consider evaluating these segments for redesignation as "scenic" segments according to guidelines, revised in 1982, which are less strict. See the Klamath National Forest's draft Forest Plan.

289

Response: All river segments evaluated in the draft EIS were based on the revised 1982 guidelines. As the recreational river segments on the Forest were designated for their outstandingly remarkable anadromous fisheries values, the river corridor for these segments follows the riparian reserve boundary. Under the preferred alternative, the restrictions for management within riparian reserves, and therefore recreational river corridors, are more strict than those for scenic river corridors. Redesignation of the Forest's recreational river segments to scenic segments would, therefore, not provide additional protection for these segments.

Comment 16: Recommend wild and scenic river designation for key watersheds, all eligible rivers, and all unprotected streams and watersheds. Include all

streams that support anadromous fisheries to protect the resource. The following streams were specifically mentioned: Blue, Bluff, Camp, Horse Linto, Pilot, Red Cap, Tish Tang creeks; Mad, North Fork Eel, Van Duzen rivers.

A	B	C	D	E	82	84	198
217	227	263	274	290	292	304	

Response: The purpose of the Wild and Scenic Rivers System is to protect, conserve, and highlight the outstandingly remarkable values representative to the Nation. While anadromous fish may be considered an outstandingly remarkable value, their presence alone does not automatically constitute sufficient suitability for inclusion in the Wild and Scenic Rivers System. The nomination process includes an extensive inventory of many potential river values. See FEIS Appendix D for further information on the Forest’s eligibility study.

The serious decline of anadromous fish populations across watersheds of the Pacific Northwest is best addressed more directly by actions such as improving habitat and limiting fishing. The Forest is cooperating with other Forests, agencies, and groups associated with anadromous fish habitat conservation in these efforts. The final Plan incorporates direction from the FSEIS ROD, which includes the designation of riparian reserves and key watersheds, and an aquatic conservation strategy. This management strategy is designed to protect and restore key watersheds and at-risk anadromous fish stocks.

Comment 17: Recommend wild and scenic river designation for Blue Creek and its forks. Specific reasons for designating Blue Creek are that it: contains the finest example of low elevation old growth forest in the area, including Port-Orford-cedar; has excellent water quality except during winter storms when turbidity is high; has stocks of native salmon, steelhead, and resident trout; is an anadromous fish producing tributary to the designated section of the lower Klamath River; and contains a National Register of Historic Places District. Blue Creek was excluded from the nationwide rivers inventory published in 1982 for administrative reasons, rather than the lack of wild and scenic river potential.

B	C	1	21	52	212	243	271
289							

Response: The Forest completed a new eligibility study of all Forest rivers during the development of the final Plan; based on this new study, Blue Creek is eligible for

inclusion in the Wild and Scenic Rivers System by cumulation of a number of potential outstandingly remarkable values. A suitability study for Blue Creek will be performed after completion of the final Plan; until then, the Forest will protect the potential outstandingly remarkable values of this segment.

Comment 18: Horse Linto and Tish Tang creeks have outstandingly remarkable features: very dense forests, waterfalls, spiritual and cultural significance — especially for the Hupa people. These creeks qualify for wild and scenic river designation and deserve full riparian protection.

271

Response: We reviewed our eligibility study for these rivers during the development of the final EIS and Plan; based on our review, we determined that the segments of these rivers located within the Forest boundary did not possess outstandingly remarkable values. See Appendix D of the final EIS for more information. These creeks will receive full riparian protection through the riparian reserve strategy.

Comment 19: The North Fork Eel and Van Duzen rivers should be found eligible and recommended for wild and scenic river designation because they possess threatened fisheries and outstanding wildlife values. Permanent protection would contribute to maintenance of downstream water quality and afford an uncommon opportunity to include additional whole rivers in the National Wild and Scenic Rivers System. The Van Duzen is a component of the state system.

23 272 289

Response: We reviewed our eligibility study for these rivers during the development of the final EIS and Plan; based on our review, we determined that the segments of these rivers located within the Forest boundary did not possess outstandingly remarkable values. See Appendix D of the Final EIS for more information.

Comment 20: The draft EIS Appendix D appears to make an eligible finding for Redwood Creek in recognition of its outstanding scenic values, but it is not clear whether the National Forest segment is included. Given the declining status of virtually all anadromous populations in California, it should be assumed that Redwood Creek also possesses outstanding anadromous fisheries. BLM has determined that Lacks Creek, a tributary to Redwood Creek, is eligible for designation as a wild and scenic river. Forest Service should

conduct a joint suitability study with BLM for Mad River designation and with BLM and the National Park Service for designation of Redwood Creek and its tributary, Lacks Creek.

274

Response: The eligibility finding for Redwood Creek pertains to the segment of the river contained on Forest lands; about 1/2 mile of the headwaters of Redwood Creek occurs on the Forest. The Forest will perform a joint suitability study with the Park Service for the segments of Redwood Creek that occur on either Forest Service or Park Service lands. Based on the Forest's eligibility study, Mad River was not found to possess any outstandingly remarkable values.

Comment 21: Designation of Redwood Creek would help protect downstream resources, including Redwood National Park, from continuing damage from upstream land uses.

23

Response: See response to comment 20.

Comment 22: Forest Service should conduct a joint suitability study with BLM for Mad River designation.

274

Response: See response to comment 20.

Timber Management

Comment 1: Some tables, figures, and percentages are incorrect or conflicting. Some sections are referenced incorrectly. These need clarification and correction.

48 175

Response: Errors and inconsistencies which surfaced during review were corrected. The timber and vegetation sections of the final EIS and Plan were edited to make reference between sections easier.

Comment 2: Linear thought in the natural sciences is typically bogus simply because, by its very simplicity, it is inappropriate. Thus it is foolish to rely on FORPLAN to do more than it was designed to do. It is, as its creators have stated, incapable of handling spatial complexity and thus can never properly plan the allocation of the forest's resources. GIS is not such an allocation program either. It is a fancy database, which like FORPLAN, is a tool. One must look elsewhere to find models which accurately predict how changes to one resource affect other resources.

210

Response: The limitations of FORPLAN are recognized. Other modeling techniques were used to help with analysis in the Plan. Linked spreadsheets, Prognosis, and a spatial disaggregation model were used to help improve modeling, predicted outcomes, and relationships between resources. These models are briefly described in Plan Appendix B.

Comment 3: The mysteries of our forests will never be unraveled until we make a commitment to learn their precise conditions, now and through time. An appropriate monitoring program should allow for data from all presently valued (that is, quantifiable) resources. It should leave room for resources which will become valued in the future. Information can be gathered by direct (manual) methods and by direct (remote) measurements. By fine-tuning the inaccuracies of simple/inexpensive sampling methods with the more complex/precise/expensive sampling methods, numerous populations can be confidently quantified across extensive tracts of land and integrated into a tightly functioning database.

210

Response: The final Plan includes an increased emphasis on integrated monitoring. Consolidation of

information, inventories, and forest mapping efforts is an ongoing part of watershed analysis and will increase in its importance as these, and other planning efforts, continue on the Forest. The final Plan, for example, combines available information from the Forest's ecological unit inventory (EUI) with the existing timber inventory. The EUI information ties a variety of biological and physical attributes together into one mapping unit.

Comment 4: Funding for monitoring must be available before cutting can begin.

288

Response: The final Plan incorporates an adaptive management strategy intended to strengthen the role of monitoring on the Forest. Many different types of monitoring occur in conjunction with timber management implementation, and these are listed as part of the monitoring and evaluation plan (Chapter 5) and in the resource-specific monitoring programs (Appendix H). The amount of monitoring accomplished will continue to vary as budgets fluctuate.

Comment 5: Could the monitoring and evaluation formula to evaluate Forest management provided on Page I-2 of the draft Forest Plan include "intensive forest management," "regeneration cutting," and "committed timber sales" which could affect future forest inventories and impacts?

200

Response: These items are included as part of the effectiveness monitoring program in Chapter 5 of the final Plan.

Comment 6: There are concerns regarding the substantial decrease in the Forest's allowable sale quantity (ASQ) and its effects: increased pressure on private timberlands to meet the demand for forest products; the global effects of substituting timber from other countries with fewer environmental regulations than the United States; the increased use of fossil fuels to transport timber from other countries; the loss of forest products and associated economic benefits; the lack of volume necessary to supply sawmills; the inability to meet demands for timber, recreation, fire protection, and forest products; and the annual build-up of fuels and the resulting fire potential.

8 48 206 213 216

Response: Supply and demand of forest products and the associated environmental impacts is specifically addressed at the national level in the USDA Resource Planning Act (RPA). Increased pressure for timber products from private lands and other countries is expected in California, and is briefly discussed in Appendix J and Chapter 4 in the final EIS. The impacts of the proposed reduction in ASQ on economics and fuels management are also discussed in Chapter 4. It is not expected that the various alternatives would have a major impact on recreational use on the Forest.

Comment 7: The Forest should re-evaluate the standards and guidelines as they apply to the different management areas in light of the different management direction under the President's Plan. Should inconsistencies arise between the Regional standards and guidelines and what is best for the land, Forest personnel should pursue changes at the Regional level.

213

Response: Management direction for Forest Service lands in California which are included in the FSEIS ROD have been incorporated into the final EIS and Plan. Amendments to the Forest Plan which would modify the standards and guidelines and land allocations from the FSEIS ROD will be coordinated through the Regional Interagency Executive Committee and Regional Ecosystem Office.

Comment 8: What are the changes to the landbase and the growth rates of the Forest's available inventory that have caused such a substantial drop in ASQ (from 175 mmbf in the 1987 draft Plan to 20 mmbf in the 1993 draft Plan)? Why is the ASQ so far below the sustained yield of the Forest? What is the amount of timber growth foregone under the draft Plan alternatives? Under the draft President's Plan there are approximately 96,000 acres available for timber management on the Six Rivers National Forest. Using an average site productivity of 480 board feet/acre of annual growth, the annual harvest volume should be 46 million board feet per year. Reducing this amount by 15 percent for adaptive management habitat retention would still leave an annual harvest volume of 39 million board feet. It is therefore unclear why the 1993 draft Plan only provides 20 million board feet of annual timber harvest.

13 17 48 206 213

Response: The suitable landbase for timber management declined from a proposed 453,550 acres in 1986 to 87,700 acres in the final Forest Plan. Acres

removed from the timber landbase include habitat reserved for late seral stage dependent species, dedicated lands within the National Recreation Area (NRA), riparian reserves, and other forested lands where harvest activities conflicted with resource objectives. For all alternatives, the ASQ is slightly below the long-term sustained yield (LTSY) because of additional resource objectives and constraints which limit harvest operations. LTSY estimates for benchmark analysis listed in Table II-1 provide estimates of potential forest growth without additional resource constraints. Comparisons between Table II-1 and Table II-14 indicate the amount of forest growth foregone under different alternatives. Annual forest growth on suitable lands is now approximately 330 board feet per acre per year and will decline in the next few decades as more older stands are retained. Table E-2 has been revised to show current and future growth and inventory. Included in this inventory are trees which will be left as legacy during regeneration harvesting. It is estimated that retention of these trees will reduce the volume by approximately 20 percent.

Comment 9: Table IV-1 of the draft Forest Plan proposes an ASQ of 43.5 mbf; however potential yield is near 400 mbf annually. If the forest can sustain 400 mbf per year, why is the ASQ so much lower than the sustained yield? If sale or harvest quantities run below long-term sustained yield the result will be a build-up of net fiber inventory. The consequences of such a build-up should be evaluated within the planning period. What is the purpose of investing in managing the Forest if the full benefit will not be realized?

213

Response: The ASQ in the final Plan is 15.5 mbf. Table II-1 lists the maximum long-term sustained yield (LTSY) for the Forest as 292 MMBF annually. This benchmark run assumes that timber policy constraints and minimum management requirements do not apply. The ranges for LTSY listed in final EIS Tables II-1 and II-14 provide an estimate of the highest wood yield that can be sustained through a 160 year planning horizon on lands managed for timber production under the strategy proposed for each alternative. It is a function of the total number of acres allocated to timber management, the productivity of these lands, and the standards and guidelines applied to the different management areas.

Increased fiber, or timber volume, that is associated with a transition from a younger aged forest to an older forest is thought to be within the range of historic variability described in the Biological Diversity section of Chapter

3. Increased use of prescribed burning to reduce fiber accumulation is also discussed in Chapter 4.

Comment 10: The calculation of suitable (CAS) lands on Plan Table E-1 indicates that there are now about 77,000 acres fewer than in the 1987 draft Plan that are capable of producing 20 cu.ft./acre/year. There has been no new inventory. The Forest needs to account for these acres.

48

Response: The number of acres capable of producing 20 cu. ft/acre/year has not changed. The 77,000 acres not shown in Table E-1 in the final Plan are now a part of the wilderness acres and are still subtracted from the suitable timber landbase.

Comment 11: The ASQ should be reduced to less than half that proposed in the draft Forest Plan.

22

Response: This ASQ is the Forest's best estimate of the maximum available timber in decade given the standards and guidelines proposed in the plan.

Comment 12: The draft Forest Plan does not accurately portray the real extent to which silvicultural activities apply and the volume expected from these activities. The final Forest plan should display the expected volume from silvicultural activities on non-CAS lands as well as from salvage and sanitation activities.

23 174 325

Response: The acres by prescription listed in Table E-3 of the Forest Plan are the best estimate of projected harvest activities on acres suitable for timber management (CAS lands). CAS acres are listed by Management Area in Table IV-4. In areas outside of CAS lands, where timber harvesting is allowed, no attempt to estimate future silvicultural activities or volumes is made since these lands are not managed for timber and do not contribute to the ASQ. It would be very difficult to try to estimate what silvicultural activities might occur on these lands. If harvest volumes for these lands were included, a proportion of the ASQ would need to be met in these areas. This would be contrary to the management objective for these lands.

Comment 13: The ASQ should be the planned and scheduled volume from CAS lands. However, this volume should include volume from thinnings, normal

mortality salvage, and biomass removal as well as the regeneration cuttings that are planned and scheduled in the draft Forest Plan. These cuttings, called intermediate cuttings, have effects on growth and yield, and if these kinds of cuttings are scheduled, the ASQ should reflect those effects through Plan amendments or revisions.

325

Response: The ASQ includes thinnings, salvage and individual tree harvest systems. Table E-3 in the final Plan lists estimated harvest acres in the first decade. Volume available for biomass removal is speculative and no consistent market exists at this time on the Forest. The vegetation management standards and guidelines in Plan Chapter 4 encourage removal of biomass where it is practicable and consistent with resource objectives.

Comment 14: When unplanned events or extraordinary events occur, such as catastrophic fire, and cuttings are made to recover mortality, consistent with good ecosystem management, the ASQ needs to be revised to reflect this volume of timber as a necessary unplanned departure. The point is not that this recovery volume, if compatible and consistent with ecosystem management and forest health, should not be cut; it is that the ASQ schedules should be adjusted to reflect the loss of this timber growing stock that was to provide future cut volume under sustained yield.

325

Response: The timber inventory should be updated for each ten year planning cycle in order to determine changes in timber volume which might have resulted from fire, harvest activities, or other factors. In the case of a catastrophic fire, where timber losses are not clearly evident, a reinventory may be required, and the ASQ modified to account for losses in inventory.

Comment 15: As part of the 1978 Redwood National Park expansion bill, Congress directed the Secretary of Agriculture to investigate the feasibility of increasing the timber harvest levels on Six Rivers National Forest to offset the reduction in timber supply. No increases in timber harvest levels on the Six Rivers National Forest occurred as a result of the study.

51 206

Response: Many events since 1978, including designation of the Smith River NRA, wilderness, and Wild and Scenic Rivers System components, changes in national direction, and requirements for the protection of

specific threatened and endangered species have resulted in decreases, rather than increases in the timber available for harvesting from the Forest.

Comment 16: Table E-2 of the draft Plan presents growing stock volumes, but it does not display hardwood volumes. They were displayed separately in Appendix D of the 1987 draft. The 1987 draft shows a total growing stock, including hardwoods, of 22,701 mmbf. The 1993 draft shows a total growing stock of 22,838 mmbf, with a question of whether or not the hardwoods are included. Please clarify.

48

Response: The final Plan Table E-2 is for conifers only. No hardwood volumes are displayed since the Forest inventory does not provide an accurate estimate.

Comment 17: The growing stock is greater in 1990, the date of the inventory update for the 1993 draft Plan, than it was in 1983, the date of the inventory update for the 1987 draft Plan. After speaking with forest timber staff personnel, we were told that the inventory was updated for timber plantations up to 1990, but not for growth. It is mathematically impossible to update for removals but not for growth and show more volume than was available at the beginning of the period. We do not defend the incomplete method of updating. We merely point out that if it was done as we were told, the results that are displayed are mathematically nonsensical.

48

Response: The timber inventory was updated for conifer growth and harvest operations.

Comment 18: Table E-2 of the draft Plan raises a number of questions regarding the suitable lands and the total timber base. For example, while the Forest deliberately plans to stop an effort to grow timber on unsuitable lands, you also plan to reduce the growth on the suitable lands by 12.5 percent. The projected growth is about 30 cu.ft./acre/year, while current growth is close to 35 cu.ft./acre/year. How, and why, does the Forest intend to slow down growth? Furthermore, how does such a program comport the Multiple Use-Sustained Yield Act's direction that management programs should be done so as to not impair the productivity of the land? It is our view that the PRF Alternative is a clear violation of that portion of the Act.

48

Response: A brief discussion on forest growth has been added to Chapter 4 of the final EIS. Selection of the preferred alternative will not affect the potential of forest lands to produce timber.

Comment 19: The text on DEIS p. III-122 states that about 84 percent of the Forest's soils are rated as capable of growing trees for industrial wood (a minimum growth rate of 20 cu.ft./acre/year. The draft Plan Table E-IV indicates that the percentage is closer to 72. The 84 percent statistic comes from the 1987 draft Plan, and that raises questions regarding the 1993 draft Plan Table E-IV. Since there was no new inventory made between the time the two drafts were prepared, why is there such a major difference in the tabulations of soil productivity? This discrepancy needs to be addressed. Among other things, there needs to be an explanation of why productivity changed from one plan to the other without any change in the database.

48

Response: This inconsistency has been corrected in the final EIS.

Comment 20: The draft Plan attempts to obtain a state of forest regulation by using area control. This would require that the oldest and most mature stands be cut first. These stands would also have the highest volume per acre of all the stands in the forest to be regulated. It seems, however, that true area control is not being used, as outputs for the earlier decades are less than for the later decades. The reverse should be the case under area control.

213

Response: The requirement in the DEIS to regulate the forest using area control was dropped in the final EIS and Plan. The final Plan regulates harvest on CAS lands by sustaining a balance of seral stages on the Forest that approximate the range found in the past two centuries. Estimated timber removals are based on resource objectives and constraints (discussed in Appendix B) and not on regulation of the forest by strict area or volume control.

Comment 21: Under the draft President's Plan rate of harvest, it would take 333 years to remove the current inventory of standing timber on suitable lands. Thus, there should be an alternative that provides for the harvest of nothing but old growth in perpetuity. At the same time, if the Six Rivers draft Plan projection of annual acreages of regeneration harvest are met, the

entire suitable landbase will be harvested in less than 150 years. The two methods of regeneration, area vs. volume, seem to be giving very different answers. This needs to be addressed.

48

Response: Growing stock and harvest acres on suitable lands have been revised in the final Plan and are included in Appendix E. The preferred alternative would increase the amount of old-growth over time. In the first decade, regeneration harvesting would occur primarily in early and mid-mature stands. Old-growth stands would not be priority for harvest but will be lost through time from fire, other disturbance, and where conifers are lost to hardwoods. Comparisons between regulation of inventory by volume or area control are difficult, since plantations which currently have no merchantable volume are included in the timber inventory.

Comment 22: The preferred alternative proposes to create non-typical old-growth habitat. Will the change to long rotation and no rotation of our Forests change the rate of carbon storage and discharge adversely?

139

Response: Silvicultural strategies proposed for much of the Pacific Northwest are new and experimental. The validation monitoring described in Chapter 5 of the Forest Plan is designed to assist in determining whether assumptions used in the plan are correct. Effectiveness monitoring will help assess how well these new silvicultural strategies meet plan goals. Questions regarding carbon storage on forest lands are beyond the scope of the plan.

Comment 23: Where rotations need to be calculated, they should be derived from yield tables using mean annual increment in board feet and not merchantable cubic feet, and will be 100 percent of the culmination of mean annual increment (CMAI), not 95 percent CMAI. Products from trees grown to rotation age produce high quality lumber products that are measured and scaled in board feet. It is therefore necessary to use a rotation that utilizes board feet in its calculation. Since the graph of mean annual increment and age is a broad curve, at the culmination point a small percentage change in mean annual increment equals a big difference in age.

325

Response: Federal regulations specify that culmination of mean annual increment (CMAI) be calculated in cubic

feet and that culmination be interpreted as being reached at 95 percent CMAI. For the majority of stands on this forest, the average age for regeneration of stands will be far in excess of culmination of mean annual increment measured in cubic or board feet. Average stand age at time of regeneration is estimated at between 120 to 240 years of age and is based on the Forest's best approximation of stand replacing disturbance events. This rate of stand replacing disturbance is discussed in the Biological Diversity sections of Chapters 3 and 4 in the final EIS, and the standards and guidelines for vegetation management in the final Plan.

Comment 24: The proposed 180-year rotation using area control in the draft Plan is an even-aged management system which creates even-aged forests that may lack the kind of structure, patterns, and diversity needed after watershed analysis is completed. It is not apparent that the draft President's Plan wants these kinds of simplified forests in the matrix. Would adequate habitat connectivity be provided under this kind of forest regulation? Isn't the matrix part of the ecosystem concern since matrix management is an essential component of an ecosystem strategy (FEMAT p. IV-186)? Why was uneven-aged management left out of the possibilities for the matrix? Would Forest prescriptions, land allocations, and standards and guidelines be able to resolve the seeming inconsistency?

23 265 325

Response: The proposed 180 year rotation has been deleted from the final Plan and replaced with a stand replacing disturbance rate of between 120 and 240 years. Harvest prescriptions on matrix lands would include both even and uneven-age systems. Standards and guidelines for retention of "legacy" trees in even-age stands would help to provide structural diversity in these stands.

Comment 25: From a forestry standpoint, the 180-year rotation is not economically or biologically based. It appears that the selection of the 180-year rotation is strictly for wildlife management considerations. However, it is unclear why it is necessary to maintain a 180-year rotation age when at least 15 percent of each timber stand will be retained, providing the necessary late seral structure in the form of large diameter green trees, large diameter snags, and down woody debris. These are all critical elements of a "late-successional" of rest, which are retained and become part of the developing young-growth forests. If these structural features are already being maintained, why is it necessary to adopt the 180-year rotation strategy? This is especially troubling considering this will be applied to

the 10 percent of the Forest available for timber management.

206

Response: See response to comment 24. The combination of longer rotation lengths and legacy requirements help to provide a balance of seral stages across the Forest which contain the structural diversity needed to provide quality wildlife habitat and conserve a variety of ecological processes. Longer rotation lengths (disturbance rates) help provide old growth habitat and habitat connectivity which can be sustained through time. Legacy requirements improve the habitat quality within each of these successional stages.

Comment 26: Forests outside of reserves and that are otherwise suitable for timber management should be managed on at least 200-year rotations (or 180-225-year rotations), implemented on the basis of suitable timber lands and average monetary returns.

84 227

Response: The final Plan contains a wider range of rotation lengths. Economics is one factor, along with other resource concerns and objectives, which will determine management strategies on suitable lands.

Comment 27: The draft Plan does not clearly state how the 180-year rotation will be implemented on the ground. Some stands, because of their inherent nature and/or disturbance patterns may not meet this rotation age. How will these stands be managed? Some other forest types naturally could grow older than 180 years. How will older trees be provided in these forest types?

23 325

Response: Standards and guidelines for vegetation management allow harvesting at a range of ages from stand culmination to over 300 years. The age at which a stand would be harvested would depend on a variety of factors, including stand condition.

Comment 28: The draft version of the President's Plan calls for green tree retention to be the greater of 15 percent of the sale unit volume or the draft Forest Plan standards and guidelines. The Six Rivers draft Plan retention standards may be in excess of the 15 percent standard. As for the 15 percent standard, half should be clustered, and the rest in scattered trees. The green tree retention should be left through succeeding rotations, and should be augmented as necessary at the time of the

next cutting to maintain retention. Retention may be in trees that have wildlife value. Standards should be established at the project level or programmatic level by wildlife, soils, and fuels specialists. The desired size of green trees and snags should be a standard. If the stand is deficient, trees will be allocated to become those sizes. If those sizes are present they shall be retained. On cut-over or high-graded stands green tree retention should be clumped or scattered based on project-specific stand conditions. If trees are windfirm, green tree retention may be in scattered trees. If the green tree retention does not contain adequate retention characteristics, additional trees will be left to grow into the amount and quality of the retention desired.

325

Response: Green-tree and snag retention standards and guidelines have been modified to meet the intent of the FSEIS ROD and provide additional direction.

Comment 29: How will the 15 percent green tree retention requirement be implemented? The 15 percent applies to volume; in understocked stands such volume could be low resulting in a retention stand of very few desirable trees that may not accomplish the objectives in the draft President’s Plan. How will retention that accomplished the intended objectives be accomplished? How long will retained stands be allowed to exist? Until the next entry? The next regeneration cutting? Through successive rotations? Will 15 percent have to be retained in each cutting?

325

Response: Green-tree and snag retention standards and guidelines have been modified to meet the intent of the FSEIS ROD and provide additional direction.

