

Common Name	Scientific Name
chestnut-backed chickadee	<i>Parus rufescens</i>
red-breasted nuthatch	<i>Sitta canadensis</i>
pygmy nuthatch	<i>Sitta pygmaea</i>
brown creeper	<i>Certhia americana</i>
golden-crowned kinglet	<i>Regulus satrapa</i>
varied thrush	<i>Ixoreus naevius</i>
solitary vireo	<i>Vireo solitarius</i>
Townsend's warbler	<i>Dendroica townsendi</i>
hermit warbler	<i>Dendroica occidentalis</i>
red crossbill	<i>Loxia curvirostra</i>
evening grosbeak	<i>Coccothraustes vespertinus</i>
Trawbridge's shrew	<i>Sorex trowbridgii</i>
silver-haired bat	<i>Lasioryctes noctivagans</i>
hoary bat	<i>Lasiurus cinereus</i>
Douglas' squirrel	<i>Tamiasciurus douglasii</i>
Northern flying squirrel	<i>Glaucomys sabrinus</i>
Western red-backed vole	<i>Clethrionomys californicus</i>
red tree vole	<i>Phenacomys longicaudus</i>
** black bear	<i>Ursus americanus</i>
** marten	<i>Martes americana</i>
** fisher	<i>Martes pennanti</i>
wolverine	<i>Gulo gulo</i>
** elk	<i>Cervus elaphus</i>

Snags/tree cavities (Tree cavity dependant species found in snags or live trees)

Common Name	Scientific Name
wood duck	<i>Aix sponsa</i>
common merganser	<i>Mergus merganser</i>
osprey	<i>Pandion haliaetus</i>
bald eagle	<i>Haliaeetus leucocephalus</i>
American kestrel	<i>Falco sparverius</i>
flammulated owl	<i>Otus flammeolus</i>
** Western screech owl	<i>Otus kennicottii</i>
** Northern pygmy owl	<i>Glaucidium gnoma</i>
** Northern spotted owl	<i>Strix occidentalis</i>
** Northern saw whet owl	<i>Aegolius acadicus</i>
Vaux's swift	<i>Chaetura vauxi</i>
lewis' woodpecker	<i>Melanerpes lewis</i>
** acorn woodpecker	<i>Melanerpes formicivorus</i>
red-breasted sapsucker	<i>Sphyrapicus ruber</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
Nuttall's woodpecker	<i>Picoides nuttallii</i>
downy woodpecker	<i>Picoides pubescens</i>
hairy woodpecker	<i>Picoides villosus</i>
white-headed woodpecker	<i>Picoides albolarvatus</i>
black-backed woodpecker	<i>Picoides arcticus</i>
Northern flicker	<i>Colaptes auratus</i>
** pileated woodpecker	<i>Dryocopus pileatus</i>
ash-throated flycatcher	<i>Myiarchus cinerascens</i>

Appendix G - Fish, Wildlife, & Botany Habitat Management

Common Name

Scientific Name

purple martin	<i>Progne subis</i>
**tree swallow	<i>Tachycineta bicolor</i>
violet-green swallow	<i>Tachycineta thalassina</i>
black-capped chickadee	<i>Parus atricapillus</i>
mountain chickadee	<i>Parus gambeli</i>
chestnut-backed chickadee	<i>Parus rufescens</i>
plain titmouse	<i>Parus inornatus</i>
red-breasted nuthatch	<i>Sitta canadensis</i>
white-breasted nuthatch	<i>Sitta carolinensis</i>
pygmy nuthatch	<i>Sitta pygmaea</i>
Western bluebird	<i>Sialia mexicana</i>
mountain bluebird	<i>Sialia currucoides</i>
European starling	<i>Sturnus vulgaris</i>
red bat	<i>Lasiorus borealis</i>
Western gray squirrel	<i>Sciurus griseus</i>
Douglas' squirrel	<i>Tamiasciurus douglasii</i>
Northern flying squirrel	<i>Glaucomys sabrinus</i>

Dead and down (Dead and down woody material, logs, stumps, slash, litter, duff)

Common Name

Scientific Name

Pacific giant salamander	<i>Dicamptodon ensatus</i>
California newt	<i>Taricha torosa</i>
ensatina	<i>Ensatina eschscholtzi</i>
California slender salamander	<i>Batrachoseps attenuatus</i>
clouded salamander	<i>Aneides ferreus</i>
ruffed grouse	<i>Bonasa umbellus</i>
shrew-mole	<i>Neotomchus gibbsii</i>
deer mouse	<i>Peromyscus maniculatus</i>
Pinyon mouse	<i>Peromyscus truei</i>
long-tailed weasel	<i>Mustela frenata</i>
rubber booby	<i>Charina bottae</i>
ringneck snake	<i>Diadophis punctatus</i>
sharp-tailed snake	<i>Contia tenuis</i>
common kingsnake	<i>Lampropeltis getulus</i>
California mountain kingsnake	<i>Lampropeltis zonata</i>

Talus/rocks

Common Name

Scientific Name

Del Norte salamander	<i>Plethodon elongatus</i>
rock wren	<i>Salpinctes obsoletus</i>
canyon wren	<i>Catherpes mexicanus</i>
rosy finch	<i>Leucosticte arctoa</i>
pika	<i>Ochotona princeps</i>
yellow-bellied marmot	<i>Marmota flaviventris</i>
bushy-tailed woodrat	<i>Neotoma cinerea</i>
night snake	<i>Hypsiglena torquata</i>
Western rattlesnake	<i>Crotalus viridis</i>

Cliff/caves

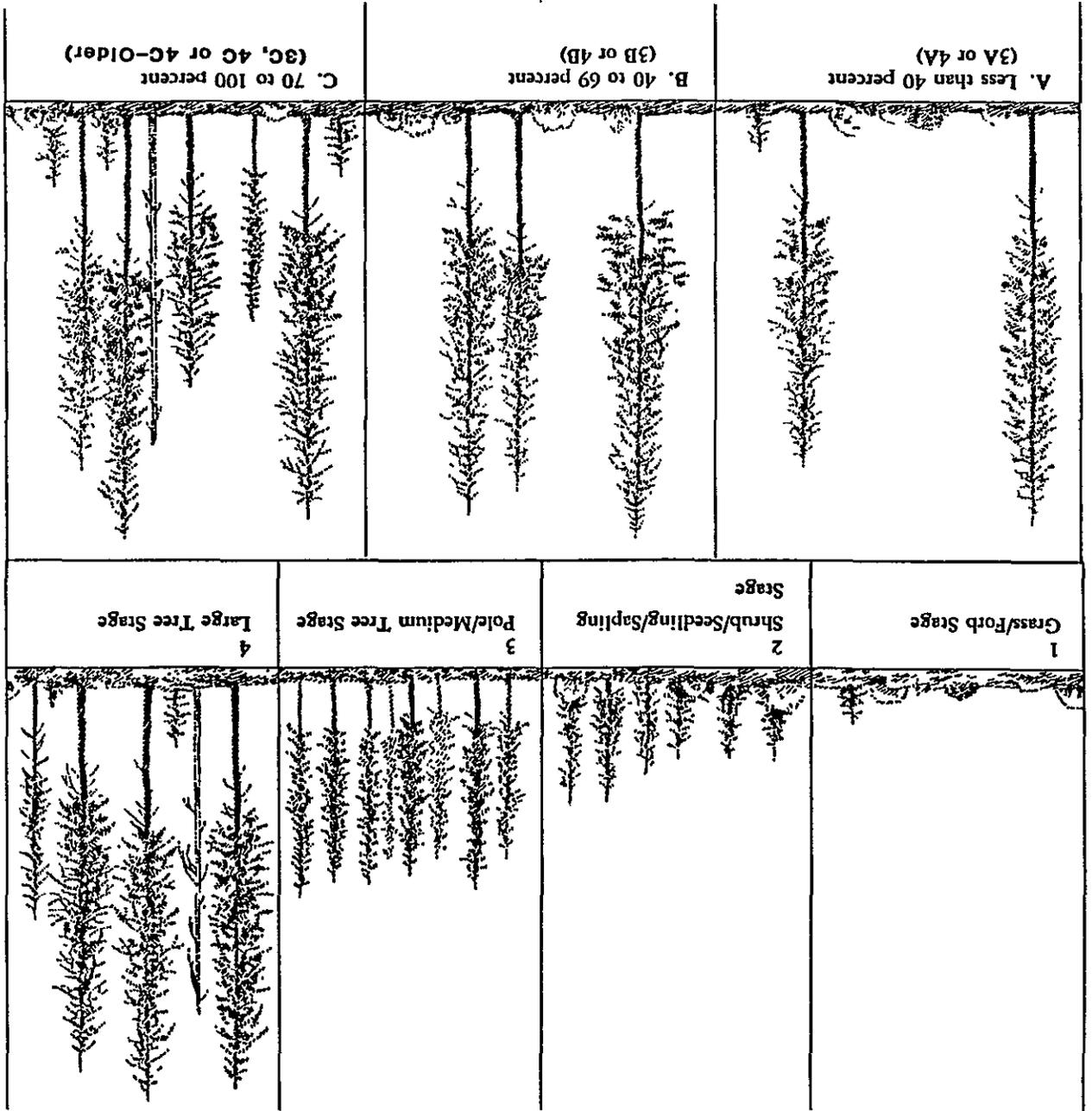
Common Name	Scientific Name
Shasta solomander	<i>Hydromantes shastae</i>
turkey vulture	<i>Cathartes aura</i>
golden eagle	<i>Aquila chrysaetos</i>
peregrine falcon	<i>Falco peregrinus</i>
prairie falcon	<i>Falco mexicanus</i>
block swift	<i>Cypseloides niger</i>
Nodhern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Cliff swallow	<i>Hirundo pyrrhonota</i>
barn swallow	<i>Hirundo rustica</i>
little brown myotis	<i>Myotis lucifugus</i>
Yuma myotis	<i>Myotis yumanensis</i>
long-eared myotis	<i>Myotis evotis</i>
fringed myotis	<i>Myotis thysanodes</i>
long-legged myotis	<i>Myotis volans</i>
California myotis	<i>Myotis californicus</i>
small-footed myotis	<i>Myotis leibii</i>
big brown bat	<i>Eptesicus fuscus</i>
spotted bot	<i>Euderma maculatum</i>
Townsend's big-eared bot	<i>Plecotus townsendii</i>
pallid bot	<i>Antrozous pallidus</i>
Brazilian free-tailed bot	<i>Tadarida brasiliensis</i>