Comment 30: There should be no clearcutting on the Forest.

C	D	E	1	22	24	35	59
72	84	103	175	198	243	271	275
288	290						

Response: The final Plan does not specifically prohibit clearcutting, but its use would be strictly limited by the standards and guidelines for vegetation management in Plan Chapter 4. In almost all cases, a minimum of 15 percent of the acreage within harvest units would be left during regeneration harvest.

Comment 31: Reforestation should be accomplished using the species mix appropriate to the forest type for

that location. Trees planted should come from seed from the planting site’s seed zone.

198 325

Response: A standard and guideline has been added to the final Plan to meet this objective.

Comment 32: Where ecosystem management practices propose reflecting historic patterns of forest structure and seral stage distribution, each National Forest should experiment with retention practices on areas not having significant environmental issues. Management activities that could be used within late successional and old-growth stands must be tried out first in the matrix to ensure that such activities can be successful. Silvicultural prescriptions or practices for areas having objectives other than timber management must be tried out experimentally in non-sensitive areas first.

227 325

Response: The final Plan specifically designates 23,647 acres of general forest in the final Plan as an adaptive management area (AMA) with the purpose of developing, testing, and applying forest management practices. Outside of the AMA, the majority of harvesting will occur on general forest lands designated by the FSEIS ROD as matrix.

Comment 33: Timber management shall have as one of its objectives to have all decay classes of snags and surface woody material generally represented on a stand basis. Recruitment of snags and downed woody material should be accomplished by natural methods rather than by girdling or other artificial methods.

325

Response: Mean snag and log densities for vegetation series and seral stages are included in the final EIS. Additional standards and guidelines have been added to the final Plan. Artificial methods of creating snags and logs will continue to be used to meet management objectives.

Comment 34: Project-level silvicultural analysis should use as much of the historical record as possible to proxy natural conditions regarding patch sizes for each seral stage regarding the pattern of their distribution over the watershed and regarding forest structure.

325

Response: The goals and direction for the vegetation management standards and guidelines in the final Plan include a discussion on natural variability.

Comment 35: What is the process and criteria that will be used to select stands for timber cutting? How and where will stands be selected for timber cutting? How will the schedule of outputs from FORPLAN actually be produced, and how will the locations to produce these outputs be located on the ground?

325

Response: Opportunities for timber harvest will be identified at several different planning scales, including the Forest Plan, watershed analysis, and on-the-ground reconnaissance. Selection of individual stands to be harvested will be determined through an environmental analysis process and will follow direction in the Forest Plan standards and guidelines. The FORPLAN outputs are estimated amounts based on the direction in the Plan. Accomplishment of these outputs is monitored in subsequent years.

Comment 36: Management activities in stands adjacent to late successional reserves must provide for the “feathering” of activities at the boundary next to the reserves.

325

Response: Standards and guidelines for matrix lands were developed to ensure adequate dispersal habitat between late successional reserves. Provisions for legacy trees and connectivity should provide a “feathering” effect on these lands.

Comment 37: The PRF Alternative uses only three of six possible silvicultural regimes for use on the Six Rivers National Forest. None of these three systems acknowledges the need to manage timber. One treats timber outputs as incidental to other concerns without explaining how timber management will be used to enhance the dependent resources, another allows only salvage, and the third uses timber only as a tool to enhance wildlife habitat. The results will be questionable.

48

Response: A full range of silvicultural tools can be utilized as long as land management objectives are met.

The three silvicultural strategies included in the Modeling and Analysis Appendix are examples of prescriptions which would likely be used to meet plan objectives. The standards and guidelines in the final Plan have been changed to reflect this.

Comment 38: Changing silvicultural methods from clearcutting in blocks to a selection system does not lend itself to the forest types on the Six Rivers National Forest.

68

Response: Estimates of proposed harvest acres in Table E-3 of the Forest Plan include both even and uneven-age silvicultural systems. Even-age systems will be used where appropriate to mimic high intensity disturbance regimes. Uneven-age systems will be utilized where even-age systems cannot be used, and will mimic small scale disturbances. The combination of high, moderate and low intensity disturbance is characteristic of vegetation on the Forest.

Comment 39: In areas where we will still have stands of healthy forest it will be better to do nothing, to let natural processes continue while rehabilitation goes forward. It’s important to realize that silvicultural systems simply don’t apply everywhere in the forest. These systems are supposed to be tools to accomplish a set of goals and objectives. These goals and objectives on public land can be to simply let natural processes occur where appropriate. Not every acre of forest needs to be managed in order to provide for forest health. Silvicultural systems are only simplified models that serve as guides to determining what, if anything, to do on the ground. They can’t be applied without adjustment for site-specific conditions in ecosystem management. At some future time we can perhaps add newly healthy forest stands to the pieces we still have today. Thus it is imperative that the National Forests operate on the same wavelength as the FEMAT scientists in their attempt to resolve these issues.

325

Response: No timber harvest is scheduled on the majority of forest lands. Approximately 91 percent of the Forest has been removed from the CAS landbase for timber management. Silvicultural activities, including plantation management, may occur in some of these areas if needed to meet management objectives. Silvicultural prescriptions for all areas will be based on site-specific conditions.

Comment 40: Selective logging should be clearly defined.

198

Response: Selective logging is not a silvicultural system, but is often used as a term to describe the harvest of individual trees from a stand as part of a thinning (even-age system) or a selection cut (uneven age system). This definition has been added to the glossary. Selection cutting is defined in the glossary as being synonymous with the term single-tree selection system. This term is described in FEIS Appendix K.

Comment 41: The Forest should not manage on an even-aged basis, and should use uneven-aged management to selectively log while protecting other forest resources and enhancing and improving the forest over time.

175 263

Response: The Forest will use both even-age and uneven-age silvicultural systems. The primary system used will be even-age since this system most closely imitates disturbance (fire) patterns on the Forest. Selection of which silvicultural system to use is dependent, in part, on the current plant association and desired species composition. Regeneration of many species, including Douglas-fir and ponderosa pine, is difficult in uneven-age stands or where hardwood trees are abundant. In even-aged stands, retention of “legacy” trees in regeneration units will create stands with multiple aged trees.

Comment 42: In both the draft Forest Plan and the draft President’s Plan, salvage, sanitation and thinning could be used to “accelerate” the development of late-successional stands and enhance wildlife habitat. Our knowledge of what must be left to achieve these purposes is not complete. Forest health sanitation prescriptions could result in the removal of high-volume, old trees with significant wildlife and forest ecosystem values. Thinning removes material from the forest that natural processes and disturbances would leave. Salvage could remove a significant volume of material from the ecosystem. How do we know which trees we need to keep to “maintain habitat quality” or which ones are “crucial” to improving habitat quality? The application of silvicultural prescriptions for accelerating the development of old forest characteristics and enhancing habitat should only occur in the matrix and only within previously managed stands. This adaptive management strategy should produce the necessary information to

determine whether, in fact, we have the knowledge to manage naturally-regenerated stands.

23

Response: The mix of management areas and associated standards and guidelines in the Forest Plan represent the most current knowledge and best estimate of how to provide for important ecological functions and sustain some level of commodity production. Varying degrees of timber harvest are allowed in these different areas depending on the land management objective. The majority of harvesting will occur on matrix lands. Within the matrix, the Forest has designated an adaptive management area (AMA) with a purpose of developing, testing and applying new and experimental forest management practices. The monitoring plan in the final Plan describes an adaptive management process intended to monitor, evaluate and revise management practices, objectives and goals for all Forest lands.

Comment 43: Sanitation treatments could result in the removal of key habitat structure and should be eliminated.

23 196 325

Response: Sanitation operations, like any other timber harvest activity, require the completion of a site specific environmental analysis before a decision to proceed can be made. The required interdisciplinary analysis considers the resource issues deemed relevant to the analysis.

Comment 44: Salvage could occur under strict criteria that ensure sufficient retention of material and the removal of only dead or dying trees with a one-year mortality.

23 325

Response: Additional standards and guidelines for salvage in Late Successional Reserves have been added to the final Plan. Salvage operations in all management areas would follow the “legacy” retention requirements for snags, logs, and green trees specified in the Forest wide Standards and Guidelines.

Comment 45: There should be no salvage of live trees.

35 72 238

Response: Salvage is permitted as long as it meets standards and guidelines in the Forest Plan.

Comment 46: Salvage should be included in the calculation of the ASQ.

219 263

Response: The ASQ is calculated only for lands that are considered suitable for sustained production of timber. If salvage harvesting takes place on suitable land following a fire or insect or disease attack and removes trees that were part of the inventory used to calculate ASQ, then the volume is counted toward the ASQ. Any salvage on unsuitable land would not count as part of the ASQ.

Comment 47: Rather than emphasize sanitation and salvage, the Forest Service should emphasize practices that thin stands and reintroduce very light intensity fire. Thinning from below as an intermediate cutting practice has been used successfully in many stands.

325

Response: A key strategy for development of older stands on matrix and adaptive management areas will be thinning. A likely scenario for stand treatment is presented in Appendix B, Modeling and Analysis Process, where after the stand reaches approximately 60 years of age, it is repeatedly thinned every 60 to 80 years in order to accelerate diameter growth of selected trees and allow for understory development. Increased use of fuels treatments (an average of 3,000 acres annually) is proposed to enhance understory vegetation and reduce fire hazard.

Comment 48: How does safety regarding workers involved in timber operations where snags have been retained, or are to be retained, or where trees left have become snags affect the ability to retain these snags after operations?

325

Response: Snags cannot always be retained through timber management operations. The California Code of Regulations allows the felling of snags in harvest units if they are deemed a safety hazard during yarding operations. Snags are also commonly felled during prescribed burning operations if they pose a safety or control problem. Silvicultural prescriptions for harvest units recognize that it may not be possible to save all existing snags in units.

Comment 49: A resource's supply is based upon production and longevity. There was very little

information on either of these pertaining to snags and downed woody material in the draft Plan. This means modeling the tree mortality from appropriate timber data to get snag/coarse woody debris production and basically guessing at their longevity. Not only were Forest (and Regional) mortality figures non-existent, but specific growth and yield timber data, by species or otherwise, was scant. Despite the historic value of timber of the Forest (100 to 200 mbf annually), there was little more than the most basic of parameters over the most expansive of stratifications over the entire region.

210

Response: Snag and log data for the plan were acquired from ecology plot data. Additional information on snag and log numbers is contained in the Biological Diversity sections of the final EIS. Increasing the knowledge of vegetation changes through time is listed as a research need in Appendix G of the Plan.

Comment 50: The draft Plan requires that between 3 and 6 snags per acre be maintained Forest-wide depending on forest type, and that a minimum of 4 downed logs greater than 20 inches dbh be retained per acre across the Forest. This is not likely to provide adequate habitat for numerous species. We ask that the final EIS discuss the scientific basis for the snag and coarse woody material guidelines in more detail and that it evaluate their effectiveness in providing adequate habitat conditions. Forest standards and guidelines should be strengthened to reflect the best available scientific information and to ensure that sufficient snags and to ensure that sufficient snags and downed logs are available throughout the Forest.

225

Response: Additional information on snag and log numbers is contained in Table III-13 of the final EIS. The Habitat Capability Models listed in Appendix B of the final EIS reflect the most current knowledge on habitat requirements for a variety of wildlife species. Based on these models, each alternative is evaluated on the adequacy of snag and log habitat.

Comment 51: The Forest should not use herbicides. There are a number of reasons for this: under ecosystem management, the Forest would have no reason to use herbicides, because ecosystem management recognizes the natural successional pathways in the revegetation of sites; the use of herbicides emphasizes commodity production, which is not consistent with ecosystem management; the majority of communities surrounded by

National Forests are dependent upon surface sources for their drinking water; herbicides are a primary hazard to fisheries and recreation uses, and are against the Native American diet exposure; and stands that do not regenerate naturally should not be logged.

C	E	1	23	35	72	84	175
196	224	229	243	263	271	286	289
325							

Response: Herbicides shall be used only if essential to meet management objectives.

Comment 52: Herbicides will only be used: a.) when their use is consistent with the biological diversity standards and guidelines; b.) when their use is essential to meet management goals that include maintenance and enhancement of native plant communities, such as eradication of non-native noxious weed populations; and c.) after all alternative methods have been considered with appropriate NEPA analysis. The season and technique of application will minimize non-target impacts. Narrow rather than broad spectrum compounds will be used. Watersheds and water bodies will be protected. Compounds will be applied only to the target species. Aerial spraying and other practices which impact non-target organisms will be avoided.

225

Response: The standards and guidelines for herbicide use have been edited to include additional direction. Most of the points mentioned here are included in the final Plan or in the Regional EIS on Vegetation Management for Reforestation.

Comment 53: The draft Plans are deficient in not showing whether the authorization of the use of herbicides has caused the CAS landbase to increase. Although it appears that the ASQ was not increased directly given the use of release prescriptions that include the use of herbicides, the Forest Service should discuss whether specific lands were classified as CAS because herbicides have been authorized. If so, what is the basis or proof that these lands can be CAS given the use of herbicides? Have under-stocked or non-stocked lands been scheduled for full timber yields based on the authorization of herbicide use? What is the basis or proof for this? Do agency scientists believe it is acceptable to use herbicides as part of ecosystem management? If so, do they have any standards and guidelines for their use?

325

Response: No acres were identified in the CAS landbase which required herbicide use in order to be classified as suitable lands for timber management. Given the goals, direction, standards, and guidelines for vegetation management in the final Plan, there may be instances where herbicide use would be the preferred treatment method to meet ecosystem objectives.

Comment 54: The draft EIS does not adequately address the cumulative effects of the years of over harvesting. Unfortunately, those effects will not be known for several years, maybe decades, as we watch the forest either recover or continue to deteriorate. I do not recommend rewriting the EIS, only that the Forest Service acknowledge its limited scope.

67

Response: An important part of the Forest Plan is the monitoring and evaluation procedures which will help determine whether management objectives are being achieved. Past harvesting activities occurred when the Forest had a substantially larger CAS landbase. Monitoring and evaluation of the effect of past harvest practices on other resources has since led to a smaller CAS landbase and reduced harvest schedule.

Comment 55: Concentrate all harvest near communities; leave wild lands wild.

84

Response: The mix of land allocations in the final Plan allows for areas with very different management strategies. Some of these areas, such as wilderness or wildlife habitat areas, permit little or no harvesting. Human activities including fire suppression and recreation are likely to affect the character of these lands. Harvesting activities will occur on approximately 9 percent of the Forest and are dispersed throughout the Forest.

Comment 56: Timber management should henceforth be the least important consideration in National Forests. First, because we require what remains of our forests to help stabilize climate and maintain watersheds. Second, timber management has been for many years the most important, almost the only factor, in forest utilization. There is a long overdue need for a balancing out, a fallowing, a recovery period and an emphasis on all other non-destructive Forest uses. Whenever entry is made into the Forest, it should be done with caution and with great respect for all life there.

175

Response: The timber management program on the Forest has been reduced significantly. Timber will be managed as one component of a total vegetation picture on the Forest. The goals, direction, standards, and guidelines in the final Plan reflect this change in the emphasis of the timber management program.

Comment 57: A committee of at least three persons not connected with the timber industry or the Forest Service should be present at timber harvests and sales and keep copies of receipts and all relevant data. Their salaries should be paid out of timber sales receipts.

175

Response: Fiscal accountability for timber sales is outlined in Federal laws, regulations, and Forest Service manuals, and is not part of the Forest Plan. Resource objectives, and standards and guidelines for project implementation are a part of the Forest Plan and are reviewed through periodic compliance reviews. In many cases, representatives from the public and other agencies may be invited to participate on the review teams.

Comment 58: By proposing to manage for timber within the Special Regeneration Management Area the Six Rivers National Forest is taking a step backwards towards the dark ages of forest management. Logging lands not suitable for timber production such as ultramafic soils is unethical if not illegal. It is timber mining and an irretrievable and irreversible commitment of resources. It certainly could not be called ecosystem management. The burden of proof must lie with the Forest Service. You must be able to assure the public that you have the technology and knowledge to adequately restock the land within five years after logging.

224

Response: All lands within the Special Regeneration Management Area have been removed from the timber suitable landbase in the final Plan. If, after site-specific analyses, some of these sites are determined to be suitable for timber management, they will be returned to the timber suitable landbase.

Comment 59: Logging should be concentrated in second-growth forest lands.

256

Response: The vast majority of lands previously regenerated through harvest are not yet of merchantable size.

Comment 60: The planned timber sales for 1995 and 1996 should be cancelled.

271

Response: The sales planned for 1995 and beyond are our best estimate of how timber sales can contribute to the goals set forth in the Forest Plan.

Comment 61: Abandon the timber sale program so that funds can be devoted to ecological recovery, and natural succession can reclaim the Forest lands.

20 291

Response: The Forest Service is mandated to provide a continuing flow of natural resource goods and services to help meet the needs of the nation and to contribute to the needs of the international community. The level of timber production is one of the considerations in selecting a preferred alternative in the land management planning process. In addition to providing a needed resource commodity, timber harvest provides income to communities and the US treasury. The emphasis for the timber management program is to develop prescriptions which assist in meeting ecosystem management goals. Timber management will be used as a tool to accelerate desirable wildlife habitat conditions, reduce fire risks, and assist in maintaining the diverse landscapes which occur naturally on the forest.

Comment 62: Individually survey all plantations from past decades to detail regrowth, mortality, and erosion pockets.

195

Response: Plantations are monitored in a variety of ways. For several years after planting plantations are surveyed to monitor reforestation success. Thereafter, most plantations are periodically checked for needed treatment, insect and disease problems, or existing stocking. Updates to the Forest Inventory also include a percentage of plantations to determine timber growth and yield from managed stands. The effectiveness monitoring program described in Chapter 4 of the Plan proposes that 20 percent of plantations less than 20 years of age be inventoried for stocking levels and yields. Erosion in plantations is recorded and tracked through field exams, aerial photos, and activity reviews.

Trees with Special Management Consideration

Comment 1: Please use restraint in issuing permits to harvest Pacific yews. While these trees may prove to be incredibly useful, they are unique and in need of protection.

289

Response: The Forest Plan recognizes the importance of maintaining Pacific yew as an important element of biodiversity. The mix of land allocations and corresponding management goals proposed in the Forest Plan will provide protection for Pacific yew on many thousands of acres. Bark collection has almost exclusively taken place outside of California, and recently only on non-federal lands. Any possible future bark collection on this Forest would be done in accordance with the goals of the Forest Plan, NFMA, and NEPA.

Comment 2: The draft Plan states that the Forest will prevent the spread of the Port-Orford-cedar root disease by implementing the Port-Orford-cedar Action Plan and by integrating strategies for reducing the risk of infection into project planning. The Port-Orford-cedar Action Plan has been inadequate in preventing the spread of the disease; also, the project planning statement implies that unless another resource's planning effort or analysis is initiated in an existing high-risk area for disease introduction, the area will not be addressed as high-risk to Port-Orford-cedar (POC). The Forest needs to improve its strategy for preventing the spread of POC root disease.

9 23 217 224

Response: The POC Action Plan provides general direction for the management of POC on the Forest. The hierarchy of planning efforts proposed in the final Plan should ensure more specific direction for the protection of this species. The standards and guidelines for POC have been rewritten to ensure that protection of this species is considered at all levels of planning from watershed analysis to individual projects.

Comment 3: The Forest should close/obliterate roads, prevent construction of new roads, and prohibit/limit access into uninfected POC watersheds to control the spread of POC root fungus disease. Specific areas mentioned for protection included: the west side of

Klamath, Blue Creek, Clear Creek, and the Middle and South Forks of the Smith River.

9 23 82 212 224 225 271

Response: The standards and guidelines for management of POC have been rewritten to include evaluation of risks associated with road systems within areas with POC. Road closure and decommissioning would be possible alternatives considered.

Comment 4: The Forest Plan should discuss the condition of POC stands and should either identify uninfected watersheds and/or stands or provide a map of POC distribution and the location of *Phytophthora* to inform the public and decision-makers.

224

Response: The Pests and Trees with Special Management Consideration sections of the FEIS includes a discussion of POC stands on the Forest. FEIS Chapter 3 includes maps of POC distribution and the location of *Phytophthora* infections.

Comment 5: The DEIS does not disclose or discuss the significant environmental impacts of the Forest Service's management activities or the lack of "action" (failure to close and obliterate roads) on POC as a species, on the maintenance of biological diversity, on POC role in riparian ecosystems and in sensitive plant habitat, and the irreversible and irretrievable loss of old-growth POC. This is in violation of NEPA. Also, the Preferred Alternative fails to provide for the maintenance of natural population levels of POC, in violation of NFMA provisions for diversity of plant and animal communities.

224

Response: The Pests and Trees with Special Management Consideration sections of the FEIS include discussions on POC stands on the Forest. Standards and guidelines for POC and vegetation management have been rewritten to provide additional protection measures for this species.

Comment 6: Do not log stands containing POC until the control of mortality from POC root fungus disease is known and available, and studies are completed for the protection of existing healthy stands.

229 325

Response: The final Plan does not prohibit harvesting in stands with POC. Standards and guidelines require a risk assessment for any activity which may affect POC. The risk assessment would be incorporated into the environmental analysis, and appropriate alternatives, including no harvest, would be considered.

Comment 7: For Standard and Guideline 10-6 of the draft Plan, when does the qualifier “Where it (POC) is present” apply? Prior to the introduction of the root fungus disease in the late 1970s? Does the standard and guideline imply that POC will be introduced into areas where it was eliminated in the past by either the root fungus disease, or management intended to eliminate the disease? If not, it should.

138

Response: Plant associations which include POC will be managed to maintain this species as a long-term component. Numbers of POC trees may vary with time, and reintroduction of POC into specific sites may be considered. Since POC is a prolific seeder, regeneration of POC into areas where the disease exists or used to exist is common.

Comment 8: The threshold of concern for POC “detected acceleration of Port-Orford-cedar root fungus disease spread,” is unacceptable. The intent of the interregional POC management team, and the resulting action plan (including various project-level mitigations) was to prevent further spread of the disease. Continued spread at any rate should trigger a greater level of effort and/or a change in the course of action.

138 152

Response: Sampling and detection surveys would determine the effectiveness of POC protection measures. The Forest Plan confirms the idea that continued spread of the disease is undesirable, and would be reason for elevated concern and needed management. The threshold of concern is not considered desirable.

Comment 9: Risk for areas containing uninfected stands of POC can be addressed through sanitation removal or (more preferably) road closures. November 1st to June 1st closures will reduce the risk of spreading the root fungus disease without impacting hunters or hikers to a large degree. Signing and closures will also reduce risk from management activities (road maintenance,

recreation facilities) that may “fall through the cracks” without a disease control strategy in place.

9

Response: The final Plan includes an increased emphasis on management strategies and risk assessments to protect POC. All of these alternatives are possible solutions. Some are specifically referenced in the final Plan.

Special Forest Products Management

Comment 1: What resource objectives are met by removing a desired component of the forest ecosystems, specifically hardwoods?

23

Response: The final Plan proposes a range of seral stages, stand structures, and species composition reflective of the recent historic vegetation patterns on the Forest. Harvest of any trees, including hardwoods, may help to accelerate habitat conditions favorable for specific wildlife species, increase stand vigor and growth, reduce fire hazard, or help mimic the patterns of disturbance which occurred in the past. Fire regimes of the past most likely thinned out many hardwoods and redistributed growth on fewer, larger trees. Harvesting hardwoods can often be accomplished with little impact to other resource values while providing a valuable and needed wood product. Meeting social and economic resource needs of people is an integral part of ecosystem management.

Comment 2: How will hardwoods be managed under a 100 year rotation? What areas with hardwoods will be so managed? Do hardwoods reach 100 year lifetimes? Will hardwoods be sold only as firewood or will the Forest Service seek to develop markets for hardwood logs to be used in manufacturing wood products?

225

Response: Regenerated stands of hardwoods, managed on a rotation, would occur on lands where timber management is an objective. Hardwoods would be managed as a component of forest stands with rotation lengths between approximately 90 and 200 years. Hardwoods can easily reach ages of 100 years or more. The percentage of hardwoods within individual stands would vary depending on the existing vegetation, management objectives, and silvicultural prescription. Firewood is currently the primary use for hardwoods, but utilization of hardwoods for commercial products would be encouraged to the extent that these operations are compatible with the goals and objectives for any given area. Opportunities to utilize hardwoods would be determined on a project level basis.

Pest Management

Comment 1: The draft Plan states that pest management includes the use of pesticides. Defining pests is important since endemic diseases, insects, and vegetation are all part of the forest ecosystem. Ecosystem management recognizes these elements are not only natural, but also vital to forest processes. These elements become pests when they compete with commodity production, which is not the focus of ecosystem management.

23

Response: Damage to vegetation by other plants, diseases, insects or animals is part of the natural disturbance regime of the forest. The Forest plan recognizes that these interactions are an important part of ecosystem management. Where this activity hinders achieving management objectives, the damaging agent is considered a “pest.” The standards and guidelines for pest management and vegetation management have been reworded to reflect this distinction.

Comment 2: The DEIS contains a brief review of the management implications of dwarf mistletoe. It properly states that dwarf mistletoe can be managed easily silviculturally, but that it is best to avoid situations in which its establishment or spread may be encouraged. That discussion should be completed by explaining that, because of the dispersal pattern of mistletoe spores, the best control for the disease is clear-cutting infected stands. Likewise, to avoid establishment, the use of shelterwood and seed tree techniques should be limited to those stands that are mistletoe-free.

48

Response: Options for treatment of mistletoe vary by stand and management objectives. Clearcutting has often been the preferred silvicultural treatment for stands comprised primarily of one species with heavy mistletoe infection. Additional wording was added to this section in the final Plan.

Comment 3: The Pest section of DEIS Chapter 3 states that the gypsy moth’s egg masses are “transported on outdoor furniture or recreational vehicles.” Is it true that these egg masses are only transported by these objects and not by others such as backpacks, clothes, hiking boots, or other vehicles? This statement should be

supported with adequate data, or it should be rewritten to not show bias towards specific user groups.

230

Response: The wording in this discussion has been changed to remove the bias.

Visual Resource Management

Comment 1: The Six Rivers Forest has a very diverse landscape; spatial profundity should be preserved not only at all viewing distances (viewshot points between observer and observed), but for many instrumentally mediated and imaginary viewing distances as well. Because of psychological biases one must consider the emotional hopes and fears culturally associated with certain spaces, and whether or not a space seems or appears useful or useless.

1

Response: Visual quality objectives (VQOs) are intended to protect and preserve this diverse landscape (natural and unnatural). VQOs represent a desired level of excellence based on physical and sociological characteristics of an area.

Comment 2: Protect the visual quality of highways, trails, roadless areas, and wilderness.

24

Response: All lands have been identified as to the public concern for scenic quality (sensitivity levels) as well as diversity of natural features (variety classes). Measurable standards or objectives for the visual management of these lands becomes the primary task. The visual quality objectives are designed to accomplish that purpose.

Comment 3: A retention VQO should be applied to middle ground areas outside wild river corridor boundaries. Refer to the Klamath LMP wild river prescription for a specific example of a prescription.

274

Response: Most of the middleground areas outside Wild River corridor boundaries fall within management areas with retention VQOs; most are also protected in reserved areas.

Comment 4: The Smith River NRA is not covered for VQOs and neither is there any indication of VQO acres in the Smith River NRA in the Plan. These need to be covered. Is the NRA less well managed from the standpoint of visual quality than the rest of the Forest?

1

Response: VQOs for the NRA are included in the final EIS and Plan.

Table O-1. List of Respondents by Letter Number

Ltr. No.	Respondent
1	Wayne D. Iverson
2	Gordon Robinson
3	Bruce Olsen
4	Harry Metzger
5	Joshua
6	Elsie Grapentin
7	Bill Devall
8	Dan Brattain Reservation Ranch
9	Leopold Club
10	John R. Swanson
11	Keith Warner
12	Bill Wilkinson
13	J. (Bud) Tomascheski
14	B. Burge
15	Jared Rossman
16	Stuart Bragg
17	Dale Warmuth Alta California
18	Dezh Pagen Laughing Heart Adventures
19	Dale Warmuth FAX of letter 17
20	Dennis Cou les
21	Aida Parkinson
22	Greg Marskell Population-Environmental Balance
23	Susie Van Kirk Sierra Club Redwood Chapter North Group
24	Fred Eissler Scenic Shoreline Preserve Conf, Inc.
25	Virginia Goldie
26	Jeffrey S. Edwards
27	Robert Feranu
28	Frost Saufley
29	Mrs. James M. Gerstley
30	Bill Cross Running Wild Whitewater School
31	Martha J. Frost
32	David Sundstedt
33	Kathleen E. Peckham
34	Richard E. Horowitz Off the Road
35	Constantina Economou
36	Deborah Roper
37	Paul E. Cooper
38	Joe M. Rivera, Jr.
39	Wayne Justin

Table O-1. List of Respondents by Letter Number
continued

Ltr. No.	Respondent
40	Joanne Siegler
41	Peter Sawyer
42	Charles L. Sanders
43	Joannie Siegler
44	Thomas A. Goldman
45	Kenneth A. Kramer
46	Karen Hopkins
47	Richard L. Elliot California Department of Fish and Game
48	James K. Craine California Forest Association
49	Mr. (Jim) R. James Humboldt County Taxpayers
50	Matthew Leffler Trinity County Board of Supervisors
51	Dan Lewis City of Fortuna
52	Dr. Daniel Raleigh
53	Clarke Moore Del Norte county Board of Supervisors
54	Lee J. Chauvet California Department of Parks and Recreation Off Highway Motor Vehicles
55	James R. Craine California Forestry Association
56	Staci L. Emmons
57	Pamela A. Branch
58	Mrade Fischer
59	A. B. McNabney Mt. Diablo Audubon Society
60	Ruth M. Niswander
61	Gene Tuck
62	Lora Floyd
63	Brett R. Matzke California Trout
64	Linda L. Pardy
65	Lillian K. Light
66	Mary Ann McKinley
67	Graham J. Wright
68	Frank Brickwedel Del Norte Taxpayer's League
69	Kelly Reagan-Robery
70	Dr. and Mrs. John L. Graham
71	Deborah A. Malkin
72	Jannis Bernot
73	Sandra I. Barbour
74	Mrs. Doris A. Cantore
75	Sisan Gitlin-Emmer

Table O-1. List of Respondents by Letter Number continued

Ltr. No.	Respondent
76	Dr. Donalo A. Wo Lochow Mo
77	Matthew Holden
78	Ms. Bobbie Harms
79	Peter M. Robbins
80	Todd A. Scales
81	Ms. Marguerite Christopha
82	Carlos Carroll
83	Robert N. Goodrich
84	Melinda and Mark Bailey
85	Peter Mason
86	Ewing Philbin Ross Recreation Company
87	John and Deborah Alexander
88	Carolyn Dorn
89	Paul Grosser
90	Eric Rogers
91	Carol Casarjian
92	Dominic B. Perello Sierra Club Santa Lucia Chapter
93	John Buckley
94	Mariana R. Cole
95	Ron Glick
96	Gregory J. Bundros
97	Mr. John J, Fritz
98	Richard S. Armano
99	Margarit C. Howard
100	James N. Broshears
101	Mike Williams
102	Lucile Goodrich
103	Doug Hansen
104	Elizabeth W. Pomeroy
105	Martin Rosen and Susan Heltor
106	David Coe Mt. Shasta Bioregional Ecology Center
107	Charles L. Curry
108	Carl H. Schwarzenberg
109	Robert J. Sharpenter
110	C. Woody
111	Jude K. Brennan
112	Steve Janosik
113	Patricia B. Honemann
114	Dr. Jack Cooksey
115	Mark and Jan Balcom
116	Cathie Lazier
117	Joanne Katzen
118	Alison Harver
119	Ron Wilson
120	Hal J. Whitaker

Table O-1. List of Respondents by Letter Number continued

Ltr. No.	Respondent
121	Marty Sochet
122	David Baxter
123	Stephen Sharnoff
124	Jodie Ibison
125	Jeff Wasielewski
126	Leonard R. Thomas
127	Jane M. Harter
128	Sally M. Scott
129	Tammy Wong
130	Richard Bloom
131	Robin Leong Napa Solano Audubon Society
132	John Savarete
133	Kenneth Smith
134	Donald B. Bartlett
135	Pam Lovdenslager
136	Mr. Roni Howard
137	Leslie Handler
138	David K. Imper California Native Plant Society North Coast Chapter
139	Ross Burgess
140	Lone PArton and Kathy Webster Backcountry Horsemen of California Redwood Unit
141	Bruce G. Halstead USDI Fish and Wildlife Service Coastal California Fishery Resource Office
142	Dan Silver, M.D.
143	Robin Chapman
144	Don Heberlein
145	Carol Orth Sea View Motel
146	Voss Michael
147	Henry W. Gaylor III
148	Philip G. Newbold
149	Bard McAllister
150	Barbara Morel
151	A. Soderlauno
152	Tony LaBanca California Native Plant Society North Coast Chapter
153	Kathy Webster Backcountry Horsemen of California Redwood Unit
154	Robin Reinhart
155	Mrs. Richard B. Kemp
156	I. Rogers

**Table O-1. List of Respondents by Letter Number
continued**

Ltr. No.	Respondent
157	Ms. Helen Pitton
158	Celeste K. Flagigan
159	Linda McCall
160	Ed Richards
161	Mark Wells
162	Frank Smekar
163	Katie Robley
164	Menko Rose
165	Richard Witteman
166	D. W. Tomer Desert Trail Association California Section
167	Peter J. Bralver Interdisciplinary Resources-WNETT
168	Sal Tromba
169	William G. Stern NyCal Corporation (FAX of letter 172)
170	Patric T. Lassiter Lost Coast 4x4s
171	Lone Parton and Kathy Webster Backcountry Horsemen of California Redwood Uni
172	William G. Stern NyCal Corporation
173	R. Dimik
174	David J. Farrell U.S. Environmental Protection Agency Region IX
175	Barbara B. Logan
176	Carol Baker
177	Arthur Eisenberger
178	Mary Ann Finocchi and Colleen Sullivan
179	Lee Haroun
180	Ned Boyer Southern California Ancient Forest Advocate
181	Susan Lincke
182	Christy Dunn
183	Karen L. Eckert Widecast-Sea Turtle Conservation
184	Bernard A. Rafacz
185	Martha A. Marks
186	Conrad F. Floeter
187	Mr. and Mrs. James B. Daniels
188	Kenneth Sickal
189	Alan C. Meier
190	John R. Swanson
191	William C. Saunders
192	Sue Cubberly

**Table O-1. List of Respondents by Letter Number
continued**

Ltr. No.	Respondent
193	Thomas Suk
194	Scheck Family and Rhonda Parkinson
195	Robbin Laey
196	Joseph Bower Citizens for Better Forestry
197	Leonard Swenson Sierra Club Redwood Chapter
198	R.E. Wallace and Marjorie Ottenberg Polar Equipment
199	Dr. Lesa J. Bemer
200	Andy Colonna and Matt Smith
201	Edward L. Adams
202	Vicky Hoover Sierra Club San Francisco Chapter
203	Sanford Wohlgemuth Los Angeles Audubon Society
204	Tim Cain Tim's Tunes
205	Gloria A. Morris
206	Gary C. Rynearson Natural Resources Management Corp.
207	Robert B. Rohde Karuk Tribe of California
208	Steve Marsden Siskiyou Regional Education Project
209	Onalee Skirk
210	Norman Peck
211	Blyth Sandy Bar Ranch
212	Phillip Purcell
213	Frank Losekoot Hi-Ridge Lumber Company
214	Sarah Bertacchi
215	David L. Gluck
216	Mark Anderson Schmidbauer Lumber, Inc.
217	Tim McKay North Coast Environmental Center
218	Lynda Jelinek
219	Marilyn McKinney
220	Mary Van Steenberg
221	Richard A. Wilson California Dept of Fire and Forestry Protection
222	Lynn and Connie Baer
223	Gerald J. Johnson California Department of Parks and Recreation Off-Highway Vehicle Motor Recreation

Table O-1. List of Respondents by Letter Number continued

Ltr. No.	Respondent
224	Barbara Ullian and Richard Nawa Siskiyou Audubon Society
225	David Magney California Native Plant Society
226	Stephan C. Volker Sierra Club Legal Defense Fund
227	Louis Blumberg The Wilderness Society
228	George Riipi
229	Margaret K. Zegart
230	Kurt Hathaway California Off-Road Vehicle Association
231	Carl Miller
232	William G. Seafroth The Resource Agency of California
233	Elizabeth Peterson
234	Rachel Eisliefsly
235	Alex Krems
236	Didicus Ramos Beverly Hills Democratic Club
237	Lori Schiriga
238	A. Stracan
239	Rana Lewis
240	Bob Lorentzen
241	Melvin and Barbara Horton
242	Donald R. Martin
243	Randall E. Hartman
244	K.E. Peckham and J.M. Leonard
245	Jack Dodson
246	Constance J. Speake
247	Michael Jackson CFFOPW & CSFPA)
248	Carol Baker
249	Mrs. Daniel Steinberg
250	Don Kimball
251	Liz Hamilton
252	William Baumgarten
253	Wilma and Bryce A. Wheeler
254	Sally Miller
255	James Wilson
256	Dennis R. Nelson
257	John R. Swanson
258	Nancy Taylor
259	Bill Dart District 36 Legislative Action Office
260	Karen Wilson
261	Gerold Firl
262	Bea Hallenbeck

Table O-1. List of Respondents by Letter Number continued

Ltr. No.	Respondent
263	Karen Wilson South Fork Trinity Up-River Friends
264	Dena A. Magdaleno Tsnungwe Council
265	Dan Martin
266	Aletta Hollister
267	Susie L.Long Yurok Tribe
268	Sandra M. Younger
269	Jeffrey B. Kitt
270	Mark Neely California Regional Water Quality Control Bd North Coast Region
271	Bruce Campbell
272	Jim Eaton California Wilderness Coalition
273	Margaret Hansell
274	Steven L. Evans Friends of the River
275	Cheryl Wysocki
276	Bonnie C. Strand
277	Rebecca Rothenberg
278	Mary Ann P. Donnelly
279	Anna Greenleaf
280	John R. Swanson
281	Steven Robery
282	Theresa and Michael Papciak
283	Arthur W. Scholbe
284	Verna H. Scratch
285	Ira Jacobowitz
286	Robert J. McLaughlin
287	Thomas and Stephe McNicholas
288	Scott Millener Coalition for the Health of California Fisheries
289	Patricia Sanderson USDI Environmental Policy Compliance
290	Elizabeth Georin
291	David Baron
292	Patrick E. Kelly
293	Dan Silver, M.D.
294	Tim Donahue Sierra Club San Francisco Bay Chapter
295	John and Marion McMahan
296	Sanford Burnstein
297	Philip G. Mullen
298	Stephen Sayre

**Table O-1. List of Respondents by Letter Number
continued**

Ltr. No.	Respondent
299	C. W. Journette
	Tehama Fly Fishers
300	Bruce Lebel
301	Jeff Kirby
302	Jane Baxter
	Range Watch
303	Mary V. Steenbergh
304	Jane P. Traweek
305	Lucile Goodrich
306	Ann A. Helms
307	James N. Broshears
308	Arthur Eisenberger
309	D. W. Tomer
	Desert Trail Association
310	Priscilla M. Jones
311	Virginia D. Skinner
312	Barbara Hearn
313	E. D. West
314	Marilyn McKinney
315	John J. Ulloth
316	Dr. and Mrs. Daniel Steinberg
317	Michael Ernstoff
318	Robin Chapman
319	Willis A. Evans
	Evans Environmental Consultants
320	Jane F. Campbell
321	Patrick Gullledge
322	Thomas Force
323	James W. May
324	Richard K. Nawa
	Siskiyou Regional Education Project
325	James W. Depree

Table O-2. List of Respondents-Letter "A"

	Letter Number
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Table O-2. List of Respondents-Letter "A"
continued

Letter Number
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Table O-2. List of Respondents-Letter "A"
continued

Letter Number
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Table O-3. List of Respondents-Letter "B"

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Table O-3. List of Respondents-Letter "B"

Letter Number
301
304
315
317
321
322
323

Table O-4. List of Respondents-Letter "C"

Letter Number
231
234
235
236
239

Table O-5. List of Respondents-Letter "D"

Letter Number
10
190
257
280

Table O-6. List of Respondents-Letter "E"

Letter Number
233
240



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, Ca. 94105-3901

January 6, 1994

OFFICIAL FILE COPY
Six Rivers National Forest

JAN 14 1994

RECEIVED
Eureka, California

Martha Ketelle
Acting Forest Supervisor
Six Rivers National Forest
Attn: Land Management Planning
1330 Bayshore Way
Eureka, CA 95501

Dear Ms. Ketelle:

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Six Rivers National Forest Land and Resource Management Plan (LRMP). Our review is provided pursuant to the National Environmental Policy Act (NEPA) [42 USC 4231 et seq.], Council on Environmental Quality (CEQ) regulations [40 CFR Parts 1500-1508] and Section 309 of the Clean Air Act.

The LRMP/DEIS contains five management alternatives which address resource management, specific management area direction, land allocations and levels of timber production. It also proposes standards and guidelines that Forest projects must meet and tentatively establishes monitoring plans.

President Clinton's forest plan for the management of old growth forest-related species will apply to the Six Rivers National Forest. The President's Plan identifies a preferred alternative, Alternative 9 - which is described in detail in Forest Ecosystem Management: An Ecological, Economic and Social Assessment (FEMAT Report). Because the Six Rivers National Forest must ultimately adhere to the direction set out in the President's Plan, our review of this DEIS was conducted in keeping with provisions set out in both the FEMAT report and the Forest Service's Draft Supplemental EIS on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl (Spotted Owl Draft SEIS). Due to the fact that the Six Rivers National Forest must adhere to the direction set out in Alternative 9, review of the LRMPs has necessitated concurrent review of the FEMAT Report and the Spotted Owl Draft SEIS.

We agree that completion and use of this LRMP in managing the forests is preferable to the uncertainty in management that has occurred without such a plan in place. The efforts that you have expended to prepare this Plan and assess the environmental

impacts of that plan are commended by EPA. However, as mentioned in our letter of December 7, 1993 to Ms. Kathy Clement, we believe there has not been an opportunity for the public to comprehensively view the proposal to manage the Six Rivers National Forest. In fact, we generally found that our review of this DEIS was complicated by not having a comprehensive document which consolidates and discusses the measures that would be accomplished in undertaking the management of the Forest. This is due in large part to the decision to postpone publication of the Spotted Owl Final SEIS. We urge the Forest Service to provide an expanded opportunity for the public to become involved and to comment on the Six Rivers National Forest LRMP and relevant related documents. We believe such an action could significantly prevent further delays caused by public confusion and uncertainty.

Based on our overall review, we have assigned the DEIS a rating of EC-2 (Environmental Concerns - Insufficient Information). We have assigned the EC-2 rating because of the difficulty we experienced in reviewing the 3 relevant documents and the lack of specificity on a forest planning level regarding land allocations, timber management and impacts on water quality. This EC-2 Rating is further defined in the attached "Summary of the EPA Rating System." Our detailed comments are enclosed.

We appreciate the opportunity to review and provide comments on the DEIS. Please send two copies of future environmental documentation to this office at the same time it is officially filed with our Washington, D.C. office. If you have any questions, please feel free to contact me at (415) 744-1574, or have your staff contact Edward Yates at (415) 744-1571.

Sincerely,

David J. Farrel
David J. Farrel, Chief
Environmental Review Section
Office of Federal Activities

Enclosure
MI# 000647 6Rivers.LMP

cc: Ronald E. Stewart, USFS, San Francisco
USFWS, Sacramento
CA Dept. of Fish and Game, Region 1, Redding
RWCQB, Region 1, Santa Rosa
APCD, North Coast Region, Eureka

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTIONEnvironmental Impact of the ActionLO-Lack of Objections

The EPA review has not identified any potential environmental impacts requiring substantive changes to the proposal. The review may have disclosed opportunities for application of mitigation measures that could be accomplished with no more than minor changes to the proposal.

EC-Environmental Concerns

The EPA review has identified environmental impacts that should be avoided in order to fully protect the environment. Corrective measures may require changes to the preferred alternative or application of mitigation measures that can reduce the environmental impact. EPA would like to work with the lead agency to reduce these impacts.

EO-Environmental Objections

The EPA review has identified significant environmental impacts that must be avoided in order to provide adequate protection for the environment. Corrective measures may require substantial changes to the preferred alternative or consideration of some other project alternative (including the no action alternative or a new alternative). EPA intends to work with the lead agency to reduce these impacts.

EU-Environmentally Unsatisfactory

The EPA review has identified adverse environmental impacts that are of sufficient magnitude that they are unsatisfactory from the standpoint of environmental quality, public health or welfare. EPA intends to work with the lead agency to reduce these impacts. If the potential unsatisfactory impacts are not corrected at the final EIS stage, this proposal will be recommended for referral to the Council on Environmental Quality (CEQ).

Adequacy of the Impact StatementCategory 1-Adequate

EPA believes the draft EIS adequately sets forth the environmental impact(s) of the preferred alternative and those of the alternatives reasonably available to the project or action. No further analysis or data collection is necessary, but the reviewer may suggest the addition of clarifying language or information.

Category 2-Insufficient Information

The draft EIS does not contain sufficient information for EPA to fully assess environmental impacts that should be avoided in order to fully protect the environment, or the EPA reviewer has identified new reasonably available alternatives that are within the spectrum of alternatives analyzed in the draft EIS, which could reduce the environmental impacts of the action. The identified additional information, data, analyses, or discussion should be included in the final EIS.

Category 3-Inadequate

EPA does not believe that the draft EIS adequately assesses potentially significant environmental impacts of the action, or the EPA reviewer has identified new, reasonably available alternatives that are outside of the spectrum of alternatives analyzed in the draft EIS, which should be analyzed in order to reduce the potentially significant environmental impacts. EPA believes that the identified additional information, data, analyses, or discussions are of such a magnitude that they should have full public review at a draft stage. EPA does not believe that the draft EIS is adequate for the purposes of the NEPA and/or Section 309 review, and thus should be formally revised and made available for public comment in a supplemental or revised draft EIS. On the basis of the potential significant impacts involved, this proposal could be a candidate for referral to the CEQ.

*From: EPA Manual 1640, "Policy and Procedures for the Review of Federal Actions Impacting the Environment."

EPA COMMENTS ON SIX RIVERS N.F.
LRMP - DECEMBER 1993

1

General Comments

1. Alternatives. As the alternatives section "is the heart of the environmental impact statement" [40 C.F.R. § 1502.14], we recommend that the EIS describe how the President's Plan will be implemented at the Forest level. The EIS should include specific information regarding what will be required in Six Rivers National Forest (Six Rivers) in regard to management area direction, land allocations (e.g. specific boundaries of administratively withdrawn areas), standards and guidelines and key watershed delineations and guidelines.

Also, we suggest that the environmentally preferable alternative be clearly identified. In the DEIS, it appears that Alternative E, Ecological Rotation may be such an alternative. We believe it is important to recognize the role disease, pests, fire, and natural processes have in a dynamic forest ecosystem. The EIS should demonstrate how such concepts can be incorporated and used in the preferred alternative.

2. Future Forest Planning. The President's Plan calls for the formation of numerous committees and working groups for the forest planning process. We recommend that the EIS explain this process so that other agencies, citizen groups and other members of the public can understand the planning process and determine where they can participate. Also, EPA recommends that the EIS clarify the stages and decision points where NEPA documents will be drafted. For example, will the Forest Service be drafting an Environmental Assessment or Environmental Impact Statement for decisions on adjusting riparian reserves (upward or downward) under the President's Plan?

3. Cumulative Impact Assessment. Cumulative impact assessment must be carried out for all federal activities at the Forest Plan level [Tenakee Springs v. Clough, 915 F. 2 1308, 1312 (9th Cir. 1990)] and for all federal and non-federal activities at the project stage [Resources Ltd. v. Robertson, No. 92-35047 (9th Cir. 11/3/93)]. Also, where biological corridors run through adjacent timber sales and roads must be assessed in one document. [see Marble Mountain Audubon Society v. Rice 914 F.2d 179 (9th Cir. 1990)]. Given the frequent checkerboarding of state, private and federal lands, the cumulative effect of federal and non-federal activities in Northern California can also be substantial. EPA encourages the Forest Service to use the Forest Plan to assess the cumulative impacts of all federal and non-federal activities (e.g. logging on private and state lands) and establish procedures for assuring non-federal activities are considered in regard to species viability, riparian habitat, watershed conditions, etc.

Air Quality

1. PSDs. The EIS should identify Prevention of Significant Deterioration Class I Areas (i.e., wilderness areas, National Parks, e.g. Trinity Alps, North Fork and Siskiyou Wilderness), which receive special protection for particulates, Sulfuric Oxide (SO₂), Nitrous Oxide (NO_x).

2. Particulate Matter. The EIS should more fully discuss particulate matter (PM₁₀) that could be produced by direct emissions from prescribed burning, construction, vehicles (tire wear, exhaust, brake wear) and reentrained road dust (AP-42 factors for road dust) and the EIS should develop general forest wide measures to mitigate these emissions.

Please note that EPA regards PM₁₀, and not total suspended particulates (TSP), as the indicator for particulate matter. For the purposes of applicability, annual operating emissions of particulate matter should be estimated from PM₁₀, rather than TSP as is done in the Monitoring section on p. V-14 of the Plan. We recommend that the Six Rivers National Forest present a chart that shows the historical averages and future particulate estimates in a manner similar to that done in the burning and air quality effects chart in Table 4.2 in the Mendocino LRMP (p. IV-18).

3. Conformity. The EIS should provide a detailed discussion on the status of air quality planning for the area and indicate if there is an approved air quality implementation plan. The EIS should describe and discuss potential impacts to air quality. The EIS should also discuss how the action would meet conformity requirements of §176(c) of the Clean Air Act. We recommend that the Forest Service consult and coordinate with the Siskiyou county Air Pollution Control District to ensure the proposed action conforms with existing efforts to maintain and improve air quality.

Water Quality

1. BMPs. The DEIS and Plan rely heavily on Best Management Practices (BMPs) to ensure protection of water quality and beneficial uses. Problems with implementation of BMPs on other Forests indicates the importance of monitoring BMP implementation. The EIS should discuss the monitoring measures which ensure that required BMPs are adequately implemented. For example, discussion on p. IV-132 to 133 of the DEIS discusses "overall effectiveness" of the BMPs yet does not mention any specific monitoring programs for BMP implementation nor are there any references under Chapter V (Monitoring) of the Plan.