*Species in the aquatic guilds are mutually exclusive **Species in open habitats are mutually exclusive For example Brush rabbits are in the shrub guild Meadowlarks are in the grass guild Deer eat forbs and shrubs, they are in the open habitat guild

Literature Used to Develop Management Indicator Assemblages

- Airola, D A. 1988 Guide to the California Wildlife Habitat Relationship System Calif Dept Fish & Game 74 pp.
- Brown, E R ed 1985 Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington Part 2 - Appendices USDA, Forest Service, Pacific Northwest Region, Portland, OR Publ No R6-F&WL-192-1985
- Crumpton, P L 1993 Bird Checklist Shasta-Trinity National Forests Shasta-Trinity National Forests, USDA Foldout Pamphlet
- Marcot, B G 1979. California Wildlife Habitat Relationships Program, North Coast/Cascades Zone, U.S. Forest Serv Rpt, Vol M. Species/habitat matrix. 50pp
- Meyer, K E and W F Laudensloyer, Jr 1988 A Guide to Wildlife Habitats of California, Calif Dept Forestry & Fire Protection 166pp
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- Stebbins, R C 1966 A Field Guide to Western Reptiles and Amphibians Houghton Mifflin Company, Boston 279pp
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- Zeiner, D C, W F Laudensloyer Jr, K E Moyer, and M White 1988 California's Wildlife Calif Dept Fish & Game Vol I Amphibians and Reptiles 272pp
- Zeiner, D C, W F Laudensloyer Jr, K E Moyer, and M White 1990 California's Wildlife Calif Dept Fish & Game Vol II Birds 732 pp
- Zeiner, D C, W F Laudensloyer Jr, K E Moyer, and M White 1990 California's Wildlife Calif Dept Fish & Game Vol III Mammals 407pp

Figure C-1
 Seral Stage Descriptions Used for Wildlife Habitat Relationships



1 - Grass-Forb Stage

2 - Shrub/Seedling/Sapling Stages

3a - Pole/Medium Tree Stage, < 40% Canopy Closure

3b - Pole/Medium Tree Stage, 40 to 70% Canopy Closure

3c - Pole/Medium Tree Stage, > 70% Canopy Closure

4a - Large Tree Stage, < 40% Canopy Closure

4b - Large Tree Stage, 40 to 70% Canopy Closure

4c - Large Tree Stage, > 70% Canopy Closure

4c - Older - old growth, Same as 4c large tree stage, but exhibiting obvious signs of decadence.

Table G-4
Sensitive and Endemic Plant List

Scientific Name Common Name	Range on Shasta-Trinity Districts	Mgt. Areas	Elevation (in feet)	Habitat
Sensitive Plants Known to Occur on the Shasta-Trinity National Forests				
<i>Arctostaphylos Klamathensis</i> Klamath manzanita	Mt Shasta Weaverville?	5	5500-6500	Montane mixed conifer forest, serpentine & gabbro soils: Scott and Trinity Mountains
<i>Calochortus longebarbatus</i> var. <i>longebarbatus</i> Long haired star-tulip	McCloud	2	3000-4300	Wet meadows within pine forest or sagebrush communities
<i>Campanula shelteri</i> Castle Crags harebell	Mt. Shasta	4,5	3600-6000	Granite and diorite cliffs, north and northeast exposures
<i>Campanula wilkinsiana</i> Wilkins harebell	McCloud Mt Shasta Weaverville	3,4	5500-8600	Streambanks and springs in red fir and subalpine forests
<i>Collomia larsenii</i> (= <i>C. debilis</i> var. <i>larsenii</i>) talus collomia	McCloud	1	7200+	Cinder and scree slopes
<i>Cordylanthus tenuis</i> ssp. <i>pallenscens</i> pallid bird's beak	Mt Shasta	3,5	3600-5200	Lightly disturbed openings in ponderosa pine forest, gravelly volcanic or ultramafic soils
<i>Draba aureola</i> Golden draba	Mt Shasta	5	7000-9000	Among rocks on ridges, fell-fields; subalpine forests.
<i>Draba carnosula</i> Mt. Eddy draba	Mt. Shasta	5,6	7600-8400	Alpine and subalpine boulder fields and rock outcrops.
<i>Epilobium siskiyouense</i> Siskiyou fireweed	Mt. Shasta	5,6	5000-8000	Exposed, rocky serpentine ridges and slopes.
<i>Eriastrum brandegeae</i> (includes <i>E. traci</i>) Brandegee's eriastrum	Hayfork	18	1000-2600	Dry, gravelly, flat openings in chaparral, foothill woodland.

* Information in this list is current as of March 1993
 ? Suspected to occur or not currently documented.

Table G-4 (continued)
Sensitive and Endemic Plant List

Scientific Name Common Name	Range on Shasta-Trinity		Elevation (in feet)	Habitat
	Districts	Mgt. Areas		
<i>Erigonum alpinum</i> Trinity buckwheat	Mt Shasta Weaverville?	5	6700-9000	Exposed serpentine ridges and talus slopes.
<i>Erigonum umbellatum</i> var. <i>humistratum</i> Mt. Eddy Buckwheat	Mt Shasta	5	5700-9000	Serpentine slopes and outcrops within mixed conifer forest or subalpine, Scott and Trinity Mountains
<i>Erythronium citrinum</i> ** var. <i>rodenckii</i> Scott Mountain fawn lily	Weaverville	4.8	900-4000?	Mixed conifer forest, Scott Mountains Serpentine & granitic soils (?)
<i>Swertia fastigiata</i> (incl. <i>Frasera umpquaensis</i>) Umpqua green gentian	Hayfork Yolla Bolla Big Bar?	20	4000-6000	Meadows, springs, openings in Douglas-fir/white fir forest
<i>Galium serpenticum</i> ssp. <i>scotticum</i> Scott Mountain bedstraw	Mt Shasta Weaverville	4.6	5100-7600	Serpentine talus slopes, rock outcrops in mixed conifer forest
<i>Ivesia pickeringii</i> Pickering's ivesia	Weaverville	6	2500-8000	Seasonally wet serpentine meadows and swales
<i>Lewisia cotyledon</i> var. <i>heckneri</i> Heckner's lewisia	Big Bar Mt Shasta Weaverville	4.7	2500-8000	Moist rock outcrops in chaparral, oak or conifer forest
<i>Lewisia cotyledon</i> var. <i>howellii</i> Howell's lewisia	McCloud Shasta Lake	10, 12	500-4500	Rock outcrops in chaparral, oak or conifer forest
<i>Linanthus nuttallii</i> ssp. <i>howellii</i> Howell's linanthus	Yolla Bolla	22	4000-5000	Jeffrey pine woodlands, mostly on serpentine soils
<i>Madia dorr-nilesiae</i> Nile's madia	Hayfork	19	2600-4400	Rocky serpentine slopes and openings in Jeffrey pine woodland

** Plants recommended to the regional Forester for addition to the sensitive species list, but not listed as of March 1993