It is stated on Page IV-48 of the Plan that proper installation of BMPs presumes compliance with the Clean Water Act. It should be noted, however, that implementation of BMPs does not constitute compliance with water quality standards per se. In the event that a Forest project, undertaken with or without appropriate BMPs, creates a water quality problem or causes a standards violation, the State and Regional Boards retain the authority to carry out their responsibilities for management of environmental quality. [See § 6217(6) of the Coastal Zone Act Reauthorization Amendments of 1990]. In addition, the EIS should identify procedures for instituting corrective measures should BMPs be determined to be failing to protect water quality. For further assistance on nonpoint source pollution prevention, see "Guidance Specifying Management Measures For Sources of Nonpoint Pollution in Coastal Waters," EPA, January 1993. Also, please note that the EPA Water Quality Handbook has a revised, 1993 edition.

2. Roads/Facilities. The EIS should describe the process which will be used to determine whether environmental assessments or EISs will be required for road construction and timber harvest in previously designated roadless areas. The EIS should indicate the management prescriptions for roadless areas on the forest under the President's Plan. For instance, under Alternative 9, no new roads would be constructed in roadless areas in Key Watersheds in order to protect high quality habitats. In addition, watershed analyses would be required in all non-Key Watersheds which contain roadless areas before any management activities could occur within those areas (Spotted Owl DEIS, p. B-79). The Six Rivers EIS should discuss how these restrictions would affect forest management and should include a map outlining the juxtaposition of roadless areas with reserves and matrix areas. EPA recommends that the impacts of the new roads and forest management activities on water quality be assessed as specifically as is possible.

While the Plan does include some general Standards and Guidelines for Road Management (IV-26), the DEIS contains little information regarding how adverse effects on beneficial uses will be measured or assessed. We recommend that the EIS include more specific information on how impacts from road construction (especially stream crossings) will be measured in regard to turbidity and suspended sediments.

3. Mining. The DEIS/Plan contains little discussion on the management of mining activities or potential adverse impacts of mining on water quality and beneficial uses. For example, the Trinity, Eel and Klamath Rivers are presently being dredged for gold. Although these activities could seriously affect beneficial uses, particularly salmonid spawning, the potential impacts of these activities are not discussed. The EIS/Plan

should discuss the water quality impacts from projected mining activities. In particular, the EIS should describe and discuss the impacts of the President's Plan on mineral entry and leasing on the Forest and indicate whether any late-successional or riparian reserve areas on the Forest are withdrawn from mineral entry or leasing.

The Monitoring Program on p. V-15 of the Plan says that "observed non-compliance with operating plans" will be used to establish Thresholds of Concern regarding mining impacts. Is random observation adequate for this monitoring technique? Is there adequate staff for adequate observation? The EIS should set out the monitoring system for these activities. On p. IV-51 of the Plan, it is stated that appropriate environmental analysis will be the basis for approving proposed mineral-related activities. Are small scale suction-dredging activities subject to environmental analysis and what analysis is necessary? We recommend that small scale mining operations in the river or in watersheds be assessed in the proper NEPA documentation for their cumulative impacts.

4. Restoration in Aquatic Areas. EPA commends the Forest Service for its commitment to an aggressive watershed restoration program. On p. IV-24 of the Plan there are goals listed for riparian management zones but there is no discussion of how restoration is to be accomplished. EPA recommends that this section include discussion of priorities, methodologies, timetables and budget estimates for restoration. The EIS should explain the Watershed Improvement Needs inventory (WIN) and discuss how it would be used under the President's Plan. Standards and guidelines in the LRMP should include scheduling watershed improvement projects based on the WIN and specified priorities (Plan, p. IV-29,49).

The Spotted Owl Draft SEIS states that modification of grazing practices would occur under Alternative 9, particularly in the Riparian Reserves and that the modification would have consequences for individual permittees (p. 3&4-115). The EIS should describe how range management would be adjusted to meet the Aquatic Conservation Strategy objectives under such an alternative.

Vegetation Management

1. Connectivity. Connectivity corridors are discussed on p. IV-57 of the Plan. It states that ecological corridors will be 1200 feet wide and stream corridors will be 600 feet wide. There is no reference or basis for the finding that corridors of this size are adequate. We recommend that the EIS discuss these corridors in more depth, including the relationship between corridors passing through both matrix areas and non-federal

lands. For instance, the EIS should provide: (1) a description of the "Ecosystem" approach to land management and how this will affect corridors in Six Rivers and (2) the location and size of the corridors. Further, the EIS should describe potential mechanisms to improve linkages and connectivity between refugia. Include a discussion of the role of non-reserved areas (matrix) in providing potential connectivity and the type of monitoring and evaluation which will be implemented to ensure connectivity is retained.

2. Land Allocations. It is not clear from the maps or the text: 1) which areas are administratively withdrawn and 2) whether these areas are permanently withdrawn or whether their status can be changed so that they may be logged in the future. The EIS should clarify these points.

3. Timber Management. The President's Plan incorporates an ecosystem approach to forest planning. EPA recommends that the EIS apply this approach to the alternatives that will be assessed for Six Rivers. This type of approach also applies to those areas outside of the established reserves. The DEIS has little information regarding whether late seral and old growth stands outside the reserves will be maintained and managed for maintenance of biological diversity. We suggest that the EIS describe how these old growth stands will be managed, whether they will be part of the 180 year rotation, whether they will be thinned, or whether there will be efforts to manage these stands in their natural state.

Further, the EIS should describe the contribution of stand maintenance, salvage sales and sanitation harvests to the estimated Allowable Sale Quantity. If possible, indicate the potential acreage on non-CASA (capable, available, suitable and appropriate) lands which would potentially be treated with the above management practices.

4. Grazing. On page IV-104 of the DEIS it is stated that AUMs are underutilized for the entire forest yet it notes that there are impacts from existing grazing in wilderness areas. The EIS should discuss possible mitigation of these impacts by shifting grazing from wilderness areas to the underutilized non-wilderness areas.



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Coastal California Fishery Resources Office
1125 16th Street, Room 209
Arcata, CA 95521-5582
(707) 822-7201

January 3, 1994

Six Rivers National Forest
Attention: Land Management Planning
1330 Bayshore Way
Eureka, CA 95501

RE: 1600

This responds to your request for comments regarding the Six Rivers National Forest (SRNF) Draft Forest Plan and Draft Environmental Impact Statement.

MANAGEMENT AREA 8 - RIPARIAN (pages IV-23 to 30)

This key section appears to thoroughly discuss the needs for protection as well as mitigation of adverse affects for all ongoing and past development situated within riparian areas. The Forest is to be commended for broadly defining riparian areas and using a whole-system approach, which attempts to "evaluate all important influences, interactions, and interconnections.

The concept of Key Watersheds appears to be similar to other proposals for fish habitat refugia, aimed at perpetuating anadromous fish stocks at risk, by preserving areas of good quality habitat. In order to assess specific populations of fish within Key Watersheds, more than just index reaches should be monitored for spawners. Fisheries studies conducted by this office, CCFRO, at Blue Creek for five years (1989-1993) have documented the annual production of juvenile salmonids, in addition to counting spawners. There have not been good correlations between peak counts (or total estimates) of spawners and subsequent juvenile production. Estimates of total number of spawners have been less than approximately 300 every year. Annual estimates of emigrating juvenile chinook have ranged from 12,500 to 51,100. Simply counting spawners is not adequate to take the pulse of any particular fish population.

GEOLOGY, SOIL, AND WATERSHED MANAGEMENT (pages IV-48 to 50)

Standards and Guidelines

There are five statements that use the word "should", in place of a forceful expression such as "required" or "will". This appears to significantly weaken the S&G for adequate protection of areas of unstable soils. Increased erosion into streams would be a concern for maintenance of fish habitats. For example, item (6-6) under Soil Erosion and Mass Movement, states:

The potential for increased mass movement and soil erosion will be addressed for proposed timber harvest and road building. Landslide hazard maps should be developed for timber harvest planning. Alternate road specifications or locations should be

evaluated where proposed management would increase the potential for mass movement and soil erosion. (emphasis added.)

Each of the "should" statements needs to be strengthened in order to better protect riparian and aquatic resources from effects of erosion and mass movements.

MONITORING PROGRAM: (Appendix H of Plan) (pages H-4 to 5)

FISHERIES

Monitoring Purposes

The eight Monitoring Purposes appear comprehensive for anadromous populations of fish, but the accompanying Thresholds of Concern do not appear adequate to answer each stated monitoring purpose. For example, Monitoring Purpose (2) refers to evaluating changes in numbers or composition of spawning populations of anadromous fish, but it is not clear that a 3-year decline in spawners at only index reaches of some streams will be an adequate measure of population declines. There is also no mention of monitoring resident populations of fish, which may be most affected by habitat changes, since those fish do not leave the streams during their lives.

General comments on using index sites to assess changes over a three year period: Anadromous salmonids have a high fidelity to natal streams and even to specific sections of their home streams. It is important to monitor all of the important habitats used by each identified fish stock at risk, in order to not base management decisions upon incomplete data. In addition, monitoring index sites only one in every three years would yield insufficient information on rapidly declining fish populations and aquatic habitats. According to Table V-1, the Effectiveness Monitoring Program, there will be annual fish counts on approximately 40 miles of representative stream reaches; and field surveys of fish habitat conditions in sample riparian corridors (approx. 70 miles) Forest-wide. Will enough sites be monitored each year to adequately assess the populations of fish stocks at risk?

A (draft) list of separate breeding populations for chinook & steelhead in the Klamath River basin was recently prepared by a committee that included Jerry Barnes, Forest Fishery Biologist for the SRNF. Four separate breeding populations of fall chinook, one spring chinook, and three summer steelhead were identified for streams on the SRNF. All of these eight groups represent fish stocks at risk identified by two recent publications of the American Fisheries Society. In addition, there are three chinook stocks, four coho stocks, three steelhead, and two cutthroat stocks with documented declines on the SRNF outside of the Klamath basin.

Any analysis of anadromous fish stocks in northern California points to the great lack of information on many stocks. Fisheries values in most streams are only studied in a cursory way. Complete annual counts of spawners, accurate annual estimates of juvenile fish emigration, and current assessments of habitat quantities and conditions are available for only a few of the streams on SRNF. An example is the very limited summer steelhead information collected on the Mad River. Karen Kenfield, a SRNF fishery biologist, reported on April 20, 1993, to an interagency group working on steelhead, on the annual count of summer steelhead along an index that covers only 14.7 km of river. The entire Mad River used by summer steelhead is about 112 km, with the upper section within SRNF, about 17 km. No other agency routinely assesses summer steelhead adults or juveniles on the Mad River. An adult count of only 13% of the anadromous

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fish habitat is, in our opinion, not adequate to monitor the entire summer steelhead stock on the Mad River.

We recognize the difficulty of thoroughly surveying all of the fish habitats for stocks at risk on the entire Forest. According to the Data Collection section of the Fisheries Monitoring Plan, "Index stream reaches, most of which correspond to Rosgen B-Type channels, have been or will be selected in watersheds representing the various terrain types throughout the Forest." It is important to ensure that enough index stream reaches are selected to include at least essential habitats for all of the fish stocks at risk on the Forest. Channel types should include both Rosgen C and B types. To quote the committee report for Klamath basin stocks,

Some differences as to (breeding) population groups remain among the members of the committee. There was a good consensus that for several groups more information is required to make good judgement decisions. We believe that in light of the depressed status of Klamath River stocks it is best to err on the conservative side in management decisions.

Thresholds of Concern/Variability

Regarding the Thresholds of Concern section, it appears that specific, quantitative thresholds were selected arbitrarily. A recent publication, Monitoring Guidelines to Evaluate Effects of Forestry Activities on Streams in the Pacific Northwest and Alaska, 1991, has excellent discussions of most of the monitoring items listed in the Plan. For example, regarding (1) residual pool depth, the Plan sets a 20% change in residual pool depth or volume over 3 years as a threshold for concern. What basis exists to judge whether a decline in 20%, or 15%, or 25% is meaningful to fish? Monitoring Guidelines agrees that "Residual pool depth also may be the most sensitive pool parameter...", but states that "Pool parameters are unlikely to be useful in bedrock channels that are regularly scoured by high flows."

Landslides and extreme floods are major determinants of pool conditions in the high energy streams located on the Forest. Will the monitoring of pool conditions at index reaches be adequate to evaluate effects of all major landslides upon pool habitats throughout the Forest?

The Monitoring Plan sets a threshold of concern for (2) anadromous population trends, which would allow as much as a 20% annual decline in measured numbers of spawning adults for three years before the threshold is reached. There are several concerns with this approach. First, a 20% decline in numbers, compounded over three years, would leave slightly more than half (51%) of the original population. For a small sized population, the loss of even 20 - 40% of the annual spawners would be a serious setback.

Second, the natural variation in numbers of spawners may easily be more than 20%, + or -, between years. For example, the Middle Fork Eel River has one of the best data sets for adult summer steelhead in the area, 1966 to present, except for 1969 and 1972. Since 1974, this threshold was apparently exceeded five times. Yet the numbers rebounded to nearly the same high counts after four of those three-year declines. Current numbers remain low.

Third, only measuring numbers of spawners may not be a suitable method to assess fish populations. Monitoring Guidelines states "Counts of outmigrating young provide a more specific indication of spawning and rearing habitat productivity than counts of resident fish or returning

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adults." Our office has several years data from Blue Creek and New River that include counts of both spawners and emigrating juveniles. For species like chinook that typically do not spend a year rearing in streams, numbers of emigrating salmon provide a good indicator of productivity of spawning. For species like steelhead that usually rear for one or more years in fresh water, emigrant numbers reflect productivity of both spawning and rearing habitats. In addition, marked recapture studies of emigrants along lower ends of rivers would allow estimates of basin-wide and perhaps even estuarine production.

The threshold also appears to conflict with the stated threshold of concern in Table V-1, Riparian section: "fish counts are below 85% of desired levels for sampled species." Which threshold of concern is correct?

The Monitoring Plan sets three thresholds for (3) Large Woody Material (LWM) in stream channels, that appear confusing. The desired-future-conditions are not stated for this parameter for various streams, but there is some research information for defining LWM levels in various sizes and channel types of fish streams. It would be best to define d-f-c for this parameter for each stream, based on site specific characteristics of channel order and channel type. Regarding the thresholds in the Plan, a more realistic time period to look for d-f-c is the number of years after an extreme flood. Also, would a 10% decline in LWM at a specific site even be detectable?

Item (5), levels of fine sediment, would allow an increase of less than 20% in fine sediments in index streams. It is not stated whether this refers to suspended or bedload sediment, but the reference to "total particle size distribution" suggests bedload. What levels would be allowed, or even measured at non-index streams? Many streambeds have background levels of fine sediments that are near the maximum tolerable for spawning (about 15-30% by volume). What effects would there be from allowing an increase of nearly 20% more fine sediments on streams with an existing high level?

Item (7), habitat diversity, would allow an overall decline of less than 10%. Presumably, this refers to some index of diversity for macro-invertebrates or perhaps fish. Would an overall change of 10% be detectable, or be meaningful if it could be detected? Monitoring Guidelines has a detailed discussion of diversity indices for both fish and macro-invertebrates. It is not clear that there is simply one diversity index that would be meaningful by itself.

WATER RESOURCES (pages H-3 to 4)

Monitoring Purposes

Stated purposes all appear to relate to Best Management Practices (BMPs), that are specifically not stated and will be applied for each project. It is not clear how often BMPs will be evaluated, and how the results of the BMP Effectiveness Program will be reported to the public.

Are there any water resources that would be monitored unrelated to BMPs? Would temperature changes at sites not measured for fisheries purposes be monitored for long-term trends?

Thresholds of Concern/Variability

For items (4,5, and 6) how would the "predicted ranges" be calculated for adverse cumulative effects of minimum stream flows, conditions of stream

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flow, and rates of landslides? Those ranges would need to be agreed to and clearly displayed before any measurements are made for comparison.

It is not clear how often and over what scale managed lands would be monitored for new landslides. To be an effective tool for land managers, areas of high potential for mass soil movements may need to be monitored annually after each wet season, and other areas may only need attention every three to five years.

DEIS Chapter 4, IV-67, Range Management


Cattle may compact soils, and break down streambanks from trampelling. Although the impacts to a particular site may be difficult to assess, similar non-impacted streams may serve as comparisons/controls: species composition, habitat quality and quantity, presence or absence of fish, and relative abundance.

Appendix C, C-1 Blue Creek

Blue Creek also produces coho salmon.

Thank you for the opportunity to provide these comments.

Sincerely,



Bruce G. Halstead
Project Leader

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
600 Harrison Street, Suite 515
San Francisco, CA 94107-1376

January 31, 1994

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Forest Dept. Office

ER 93/822

Martha Ketelle, Deputy Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, California 95502

Dear Ms. Ketelle:

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the Six Rivers National Forest (SRNF) Land and Resource Management Plan, Humboldt, Del Norte, Siskiyou, Tehama, and Trinity Counties, California. The following comments are provided for your use and information when preparing the final documents.

GENERAL COMMENTS

Vegetation Management and Herbicide Use

Under the Preferred Alternative all types of vegetation management strategies are to be used, including herbicides. However, what cumulative effect will these toxins have on the environment? It is assumed that all herbicide applications will be conducted under the guidelines of the Vegetation Management Plan, but what are these Forest-wide Standards and will they mitigate any negative effects on Sensitive plant populations?

Such factors as the timing of applications can have a significant impact on Sensitive plant populations. Additionally, will the different methods of application have an effect? For example, how much, if any, aerial spray will contaminate neighboring streams and will the concentrations affect fish and wildlife? Are aerial applications always necessary or could the herbicides be applied by hand?

Timber

The Department wishes to encourage any attempts to manage forests on a ecosystem level. The change in priorities and values is welcomed. We also support increasing the amount of standing trees after a regeneration cut and minimizing the size and

frequencies of clearcuts. The Department is pleased to see K-V funds used to improve wildlife and fish habitat as well.

The Department is pleased by the stated priorities to develop and enhance habitat for old growth wildlife. We cannot help but to wonder if this in fact will be possible under the constraints of a 43.5 MMBF annual cut. What sort of evidence indicates that these goals are compatible? Or, will old growth be sacrificed to meet the timber goal?

Special Trees

The Department supports the opportunity to join the war on cancer. However, please use restraint in issuing permits to harvest Pacific yews. While these trees may prove to be incredibly useful, they are unique and in need of protection.

Range

Given that the demand for additional grazing is low, the Department sees this as an excellent opportunity to utilize range improvement techniques. These include removing riparian land from allotments and encouraging ranchers to move their herds as much as possible to avoid over-grazing.

Fisheries

While it is beyond the ability of the Forest to affect the ocean environment in which anadromous fish live, what steps are being taken to protect the summer steelhead and anadromous fish that spawn in Forest land? Would restricting sport and commercial fishing during the summer have a beneficial effect on fish populations?

The Department also wonders if revenues from increased commercial fishing over the span of the plan mitigate to some degree economic effects resulting from reductions in timber harvesting?

Energy and Biomass

What precautions are in place to insure against over collection of biomass? While biomass may be a cleaner source of energy production than oil or coal, its ecological use may preclude extensive removal. What measures will ensure that the biological service that biomass provides to the Forest are met?

Fish and Wildlife Resources

Reduction of Potential for Catastrophic Fire - The increased emphasis for managing large contiguous reserves of late seral timber stands has led to decadence, multiple canopy layers, and increased amounts of coarse woody debris. Coupled with poor

access and a history of fire suppression, the resulting conditions may have increased the probability of stand-replacing fires.

The Department recommends that the SRNF increase the use of prescribed natural fire or mechanical treatments to achieve a range of natural variability of structure and vegetative types which would benefit wildlife while reducing the likelihood of catastrophic events.

Sensitive Plants - The SRNF's sensitive plant species list should be reviewed and updated at least annually in coordination with the FWS and other knowledgeable agencies, organizations, academics, and individuals.

Candidate Species - The SRNF should conduct surveys for Federal category 2 candidate species. The Department also recommends that their status and distribution be determined and that standards and guidelines for their protection be developed.

The Fish and Wildlife Service (FWS) is available to provide guidance to the SRNF on survey protocol, methods, and data interpretation.

Goshawks - The goshawk management guidelines on nest stand size and distribution are inadequate to provide for the long term habitat needs of the species. The guidelines, as outlined in the LRMP and the DEIS, should be improved in the final documents.

Management of single, static nest territories may involve territories which remain unoccupied over the life of the planning period. The strategy of applying silvicultural methods that will provide suitable nest sites, post-fledging family areas, and foraging territory characteristics on a landscape basis is a preferred management strategy. The Department suggests following the northern goshawk management strategies recommended in the Southwest Region (USDA 1992).

Bald Eagle/Peregrine Falcon Species - The proposed forest planners bald eagle and peregrine falcon management to the recovery plans for these species. The recovery plans for the bald eagle and peregrine falcon are necessarily general for some recommendations and conservative for others.

Therefore, the Department recommends that the Forest develop specific management objectives (e.g., protection zones, number of territories to be managed, and monitoring goals) that are applicable on the SRNF for these species. The Habitat Capability Models in the DEIS could include these specific management criteria.

In addition, the monitoring plan for bald eagle and peregrine falcon identifies annual monitoring and reporting frequency. We recommend that annual monitoring plans include several visits to the nest site to determine occupancy or nesting attempts early in the season as well the reproductive success late in the season.

Monitoring and Evaluation - The monitoring goals for threatened and endangered species refer to "approved" recovery plans for threatened and endangered species. However, the monitoring methods and protocol for achieving those recovery goals are vague. Specific monitoring items for threatened and endangered species should be identified in a monitoring plan.

In addition, since a recovery plan for the northern spotted owl has not been approved, the Department recommends that monitoring methods and protocols for the northern spotted owl recovery be outlined in the final documents.

It is particularly important that the results of planned actions, mitigations, and monitoring actually be used. Knowing what works and what doesn't must lead to adaptive management, i.e., using this information and knowledge to appropriately continue or change what you are doing to manage the resources.

The final documents should discuss in some detail the mechanisms you have devised to identify and commit budgetary and organizational resources to both the monitoring and adaptive management of the Forest. We would be happy to assist you in this process if you so desire.

National Recreation Resources

Redwood National Park - With the exception of the Smith River National Recreation Area (NRA), no SRNF lands are directly adjacent to Redwood National Park (RNP) or the protection zone for the RNP. However, we do have some suggestions regarding the adjacent NRA lands. These are addressed in the following SPECIFIC COMMENTS section.

We also refer you to the October 27, 1993, RNP comments on the Draft Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl, referred to in the SRNF draft plan as President Clinton's plan. Because the SRNF plan is closely related to the President's plan, the RNP October 27, 1993, comments are applicable to the SRNF plan.

National Park Service (NPS) staff at the RNP is available to share knowledge and experience in watershed management and rehabilitation with SRNF, to coordinate the development of ecosystem-wide geographic information systems (GIS), and to cooperate in managing recreational use on park lands adjacent to

Smith River NRA according to the National Recreation Strategy. Increased cooperation and coordination between the SRNF and RNP will promote the mutual goal of ecosystem management and strengthen RNP's ability to protect park resources.

Wild and Scenic Rivers - In Chapter 3, page III-143 of the DEIS, it is indicated that the undesignated portions of the North Fork Eel and Van Duzen rivers have characteristics "common to SRNF and therefore not considered to be outstandingly remarkable." Nearly two thirds of the Van Duzen River and nearly all of the North Fork Trinity River are existing components of the National Wild and Scenic Rivers System (NWSRS) through the 1981 designation by the Secretary of the Interior.

The 1981 designation was required to mirror the existing California Wild and Scenic Rivers System which excluded some portions of rivers based on political reasons or assumed existing protection rather than on a resource protection basis. Many of these excluded areas are in headwaters areas on national forest lands.

In recent reviews of the forest plans for the Klamath, Shasta-Trinity and Mendocino National Forests, the NPS has noted that those plans recommend adding such undesignated portions of the Eel, Klamath, and Trinity river systems to protection of the whole river system.

While the undesignated segments of the North Fork Eel and Van Duzen rivers may lack specific outstandingly remarkable elements, their permanent protection would contribute to maintenance of downstream water quality and afford an uncommon opportunity to include additional whole rivers in the NWSRS. Also, the undesignated segments are wholly within the SRNF boundaries. Accordingly, the Department recommends that the suitability of these river segments be reconsidered for designation.

In regard to the additional river segments considered from public scoping, Blue Creek appears to meet the standards for eligibility. The NPS excluded Blue Creek from the Nationwide Rivers Inventory published in 1982 for administrative reasons rather than lack of wild and scenic river potential. This inventory should be referenced instead of "HCRS 1980 Phase I" on DEIS page III-141.

The Blue Creek data in the DEIS' Appendix D and the data in the NPS' inventory files make a compelling case for eligibility. At the minimum, there are two factors which have potential outstandingly remarkable values. These factors are Blue Creek which is an anadromous fish producing tributary to the already designated section of the lower Klamath River and the presence of a National Register of Historic Places District. The Department recommends that the SRNF reconsider eligibility for Blue Creek.

On page IV-136, the DEIS indicates that individual river management plans will be prepared for designated river segments other than the Smith and South Fork Trinity Rivers. Since the draft forest plan delineates alternative management corridors, what additional information or decisions would these separate management plans address?

Also, the classifications that accompanied the 1981 designations were based on criteria contained in the 1970 National Wild and Scenic Rivers: Guidelines for Eligibility, Classification and Management of River Areas. The 1982 revisions in these guidelines offer a less strict criteria for "scenic" rivers.

We recommend that existing "recreational" classifications be evaluated to determine if some river segments may now meet "scenic" criteria. This evaluation was presented in the recent Draft Forest Plan of the Klamath National Forest.

SPECIFIC COMMENTS

The following comments address the Draft Forest Plan for the SRNF.

Page IV-20. Management Area 3, Yurok Experimental Forest - The first paragraph, sixth sentence, correctly states that the marbled murrelet "has been federally listed as a Threatened species." However, this sentence continues, "and is currently under review by the U.S. Fish and Wildlife Service."