? Suspected to occur or not currently documented

**Table G-4 (continued)
Sensitive and Endemic Plant List**

Scientific Name Common Name	Range on Shasta-Trinity Districts	Mgt. Areas	Elevation (in feet)	Habitat
<i>Madia stebbinsii</i> Stebbins' madia	Yolla Bolla	21,22	4000-5000	Rocky serpentine openings in chaparral, Jeffrey pine forest.
<i>Minuartia rosei</i> Peanut sandwort	Hayfork Yolla Bolla	18,19,21	2500-5800	Rocky serpentine slopes and openings in Jeffrey pine and mixed conifer forest
<i>Nevusia cliffonii</i> ** Shasta snow-wreath	Shasta Lake	8,12	2400-3000	North-facing slopes on limestone-derived soils, within riparian areas
<i>Penstemon filiformis</i> Thread-leaved penstemon	Mt Shasta Weaverville	4-7,9	2000-6000	Meadows and lightly disturbed openings: serpentine soils.
<i>Penstemon tracyi</i> Tracy's beardtongue	Big Bar Weaverville	4	6000-8000	Rock cliffs and outcrops, Trinity Alps
<i>Phacelia cookei</i> Cooke's phacelia	Mt. Shasta	3	4100-5000	Lightly disturbed volcanic sand
<i>Phacelia dalasiana</i> Scott Mountain phacelia	Mt. Shasta Weaverville	4-6,9	5000-7000	Meadows and openings in red fir forest, serpentine soils
<i>Phacelia greeneri</i> Scott Valley phacelia	Weaverville	6	5000-7000	Gravelly serpentine slopes and forest openings
<i>Potentilla crataegi</i> crested or Klamath potentilla	Mt. Shasta	4,5	7000-9000	Rocky slopes and ridges in depressions where snow lingers, serpentine or basic substrate.
<i>Raillardella pringlei</i> showy raillardella	Mt. Shasta Weaverville	4-6	4000-7500	Wet serpentine meadows, seeps and streambanks.
<i>Raillardopsis scabrata</i> (= <i>Raillardella scabrata</i>) rough raillardella	Shasta Lake Yolla Bolla?	11	5500-7500	Rocky, open subalpine slopes

** Plants recommended to the regional Forester for addition to the sensitive species list, but not listed as of March 1993

? Suspected to occur or not currently documented

Table G-4 (continued)
Sensitive and Endemic Plant List

Scientific Name Common Name	Range on Shasta-Trinity Districts	Mgt. Areas	Elevation (in feet)	Habitat
<i>Ranpa columbiae</i> ** Columbia cress	McCloud	2	500-4500?	Seasonal lakebeds and drainages east of the Cascades.
<i>Sedum laxum</i> ssp. <i>flavum</i> pale yellow stonecrop	Hayfork Yolla Bolla	18-20	2500-6000	Rock outcrops
<i>Sedum paradisum</i> (= <i>S. obtusatum</i> ssp. <i>p</i>) Canyon Creek stonecrop	Big Bar Shasta Lake? Weaverville?	4	3800-6500	Granite outcrops
<i>Silene invisa</i> short-petaled campion	Weaverville Mt Shasta?	4	5800-8000	Red fir and subalpine forest
<i>Trillium ovatum</i> ssp. <i>oettingen</i> Salmon Mountains wakerobin	Weaverville McCloud	2, 4, 6, 7, 10, 11	3900-6400	Moist, shady conifer forest, especially near streams and montane riparian scrub
<i>Trimorpha acaes</i> var. <i>debilis</i> (= <i>Engeron a</i> var. <i>d</i>) northern daisy	Mt Shasta	4	7000 +	On Shasta-Trinity known only from Mt. Shasta, open rocky habitat above timberline

Sensitive Plants Suspected to Occur on the Shasta-Trinity National Forests

<i>Botrychium pumicola</i> pumice moonwort	Mt. Shasta (poex)		5500-9000?	Pumice slopes, sometimes in lodgepole pine forest
<i>Calochortus greener</i> Greene's mariposa lily	Mt. Shasta		4000-5000	Brushy openings in montane conifer forests
<i>Ivesia longibracteata</i> Castle Crags ivesia	Mt. Shasta?		4000-5000	Granite and diorite outcrops near and above timberline
<i>Lewisia cantelovii</i> Cantelow's lewisia	Mt Shasta?		500-3000	Moist rock outcrops in broad-leaf and conifer forests

** Plants recommended to the Regional Forester for addition to the sensitive species list, but not listed as of March 1993

? Suspected to occur or not currently documented Poex Possibly extirpated (not relocated in recent times)

**Table G-4 (continued)
Sensitive and Endemic Plant List**

Scientific Name	Range on Shasta-Trinity		Elevation	Habitat
Common Name	Districts	Mgt. Areas	(in feet)	
<i>Lomatium peckianum</i> Peck's lomatium	Mt Shasta?		2500?	Pine-oak woodland, often on ultramafic soil.
<i>Munartia decumbens</i> The Lassics sandwort	Yolla Bolla?		5100	Jeffrey pine woodland, dry serpentine soil.
<i>Ophioglossum vulgatum</i> adder's-tongue fern	Mt Shasta (poex)		1000?	Meadows, marshes, moist forests
<i>Puccinellia howellii</i> Howell's alkali grass	Weaverville?		1500	Mineral seeps.
Endemic to the Shasta-Trinity National Forests (In addition to endemic sensitive species)				
<i>Ageratina shastensis</i> (= <i>Eupatorium shastense</i>) Shasta eupatory	Shasta Lake	8, 10, 12	2000-6000	Limestone outcrops
<i>Arnica venosa</i> veiny arnica	Shasta Lake Weaverville	7, 8, 12	1500-5000	Mixed conifer-hardwood forest with Douglas-fir; ponderosa pine, black oak, mostly north slopes & ridgetops
<i>Ericameria ophitidis</i> (= <i>Haplopappus ophitidis</i>) serpentine macronema	Hayfork Yolla Bolla	19, 21, 22	2600-5600	Serpentine outcrops, open Jeffrey pine forest on serpentine soil.
<i>Eriogonum lbertini</i> Dubakella Mountain buckwheat	Hayfork Yolla Bolla	19, 21, 22	2400-5500	Open Jeffrey pine forest on serpentine soil

? Districts not currently documented.
Possibly exist in the Trinity

Figure G-3
Shasta -Trinity National Forests
Wildlife/ Fisheries/ Botany Programs

Program Guided by Nation; Regional and Forest Policy, Management Direction, Mission Statements, Program like "RISE TO THE FUTURE" & "LET'S GET WILD", Forest Goals & Objectives, Species Priorities, etc

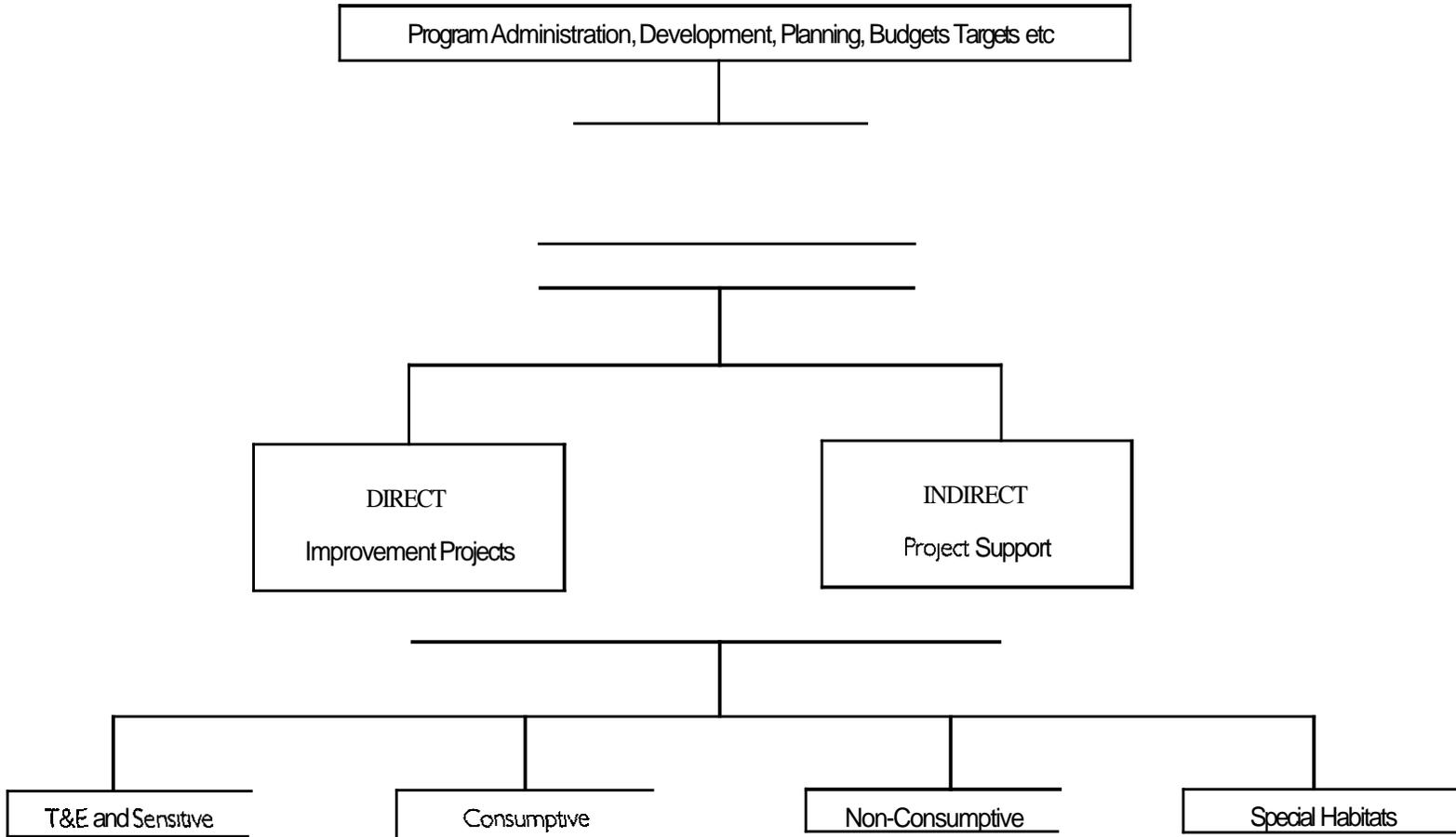
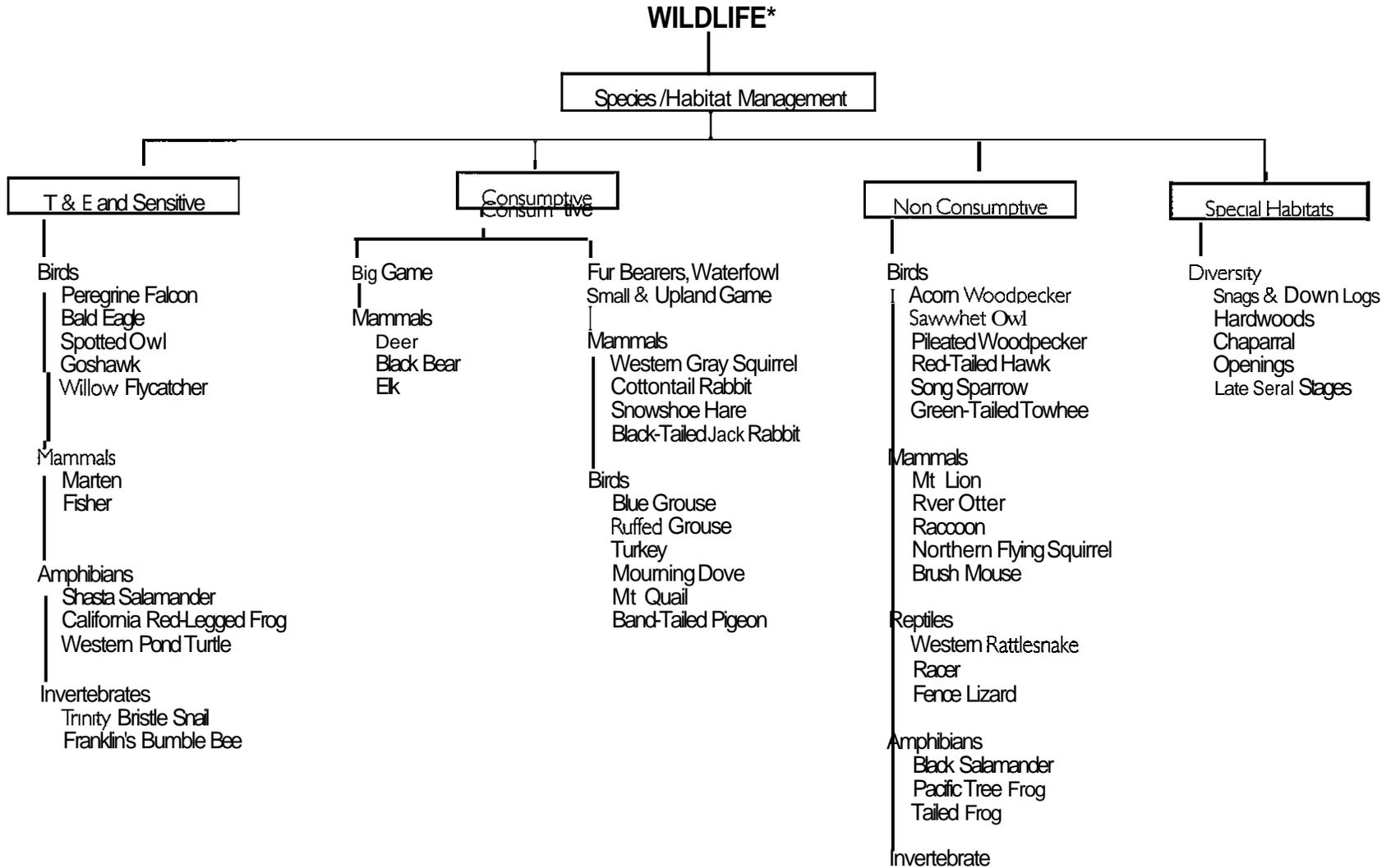
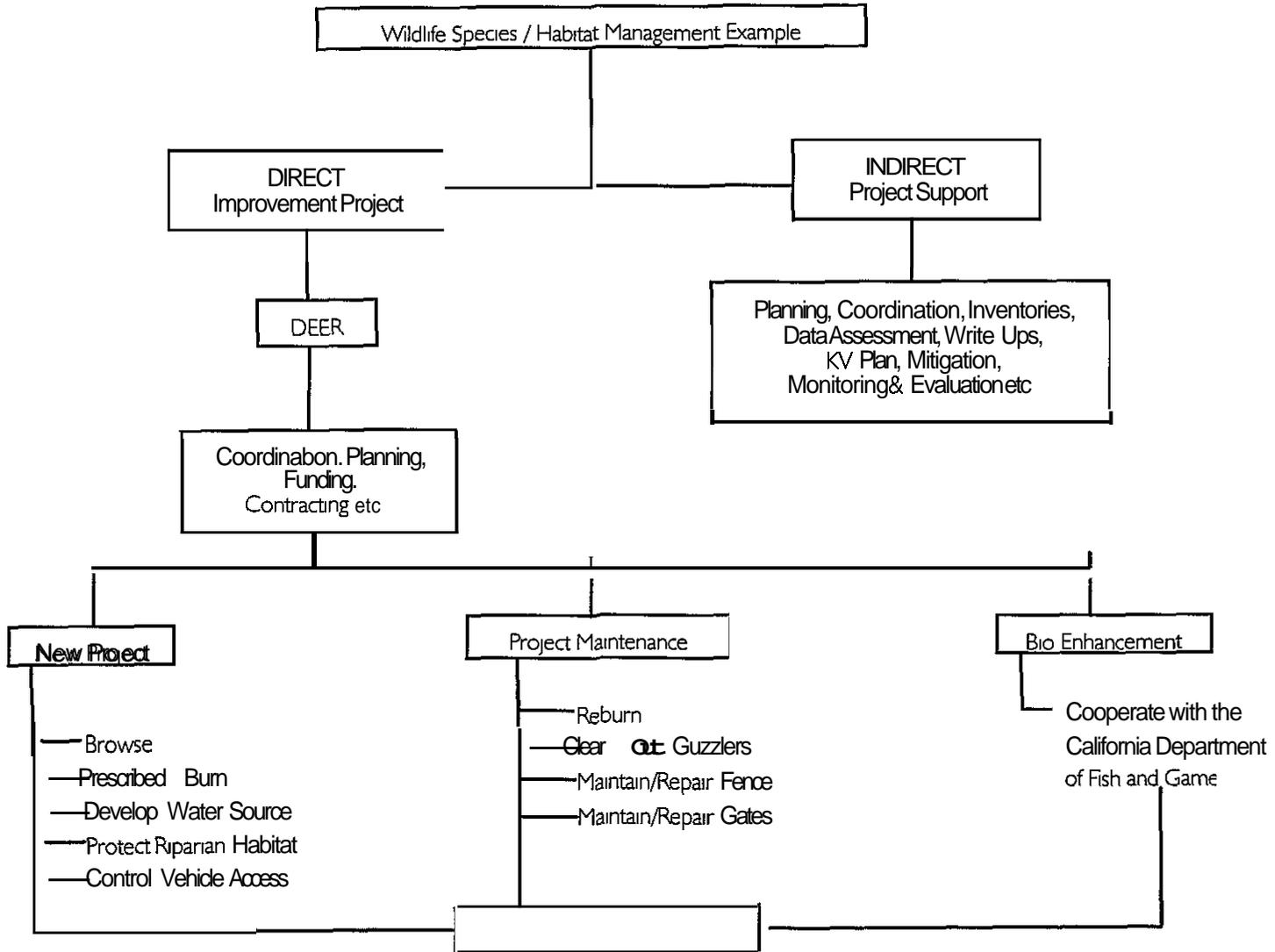


Figure G - 4
Shasta -Trinity National Forests
Wildlife / Fisheries/Botany Programs