This sentence provides confusing information because the marbled murrelet was listed as a threatened species on October 1, 1992 (USDI 1992). It is, therefore, no longer under consideration for anything other than recovery plan development and critical habitat designation. All other references to the marbled murrelet in the Forest Plan and DEIS should recognize threatened species status for the species.

Page IV-31. Wildlife Management Area 9, Dedicated Wildlife Habitat, (b) Winter Roosts - The document recognizes the importance of winter roosts for bald eagles; however, bald eagles frequently utilize roost sites during other times as well. Roost sites provide protection from thermal conditions and disturbance and may be used during all seasons and hours.

Therefore, the Department recommends that the DEIS outline criteria to identify and protect bald eagle roost sites regardless of the time of year they are used.

Page IV-55. Recreation, Trails, Standards and Guidelines, General Recreation, 13-1 - We wish to coordinate recreation signing with the Smith River NRA to inform visitors when they have entered RNP from the NRA lands.

Page IV-55. Standards and Guidelines, Dispersed Recreation, 13-6
- Increased coordination with the Smith River NRA is necessary to ensure that users of multiple-use trails originating on NRA lands are informed of NPS trail regulations for those trails that cross agency jurisdictions.

Page IV-60. Action item 16-3 references, "field reconnaissance" to determine the presence of threatened, endangered, proposed, candidate, and sensitive species - The Department recommends that project specific field reconnaissance be conducted according to established survey protocol, if available.

Page IV-61. Endangered, Threatened, Proposed, Candidate and Sensitive species, 16-6 - Please refer to the IV-31 comments regarding winter roosts.

Page IV-61. Bald Eagle and Peregrine Falcon - The LRMP references the peregrine falcon Habitat Capability Model for SRNF in Appendix B of the DEIS; however, Appendix B does not contain a Habitat Capability Model for the peregrine falcon.

The Department recommends that the Habitat Capability Model for the peregrine falcon be included in the FEIS and that a nest site protection zone of at least 0.5 miles unless topographical influence or the nature of the disturbance indicates adjustments (increase or decrease) are required.

Page IV-61. Northern Spotted Owl - The document incorrectly states, "Formal Consultation, requesting an incidental take permit be issued by the FWS, is currently required to reduce suitable habitat below 500 acres within 0.7 miles, and/or below 1,340 acres within 1.3 miles of nests or activity centers."

Formal consultation and incidental take authorizations are required when a Federal agency determines that a proposed project may adversely affect a listed species and take is anticipated. The amounts of habitat that remain within 0.7 and 1.3 miles of an owl nest/activity center are not, in and of themselves, the criteria for initiating formal consultation and determining take.

They are only recognized as guidelines for evaluating the effects of proposed management activities on the northern spotted owl. We recommend removing reference to these guidelines as criteria for initiating formal consultation and assessing the extent of incidental take.

Page IV-64. Golden Eagle - This section references the maintenance of "essential habitat characteristics within 500 feet of active or recently occupied (within the last 5 years) nest sites." We recommend that the SRNF identify and manage a 0.5

mile primary nest zone protection area around each nest site, in addition to the 500-foot zone.

This provision is similar to what is provided for peregrine falcon and bald eagle nest sites as outlined in the Habitat Capability Models for those species. A 0.5 mile buffer is a general recommendation to protect the nesting bird from disturbance (see action item 16-20 on page IV-64) which may be adjusted depending on topography or the disturbance.

We support vegetative management within the 500-foot zone for "nest site protection/essential habitat-characteristic" when the management goal is to improve habitat capability or characteristics for that species.

We also support vegetative management within the 0.5 mile "protection/feeding zone" when the management is consistent with the conservation of the species.

Page IV-66. Table IV-9 Restricted Activities and Periods of Restriction for Wildlife Species - Standards and guidelines for osprey and golden eagle reference adherence to action item 16-21; however, action item 16-21 does not exist in the text. In addition, the standards and guidelines for several species in this table reference adherence to action item 16-23 which does not exist in the text.

We recommend clarifying the references for the action items referred to in the table.

Page V-7. 2. Effectiveness Monitoring - The LRMP states that, "Effectiveness monitoring is the 'heart' of the monitoring plan" and it will "provide the most useful information on Plan performance." However, the document further states that "effectiveness monitoring will depend on funding levels and project activity levels."

We recognize that effectiveness monitoring is very important and that in many cases it is the only means to determine the effects of management activities on threatened, endangered, and candidate species.

Therefore, we recommend that effectiveness monitoring be funded in the same manner as implementation monitoring on page V-5.

Page V-11. Table V-1 - For Monitoring Element: Dedicated Wildlife, the matrix block for Effectiveness Monitoring Questions states, "Is identified critical habitat for Peregrine Falcon, Bald Eagle & Spotted Owl occupied at anticipated levels?"

Critical habitat, as defined by the Endangered Species Act, has not been designated for the bald eagle or peregrine falcon within the boundaries of Six Rivers National Forest.

Page V-13. Table V-1 - Under Monitoring Element: Managed Wildlife, the matrix block for Effectiveness Monitoring Questions states, "Do silvicultural practices produce stand structure... that mimics known, occupied habitat?" The species of fish, wildlife, or plants that the stand structure is being manipulated for, needs to be identified.

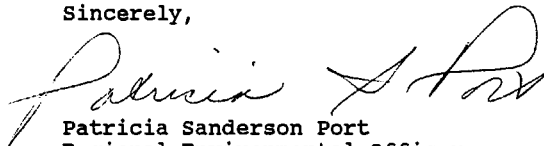
The following comment addresses the DEIS.

Page B-37. Table B-7. Bald Eagle Habitat Capability Model, Roost Trees - The model may be describing perch trees rather than roost trees. Roost trees are generally considered trees that provide shelter from climatic and disturbance conditions, and perch trees generally provide visual access to a food source.

Although there is some overlap in function between the two trees, they have distinct structural characteristics. The model needs to provide a distinction between perch and roost trees.

We have appreciated the opportunity to comment.

Sincerely,



Patricia Sanderson Port
Regional Environmental Officer

cc:
Director, OEPC w/original incoming
Regional Director, FWS, Portland
Regional Director, NPS, WR

Reference

USDA, Forest Service. 1992. Management recommendations for the northern goshawk in the southwestern United States. Rocky Mountain Forest and Range Experiment Station, Fort Collins Colorado, General Technical Report RM-217. 90p.

#47

#47

DEPARTMENT OF FISH AND GAME

601 LOCUST STREET
REDDING, CA 96001
(916) 225-2300

December 23, 1993



RECEIVED

DEC 23 1993

Forest Supervisor's Office

Ms. Martha Ketelle, Acting Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, California 95501

Dear Ms. Ketelle:

SCH 93104006, Draft Environmental Impact Statement (DEIS)
and Land and Resource Management Plan (LMP),
Six Rivers National Forest (SRNF), Humboldt County

The Department of Fish and Game (DFG) has reviewed the SRNF LMP and the related DEIS. The DFG applauds the changes in forest planning which have occurred since the 1987 SRNF LMP. The LMP identifies the preferred alternative for managing lands and resources within the SRNF. For the most part, this LMP incorporates the changes outlined in President Clinton's proposed forest plan (Option 9) of the Report of the Forest Ecosystem Management Assessment Team (FEMAT). The LMP itself is a broadly based collection of forestwide management goals and objectives for the next 10 to 15 years.

Option 9 envisions the development of ecosystem management rather than the commodity output type of forest management common in the past. Although the addendum found in the DEIS indicates that the LMP closely complies with Option 9 direction, standards and guidelines, as well as outputs presented in the LMP indicate that the LMP is still output oriented. The final LMP should provide the framework for developing and implementing ecosystem management.

Because not all of the changes to the preferred alternative of the DEIS brought about by Option 9 of the FEMAT report are evident in the LMP, we are concerned that review of this document may well be a review of alternatives and analysis that cannot be implemented. We have concern with the process of reviewing a draft document that has a major part of its direction set by another document that has yet to be finalized. Further, it has been our experience that it is not very efficient to comment on a draft document and then await and respond to a final document without communicating during the development of the final document. Because of that experience, we are concerned that the process we are currently involved in will be even more ineffective. For that reason, we feel it is very important that the US Forest Service (USFS) contact appropriate departmental units during (not after) the development of final LMP so that issues and concerns can be dealt with prior to the issuance of a final document.

Sincerely,
Richard L. Elliott
Richard L. Elliott
Regional Manager

Enclosure

cc: See attached list.

Ms. Martha Ketelle
December 23, 1993
Page Two

cc: Mr. Terry Mansfield
Department of Fish and Game
Wildlife Management Division
Sacramento, California

Ms. Susan Cochrane
Department of Fish and Game
Natural Heritage Division
Sacramento, California

Mr. Tim Farley
Department of Fish and Game
Inland Fisheries Division
Sacramento, California

Mr. John Turner
Department of Fish and Game
Environmental Services Division
Sacramento, California

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GENERAL COMMENTS

Maintaining ecological management of the Six Rivers National Forest (SRNF) will require continued monitoring, review and evaluation. Because of previous emphasis on timber management, explicit direction will be necessary to assist forest managers in implementing the new forest direction. The wording in LMP direction must provide precise guidance to allow for consistent decision making. Only specific guidance will allow managers from the various forest disciplines to implement the specific actions necessary to achieve the LMP direction and stated goals.

The Department of Fish and Game's (DFG) comments are intended to assist the SRNF with developing that level of direction.

COMMENT:

The interrelationship between the four documents pertaining to the direction within the LMP is understandable but difficult to follow without the pertinent documents immediately at hand. Those documents are the LMP, DEIS, the DEIS on management of habitat for late-successional and old-growth forest related species within the range of the northern spotted owl (SEIS) and the forest ecosystem management, an ecological, economic and social assessment (FEMAT). The present arrangement leads to both confusion and frustration. Managers are not likely to spend time researching four documents but will likely rely solely on the LMP.

LMP construction makes the LMP difficult to follow. Part of the direction is provided under the Management Area section and part of the direction is provided in a separate section titled "Resource Goals, Direction, and Forest-wide Standards and Guidelines". Standards and guidelines for most activities are in the Standards and Guidelines section but riparian management area (RMA) standards and guidelines are with the Management Direction section. These variations and complexities will make the LMP difficult for managers to use and may lead to errors in use. We have experienced that planners have difficulties with regional land use plans much more simple to use than this one, causing errors which impact fish and wildlife resources.

RECOMMENDATION:

All direction necessary to understand the guidance should be in the LMP without going to other publications. Direction pertinent to a specific management area should further be available within a single area of the LMP. Management area prescription, goal, direction, standards and guidelines, along with other necessary information, should be displayed contiguously for each management area.

COMMENT:

The LMP bases part of its direction on an as yet to be finalized concept, Option 9, from FEMAT. The wording within Option 9 is general and may change even if it is approved. The DFG has concern that the LMP is being tied to a position which has yet to be finalized and may change before finalization. The DFG finds it inappropriate to rush to certify the LMP when finalization of definitive guidance which may have a substantial effect is a few months from completion.

RECOMMENDATION:

The LMP should be held in abeyance until Option 9 has been approved and the specific wording from it can be incorporated into the LMP. The revised LMP should then be circulated for review.

COMMENT:

Planning on a regional basis such as a national forest requires the understanding and coordination of a large variety of people over a long period of time. Those individuals who will be using the LMP should be able to understand the goals and the direction of the LMP without interpretation. Guidance within the LMP should be specific so that SRNF directed activities can be monitored, measured and enforced.

The DEIS, on page IV-22, item 7, in the section on Environmental Consequences, Wildlife, Assumptions Common to all Alternatives (page IV-22, number 7) states that, "Forest-wide Standards and Guidelines would be expected to maintain the habitat requirements of wildlife species in general, and provide seasonal protection for essential occupied breeding habitat." That objective cannot be reached unless standards and guidelines provide specific direction that will require that objective be accomplished. The guidance which is provided is not specific enough to accomplish that task.

In many areas of the LMP direction is lacking or cannot be monitored, adequately measured and enforced. The range of interpretation that can be made of the wording within the LMP allows for potential misunderstanding and manipulation of the intent of the LMP. The DFG is particularly concerned about the wording within the standards and guidelines.

It is difficult to follow the definitive direction in the LMP. The LMP states, on page IV-8, that "Management area prescriptions embody further specific standards and guidelines together with goals and desired future conditions to formulate the intent and direction of each management area and guide the implementation of the direction, which in summation for the USFS' 17 management areas comprises the key working components of USFS LMP direction and implementation." That appears to mean the wording within the management area prescriptions is equivalent to the standards and guidelines within the resource goals, direction and that management area prescriptions carry the same weight. Confusion lies in the fact that the LMP also states on page V-3 that "The Standards and Guidelines are the most important controls affecting projects implementation on the ground." If standards and guidelines are the part of the LMP against which accomplishment will be measured and enforced, we have concern. Many of the standards and guidelines do not effectively provide definitive direction and there will be no way to measure or enforce their "direction".

The definitive direction becomes more confusing in the definition of standards and guidelines and the wording contained in them. On page IV-44 the Resource Goals, Direction, and Forestwide Standards and Guidelines section of the LMP provides a definition of standards as opposed to guidelines. It states that standards are identified by the word "will" and are baseline criteria for measuring quality or quantity of the action, while guidelines use the word "should" and only identify a desirable level of attainment. In other words, guidelines are recommendations for a level of attainment but are not necessarily to be enforced. The two words "will" and "should" are the only indicators given of the difference between these two significantly different levels of direction which are grouped together under the heading "Standards and Guidelines".

Many of the items listed as "Standards and Guidelines" contain neither a "will" or a "should" and do not contain words which could be considered synonymous with "will" or "should".

How is the manager, or the public, to determine whether these items are a desirable level of attainment or a standard against which to measure the correctness and success of an action? These items cannot be considered direction as the manager will be unable to determine the specific action required and the public will be unable to determine if compliance with the intended direction has occurred. This makes much of the LMP unenforceable by management and provides no recourse to the public.

Examples of standards and guidelines which do not follow the LMP's prescribed format include but are not limited to riparian standards and guidelines on timber management within riparian management zone (RMZ) numbers 2, 4, 5, 6 and 7 (page IV-25) on range management within RMZ numbers 1 through 5 (page IV-26) on lands and hydropower development within RMZ number 1 through 5, and on roads and facilities management within RMZs relative to minimizing mileage of open roads.

Many "Standards and Guidelines" contain the words "will" or "should" but do not attach those terms to a meaningful direction. These standards and guidelines also cannot be monitored, measured or enforced. Examples are the standards and guidelines for range management. Standard 12-1 (page IV-54) states that "Grazing allotments and activities that involve riparian and/or stream ecosystems will be managed to follow the standards under the RMA section above." Conditions within riparian areas which are most significantly affected by range management are stream bank and soil stabilization, riparian and understory vegetation protection, deer fawning, elk calving and other wildlife denning habitat protection. None of the RMZ standards and guidelines specifically address those concerns. Range Management Standard 12-1 is meaningless without specific definitions against which to measure the success of the actions taken.

Range Management Standard 12-4 is another example of a meaningless standard. It states that grazing allotments will be managed to maintain adequate forage for wildlife species dependent upon the range resource. The LMP does not provide a definition of adequate forage for wildlife dependent upon the range resource. Unless a definition of adequate forage for wildlife species is developed, adherence to this standard is unmeasurable, debatable, and unenforceable.

The DFG worked with the SRNF on wording within the LMP. LMP standards and guidelines which we believed would accomplish resource protection do not appear in the draft LMP. As an example, a standard which stated "Range use that adversely affects riparian areas will be resolved. Fencing of riparian corridors and sensitive plant sites will be used when other avenues fail to conserve riparian areas" was deleted. That wording provided more meaningful direction than the proposed wording in the circulated draft.

RECOMMENDATION:

The standards and guidelines must be written to provide specific mandatory guidance that leads to consistent application of the LMP. The guidance must be able to be monitored, measured and enforced. We recognize that NEPA requires specific comments and recommendations relative to our concerns about the LMP, however, the DFG thinks it would be presumptuous to reword all of the standards and guidelines to meet DFG concerns for the SRNF. Rather we would prefer to work closely with the SRNF during the period between this review and the final of the LMP to develop wording which will be protective of fish and wildlife resources.

After review of the LMP and the DEIS, it is clear that the success or failure of the effort to achieve the objective of ecosystem management lies primarily in the adequacy of standards and guidelines. Therefore it is imperative that those measures necessary to achieve ecosystem management be specifically identified as standards. This will provide not only some measure of how well the LMP is progressing but also hold the SRNF accountable for implementing program direction.

COMMENT:

FEMAT states that it is expected that planning will be carried out that extends ecosystem management concepts. DFG heartily endorses this concept. The LMP, on the other hand, deals with specific project areas, species and politically grouped species, most notably threatened and endangered and sensitive species. As an example, the wording in the Driving Issue 1, on LMP page II-1, appears to equate biodiversity specifically with populations of northern spotted owls and other threatened, endangered, candidate or sensitive

species dependent on mature and old-growth forests. Further, we do not find any direction or standards and guidelines that direct management to work toward an overall ecosystem concept. The LMP standards and guidelines are directed to specific activities related to commodity output.

RECOMMENDATION:

Recognize that biodiversity is an ecosystem approach and commit to that approach. Emphasize within the LMP that ecosystem management is the preferred approach and that commodity output should be a product of that approach rather than the driving force for the LMP. Develop specific direction to give emphasis to the concept. Overall planning standards may state that the SRNF will manage the SRNF on an ecosystem basis. A reasonable guideline to be placed with those standards would be that materials and services should be considered if ecosystem management objective are accomplished.

COMMENT:

The LMP emphasizes aggressive suppression of wildfire. The DFG recognizes the importance of protection of human resources from fire but also recognizes that wildfire is an integral part of the natural ecological system which assists with the maintenance of biodiversity. Across the board aggressive suppression of fire adversely affects early seral stage ecology.

RECOMMENDATION:

The SRNF must consider the use of fire as a tool for maintaining the ecological relationships on the SRNF. We recognize that there is an inherent danger in management through the use of fire without a good understanding of fire management. We would like to see the SRNF commit to developing a realistic fire management program that will mimic aspects of wildfire that assist in maintaining biodiversity on the SRNF.

SPECIFIC COMMENTS

RMA

COMMENT:

The LMP provides wide riparian management zones and scheduled commercial timber harvests are prohibited within the zone under the LMP. Riparian reserves are also reserved from timber management under Option 9 within FEMAT. However, the LMP leaves open the opportunity to continue to harvest within the riparian areas for a variety of activities such as sanitation and salvage logging, pest control, firewood cutting and, ostensibly, riparian management. Unscheduled harvests are not addressed within Option 9. In the past such harvest schemes have been used to remove and sell trees from riparian areas. Considering the intent of Option 9 and the value of the RMAs to fish and wildlife, the riparian zones must be carefully protected. Because of the potential for abuse of the opportunity to remove wood from riparian areas, the DFG believes the strategy should be to allow the riparian areas, including the associated river or stream, to succeed to a natural condition without commercial activity within them. The DFG also believes that if the riparian reserves are not manipulated, stream rehabilitation will occur without human intervention.

RECOMMENDATION:

The LMP states that the more restrictive language found within the LMP or Option 9 will be the guidance upon the SRNF. Therefore, it would appear that wording may be included which is more restrictive than Option 9 but which would lead to the intent of the option. We recommend that the SRNF not allow commercial timber harvests or fuel wood cutting in riparian areas and prohibit removal of wood for economic purposes. It is preferable to allow the riparian management zone to return to a naturally functioning ecosystem rather than to attempt to manipulate it. Should there be need to fall trees for the benefit

of the riparian area, the trees should be left on the ground or in the stream for the benefit of fish and wildlife. The wording in the timber management standards and guidelines of the RMA guidelines should be synonymous with the direction given in the Timber and other Forest Products subsection of Management Area 10 - Special Interest Areas, items 1-4, on LMP page IV-33.

COMMENT:

Within the RMA direction, the LMP discusses RMZ widths for wetlands but does not define a wetland. It will be difficult for managers to determine how to measure the RMZ width unless the edge of the wetland can be determined. It is necessary for the LMP to provide and use a definition of wetlands as guidance for wetland protection.

RECOMMENDATION:

The LMP should provide a definition of wetlands. We recommend the USFS use the wetland definition used by the US Fish and Wildlife Service, in its publication by Lewis M. Cowardin, et al., 1979. Additionally, the LMP should indicate the level of mitigation that will be provided such as "full replacement of wetland area or of wildlife habitat as measured before project commencement". It should also state the level of impact which would be considered acceptable without mitigation.

COMMENT:

The second sentence of RMA standard or guideline #4, under Timber Management on LMP page IV-25, states that the standards and guidelines requirements may be waived when approving activities inside the RMZ would result in less impact to forest resources than approving the activities outside the riparian area while still meeting riparian goals. This wording is not specific enough to provide protection from various management activities. "Riparian goals" as used can be widely interpreted.

RECOMMENDATION:

The standard or guideline should indicate the type of impacts to SRNF resources that would be considered allowable in the riparian zone and the type of impacts which need to be protected in the area outside the riparian zone for which a variation from the item would be allowed. The existing wording could be construed to mean that miscellaneous impacts to riparian zones could be considered less damaging to SRNF resources than loss of timber resources.

COMMENT:

LMP, page IV-26 standards and guidelines for management of RMZs, Roads and Facilities Management subsection, Standards and Guidelines #1. This standard states that roads will not be constructed in RMZs unless there is no other way to meet management objectives. It does not state which management objectives to which it refers and it does not provide wording against which to measure the success of actions to meet the requirements of the standard. There should be a standard for determining the value of the road or facility project as opposed to the value of riparian area which will be disturbed and a mechanism to weigh the value of those projects and resources so that the management objective dealing with incidental projects do not compromise fish and wildlife resources.

RECOMMENDATION:

Specifically state which riparian goals are being referred to in these sections or state specifically where the user can look to find the specific goals. The standards and guidelines need to be more specific at this point. Where does one go to find the specific goals referred to? How does the LMP user know which of these are standards and which are guidelines since none of them use the key words "will" or "should"? The LMP's approach does not seem

specific or enforceable to us. Not only should the manager be made aware of the parameters, but the general public should also be able to distinguish that information.

COMMENT:

The range management standards and guidelines for the RMA do not provide language which allows range management in riparian management zones to be adequately monitored, measured or enforced. See our comments and recommendations on the RMA below.

RECOMMENDATION:

The standards in this subsection should state specific conditions which would be expected to be protected from grazing impacts and the degree of impact that would be considered acceptable. Examples of conditions which should be considered are stream bank stability and soil stability, maintenance of naturally occurring understory and riparian vegetation, deer fawning areas, etc.

COMMENT:

The constituents of the proposed emergency rehabilitation team mentioned in the RMA fire/fuels Standard or Guideline 6, on LMP page IV-28, are not mentioned. It cannot be determined from the wording whether this is a standard or a guideline. It does not meet the definition of either one.

RECOMMENDATION:

Develop standards for the disciplines and/or agencies which would constitute the team and state them in this standard or guideline. The makeup of the emergency rehabilitation team should be the same as the "ID" teams in terms of the disciplines represented. Make this item a standard by rewording it to follow the definition of a standard; qualify that silvicultural treatments may be used where that specific treatment will not impact other SRNF resources.

RANGE MANAGEMENT AREA

COMMENT:

The LMP stated goal for range management is to "manage for healthy ecosystems". At the same time, the DEIS identifies that there are adverse impacts of range management to the riparian zone on page IV-15. The DEIS proposed mitigation for grazing impacts on the riparian zone is close monitoring of grazing allotments and control of animal numbers and season of use. Monitoring, in and of itself, does not provide protection of the resources. Management of healthy ecosystems cannot be achieved and the stated impacts of range management overcome without providing meaningful direction that can be monitored, measured and enforced. The LMP proposed guidance for range cannot be monitored, measured or enforced and is therefore meaningless as a planning tool.

Range Management Standard 12-6 should be eliminated. Wildlife depredation control is generally unacceptable on public lands. It cannot be considered conducive to healthy ecosystems and therefore is in conflict with the stated goals of range management within the LMP. The DFG is the agency responsible for fish and wildlife on the SRNF. Issuance of wildlife depredation permits is the responsibility of the DFG (Section 4181 of the Fish and Game Code).

RECOMMENDATION:

Rewrite the Range Management section of the LMP to provide direction, standards and guidelines that address the impacts of cattle to stream banks and soil stability, riparian and understory vegetation. The LMP must also identify the impacts of cattle to deer, elk and other wildlife, particularly

relative to fawning, elk calving, denning and nesting. The fact that grazing has a tendency to favor an increase of invasive, nonnative, less palatable vegetation for wildlife should also be addressed. The standards and guidelines must provide monitorable, measurable and enforceable language for protection against impacts in these areas. Examples of the kinds of protection which may singly or in combination provide protection for fish and wildlife resources from grazing are:

1. Elimination grazing allotments with riparian areas.
2. Fencing cattle out of riparian areas.
3. Reduction of the number of cattle on allotments with riparian areas.
4. Fence cattle out of deer fawning and elk calving areas.
5. Manage rangeland to reduce invasive nonnative, plant species and to enhance the production of native species.
6. Reduce the total animal unit months (AUMs) on the SRNF over time.
7. Commitment to protection of various fish and wildlife resources at specific, measurable levels which can be monitored and enforced.

We would like to work with the SRNF prior to the final SRNF LMP to develop range management standards which will be protective of fish and wildlife. The LMP should also recognize that issuance of kill permits for wildlife is the sole responsibility of the DFG.