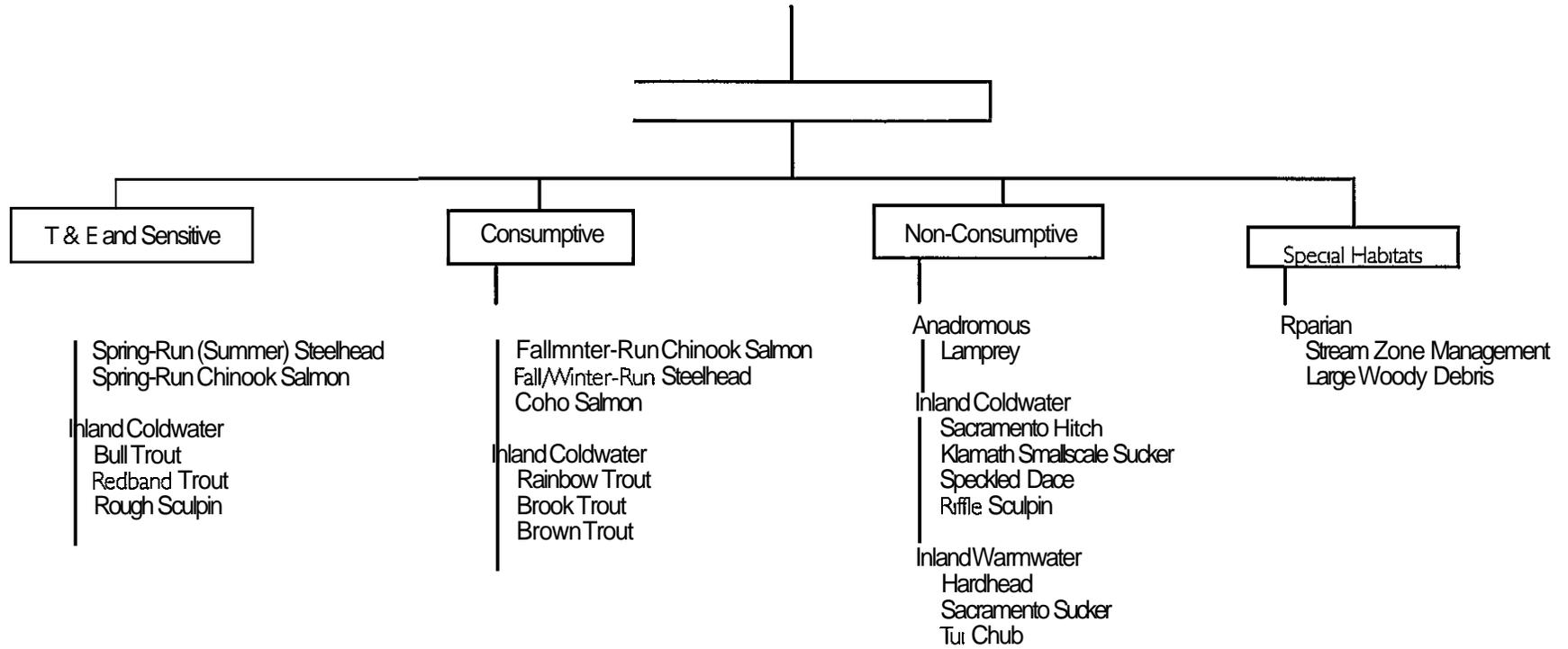


* Lists do not include all species on the Forests

**Figure G - 5
Shasta -Trinity National Forests
Wildlife Program**



**Figure G - 6
Shasta -Trinity National Forests**



* Lists do not include all species on the Forests

Figure G - 7
 Shasta -Trinity National Forests
 Fisheries Program

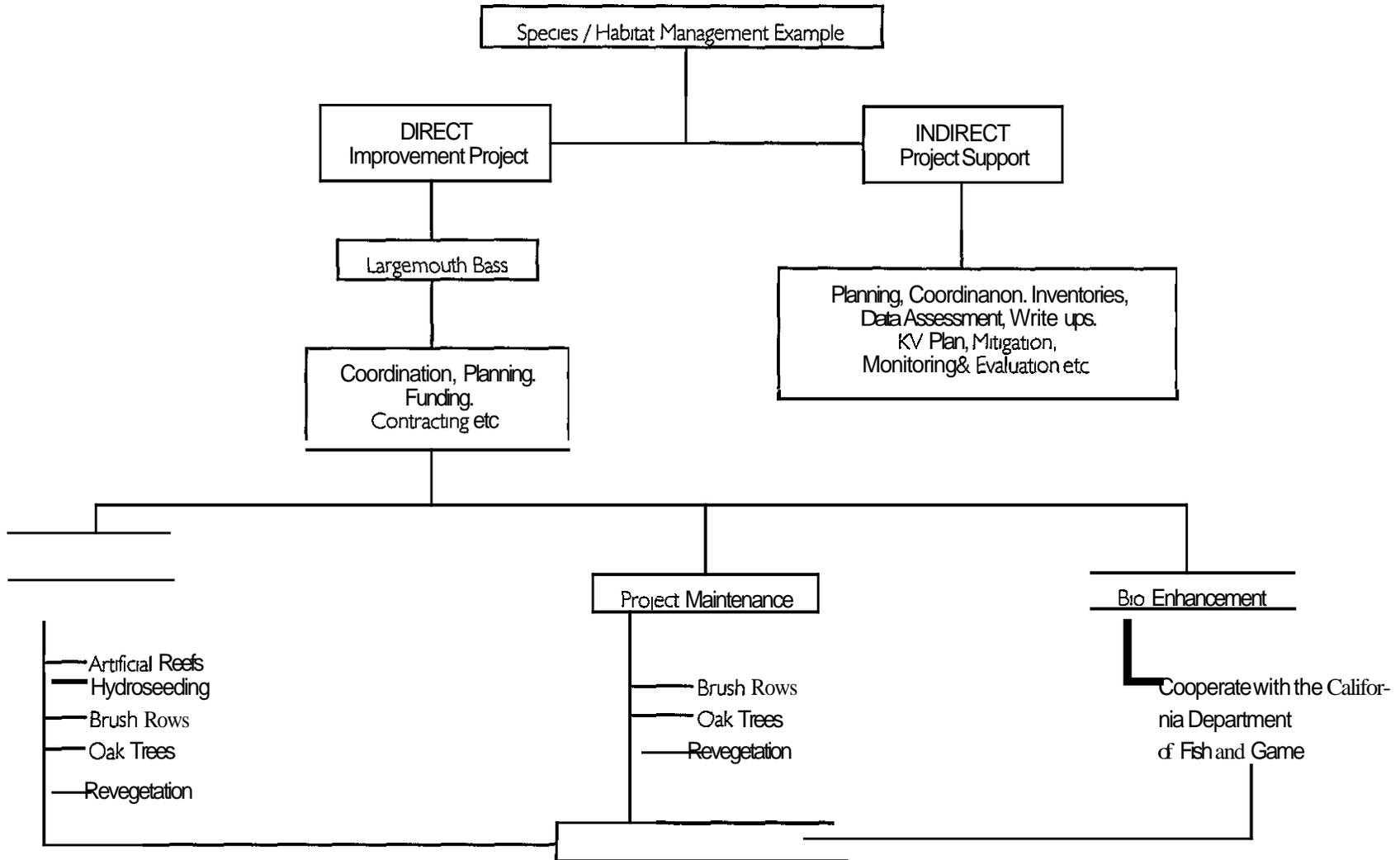
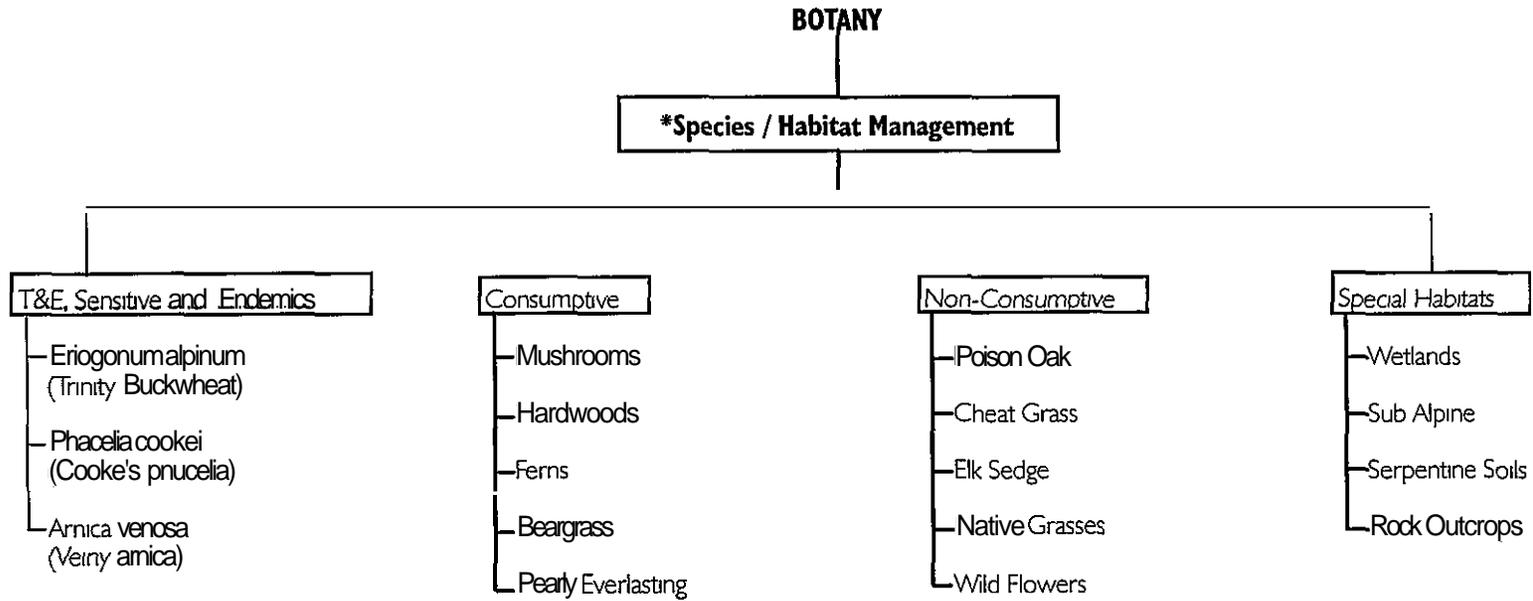
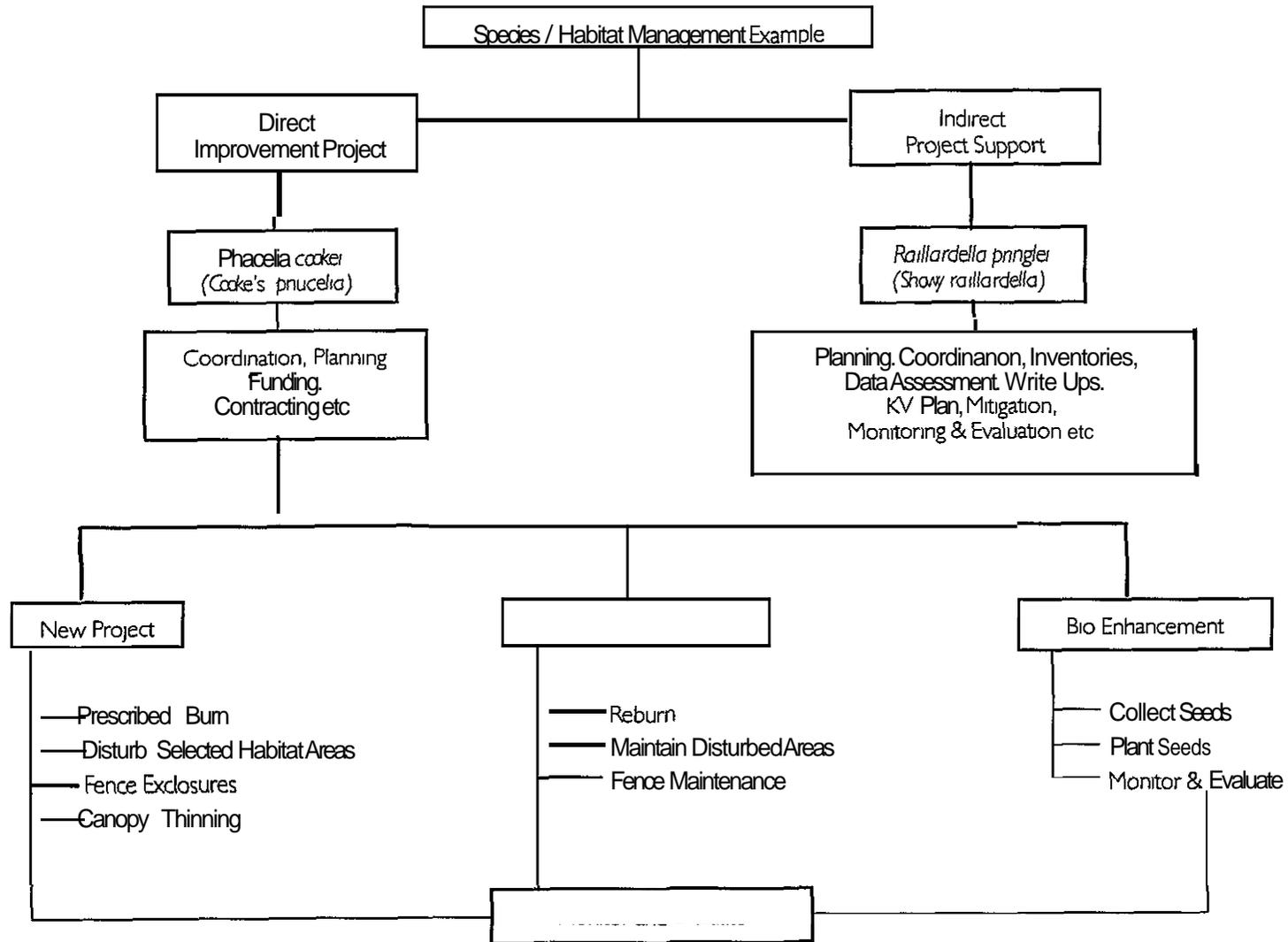


Figure G-8
Shasta -Trinity National Forests



** Lists do not include all species on the Forests*

Figure G-9
Shasta-Trinity National Forests
Botany Programs



Appendix :

Watershed Condition/Cumulative Watershed Effects

APPENDIX H

Watershed Condition/Cumulative Watershed Effects

Watershed condition, as described in the Forest Service Manual Section 2521, is a description of the health of a watershed, or portion thereof, in terms of the factors which effect hydrologic function and soil productivity. Hydrologic function includes the quality, quantity, and discharge characteristics of surface and groundwater resources. Soil productivity is the capacity of a soil for producing a plant community or sequence of plant communities under a specified system of management.

The concept of watershed condition was conceived because watershed scientists and managers desired to have a holistic appraisal of a watershed, based on integrated soil, water, geologic, vegetative, and management factors. There are a number of factors which influence watershed condition, natural and/or human induced, which can have either a negative or positive effect. Examples of these factors include changes in peak streamflows, erosion (sheet, rill, and mass wasting), soil compaction, and deforestation. Additionally, the cumulative effects of management activities, including the relative timing, location, type and level of activities are significant because they can affect any of the above factors.

In watershed management in Northern California, the primary concerns are impacts resulting in (1) increases in erosion and sedimentation rates related to management activities which lead to decreased soil productivity and water quality, (2) factors which may lead to deleterious changes in stream channel condition, including road and harvest unit related impacts to peak streamflows, and (3) compacted areas, including roads, landings, and skid trails, which reduce site productivity and take land out of production.

Successive and increasing amounts of soil disturbance and compaction decrease soil productivity and increase erosion and peak streamflows through increased surface runoff, interception of subsurface runoff, and more rapid delivery of runoff and sediment to stream channels. In-

creased peak streamflows result in greater sediment carrying capability, which allows for the mobilization of stored sediment. Additionally, higher streamflows contribute to channel margin undercutting and downcutting, which often lead to valley inner gorge landsliding. Sediment derived from these processes is transported and eventually deposited downstream, much to the detriment of fish habitat. In order to monitor watershed condition over time, some system of measures is needed which considers these factors.

The probable effects of implementation of each of the alternatives on watershed condition was evaluated in terms of the potential for initiating cumulative watershed effects. Cumulative effects are a function of (1) the amount of sensitive ground and its hazard level within a watershed, (2) the level of management activities, and (3) the location of impacts relative to hazardous areas. In the Forest Plan and this Final EIS, both the amount of sensitive ground present within a watershed and the level of past and present harvesting activities were evaluated.¹

Sixty-one fourth and fifth-order watersheds were identified on the Forests. They range in size from 11 to 410 square miles. The available data base utilized to evaluate cumulative effects was the third-order Soil Resource Inventory, a harvest history of the Trinity Forest, a Forest-wide Water Resource Inventory, and a third-order Geologic Resource Inventory.

The following factors were used to assess each watershed's sensitivity to cumulative effects: (1) slope gradient, (2) soil erodibility, (3) mass wasting potential, and (4) the peak streamflow characteristics of each watershed. These factors were weighted through a calibration process, and combined through a simple equation yielding a sensitivity index. This sensitivity index ranged from 5 to 66, and served well in contrasting highly unstable, sensitive watersheds from low hazard, non-sensitive watersheds. According to their sensitivity index, the 61 watersheds

¹ Haskins, D M, 1986, A Management Model for Evaluating Cumulative Watershed Effects, Proceedings from the California Watershed Management Conference, West Sacramento, CA, November 18-20, 1986, pp 125-130

Appendix H - Watershed Condition/Cumulative Effects

were grouped into low, moderate, high and extreme sensitivity classes

The second factor in cumulative watershed effects, the level of management activities, was determined using the equivalent road area (ERA) method. This is simply an accounting system used to normalize all forms of management activities which have occurred in different time periods. The common denominator is the disturbed and compacted area of any activity related to an area of road. It is used to normalize the disturbances from roads, skid trails, landings, cableways, and site preparation activities and their influence on peak streamflow and sediment delivery.

Recent studies³ have shown that there are management level thresholds within watersheds, where if exceeded, the risk of cumulative effects increase dramatically. For high risk or extremely sensitive watersheds, various workers have defined a threshold of from 12 percent to 15 percent ERA. It is apparent that watersheds having only small areas of sensitive ground and therefore, a low sensitivity index, can withstand greater levels of management activity without undergoing cumulative watershed effects. Therefore, different thresholds have been defined for the different sensitivity classes: 12 percent ERA for extremely sensitive, 14 percent ERA for highly sensitive, 16 percent for moderate, and 18 percent for low sensitivity watersheds.