MINERALS STANDARDS AND GUIDELINES

COMMENT:

Mineral management may cause significant environmental impacts to fish and wildlife resources. Neither the LMP nor the DEIS addresses the potential impacts that may occur to fish and wildlife from mineral management. Example of the impacts include displacement through elimination and degradation of habitat and operational disturbances, including siltation of water and noise and activity levels. The DEIS also fails to identify means to offset impacts of mineral management. Particular attention should be paid to mineral management subsections associated with Management Area 8 - RMA and Management Area 9 - Dedicated Wildlife Habitat. The standards and guidelines for mineral management in the RMA, LMP pages IV-27 and 28, and the direction in the Dedicated Wildlife Habitat Area, LMP page IV-31, for the most part cannot be monitored, measured or enforced because they do not require specific actions which can be evaluated.

RECOMMENDATION:

Riparian management zones are areas which are expected to be protected for their ecosystem resource values, yet the minerals management standards and guidelines in that section and other sections important to fish and wildlife do not provide strong protection from the potential impacts of mining and extraction. Management Area 10 - Special Interest Areas have similar resource values to the riparian area but receive substantially greater protection from mining activity. The minerals subsection for that management area identifies generally acceptable means to mitigate mineral management activities (See LMP page IV-33). The concepts suggested for mineral management, including "common variety minerals (sand, gravel, concrete aggregate, building stone and riprap)", within the Management Area 10, Special Interest Areas should be incorporated into the other management areas and established as standards.

OFF-HIGHWAY VEHICLE USE STANDARDS AND GUIDELINES

COMMENT:

The LMP allows in Off-highway Vehicle standard 13-13, on LMP page IV-56, for over-the-snow-vehicle (OSV) travel upon at least 12 inches of snow. No other constraints are provided. Indiscriminate travel even over snow may allow for the harassment of wildlife. Over-the-snow travel should be restricted to areas designated specifically for its use.

RECOMMENDATION:

Establish designated OSV travel areas and provide a standard that requires OSV's to stay within the designated OSV areas.

VEGETATION MANAGEMENT STANDARDS AND GUIDELINES

COMMENT:

The LMP suggests in Vegetation Management Guideline 14-3, on page IV-57, "Lands classified as timber production and currently not stocked with conifer should be treated to maintain a conifer component. Pure hardwood stands (white oak and black oak) will not be converted to conifer stands." This wording tends to imply that mixed stands may be converted. Ecosystem management would dictate that neither pure nor mixed hardwood stands would be converted to conifer.

RECOMMENDATION:

Reword the guideline as a standard which would prevent converting pure or mixed hardwood stands to conifer stands.

PEST MANAGEMENT STANDARDS AND GUIDELINES

COMMENT:

The statement in Pest Management Guideline 10-1, on LMP page IV-52, that silvicultural treatments should be used to prevent potentially damaging population increases of SRNF pest organisms is too encompassing and too general. In many instances there may be a situation where using silvicultural methods to reduce populations of SRNF pests may be damaging to other resources.

RECOMMENDATION:

Provide as many examples of potential impacts as possible and the mitigation that would be considered appropriate for each one.

Table IV-9. Restricted Activities and Periods of Restriction for Wildlife Species

Several items refer to Standard and Guideline 16-23. There is no Standard or Guideline 16-23.

RECOMMENDATION:

Re-evaluate this table or correct typographic errors.

MONITORING PROGRAM

COMMENT:

The LMP states that the Monitoring and Evaluation Program is the management control system for the SRNF but no direction is provided to assure the monitoring program. Monitoring is not provided within the standards and

guidelines and the LMP. The LMP further states that "monitoring must fit within real constraints of budget and personnel that would be allocated to monitoring activities as a percentage of the total program."

Monitoring appears to be limited in its scope to specific situations and species as opposed to being designed to provide an overview of the ecological system. The fish and wildlife emphasis appears to be on threatened, endangered and sensitive species.

RECOMMENDATION:

The LMP should provide standards and guidelines which will assure that monitoring occurs and that it will provide the information necessary to meet the objectives. It should also be designed to sample the overall ecological system.

The Resources Agency

#232

State of California

Post Mile File
Business, Transportation and Housing Agency

#232



Douglas P. Wheeler
Secretary

Memorandum

Pete Wilson
Governor

of California

To : RON HELGESON
Office of Advanced Transportation

Date : November 4, 1993

File No.: 1-Hum/Tri/DN-Various
US Forest Service
Six Rivers National
Forest Plan and DEIS
SCH #93104006

California Conservation Corps • Department of Boating & Waterways • Department of Conservation
Department of Fish & Game • Department of Forestry & Fire Protection • Department of Parks & Recreation • Department of Water Resources

January 6, 1994 OFFICIAL FILE COPY
Six Rivers National Forest

From : DEPARTMENT OF TRANSPORTATION - District 1
E. L. Wahl, District Director

Subject :

U. S. Forest Service
Six Rivers National Forest
ATTN: Land Management Planning
1330 Bayshore Way
Eureka, California 95501

JAN 10 1994

RECEIVED
Eureka, California

Dear Ms. Ketelle:

The State has reviewed the Draft Forest Plan, and Environmental Impact Statement, Six Rivers National Forest, Del Norte, Humboldt, Mendocino, Trinity, and Siskiyou Counties, submitted through the Office of Planning and Research.

We have reviewed the Draft Forest Plan and the Draft Environmental Impact Statement (DEIS) for the 958,470 acre Six Rivers National Forest, located in Humboldt, Trinity and Del Norte counties, and have the following comments:

We coordinated review of this document with the Air Resources, and North Coast Regional Water Quality Control, Boards; Native American Heritage, and State Lands Commissions; and the Departments of Fish and Game, Forestry and Fire Protection, Parks and Recreation, Transportation, and Water Resources.

The Draft Forest Plan (page IV-45) states that a Transportation System Development Plan and a Transportation System Management Plan will be established and updated annually. We recommend that Caltrans' Transportation Planning Branch have an opportunity to review and comment on these documents.

The Department of Transportation responded to Ron Helgeson, November 4, 1993, regarding this proposed project. We have attached a copy of their comments for your consideration.

The Draft Forest Plan (Table V-1, page V-14) states that an "annual survey of roads & facilities on planned 3-year rotation schedule" will be conducted to determine any significant unsafe condition. If the survey identifies any safety concerns at intersections of State highways and Forest roads, we recommend the Caltrans Traffic Operations Branch should have an opportunity to review and comment on the survey.

Thank you for providing an opportunity to review this project.

The DEIS identifies State Highway Routes 199, 299, 96 and 36 within the Forest (page III-84). Any proposed improvements to Forest Highways where they meet State highway right of way will require a Caltrans encroachment permit. Also, improvements to the Forest road system that will impact traffic on the State highway system should be reviewed by Caltrans.

Sincerely,

for William G. Shafroth
Assistant Secretary,
Land and Coastal Resources

The DEIS states that "all 36 bridges and 34 major culverts in the Forest transportation system are in good condition," and that there are airfields and helispots on Forest land (page III-85). If proposed projects are developed that will impact the bridges, large culverts, airfields and helispots in the Six Rivers National Forest, Caltrans' Division of Structures and Division of Aeronautics should be contacted for comment.

Attachment

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 93104006)


The Resources Building Sacramento, CA 95814 (916) 653-5656 FAX (916) 653-8102

California Coastal Commission • California Tahoe Conservancy • Colorado River Board of California
Energy Resources, Conservation & Development Commission • San Francisco Bay Conservation & Development Commission
State Coastal Conservancy • State Lands Commission • State Reclamation Board

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Ron Helgeson
November 4, 1993
Page 2

Should you have any questions, please call Dave Carstensen
at (707) 441-5813.


CHERYL S. WILLIS, Chief
Transportation Planning Branch

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DEPARTMENT OF FORESTRY AND FIRE PROTECTION

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Ms. Martha J. Ketelle

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Page Two

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JAN 10 1994

RECEIVED
Eureka, California

Ms. Martha J. Ketelle
Acting Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, California 95501

Dear Ms. Ketelle:

Please find enclosed comments by the California Department of Forestry and Fire Protection (CDF) on the Land and Resource Management Plans and the associated Draft Environmental Impact Statements for the Six Rivers, Klamath, Shasta-Trinity, and Mendocino National Forests. Since both state and federal policy initiatives consider northwestern California as a region, this document assesses the cumulative impact of all forest plans within the regional context but also draws distinctions between individual forests when merited.

CDF is vitally interested in the impacts of these plans on the environment and economy of northwestern California, on CDF's ability to fulfill fire protection and resource management mandates, and on the conduct of future state-federal resource planning efforts. The Department is committed to providing rigorous, substantive, and constructive comments.

CDF has several analyses in progress and will provide their results before the forests finalize the EISSs. Additional analysis of impacts across the region will require longer term commitments by CDF, the Forest Service and others. Therefore, we identify institutional needs that must be addressed to accomplish long-term forest planning and management.

The Department finds that an on-going dialogue between the Department, the Region V of the Forest Service, and individual forests constitutes an important means of implementing the Agreement on Biological Diversity of which both CDF and the Forest Service are signatories. Cooperation on the aforementioned analyses could significantly improve the final plans and EISSs to address both CDF and Forest Service concerns. We welcome your comments on these proposals and look forward to collaboration between the Forest Service and the Department.

Sincerely,

Richard A. Wilson
Director

cbc

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California Department of Forestry
and Fire Protection

A
Review of
the Four Northern Forest Plans

6 January 1994

The mission of the Department of Forestry and Fire Protection (CDF) is to protect and enhance the range, forest and watershed resources in the State of California. The action of the largest single landowner in northwestern California, the United States Forest Service, has numerous impacts on these resources. In a recent review of Option 9 (An Evaluation of Option 9 of the Federal Forest Plan as it Relates to Northwestern California) CDF developed an analytical framework with which to assess the contribution of proposed actions and policy to ecosystem integrity and sustainable economic development. This document applies that framework to the National Forest Land Management Plans (LMPs) of the Six Rivers, Klamath, Shasta-Trinity and Mendocino National Forests (NFs) to determine the cumulative impact of these four Plans on the resources and people of northwestern California.

THE IMPACT OF THE PLANS ON THE RESOURCE SYSTEMS OF THE REGION:
WILL THEY ACHIEVE ECOSYSTEM MANAGEMENT AND PROTECTION?

Forestry issues have changed significantly since the original scoping period of the Plans. These changes cloud the relevance of the Plans to the current situation in northwestern California. The extent of this problem varies across the four Forests. Both the Six Rivers NF and the Klamath NF LMPs respond better to current concerns. The Klamath NF LMP recognizes biodiversity as a critical issue and uses more advanced analytical approaches. The Six Rivers NF LMP aims toward the establishment of adaptive management on the Forest. However, the Mendocino NF scoped issues fifteen years ago and has consequently produced a Plan that addresses individual commodity values with little integration under the ecosystem paradigm. The Shasta-Trinity NF LMP does not reflect the change in issues even though those changes form the basis for ongoing and planned activities within the National Forest. For example, on the Hayfork Ranger District, the Forest has organized a grass-roots effort to

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evaluate ecosystem management and define appropriate desired future conditions, though the LMP does not use those concepts.

While two of the LMPs (the Six Rivers NF and the Klamath NF) have elements related to ecosystem management, the two remaining Forests (the Mendocino NF and Shasta-Trinity NF) do not adequately address this paradigm. The measures of environmental consequences employed in all the DEISs to evaluate different alternatives include some pertinent to ecosystems but are, by and large, individual resource, economic or social concerns poorly related to ecological integrity. Thus, at a most fundamental level, the Plans fail to establish benchmarks for ecosystem integrity and health. In the absence of these benchmarks, it is unclear if the desired future conditions of the Plans are consistent with ecosystem integrity. The impacts of the preferred alternatives on the integrity of the ecosystems of northwestern California remain therefore unanalyzed.

Certain Plans employed some of the concepts usually associated with ecosystem management: desired future conditions, range of natural variability, adaptive management and consideration of adjacent lands. For the Klamath NF, teams with representation from a range of interests, including private landowners, developed the alternatives examined in the DEIS. The Forest also consulted specialists to define issues and key indicators of social impact and biological diversity across ownership boundaries. The Plan's desired future condition statements refer to individual management areas and provide more useful management guidance than condition statements that refer to the entire Forest. Finally, the Forest established a policy to mimic the landscape patterns created by natural disturbance regimes.

The Six Rivers NF used a vocabulary similar but not as developed as that of the Klamath NF. The Forest recognized the need to mimic natural processes and disturbance rates, and similarly established desired future condition statements for management areas. The avowed strategy of the preferred alternative is to use active adaptive management to test different methods of achieving ecosystem management.

Neither the Shasta-Trinity NF nor the Mendocino NF addressed ecosystem management. The vocabulary of ecosystem management is generally absent in both Plans, though the Shasta-Trinity NF does establish desired future conditions for management areas. Certain Ranger Districts on the Shasta-Trinity NF have begun to embrace ecosystem management as seen in their commitment to public education and outreach, but nonetheless the governing document of the Forest lags far behind and therefore cannot guide operations. The Mendocino NF uses individual species as indicators rather than overall ecosystem conditions to guide

management. The Plan does not consider such issues as biological diversity, connectivity of habitats, or ecosystem management.

Most DEISs indicates that the Plans will induce more harvest on adjacent private lands but do not adequately assess the cumulative impact on the entire landscape. It is at least plausible that the four Plans will together lead to a regional landscape with a very pronounced contrast between private and public lands, with neither emulating pre-management conditions. This cumulative effect may not be optimal for either biological or social values in northwestern California.

CDF recognizes that existing law forces management to respond to a few select species. While the Six Rivers and the Klamath NFs have taken the first step toward ecosystem management in this constrained environment, the Shasta-Trinity and the Mendocino NFs lag far behind in adopting components of ecosystem management.

Even assuming that the desired future conditions are congruent with ecosystem integrity, the Plans do not clearly show how standards and guidelines will lead to desired future conditions. The management area direction is not sufficiently precise to project the location and nature of management activities. Therefore their ultimate impact on ecosystem conditions is unknown. Without such a projection methodology, the public cannot be certain that the Plan directs management in a manner consistent with the Plan's objectives for management areas.

The development of this analysis is central to any realistic ecosystem planning. In theory, if the Forest establishes desired future condition statements sufficient to ensure ecological integrity, then the public might well be indifferent to the means employed by the Forest to achieve those conditions. With a good understanding of ecosystem structure and function, Forest staff could devise management activities with a high probability of achieving the desired future condition. A well-designed monitoring program that quantified performance would detect a posteriori deviations from the desired future conditions and in many ways replace the a priori regulatory or consultation processes employed currently. Given, however, the current poor understanding of how management affects future conditions, and how those conditions contribute to ecological integrity, prudence requires that the link between management, that proximate objective and ultimate goals be clearly demonstrated. As managers and scientists gain more experience with managing ecosystems, assessment and monitoring methodologies improve, and public renews its trust of resource managers, this requirement may be further relaxed.

The Plans do not portray existing ecosystem conditions in sufficient detail to determine if proposed management will move the system toward or away from the desired future condition. Analysis of the impacts of management requires a starting point of current ecosystem composition, structure and pattern.

Several additional factors hamper the projection of management impacts on ecosystem conditions. First, the Addendum attached to each DEIS fails to clarify the relationship between the zoning proposed in the Plans and that of Option 9. The essence of each Plan is a zoning scheme with management guidance for each zone. Since Option 9 will change that zoning to an unknown extent, the true impact of management is unpredictable. Second, the Plans do not analyze the role of both fire and fire management in structuring ecosystems. Preliminary analysis by CDF with PROBACRE indicates a strong likelihood that stand-replacement fires in reserve areas are sufficiently common that they swamp the influence of the reserve itself on the extent of late successional forest. In a similar manner, without a quantitative analysis of the effects of fire suppression and prescribed fire on ecosystem structure and function, the Plans cannot integrate these major programs into ecosystem management. Finally, in most cases the Plans consider ecological impacts primarily on federal lands even though the Plans induce changes on adjacent ownerships. The appropriate reference environment for ecological analysis should encompass all lands affected, even if they fall outside the federal land base. This larger reference area is particularly important for terrestrial and aquatic species whose range extends beyond the National Forests, for landscape patterns important for biodiversity, and for water and air quality.

While the Plans mention diversity, they appear to underestimate the technical requirements of the concept. Since the Plans do not portray current ecosystem conditions, they do not confront the difficulties of distinguishing appropriate habitat types and structure classes needed to characterize responses to disturbance. Beyond that, the Plans do not consistently integrate diversity into forest management. The Klamath NF LMP discusses ecosystem health in terms of the diversity of forest structure classes. However, timber and silviculture elements consider forest health in terms of young actively growing conifer trees, a small subset of all structural classes. Similarly, thinning operations for the enhancement of late successional forest may greatly limit the extent of the early seral stage brush component of the forest ecosystem.

The Plans affect the management actions of private land owners in ways not recognized in the DEISs. Reductions in salvage

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on NF land may put trees on adjacent private lands at risk. CDF Resource Management staff have already noticed a significant increase in harvesting above historic levels on private lands. Many marginal areas that would not have been considered for harvest in the past are now being logged. The reduction in available timber supply from public lands has already been blamed for significant increases in timber and lumber prices. In the last two years, the price of Douglas-fir logs has doubled in areas around the Six Rivers NF. The high prices have led to a record number of harvests without Timber Harvest Plans under a three acre exemption in the California Forest Practices Program. Each of these impacts has potential repercussions for ecological integrity.

The Plans may significantly affect the incidence and severity of fire, and the fire protection capabilities within the region. The severe decline in the timber programs on the Forests will have a number of negative effects. First, the loss of timber staff will reduce trained personnel during fire season. Since 1988 the Mendocino NF has reduced staffing in all programs for 260 to 200 persons. More staff reductions will result from consolidating Districts and Forests and will reduce the labor pool for both federal and mutual aid fires. For instance, on the Six Rivers NF, the reductions in the timber program may eliminate up to 12 Incident Command support staff and 20 Type 2 handcrew members. Because of these reductions, CDF expects an increase in its participation on federal fires with no reciprocal help on state fires. Second, the loss of timber revenues will reduce the funds available to remediate fire hazards created by previous harvests, the recent drought and associated insect kills. Third, the decline in harvest will reduce the private sector heavy equipment capacity that has historically been used under contract during fire season. Fourth, road closures or reduced maintenance will lengthen response times and reduce the effectiveness of initial attack. Fire size will increase along with resource losses and suppression costs.

In addition, changes in suppression strategies on NF land will affect CDF's operations. First, when CDF responds under mutual aid it will face the additional challenge of adapting its tactics to fit the modified suppression prescriptions on certain areas on the Forests. Beyond that, the modified suppression strategy will change the level of protection on private in-holdings which are state responsibility but protected by the Forest. Private landowner desires for full suppression and the equal protection policy of the Board of Forestry may conflict with the service provided by the Forests.

Once again, the Plans consider fire suppression as a stand-alone activity and usually do not specify fire management policy in a manner analogous to land management standards and

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guidelines. Yet the continued separate analysis of resource management and fire suppression ignores the very basic observation that both are components of ecosystem management. Ideally, the Plans would specify standards and guidelines for fire and fuels management for all management areas. In order to assess the impact of these standards and guidelines on ecosystem integrity, the Plans should project the cumulative effect of all management activities on the condition of the ecosystem.

The Plans do not specify how they can be altered in the event of large catastrophic fires. USFS personnel on the Shasta-Trinity NF indicate that a regional or provincial review group would need to approve any deviations from Option 9 guidelines. Thus the Plans are severely limited as adaptive management tools in a region where catastrophic fires are certain to occur.

Limited resources may preclude adequate Plan implementation. Recent history shows a persistent decline in the human and financial resources committed to NF management. The scarcity of funds has severely limited monitoring in the past, and is clearly insufficient for the intensity of monitoring proposed in the Plans. Thus without a drastic shift in funding priorities, the Plans may never lead to effective adaptive management.

Even though CDF is continually assured that funding for fire management will be maintained or increased, it appears unlikely that given the loss of timber revenues the federal government will continue to subsidize NF forestry for the decades needed to achieve true ecosystem management. Unless the Forests can convert into revenue the non-timber values that are driving forest policy, the move to ecosystem management will always be at risk.

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**THE IMPACT OF THE PLANS ON LOCAL AND REGIONAL ECONOMIES:
IS THE ANALYSIS ADEQUATE?**

Realistic sale quantities will probably be lower than those specified in Option 9 and carried over into the four Forest plans. In the near term particularly, a number of factors not addressed in the four Forest plans are highly likely to reduce timber outputs below those specified in the plans. These factors include:

- the constraints of watershed analyses and other Option 9 planning and operation requirements, some of which have not yet been developed at the operational level;
- completion of surveys for listed species such as the northern spotted owl and marbled murrelet which may take up to two years and require extensive consultation with the Fish and Wildlife Service;
- difficulties inherent in catching up with shifting program priorities;
- losses of personnel and decreases in funding, resulting in fewer personnel and other resources to process timber sales.

Implementation of Option 9 will reduce the Shasta-Trinity NF Preferred Alternative harvest level by almost 30%, from 87 MMBF/year to 60 MMBF/yr. It is doubtful that even this sharply reduced harvest level can be met within 3 to 5 years. Local Forest Service personnel indicate that the likely target for 1994 is around 30 MMBF for the entire Shasta-Trinity NF.

Under the President's Option 9 strategy and the respective DEIS, harvest on the Six Rivers NF would be cut by 55 percent, from the 45 MMBF/year proposed in the original Forest Preferred Alternative to the 20 MMBF/year under the current DEIS. This change represents a reduction of 86 percent from the annual average sale quantities of the last decade.

For the Klamath NF, CDF staff expect that the most optimistic output will be 50 MMBF/year instead of a projected 60 MMBF/year.

On the Mendocino NF, the harvest level will be 12 MMBF/year under the Option 9 adjustments, as compared to the 22.5 MMBF/year proposed in the original Forest plan preferred alternative. This reduction represents a 47 percent decrease.

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These harvest levels are below all of the studied alternatives within the Land and Resource Management Plan DEISs for these Forests.

There are several additional current issues that may further reduce the available timber harvest. These include the listing of salmonid species as threatened or endangered, the designation of critical habitat for the marbled murrelet, and potential management concerns regarding the marten and fisher.

Given these realities, the reductions in timber harvest volume likely to result from Option 9 are greater than anticipated in the DEISs, calling into question the accuracy of the DEISs' economic impact assessments. Further, the DEISs do not fully address state and county administrative costs associated with changes in private land management and federal fire protection capabilities.

The economic impacts (and concomitant social impacts) to forest communities will be much more severe in reality than the picture painted in the four Forests' DEISs. The EISs for Option 9 and individual LMPs should reflect the economic and social cumulative impacts of the drastic reductions in USFS harvesting that have occurred over the past decade.

Budget reductions are occurring throughout the National Forest System. Budget reductions may shift costs for fire protection and road maintenance to state and local governments. The Forest Service will have increasing difficulty in fulfilling its responsibilities under cooperative road agreements with local governments and others.

Impacts to CDF will result for at least two reasons. First, decreased Forest Service timber harvest levels are likely to result in increased harvesting on private lands. Such a shift will increase the workload of CDF's resource management program. Further, an imbalance may result in mutual aid relationships as CDF responds to more incidents on federal lands due to reduced Forest Service staffing and resources.

RECOMMENDATIONS FOR IMPROVED PLANNING, ADMINISTRATION AND IMPLEMENTATION

Additional information on ecosystem conditions is needed to advance ecosystem planning. More information on existing and desired forest conditions is needed to fully develop plans. Information on private forest lands must be considered, including existing conditions and projected biological and economic effects of National Forest policies on those lands. The State of California, the Forest Service, and others must provide incentives and benefits to ensure the cooperation of private landowners in this effort. These may include inexpensive or free access to data and analytical tools, training in data analysis, and data development.

Collaborative efforts must be established to access and analyze existing data. More cooperative efforts must be made by state and federal agencies, and local government to use existing analytical tools such as PROBACRE, the California Fire Economic Simulator (CFES), and the National Fire Management Analysis System (NFMAS) to model fire at regional levels across ownership boundaries. More in-depth analyses should be done to predict the changes in suppression capabilities under projected personnel reductions by the Forest Service and private industry. These models should be improved and integrated with other spatial information to allow their use in evaluating the effects of fire on forest structure.

Efforts to compile data, develop data standards, and establish Geographic Information Systems should be identified and integrated. Projects currently underway include the Federal Forest Plan's Inter-organization Resource Information Coordinating Council (IRICC), Humboldt State University and the USFWS Ecosystem Restoration Office, and the University of California and the Trinity Bioregion Group.

CDF has developed particular expertise in the representation of ecosystem conditions in geographic information systems and the development of analytical tools to support ecosystem management. A collaborative effort would lead to substantive, rigorous and constructive comments that could significantly improve the Plans' likelihood of contributing to ecosystem integrity and sustainable economic development of northwestern California.

Planning should take advantage of local and regional groups established to foster stewardship of watersheds and natural resources. Goal development, management planning, and

data collection and analysis must include private industry, local landowners and the public. Groups such as the Trinity Bioregion Group, the Shasta-Tehama Forest Work Group, the Redwood Coast Watershed Alliance and others have been established to promote stewardship of local forest communities. These groups include members from a range of interests dedicated to identifying local goals for sustainable forest and watershed systems and to developing strategies to achieve these goals.

These groups should be involved in planning, implementation, monitoring and evaluation of National Forest Plans. These groups may be particularly valuable in exploring emerging land use pressures, management opportunities, and innovative management practices.