Thresholds in this methodology are not thought of as a point where if exceeded, erosion, sedimentation and water quality degradation will occur. They are instead treated as "red flags" or thresholds of concern (TOC) where, if exceeded, it is realized that the risk has increased significantly and mitigation measures should be implemented to protect against the onset of cumulative effects. Mitigation measures might include such things as increasing the size of culverts to carry potentially greater peak streamflows, rocking roads to reduce surface erosion, and wider riparian management zones to help insure their effectiveness. Therefore, a watershed projected to be over the TOC could still be managed, but special management practices would be recommended to decrease the risk of initiating cumulative effects and watershed condition

degradation. It is also recognized that if the TOC is exceeded and mitigation measures are not employed, that the risk of initiating cumulative effects is significant and unacceptable.

The FORPLAN model calculates and accumulates ERAs Forest-wide. These are generated from timber harvest and road building activities. Through revegetation, re-establishment of surface cover and physical processes such as frost heaving, disturbed and compacted areas gradually recover. To account for this, the calculated harvest ERA value is recovered linearly over a 30 year period in the model. However, a residual ERA value is retained to account for system roads which do not recover over time.

This methodology is linked to watershed condition through classifying watershed condition in terms of the level of ERAs for individual watersheds with respect to their individual TOC. The classes are defined as follows:

Class 1

ERA is less than 40 percent of TOC (watershed condition is at or near potential)

Class 2

ERA is between 40 and 80 percent of TOC (watershed condition is between near potential and a point near tolerance)

Class 3

ERA is greater than 80 percent of TOC (watershed condition is near or below tolerance)

Field experience indicates that Class 1 watersheds, having ERA levels lower than 40 percent of their individual TOC, are generally in excellent condition. Within the hundreds of subwatersheds that together comprise the typical fifth-order watershed, stream channel conditions are generally good to excellent, and soil productivity is maintained at optimal levels. Water quality generally exceeds objectives. Within the subwatersheds, there is generally only a low potential for degraded water quality or soil productivity due to the initiation of cumulative watershed effects.

2 Coats, R. N., Miller, T. O., Kallstrom, D. W., 1979, Assessing Cumulative Effects of Silvicultural Activities. John Muir Institute, Napa, CA.

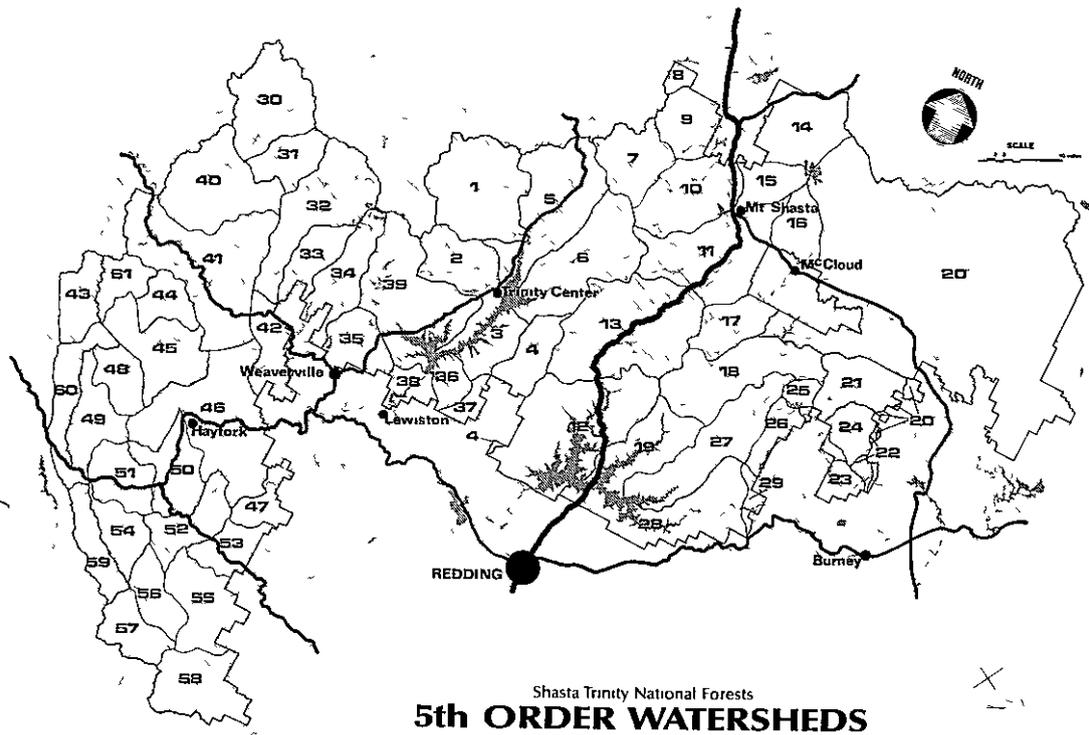
3 Seidelman, P. J., 1980, Methodology for Evaluating Cumulative Watershed Impacts, U.S. Forest Service, Watershed Management, Pacific Southwest Region, Dept. of Agric.

On Class 2 watersheds stream channel conditions generally range from fair to good, while water quality generally meets objectives. Soil productivity is maintained, although at lower levels than Class 1 watersheds. Within subwatersheds, there is a low to moderate potential for increased erosion and accompanying decreased site productivity and water quality due to cumulative effects.

Class 3 watersheds have ERA levels greater than 80 percent of their TOC. Since this condition class straddles the TOC, which is defined as the point where the risk of initiating cumulative impacts increases significantly, it is apparent that actual conditions can vary tremendously as a function of actual ERAs. Therefore, watershed condition can range from good to poor. Water quality can meet or be below objectives, and channel conditions can range from good to poor. Soil productivity is acceptable but at levels lower than Classes 1 and 2. The potential for decreased water quality and soil productivity from erosion, related to cumulative effects, range from moderate to high.

Sixty-one watersheds have been identified within the Forests (refer to map, **Figure H-1**). These watersheds range from 11 to 410 square miles in size. An inventory of the existing watershed condition of these watersheds indicates that most are presently Class 1 and Class 2 (**Tables H-1** and **H-2**). However, five watersheds have relatively high disturbance levels which cause them to be Class 3. These watersheds are the East Fork of the South Fork Trinity River, Rattlesnake Creek, Gulch, Hyampom and Upper Hayfork Creek. Cumulative effects have occurred within subwatersheds of these watersheds, and there remains a significant risk of initiating cumulative effects within the main channels which drain these watersheds. In addition, some watersheds were extensively affected by the 1987 fires, and although they are considered to be in condition Class 2, they could undergo cumulative watershed effects in some of their subwatersheds. These watersheds are Plummer and Butter Creek.

Figure H-1
5th Order Watersheds



Watershed boundaries are only approximate of this scale

Table H-1
Shasta Forest
Watershed Summary

#	Watershed Name	Watershed Area* (Acres)	Threshold of Concern (%ERA)	Existing ERA (%ERA)	Watershed Condition (Class)
1	Coffee Creek	59,334	16%	1.5%	1
2	Swift Creek	35,790	16%	6.2%	1
3	East Trinity Reservoir	23,860	18%	6.6%	1
4	Clear Creek	20,334	16%	1.0%	1
5	Main Fork Trinity River	47,222	16%	5.0%	1
6	East Fork Trinity River	40,434	16%	6.2%	1
7	Upper Trinity River	19,864	16%	5.1%	1
8	Willow Creek	4,555	14%	4.0%	1
9	Parks Creek	20,406	16%	8.0%	2
10	South Fork Sacramento	40,139	16%	10.0%	2
11	Upper Sacramento River	28,855	16%	8.0%	2
12	Sacramento Arm	68,996	16%	1.0%	1
13	Lower Sacramento River	54,950	16%	6.0%	1
14	Whitney Creek	40,760	18%	4.0%	1
15	Avalanche Creek	15,810	18%	6.0%	1
16	Upper Squaw Valley Creek	18,110	16%	8.0%	2
17	Lower Squaw Valley Creek	22,215	16%	7.0%	2
18	Lower McCloud River	44,372	16%	1.0%	1
19	McCloud Arm	31,383	16%	1.0%	1
20	Upper McCloud River	263,934	18%	10.0%	2
21	Kosk Creek	11,812	14%	7.0%	2
22	Pit #4	6,996	16%	6.0%	1
23	Pit #5	11,930	14%	6.0%	2
24	Nelson Creek	7,464	14%	5.0%	1
25	Iron Canyon	7,757	14%	6.0%	2
26	Pit #6	9,520	14%	4.0%	1
27	Squaw Creek	46,074	14%	3.0%	1
28	Pit Arm	48,485	14%	2.0%	1
29	Pit #7	7,640	14%	4.0%	1
Shasta Forest Total		1,059,003			