Adequate resources must be provided and appropriate processes established to ensure adaptive management planning. Adaptive management will provide the flexibility to adapt management to contingencies such as fire, disease and other unforeseen disturbances that compromise the desired forest conditions. The establishment of trust and the provision of adequate data are critical to this process.

The Forest Service should consider incentives for public participation in the planning process, the role of public interest groups or contractors for monitoring, and access to information and analysis.

Adaptive Management Areas should represent the full range of biological diversity present in the region. Analyses beyond the initial ones developed by CDF should be done across the region. The establishment of AMAs should also take advantage of local management or economic opportunities, and local recommendations on management alternatives. Standards and practices should be evaluated by interagency/public groups on an on-going basis.

Funding and personnel must be ensured for the collection, analysis and dissemination of monitoring data. The availability of this information is critical to adaptive planning and management.

Additional interagency cooperation will be needed to ensure adaptive ecosystem management. Federal and state agencies must resolve existing policy and regulatory conflicts that impede ecosystem management.

Air quality regulations may impede prescribed burning critical to achieving desired forest conditions and to minimizing wildfire risks. Cooperative research, analysis and management

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efforts with the Air Resources Board and local Air Quality Management Districts may be needed to identify acceptable management practices and efficient permitting processes.

Cooperation between the USFWS and the State in implementing and evaluating the effects of the 4(d) rule on the northern spotted owl and the ecosystem at large will be needed. These agencies should cooperate closely on any future rulemaking efforts to ensure adequate ecosystem assessment and monitoring.

In summary, additional efforts are needed to make the LMPs consistent with current federal policy, to adequately assess the impacts of those plans on ecosystems, and to implement ecosystem management in general. The plans vary in their efforts to describe desired forest conditions and the means for achieving them. The plans must include information on private lands and a full evaluation of the biological and economic effects of federal activities on those lands.

Ecosystem management planning will require a level of information, analysis, monitoring and administration which can only be achieved through increased cooperation with the State and the public. CDF emphasizes three areas of analysis that must be done to fully evaluate the effect of the LMPs:

- the impact of fire and fire management on ecosystem conditions;
- the effect of management prescriptions on forest conditions within management areas and across landscapes;
- the effect of public policy on private management decisions and the cumulative economic and biological impacts in various regions.

CDF is prepared to select several areas to demonstrate these types of analyses and to develop additional analytical tools or applications, as needed. We would like to work closely with the Forest Service and other groups to accomplish this.

OFF-HIGHWAY MOTOR VEHICLE RECREATION

(916) 653-8244



A DIVISION OF DEPARTMENT OF PARKS AND RECREATION

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DEC 27 1993

RECEIVED
DEC 29 1993
Forest Supervisor's Office

Martha J. Kettle, Acting Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, California 95501

Dear Ms. Kettle :

The Off-Highway Motor Vehicle Recreation Division (OHMVR) of the California Department of Parks and Recreation is requesting a 90 day extension of the public comment period for the Draft Six Rivers EIS/LRMP. We are requesting this extension due to fact that we are mandated to review and comment concurrently on four Land Management Plans and two major land plans from the Forest Service and the Bureau of Land Management.

Your consideration of this matter is greatly appreciated.

Sincerely,

Lee J. Chauvet, Deputy Director
Off-Highway Motor Vehicle Recreation



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JAN 6 1994

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Six Rivers National Forest

JAN 10 1994

RECEIVED
Eureka, California

Martha J. Ketelle, Acting Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, California 95501

Dear Ms. Ketelle:

The Off-Highway Motor Vehicle Recreation Division of the California Department of Parks and Recreation is pleased to respond to the Draft Six Rivers National Forest Plan and Environmental Impact Statement. Our comments are enclosed.

Sincerely,

Gerald J. Johnson, Acting Deputy Director
Off-Highway Motor Vehicle Recreation

Enclosure

STATE OF CALIFORNIA
CALIFORNIA DEPARTMENT OF PARKS AND RECREATION
OFF-HIGHWAY MOTOR VEHICLE RECREATION DIVISION
COMMENTS ON
DRAFT ENVIRONMENTAL IMPACT STATEMENT
AND
DRAFT FOREST PLAN
SIX RIVERS NATIONAL FOREST

The Off-Highway Motor Vehicle Recreation Division (OHMVR) of the California Department of Parks and Recreation recommends that the Draft Environmental Impact Statement (DEIS) and the Draft Forest Plan be withdrawn. Deficiencies within the existing DEIS make it impossible to adequately analyze the alternatives relative to off-highway vehicle (OHV) recreation. Additionally, all DEIS alternatives will be modified by the President's Option 9 when it is released. These modifications and their effects on OHV recreation are not addressed in this DEIS. Analysis of the Draft Forest Plan was not undertaken since it was impossible to adequately analyze the various alternatives.

GENERAL DISCUSSION

The DEIS states that:

"California is the leading state for off-highway vehicle (OHV) use. One in every eight of the nation's motorcycles and all-terrain vehicles were registered in California during 1988. While the demand has been steadily increasing for OHV use opportunities, the supply of designated OHV routes on the Forest has declined. There are no OHV staging areas or facilities designed to accommodate their use. Opportunities exist to use non-system roads, designate specific Forest roads, and to construct new routes to provide a system of OHV routes." (DEIS, page III-117).

OHMVR agrees with this statement in concept but notes that a significant portion of the OHV use is not mentioned. OHMVR recommends that four wheel drive vehicles, two wheel drive OHV type vehicles and regular passenger, vehicles that are driven off highway also be mentioned in this statement and be considered in all analysis that is relative to OHV recreational use. In a 1990 scientifically defensible study, the California Department of Transportation found that 14.7 percent of the households surveyed in California drive at least one of their vehicles off-road. (*A Study to Determine Fuel Tax Attributable to Off-Highway and Street Licensed Vehicles Used for Recreation Off-Highway*, Tyler and Associates for the California Department of Transportation, Corte Madera, 1990).

The actual size of the OHV trail network under all five alternatives cannot be determined. The total amount of OHV trails and designated routes, the amount to be maintained, nor the amount to be constructed/reconstructed are not listed anywhere in the plan. These

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figures are presented in the DEIS for non-motorized trails and are presented by alternative and by decade for five decades.

The DEIS states in all alternatives that "Designated OHV routes would increase, and would consist primarily of maintenance level 2 roads." (DEIS pages S-5, S-6, S-8, S-9 and S-11). On page IV-105, the DEIS states that:

"None of the alternatives would provide any open areas of OHV use. All alternatives would control OHV use by restricting such use to designated routes."

The DEIS also states that "An OHV implementation schedule would be developed." (DEIS pages II-20, II-29, II-37, II-45 and II-54) and that "An updated OHV route inventory will define an OHV system with specific existing routes mapped and designated." (DEIS page III-116). Total Forest road miles, as presented in DEIS Tables II-5 and II-7, shrink by 210 miles in Alternative B and 190 miles in Alternative C. OHMVR questions how OHV routes could increase in Alternatives B and C when overall forest road mileage is shrinking. Further, the effects of the President's Option 9 on OHV recreation and recreation in general were not addressed.

For each alternative, and taking into account the effects of Option 9:

- (1) What is the total OHV route mileage by decade for five decades?
- (2) How many OHV route miles will be maintained by decade for five decades?
- (3) How many OHV route miles will be constructed or reconstructed by decade for five decades?
- (4) When will the OHV implementation schedule and updated OHV route inventory be produced?
- (5) What kind of OHV recreational opportunities are going to be provided?

OHMVR further recommends that all forest roads be open to OHV use, unless posted closed. This approach will reduce sign and sign maintenance costs as well as, providing a positive approach to OHV recreation.

The DEIS states that "Driving for pleasure and viewing scenery accounts for the greatest amount of recreational use on the Forest." (DEIS, pages III-84, III-115). OHMVR agrees with this statement. Table III-20 fails to mention either OHV use or driving for pleasure. These categories should be included in Table III-20.

Concerning persons with disabilities, the DEIS states on page 115 that "Most of the campgrounds are not fully accessible to many segments of the population." On page 117, the DEIS provides direction for improving access for persons with disabilities by stating that "The installation of flush toilets, larger parking spaces for recreational vehicles, and special facilities for physically challenged users can increase the number and range of

campground users." For Alternatives B and C, the DEIS states that "Approximately 50 percent of developed sites would be rehabilitated during the first decade to respond to changing user needs and accessibility requirements." (DEIS pages II-29, II-37). For Alternatives A, D and E, the DEIS states that "Approximately 25 percent of sites would be rehabilitated during the first decade to respond to changing user needs and accessibility requirements." (DEIS pages, II-20, II-45, II-54). This rehabilitation will affect a portion of the OHV users in the forest, especially OHV users with disabilities. The DEIS fails to mention the Americans with Disabilities Act of 1991 (ADA) or provide significant emphasis to ensure that the forest meets the requirements of the ADA.

(1) Why are 50% of the developed sites in Alternatives B and C to be rehabilitated during the first decade while only 25 percent of the sites are to be rehabilitated in Alternatives A, D or E?

OHMVR recommends that 50% of the developed sites be rehabilitated during the first decade in all alternatives.

For a significant number of persons with disabilities, OHV's (primarily four wheel drive vehicles) provide their only access to the nation's public lands. Without OHV access, persons with disabilities would not be able to hike the many miles required to reach the forest's roadless hunting, fishing, camping and scenic areas. Alternatives B and C reduce the total forest road mileage by 210 and 190 miles respectively over five decades. Neither alternative addresses how this reduction will negatively impact access for persons with disabilities.

For each alternative, and considering Option 9:

- (1) How will the reduction of forest road miles in Alternatives B and C impact persons with disabilities?
- (2) How will those impacts be mitigated?

OHMVR recommends that the ADA be referenced in the DEIS and that all alternatives be developed to ensure full compliance with the ADA. OHMVR further recommends that any loss of access to the public lands by persons with disabilities due to road closures and OHV routes be fully mitigated by opening new OHV routes of comparable difficulty and offering equal amenities and resource values.

For Alternatives B and C, the DEIS states that "Staging areas with facilities to accommodate OHV use would be constructed during the first decade." (DEIS pages II-29, II-37). No further information is given. These facilities are not included in Alternatives A, D or E.

- (1) Why were OHV staging facilities only included in Alternatives B and C and not in Alternatives A, D or E?
- (2) How many OHV staging facilities are planned?

(3) Where are these facilities planned?

OHMVR recommends that the construction of new OHV staging areas be included in all alternatives.

On pages II-18 and II-44, the DEIS states that "All level one roads would be closed or obliterated, and some level two roads would be closed seasonally for resource protection and economic efficiency." On page II-53, the DEIS states that:

"All level one roads will be closed, and some level two roads will be downgraded to level one and closed. There will be an increase in the number of level one roads put to bed or obliterated."

On page III-85 the DEIS states that the:

"Current direction is to close roads not needed for resource management and to manage needed roads at the lowest maintenance level consistent with resource management needs. In addition some no longer needed roads will be reclaimed (obliterated) under each alternative."

OHMVR recommends that the NEPA process, as stated on page IV-95 of the DEIS, be closely followed. OHMVR recommends that as part of that process, prior to the closure or obliteration of any level one road or the seasonal closure of any level two road, that (1) the potential for general recreation use of that road be evaluated; (2) that the road be evaluated for inclusion in the designated OHV route system, (3) that public notice be given and public hearings be held prior to any closure, and (4) that the above information be taken into account prior to closing any road. OHMVR further recommends that for any roads that are closed, that the loss of OHV recreation potential be fully mitigated. Full mitigation includes the replacement of the original route on comparable terrain at a comparable skill level. These recommendations should be included in all alternatives.

On page II-19, the DEIS states that "The overall Forest road system would decrease from the present level of 2,490 miles to a maximum of 2,580 miles at the end of the second decade." This sentence does not make sense and should be rewritten.

On page IV-17, the DEIS states that "Many of the resource conflicts mentioned in relation to mountain bikes pertain to OHVs, but the extent and nature of the latter would be more severe." What studies were used to determine that OHV use creates the same or more severe resource conflicts than mountain bicycle use in special interest areas? Specifically, what are the conflicts that are shared by mountain bicycle use and OHV use in special interest areas? What conflicts are shared by mountain bicycle use and OHV use and the conflict is more severe for OHV use in special interest areas? How do these conflicts differ from areas outside special interest areas?

On page IV-18, the DEIS states that "OHVs traveling along designated routes would not cause the bulk of the impact." What studies were used to make this determination? Specifically, how much impact do OHV's traveling on designated routes in special interest areas cause? How much impact do OHV's traveling off designated routes in special interest areas cause? How much of this impact in special interest areas is the result of non-OHV activities both on and off designated routes? How many documented occurrences are there of OHV's traveling off route in the Forest's special interest areas for the past five years? For each occurrence, what are the documented impacts? What type of vehicle was involved in each documented incident? For each incident, what action was taken to prevent similar occurrences from happening? Impacts from OHV's on properly designed and maintained OHV routes in special interest areas should be minimal and should fall within acceptable limits.

On page IV-18, the DEIS states that "Due to their ability to travel across a wide range of terrain, all-terrain-vehicles (ATVs) would cause greater on- and off-site damage than four-wheel drive (4WD) vehicles." What studies were used to determine that ATV use creates greater on- and off- site damage than four wheel drive vehicles in special interest areas? How does the on- and off-site damage caused by an ATV and a four wheel drive vehicle differ? During the past five years in the Forest's special use areas, how many documented incidents are there of ATV use causing greater on- and off-site damage than four wheel drive vehicles? For each occurrence, what are the documented impacts? For each incident, what action Was taken to prevent similar occurrences from happening?

On page IV-18, the DEIS states that "OHV use in the Horse Mountain Botanical Area has the potential to introduce Port-Orford cedar root disease into uninfected tributaries supporting Port-Orford cedar stands." It must be noted that any vehicle use has the potential to introduce Port-Orford cedar root disease and that this is not an OHV specific problem. OHMVR recommends that this whole paragraph be deleted. OHMVR further recommends that a separate paragraph addressing vehicle use in general and the spread of Port-Orford cedar root disease be developed for this section.

On page IV-18, the DEIS states that:

"OHV use in botanical areas have the potential to affect the visitor's experience. Unmanaged OHV use would increase the potential for user conflict between hikers and vehicles."

This issue is of forest-wide significance and not limited exclusively to special interest areas. These issues have been adequately addressed on a forest-wide basis and do not justify amplification in the special interest area section. OHMVR recommends that this paragraph be removed. OHMVR further recommends that any reference to this issue be deleted from the consequences and mitigation's specific to the various alternatives for special interest areas.

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OHV's provide an opportunity to increase visitation to, and the appreciation of these unique, areas. OHMVR recommends that all routes and trails (both motorized and non-motorized) in special interest areas be evaluated for impacts. Where significant, documented levels of impact exist, those routes and trails should be maintained or reconstructed to reduce the impact to acceptable levels. A strong interpretive program targeting all visitors should be developed that addresses the significance of the special interest area, the sensitive nature of the environment and proper trail etiquette.

OHMVR recommends that prior to the closure or obliteration of any road or trail in a special interest area, that the NEPA process as defined on page IV-95 of the DEIS be followed; and, (1) the potential for general recreational and OHV use on that road or trail be evaluated; (2) that alternatives are developed, including rerouting the existing road or trail within the special interest area, (3) that public notice is given and public hearings are held on the issue of closure, and (4) that the above information be taken into account prior to any decision on road or trail closure. OHMVR further recommends that for any roads or trails that are closed, that the loss of OHV recreation potential be fully mitigated. Full mitigation includes the replacement of the original route on comparable terrain at a comparable skill level. These recommendations should be included in all alternatives.

On page IV-18, the DEIS presents the following mitigation in Alternatives B and C: "The presence of law enforcement officials could deter illegal and inappropriate use of botanical areas." On page IV-19, the DEIS presents the following mitigation in Alternatives A, D and E: "Designate which roads are open (or closed) to OHVs and ensure law enforcement." Is the level of law enforcement that is implied for Alternatives A, D and E to be applied generally to all users in a special interest area or specifically targeted at OHV users? Why is there a different standard for the level of law enforcement in Alternatives B and C versus Alternatives A, D and E?

The DEIS describes a special interest area on page II-15 as:

"These areas are managed to maintain their unique botanical and geological values for public use and enjoyment. Botanical areas are managed for educational and recreational use while protecting important botanical resources."

On page IV-19, the DEIS states the following mitigation for special interest use areas:

"Obliterate or gate roads constructed for timber access near the Botanical Area to deter use by recreationist's. Locate level 3 collector roads for recreational purposes so as not to increase the potential for access into botanical areas."

This statement is highly inflammatory and possibly in direct conflict with the policy of the Forest Service, the Six Rivers National Forest and law. OHMVR requests that it be removed.

The DEIS states on page IV-23 that "Uses with the greatest potential for disturbance are OHVs, 4-wheel drive vehicles driven off road into sensitive areas such as meadows and lake shores, campgrounds, and popular beach spots along rivers; poaching; and excessive river recreation." As it is written, this sentence implies that driving an OHV or a four wheel drive vehicle in a campground or a popular beach spot along a river creates a situation with the greatest potential for the disturbance of wildlife. OHMVR recommends that this sentence be rewritten to indicate that campgrounds and popular beach areas along rivers by themselves create this potential.

On pages IV-29, IV-35, IV-41, IV-46, IV-49 and IV-52, the DEIS discusses black bear management. The focus of these management strategies revolve around reducing open road densities and "well designed activities." Specifically, what are these "well defined activities? By alternative, how will these "well defined activities" impact the black bear population and how will they be applied? By alternative, how do these "well defined activities" relate to the strategy of reducing open road densities. OHMVR recommends that the management of the allowable hunting take of black bears be included in the broad definition of "well defined activities", if it is not already.

On pages IV-42 and IV-46, the DEIS states that "Recreational opportunities associated with viewing and hunting wildlife would increase as access to previously unroaded areas is developed." OHMVR does not agree with this statement. While it is true that wildlife viewing and hunting would increase in these areas, the net effect of closing 210 miles and 190 miles of roads in Alternatives B and C respectively would decrease overall wildlife viewing and hunting opportunities. OHMVR requests the DEIS be changed to reflect this fact.

On pages IV-77 and IV-79, the DEIS states that "Part of the increase in cost would be due to additional funding for the Smith River NRA and funding from the State Green Sticker program that has not been available in the past." Statements on DEIS pages IV-80, IV-81 and IV-82 indicate that the above statement applies to all alternatives. OHMVR notes that Green Sticker funds are allocated on an annual basis with the approval of the Off-Highway Motor Vehicle Recreation Commission, the state legislature and the governor as part of the State's budget process. Future Green Sticker funds are dependent upon this process and are not guaranteed.

On page IV-104, the DEIS states that "The construction of roads may require the installation of fences, gates, and cattle guards (at the time of road construction) to prevent trespass." OHMVR highly recommends the use of cattle guards instead of gates to control the movement of cattle. Gates can easily be left open allowing cattle to move off of the range allotment. Gates can also be easily and unlawfully locked shut, thus blocking public access to their public lands.

Table IV-41 on page IV-106 of the DEIS lists the ROS Acres and Capacity by Alternative. The total acreage for all ROS classes for Alternatives A, C, D and E is

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653,400 acres. The total acreage for all ROS classes for Alternative B is 945,090 acres. Their appears to be an error in the acreage's listed for Alternative B. If these acreage's are correct, why is there a difference between alternatives?

On page IV-107, the DEIS states that "Approximately 2 percent (sic) developed sites would be rehabilitated during he first decade to respond to changing user needs and accessibility requirements." The two percent figure appears to be in error.

Table IV-45 is either missing or mislabeled.

On Page IV-130, the DEIS states "Alternatives that regulate a timber harvest, increase the risk of adversely affecting water quality." (sic) This sentence needs to be rewritten.

On page IV-140, the DEIS states that "Direct disturbance of soils from off-highway vehicle use on open areas would result in some erosion and impairment of productivity, regardless of preventive erosion control methods." There are no open OHV areas on the Forest. OHV use is only allowed on designated routes. OHMVR recommends that this statement be removed. If the intent was to discuss erosion from designated OHV routes, and not OHV open areas, OHMVR recommends that it be rewritten to reflect this.

OHMVR PROPOSED SOLUTION

As stated above, OHMVR recommends that the DEIS and the Draft Forest Plan be withdrawn. Deficiencies within the existing DEIS make it impossible to adequately analyze the alternatives relative to OHV recreation. Additionally, all DEIS alternatives will be modified by the President's Option 9 when it is released. These modifications and their effects on OHV recreation are not addressed in this DEIS.

OHMVR further recommends that a Draft Forest Plan be issued only after the issuance of the Final Environmental Impact Statement (FEIS). This will ensure that the Forest Plan fully reflects the scope and depth of comments received on the DEIS.

OHMVR does not support the Forest's choice of Alternative B as the Preferred Alternative. Should these alternatives be retained and not withdrawn, OHMVR would support Alternative D with the following modifications:

- (1) Rehabilitate approximately 50% of developed sites during the first decade to respond to changing user needs and accessibility requirements instead of the 25% currently mandated by Alternative D.
- (2) Construct OHV staging areas during the first decade, as proposed in Alternatives B and C.

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

NORTH COAST REGION

5550 SKYLANE BLVD SUITE A

SANTA ROSA, CA 95403

PHONE: (707) 576-2220

January 10, 1994



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Six Rivers National Forest

JAN 13 1994

RECEIVED
Eureka, California

Six Rivers National Forest
Attention: Land Management Planning
1330 Bayside Way
Eureka, CA 95501

Dear National Forest:

Thank you for providing us the opportunity to comment on the Draft Forest Plan. It is encouraging to see the evolution of the agency's approach: from a commodity-based approach where water quality is another output to be mitigated for, to a landscape and watershed-based approach where water quality is a natural result of good land stewardship. In combination with the adherence to Best Management Practices (BMPs) on the hillslopes, the preferred alternative will result in the maintenance of all the beneficial uses of the Forest's water.

Our comments will be organized by document; that is, comments on the Forest Plan itself, followed by comments on the Environmental Impact Statement and the individual alternatives.

Forest Plan

The Riparian Protection Driving Issue is our primary focus, because most of the elements of water quality protection were largely incorporated into it. The proposals to designate Riparian Management Zones (RMZs) on all streams and to designate key watersheds for the protection of anadromous fisheries are laudable, and will largely accomplish the protection we believe is necessary. Of the other issues, the ones of highest concern to us are fisheries, range, and water. Wild and Scenic River issues are also important, because these reaches are usually areas of high quality water whose beneficial uses can be protected and enhanced by such designation.

Resource Goals, Direction, and Forest-wide Standards and Guidelines

Geology, Soil, and Watershed Management

Proper installation, operation, and maintenance of BMPs are presumed to meet water quality standards, but the BMPs will probably evolve as more effectiveness monitoring is performed and some BMPs may not prove to be sufficient.

Range

Scheduling the future revision of Allotment Management plans is a good one. Although the progress of the revision schedule is dependent on the funding, we hope the task will still be performed in a timely manner.

Six Rivers National Forest

January 10, 1994

Page 2

Monitoring & Evaluation

This section presents a well organized, clearly stated program. It is obvious that the Forest is placing a high emphasis on monitoring and evaluation. Tying specific compliance and effectiveness monitoring tasks to each Management Area and to specific projects ensures there is a mechanism in each place to measure attainment. Including it as an overhead cost will ensure that the funding for each monitoring effort is secure, which has been a problem in the past. We would be happy to participate in the compliance monitoring review team.

One of the stated objectives of the water resource monitoring effort is to evaluate the "appropriateness of basin water quality standards". The appropriateness of water quality standards contained in the North Coast Water Quality Control Plan (Basin Plan) is of course of interest to this agency, and we would welcome the chance to work cooperatively with you.

Environmental Impact Statement

This document would have benefitted from listing each alternative's Average Annual Outputs and Activities for easy cross-reference. The use of the term "regulated" to mean areas to be managed for timber is confusing, because the word implies that there will be no controls on activities in an "unregulated" area (an RMZ, for example).

We largely concur with the preferred alternative (PRF), with a few exceptions. From a water quality perspective, it is the least damaging while still allowing production of wood products. We believe the most important provisions are that it:

- o ensures that water quality, along with fisheries and wildlife, would be the primary value of the RMZs,
- o has the least amount of total road miles and the most roads obliterated,
- o provides the highest protection to riparian areas,
- o commits to restoration of all areas that fail to meet State water quality objectives.

Many aspects of the other alternatives are much less desirable. CUR contains some elements that perhaps demonstrate why a change in land management approach by the USFS was necessary:

- o the second highest totals of road construction and acres of timber harvest
- o no commitment to restore areas contributing low quality water

Six Rivers National Forest
January 10, 1994
Page 3

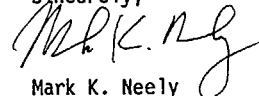
MKT has many of the same shortcomings:

- o the highest mileage of roads built and least amount of roads obliterated,
- o no commitment to restore areas contributing low quality water.

However, MKT claims to have the most fish habitat and watershed improvement acres. Is this because funding is tied to K-V dollars resulting from timber harvesting? Because roads provide access to suitable areas? Or a commitment to restore the damage to fisheries while putting additional pressure on such resources?

We look forward to reviewing the final version of the Forest Plan, and we wish you good luck with the task of incorporating the volumes of comments and responses you will get. If there is any way we can be of service, do not hesitate to give us a call.

Sincerely,



Mark K. Neely
Associate Engineering Geologist
CEG #1582

MKN:lmf/6rvrsImp.ltr

cc: Laura Fujii, U.S. EPA, 75 Hawthorne Street, San Francisco, CA 94105



#50
TRINITY COUNTY

BOARD OF SUPERVISORS
P.O. Drawer 1258 (916) 623-1217
WEAVERVILLE, CALIFORNIA 96093
Barbara M. Rhodes, Clerk
Donald E. Benedetti, Administrative Officer

December 22, 1993

Ms. Martha Ketelle, Acting Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka, CA 95501

Re: Comments on Draft Land Management Plan

Dear Martha,

At our regular meeting of December 21, 1993, the Trinity County Board of Supervisors agreed that we are unable to submit any meaningful comments on the draft plans when so much depends on the implementation of Option 9 and particularly the management parameters for the AMA's.

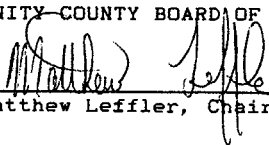
We are, obviously, greatly concerned about how these LMP's will ultimately affect the management activities of the USFS in the forests of Trinity County, however, at this time we are not interested in holding up the process. We are well aware of the long arduous process involved in getting a forest plan adopted and all of the problems presented when there is no plan in place.

We would request that Trinity County be notified when any amendments or modifications of the draft plans are made as the details of Option 9 become more clear, and would retain our right to comment on these amendments or any part of the plan as appropriate and necessary.

Thank you for the opportunity to comment and please keep us informed as the process slowly moves forward.

Sincerely,

TRINITY COUNTY BOARD OF SUPERVISORS

By 
Matthew Leffler, Chairman

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COUNTY OF DEL NORTE

XXXXXXXXXXXXXXXXXXXX
583 G STREET, SUITE 1
CRESCENT CITY, CALIFORNIA 95531

AREA CODE 707
464-7204

BOARD OF SUPERVISORS

December 27, 1993

By providing jobs, recreational opportunities and cash-flow generation, this alternative will best serve the North Coast and its citizens. We urge your support of the Preferred Alternative.

Very truly yours,

CLARKE MOORE, Chairman
of the Board of Supervisors

BOS/kiw

cc: CDD

Attention: Land Management Planning
Six Rivers National Forest
1330 Bayshore Way
Eureka, CA 95501

RE: SIX RIVERS NATIONAL FOREST PLAN EIS

Dear Sirs/Madams:

At its December 14, 1993 regular session, the Del Norte County Board of Supervisors voted unanimously to support the Six Rivers National Forest Plan Environmental Impact Study Preferred Alternative (PRF)

The PRF Alternative allows for management of the Forest based on the proposed Land Management Plan which our Smith River National Recreation Area already manages under. This alternative proposes the rehabilitation of approximately fifty percent (50%) of the developed recreation sites during the first decade, while providing sufficient habitat to contribute to the recovery of the "old-growth dependent" species.

No new wilderness areas are planned with the Preferred Alternative. While, the Board can appreciate the need for wilderness protection and safe utilization of resources, the size of the Smith River National Recreational Area, and State and Federal Parks within the County of Del Norte, the need for privately owned tax generating lands is very important to this County.

It is anticipated that the PRF Alternative would generate 1,537 jobs within the area, equaling some \$42.6 million in personal income, and decreasing the overall road mileage by 2.6%. The average annual timber sales are anticipated at 43.5 million board feet with 1,560 acres being regenerated within the first decade of the alternative's use. These statistics point directly to the current need to generate jobs within our Counties, while providing for the future of our forests and wilderness areas.

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Eureka, California

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City of Fortuna

621 - 11th Street - P.O. Box 545 - Fortuna, CA 95540

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DEC 28 1993

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Eureka, California

City Hall (707) 725-6125
Police Department 725-7550
Public Works Department 725-3300
Parks & Recreation 725-5171
Fax Number (707) 725-4601

December 27, 1993

Six Rivers National Forest
Attn: Land Management Planning
1330 Bayshore Way
Eureka, CA 95501

To Whom It May Concern:

As the Mayor of a community largely dependent upon the wood products industry, I am writing you to strongly object to the Preferred Alternative in the Environmental Impact Statement for the proposed Land and Resource Management Plan for the Six Rivers National Forest. The Preferred Alternative is a preservation plan rather than an ecosystem management plan since 83% of the National Forests will be managed like Redwoods National Park. We endorse the Market Products Alternative.

The Preferred Alternative would result in economic disaster for North Coast communities, and particularly Fortuna since most of our citizens are employed either directly or indirectly by the wood products industry. This is important since the forest products industry is an important component of California's economy. For example, the forest products industry is a \$ 1.2 billion industry in California according to a report by the Timber Association of California in 1989.

In addition, for every wood products job lost, we will also lose a service or retail sector job. In Humboldt County, this could mean the loss of 4,500 banking, real estate, and health care jobs. In other words, Preferred Alternative transfers productive wood products industry employees into our growing unemployment lines. These productive employees will also lose their health insurance.

The Preferred Alternative would also put an added burden on our safety net programs such as unemployment insurance and aid to families with dependent children. The fastest growing source of local income in Humboldt County comes from transfer payments such as welfare and social security according to a recent article by Smithsonian Magazine. This is in large part due to the loss of jobs in the timber industry from the expansion of Redwoods National Park and the reduced timber cut in the Six Rivers National Forest.

The Preferred Alternative would duplicate the negative effect of the creation of the Redwood National Park in 1968. The creation of the National Park resulted in 75,000 acres taken out of timber production in the region for the Park. The loss of this timberland created chaos in the long-range plans of companies to operate on a sustained yield basis.

In addition, when the Redwoods National Park was expanded in the late 1970's the Federal government *made a commitment to increase the timber cut in Six Rivers National Forest* to help offset the economic impacts. The timber cut in Six Rivers has dropped steadily from 144 million board feet in 1985 to less than 11 million in 1993. This represents a 92% decrease in timber production in the Six Rivers National Forest. The reduction of harvest of timber in the Six Rivers National Forest will also result in an increase in timber production on privately held lands.

Furthermore, the North Coast of California is quite different than the Northwestern US. For example, Redwoods are preserved in more than 255,000 acres of national, state, county, and regional parks and preserves throughout the Redwood Region. California's Forest Practice Act includes the most stringent harvesting regulations in the nation and includes mandatory reforestation. These factors were not adequately addressed since the North Coast of California was treated the same as the Northwest. In other words, the forest, amount of land preserved, and the forest practices are quite different on the North Coast in comparison to other parts of California, Oregon, and Washington.

In addition, in Northwestern California's moist coastal climate, harvest openings in the forest green up rapidly with new grasses, shrubs, and young trees that attract insects, birds, rodents, and the coyotes, bobcats, owls and other predators in the food chain. Black bears use the openings heavily for berry browsing, and these areas also become the "kitchens" for deer and elk while the timbered edges provide wildlife cover. Also, the Spotted Owl controversy is the primary reason why the Preferred Alternative was selected. However, recent wildlife studies have shown that the Spotted Owl is thriving in our second growth forests on the North Coast. These factors were not adequately addressed in the Environmental Impact Statement since a broad brush approach was taken for the entire Northwest. In other words, the North Coast of California is quite different than other parts of the Northwest and this factor was not considered in the overall plan for Six Rivers National Forest or the Option 9 Plan.

The Option 9 Plan classifies Coastal Redwoods as a *"sacred resource that shall not be managed for harvest."* The Coastal Redwood is the fastest-growing soft-wood tree in the US. They are also preserved in more than 255,000 acres of national, state, county, and regional parks and reserves throughout the Redwood Region. No other commercial species in the world has had so great a proportion of its trees set aside forever in governmental parks and other reserves. Redwood products are also in great demand because it is long-lasting and has unique properties. Furthermore, tree nurseries operated for the forest products industry produce more than 5 million redwood seedlings annually for reforestation programs. There are also more redwoods today than when man first harvested the species and they are growing faster than they are being harvested. We find your statement that the Coastal Redwoods are a *"sacred resource that shall not be managed for harvest"* outrageous.

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The Preferred Alternative also indicates that there will be more recreational and tourism opportunities. Past examples show that this is not the case. For example, Arthur D. Little, a management consulting firm, predicted a gain of 1.6 million visitors by 1983 when Redwoods National Park was created. In 1992, 388,000 visitors visited the Redwoods National Park. In other words, the consulting firm's estimate was off by more than 75% nine years later. Furthermore, a recent article by Smithsonian Magazine pointed out that the average visitors spends less than 50 minutes in Redwoods National Park. To put this in more perspective, Redwoods National Park cost more than **\$ 1.4 billion** to increase the number of annual visitor by 388,000.

In conclusion, the Preferred Alternative will hit Fortuna and the surrounding area significantly harder than the earthquake did in 1992.

Sincerely,

A handwritten signature in cursive script, appearing to read "Dean Lewis".

Dean Lewis
Mayor

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Karuk Tribe of California



ADMINISTRATIVE OFFICE:
POST OFFICE BOX 1016
HAPPY CAMP, CA 96039
(916) 493-5305

DEPARTMENT OF NATURAL RESOURCES
POST OFFICE BOX 282
ORLEANS, CA 95556
(916) 627-3446 FAX (916) 627-3448

January 6, 1994

Martha Ketelle, Forest Supervisor
Six Rivers National Forest
1330 Bayshore Way
Eureka CA 95501

Barbara Holder, Forest Supervisor
Klamath National Forest
1312 Fairlane
Yreka, CA 96097

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Eureka, California

Dear Forest Supervisors:

The Karuk Tribe has received copies of both the Six Rivers and Klamath National Forest Draft Plans. The Tribe has invested a great deal of time and money in preparation of our Ancestral Lands Forest Management Plan, which we submitted to you in 1989, along with detailed comments submitted to you in 1983 (Kranz, 1983) and our efforts to review these current draft documents. Please refer to all of our previous correspondence to you in relation to your proposed Forest Plan along with our enclosed comments.

The Karuk Tribe understands that the annual Congressional budgeting process may or may not meet the budget requirements of the approved Forest Plans. We understand that the preparation of each Forest Plan is required by the Forest and Rangeland Renewable Resource Planning Act of 1974 (RPA), as amended by the National Forest Management Act of 1976, and the implementing regulations found in the Code of Federal Regulations (36 CFR 219, issued September 30, 1982). We are also aware that District and Forest staffs will conduct environmental analyses and document them in appropriate environmental documents (such as Environmental Assessments) which will be tiered to the Forest Plan EIS (40 CFR 1508.28). The Tribe recognizes that the Plan and the EIS are to be considered as a whole, rather than as separate documents. In recognition of these facts, along with the reality that the Karuk Tribal Council has been unable to adequately discuss the ramifications of your Forest Plan and EIS documents, the Karuk Tribe is formally requesting consultation with you and your planning and management staff as the Final Forest Plans are being prepared and implemented.

The Karuk Tribe appreciates the efforts to reflect our concerns in these Forest Plan documents. However, there are issues which are perhaps not apparent that could cause future conflicts between the U.S. Forest Service and the Karuk Tribe. To resolve these differences, the Karuk Tribe feels that the government's trust

responsibility to federally recognized Indian Tribes requires that we work closely together throughout the planning and implementation process. Therefore, any issues that are not raised by us during this Draft Forest planning phase are still appropriate for discussion and resolution at a later date.

To provide a framework for future discussions, we have prepared a list of issues along with a few specific recommendations that we would like you to include in the Final Forest Planning documents. We would also like you to seriously consider any additional comments you may receive from individual tribal members.

We recognize that this forest planning process has required a vast amount of your time to produce. We appreciate the opportunity to comment during the public comment period and look forward to future government to government relations.

Sincerely,

Robert B. Rohde
Robert B. Rohde
Natural Resources Manager

RBR/sms

Enclosure

Karuk Tribe of California



ADMINISTRATIVE OFFICE:
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HAPPY CAMP, CA 96039
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FOREST PLAN COMMENTS

January 6, 1994

The Karuk Tribe's Department of Natural Resources recommends that both Forests provide consistent language in each section of their Forest Plan documents in reference to the federal government's trust responsibilities to federally recognized Indian Tribes. The issues that we have identified during our review of the Draft Forest Plan document include:

1. Tribal Involvement is not articulated throughout the Draft Forest Plan documents. In addition, budget and forest management priorities may be insufficient to support existing cultural resource staff and implement adequate cultural resource protection programs.
2. Cultural Area Designations.
3. Technology transfer, Tribal member employment along with Tribal participation in forest planning and management needs to be articulated in each Forest Plan.
4. Forest management prescriptions and land area designations may significantly change following acceptance of President Clinton's Forest Ecosystem Plan.

Forest Plan Comments continued

1. Tribal Involvement is not articulated throughout the Draft Forest Plan documents.

There are situations throughout the Draft Forest Plan documents where a reference to federally recognized Indian Tribes should be included along with Private, State and Federal entities. For example, Tribes should be included in the list of cooperators on the development of off-highway vehicle use (page IV-55 of the Six Rivers Draft Plan) and reference to the multi million dollar programs and services that the Tribe provides in Siskiyou County should be included along with the other entities mentioned on pages 3-21 and 3-22 in the Klamath Draft Forest Plan.

There is a tendency by both Forests to imply that cultural resource protection is limited to Native American Contemporary Use Areas, Cultural Areas or project related surveys. This limited approach demonstrates a profound difference in our perspectives. Although protection of specific cultural resources are obviously important, the Tribe was placed here by the Creator as steward of all cultural and natural resources within our Ancestral Territory. Therefore, reference to Tribal involvement should be included in all resource categories within each Forest Plan.

Both Six Rivers and Klamath National Forests place a great deal of emphasis on cultural inventories by Forest Service staff, while from the Karuk Tribe's perspective cultural inventories of Tribal cultural resources within our Ancestral Territory should be conducted by the Tribe. Many of our cultural values can only be identified by Karuk people, such as the location of traditional gathering areas, prayer sites and religious trails. Cultural inventories rely on common knowledge and landscape analysis principles while Forest Service inventories are focused primarily on archeological sites. A reliance on Forest Service staff to perform these inventory responsibilities in the past has often led to conflicts that could have been avoided if Tribal participation in the actual surveys was recognized as a legitimate requirement for project success. In addition, both Forests have reduced their cultural resource staff and focused cultural resource surveys meeting archeological survey requirements for proposed timber sales. To avoid future conflicts, surveys of Karuk cultural resources should be developed through a formal consultation process. Future cultural surveys should provide employment opportunities for tribal people to work with Forest Service staff. These issues should be reflected in the Forest Plans in such places as the Standards and Guidelines for each Forest and anywhere where cultural resource management is discussed.

Other specific examples where a reference to Tribal involvement should be included, but not limited to, are:

The Management of Alternative Forest Products

A reference to the federal government's trust responsibility to Indian Tribes and the recognition that formal consultation with federally recognized Indian Tribes will occur prior to the initial evaluation of any proposed forest product program should be included in each Forest's standards and guidelines.

The use of the Small Tracts Act within Karuk Ancestral Territory

The U.S. Forest Service has used the Small Tracts Act numerous times in the past to consolidate National Forest land holdings. Six Rivers National Forest, for example, makes reference to the Small Tracts Act in "Wild and Scenic" River segments where encroachments or interspersed mineral patents qualify for sale (Six Rivers Draft Plan, pg. IV-36). Both Six Rivers and Klamath National Forests fail to recognize that lands adjacent to the river and other non-federal parcels are extremely important to the Tribe as well. All lands within the Karuk Tribe's Ancestral Territory considered for acquisition by the federal government should be reviewed in consultation with the Karuk Tribe to determine their cultural significance prior to European involvement in the area. Transfer of ownership to Tribal Trust status should be evaluated before transfer of additional land into Forest Service holdings is considered.

The implementation of proposed recreational improvements

As described in the Klamath Forest Plan, pg. 2-5, "The number of acres which provide primitive, semi-primitive motorized and rural recreational opportunities will increase from the current situation, while the number of acres providing semi-primitive non-motorized and roaded natural opportunities will decrease with the Forest Plan." This approach to recreational resource management will continue to provide challenges for the Forest Service to avoid conflicts with Tribal cultural resource values. Many of the target areas for recreational improvements are located near ancient village sites and other significant cultural areas along the rivers and creeks that flow throughout our Ancestral Territory. A reference to the federal governments Trust Responsibility to Indian Tribes and the recognition that formal consultation with federally recognized Indian Tribes will occur prior to the initial evaluation of any proposed recreational program should be included in each Forest's standards and guidelines.

2. Cultural Area Designations

The Karuk Tribe appreciates that each Forest recognizes that specific land areas

should be set aside for cultural and religious purposes. Ceremonies, for example, are essential to the maintenance of world order, and substitutions cannot be made for localities used in a ceremony without causing it to lose effect or fail completely. A Cultural Resource Overview prepared by James A. McDonald of the U.S. Forest Service (1979) points out the importance and requirement by law for the preservation of cultural resources. The Antiquities Act of 1906, National Historic Preservation Act of 1966, National Environmental Protection Act of 1969, Archaeological and Historic Preservation Act of 1974, and the American Indian Religious Freedom Act of 1978 all (in one way or another) establish federal law to protect, avoid and minimize adverse effects of management actions on American Indian religious practices (Kranz, 1983).

In order to fully recognize the religious and culturally significant areas of the Karuk Tribe, through consultation Six Rivers National Forest needs to include protection for Amekyaram, Panamnik, Savorum, and Onion Mountain within your Forest Plan. Klamath National Forest has recognized the importance of Inam and Katamin, however the actual land area used for these two areas needs to be expanded through consultation to include both sides of the Klamath River.

Six Rivers National Forest eloquently points out that "Since the Forest Plan is a programmatic document, it cannot be expected to cover every contingency regarding site-specific management...Supplemental direction will be developed for certain management areas or resource issues where the planning data base was insufficient at the time of writing to resolve management issues completely (Six Rivers Draft Forest Plan, pg. V-3)." To avoid unnecessary conflict over the appropriate location of cultural land area designations, the Karuk Tribe recommends that through consultation the U.S. Forest Service work with us to protect all of our culturally significant areas. We agree with the Klamath National Forest that through a formal agreement process between the U.S. Forest Service and the Karuk Tribe of California, important land areas will be managed to maintain special Native American ceremonial values (Klamath Draft Forest Plan, pp. 4-111).

3. Technology transfer, Tribal member employment along with Tribal participation in forest planning and management needs to be articulated in each Forest Plan.

There have been a number of improvements in U.S. Forest Service commitments to Federally recognized Indian Tribes.

"In 1988, the United States Department of Agriculture (Forest Service)

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Forest Plan Comments continued

and the United States Department of Interior (Bureau of Land Management and National Park Service) entered into an Agreement in Principal that supports Forest Service interests in establishing a mutual and beneficial partnership with American Indian and Alaska native neighbors. Forest Service policy states that the Forest Service will:

Maintain a governmental relationship with federally recognized governments.

Implement our programs and activities honoring Indian rights and fulfill legally mandated trust responsibilities.

Administer programs and activities to address and be sensitive to traditional religious beliefs and practices.

Provide research, transfer of technology, and technical assistance to Indian governments.”
(California Indians and the Forest Service, 1993)

Both Six Rivers and Klamath National Forests should include this language in your Forest Plan documents. The Karuk Tribe and other Tribal governments have Tribal Employment Rights Ordinances (TERO) which require that indian people are provided available employment opportunities. In addition, in order for the Karuk Tribe to successfully work cooperatively with each National Forest, opportunities for training, technical assistance, participation in planning and management, and technology transfer need to be provided by the Forest Service to establish a mutual and beneficial partnership. These aspects of governmental relations should also be articulated within each Forest Plan.

4. Forest management prescriptions and land area designations may significantly change following approval of President Clinton's Forest Ecosystem Plan.

Despite the efforts that both Six Rivers and Klamath National Forests have taken to prepare their Forest Plan documents, the forest management prescriptions and land area designation specified in each Plan may be significantly altered once the President's Forest Ecosystem Plan is approved. Recognizing that there may be changes that are not currently reflected in the current Draft Plans, the Karuk Tribe reserves the right to provide additional comments both written and through consultation once we have had adequate time to review the President's Final Ecosystem Plan document.

YUOK TRIBE

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INTERIM COUNCIL

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January 6, 1994

Martha J. Katelle
Acting Forest Supervisor
USDA Forest Service
1330 Bayshore Way
Eureka, CA 95501

OFFICIAL FILE COPY
Six Rivers National Forest

JAN 11 1994

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Eureka, California

Dear Ms. Katelle,

The purpose of this letter is to comment on the Six Rivers National Forest Plan. After reviewing the five alternatives for the management of the Six Rivers National Forest the Yurok Tribe prefers the OGR (Old Growth Reserve) plan, with Option 9, due to the fact that it provides the best water quality and habitat protection.

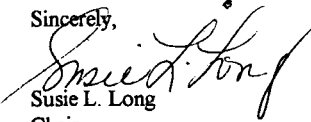
The history of the Yurok people has always included good forest stewardship in the Klamath drainage. When the Reservation was created the intent included that the fisheries provide subsistence for the Yurok people. It is clear that part of the trust responsibility of the federal Government is to insure preservation of a viable, historically productive salmon and steelhead fishery. Any forest activities that impact water quality, fish habitat, wildlife habitat, cultural sites and/or gathering activities are of grave concern to the Tribe.

The Tribe is very concerned with ecosystem management and believes it is imprudent for any forest plans to be finalized before the Option 9 plans take effect which will supersede any of the five alternatives. As such, the Tribe prefers an extension of finalization of the Six Rivers Forest plan.

In the event that an extension is not granted the OGR plan appears to have the least negative impact on the Klamath River fisheries and is the Tribes preferred plan.

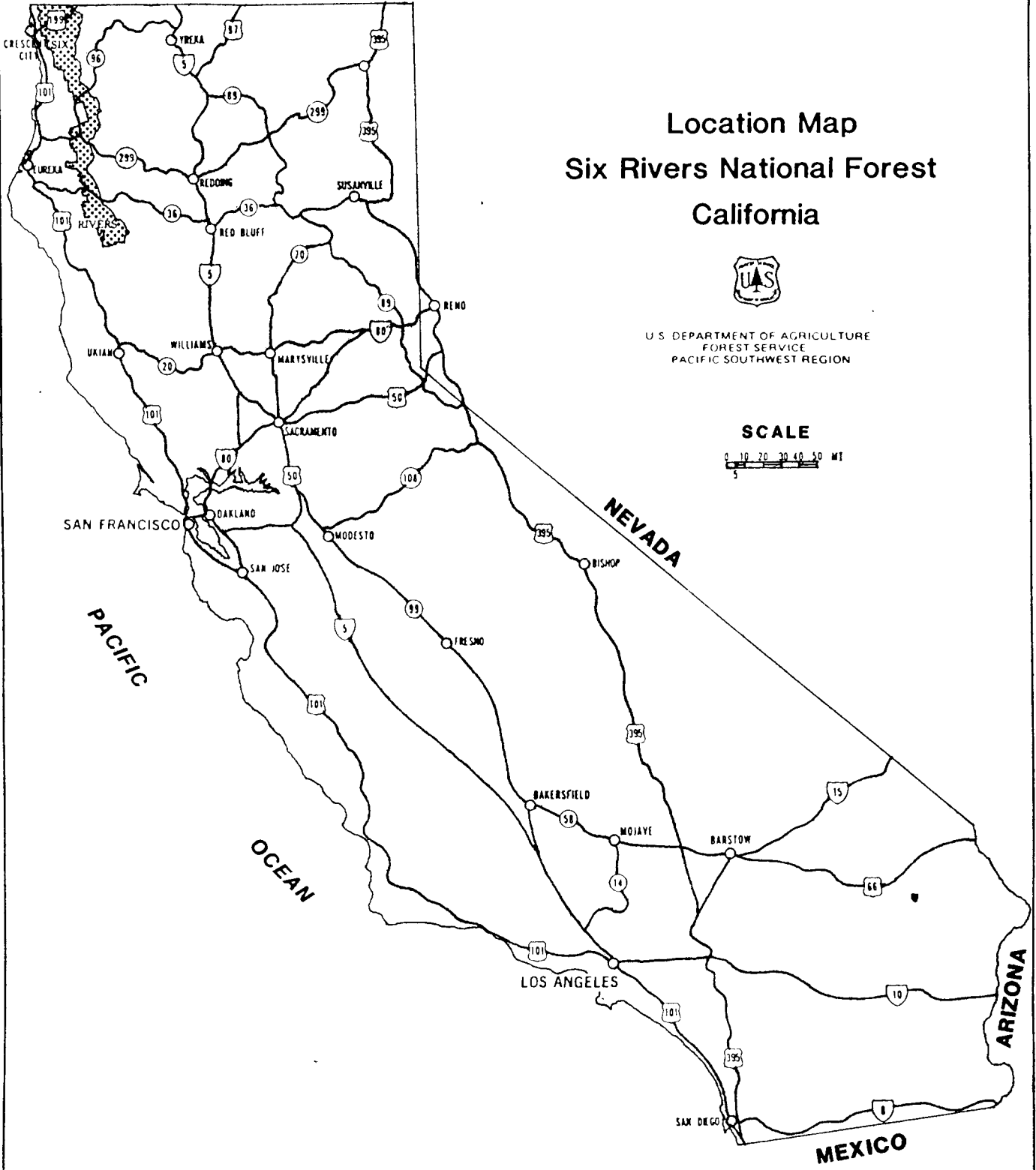
The Tribe also requests that the Six Rivers National Forest schedule a meeting to further allow Council input.

Sincerely,


Susie L. Long
Chair

BF/cjc

OREGON



**Location Map
Six Rivers National Forest
California**



U.S. DEPARTMENT OF AGRICULTURE
FOREST SERVICE
PACIFIC SOUTHWEST REGION

SCALE