* Watershed area includes only National Forest Lands

Table H-2
Trinity Forest Watershed Summary

#	Watershed Name	Watershed Area* (Acres)	Threshold of Concern (%ERA)	Existing ERA (%ERA)	Watershed Condition (Class)
30	Upper New River	56,536	14%	10%	1
31	East Fork New River	26,152	16%	14%	1
32	North Fork Trinity River	67,056	16%	05%	1
33	East Fork North Fork Trinity River	23,919	16%	12%	1
34	Canyon Creek	32,617	14%	12%	1
35	Weaverville	22,156	16%	63%	1
36	West Trinity Reservoir	15,104	16%	106%	2
37	Upper Clear Creek	4,642	16%	30%	1
38	Lewiston	11,930	16%	46%	1
39	Stuart Fork	66,997	16%	70%	2
40	Lower New River	65,822	14%	25%	
41	Burnt Ranch	102,906	14%	35%	
42	Helena	21,569	16%	52%	
43	Hyampom	12,833	12%	105%	
44	Corral Creek	18,923	16%	98%	
45	Lower Hayfork Creek	47,192	16%	38%	
46	Hayfork Creek	71,816	18%	60%	1
47	Browns Creek	15,457	18%	60%	1
48	Butter Creek	22,039	16%	100%	2
49	Plummer Creek	26,840	16%	78%	2
50	Salt Creek	30,149	16%	68%	2
51	Rattlesnake Creek	27,974	16%	158%	3
52	Upper Hayfork Creek	28,679	16%	129%	3
53	Middle Fork Cottonwood Creek	17,572	18%	80%	2
54	Smoky Creek	21,834	16%	82%	2
55	Beegum Creek	42,020	16%	72%	2
56	East Fork South Fork Trinity	23,864	14%	113%	3
57	Upper South Fork Trinity	26,741	14%	106%	2
58	South Fork Cottonwood Creek	45,557	16%	13%	1
59	Happy Camp Creek	23,120	12%	80%	2
60	Hidden Valley Watershed	27,688	12%	82%	2
61	Gulch Watershed	14,840	14%	100%	3
Trinity Forest Total		1,062,544			
Combined Shasta-Trinity Total		2,121,547			

* Watershed area includes only National Forest Land

Appendix

The Regional Timber Supply-Demand Situation in California

APPENDIX I

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 I-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 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

Table I- I
California Timber Harvests by Ownership
1952 - 1993

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 56
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 8 6	07	1 5 1	3 4 4
1981	1 7 2	04	1 0 9	2 8 5
1982	1 5 0	06	9 4	2 5 0
1983	1 8 9	08	1 6 8	3 6 5
1984	2 0 9	03	1 5 6	3 6 8
1985	2 1 7	06	1 8 2	4 0 5
1986	2 3 1	09	1 9 6	4 3 6
1987	2 5 8	1 0	1 9 7	4 6 5
1988	2 6 0	06	2 1 8	4 8 4
1989	2 6 4	06	2 0 2	4 7 2
1990	2 6 7	05	1 5 3	4 2 5
1991	2 0 7	06	1 3 4	3 4 7
1992	2 1 2	06	1 0 3	3 2 1
1993	2 2 6	05	5 8	2 8 9

Sources California Department of Forestry and Fire Protection
 California State Board of Equalization
 Bureau of Indian Affairs, USDI
 Bureau of Land Management, USDI
 Forest Service, USDA

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

**Table I - 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	1,100	1,080	39.4
Northern Interior	542	503	18.0
Sacramento	467	413	19.7
San Joaquin	145	148	6.4
All Private Land	2,254	2,144	83.5
Industrial Private	1,760	1,169	41.5
Non-industrial Private	496	974	42.1

Source Krumland, Bruce, and William McKillop, Prospects for Supply of Private Timber in California, University of California, July 1990.

Appendix I - Regional Timber/Supply Demand Situation

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.

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.

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.

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)	177	30-40
	Sierra	99	60-70
	Sequoia	70	40-50
	Inyo (6)	8	8-10
R5 Total		1,236	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 and 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.

Appendix I- Regional Timber/Supply Demand Situation

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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Appendix

Major Silvicultural Systems and their Application

APPENDIX J

Major Silvicultural Systems and their Application

Introduction

A

The purpose of this appendix is to describe the major silvicultural systems used in land management planning for the Shasta-Trinity National Forests, and the advantages and disadvantages of each, considering both biological and managerial perspectives. However, almost all of the information in this appendix also applies to selecting an appropriate silvicultural system for a particular stand.

Silvicultural systems are used to manage forest stands. A silvicultural system is a planned sequence of treatments for controlling the species composition and structure of the vegetation during the life of a stand. A stand is a community of trees sufficiently uniform to be distinguishable as a silvicultural or management unit. Typically, stand sizes vary from about 5 to over 30 acres on National Forest lands.

Management objectives for stands typically are combinations of forest products and amenities. An example is specific amounts of livestock forage, water runoff, and wood products, kinds of wildlife habitat, and specific scenic view qualities. No single silvicultural system can produce all desired combinations of products and amenities from a particular stand, or from a National Forest.

Forests are managed by using combinations of silvicultural systems to achieve the forest management objectives. The combinations vary greatly, depending on the characteristics of local forest ecosystems and differing management objectives.

Selection of the appropriate silvicultural systems occurs at both the National Forest land management planning level and Ranger District project level. The Forests' selection is based on a broad match of silvicultural systems with the overall planning objectives and ecological characteristics of broadly-defined land classes. Examples of land classes are areas capable, available and suitable for growing commercial wood products, riparian management zones, and spotted owl habitat conservation areas. At the Ranger District, project level selection of silvicultural systems is typically made by a certified silviculturist. Choices are based on matching the attributes of the silvicultural systems with specific management objectives and the ecological characteristics for specific stands.

Descriptions of the Silvicultural Systems

B

A silvicultural system typically includes cutting trees, growing new trees, and controlling competing plants. Cuttings are classified as regeneration cuttings (those that help to replace stands), and intermediate cuttings (those that maintain or improve the character of existing stands).

Silvicultural systems are not just the creation of professional foresters, rather, they are adaptations of natural occurrences. Nature makes "regeneration cuttings" by means of fire, insects, disease, wind, and other phenomena, by removing a single tree, a small group of trees, a stand, or sometimes an entire forest.

Regeneration cuttings strongly influence stand characteristics and management options. Therefore, the five major silvicultural systems are named after them: clearcutting, seed-tree, shelterwood, single-tree selection, and group selection. Each of these systems includes regeneration cuttings to establish new tree seedlings or sprouts, and intermediate cuttings to develop the desired stand characteristics, such as species composition, spatial distribution, and plant vigor.

The clearcutting, seed-tree, and shelterwood systems are even-aged systems. This means that all of the trees in the stand are approximately the same age. The single-tree and group selection systems are uneven-aged systems, the trees in the stand differ markedly in age, with at least three major age classes present. Uneven-aged stands have no beginning or end points in time.

Even-aged Systems

Clearcutting is the harvesting, in one operation, of all merchantable trees in a stand or a larger area to help establish a new even-aged stand. The new stand may be created by natural processes, such as seeding from trees in adjacent stands, or by sprouting from the stumps or roots of the cut trees. The new stand can also be created by man through broadcast scattering of seeds, or by planting seeds or seedlings. On the Shasta-Trinity National Forests, clearcut stands are usually regenerated by planting seedlings.

Clearcutting does not necessarily mean that all unmerchantable trees are removed. Where feasible, high-quality unmerchantable trees are saved to become part of the new stand. It is estimated that high-quality unmerchantable trees, in logical treatment units, can be retained on about 10-20 percent of the acres to be regenerated by clearcutting on the Forests, particularly on gentle terrain.

The clearcutting silvicultural system is illustrated in **Figure J-1**

The seed-tree system (shown in **Figure J-2**) requires leaving a few good seed-producing trees per acre (typically about 3 to 10) during the regeneration cutting. These trees produce the seed needed to establish a new even-aged stand. Following seedling establishment, the seed trees are harvested. This system has seldom been used for intensive timber management on the Forests. The primary reasons are frequent unreliability of natural regeneration in the desired periods, invasion of cleared lands by unwanted vegetation (particularly shrubs), and the poor economics of harvesting the few seed trees after natural seedlings were established.

The shelterwood system (shown in **Figure J-3**) requires leaving sufficient trees per acre (typically 10 to 20), during the regeneration cutting, to provide an environment that protects (shelters) the seedlings of a new even-aged stand. This is referred to as the "seed step." Protection may be needed from excessive moisture stress or frosts in some forest areas. The new stand can be created by the natural or artificial processes described above.

Regeneration by planting seedlings under shelterwoods is a common practice on the Forests. The shelterwood trees are normally harvested following establishment of the seedlings of the new even-aged stand. Removal of the shelterwood trees is called the "overstory removal" step. The shelterwood system is most commonly used in stands where red or white fir are to be regenerated.

Seed and shelter trees left after a seed tree or shelterwood seed step cut may be retained through the life of the newly regenerated stands. When this occurs, these cuts are commonly referred to as green tree retention. This is most commonly done to meet ecological needs such as for wildlife habitat.

Uneven-aged Systems

In the single-tree selection system (shown in **Figure J-4**), each tree is evaluated for its contribution to the desired

characteristics of the uneven-aged stand. Regeneration and intermediate cuttings are usually done in one operation. The desired seedlings or sprouts grow in the spaces created by harvesting of individual trees.

Repeated selection cuttings, part of the single-tree selection system, have been used frequently to manage National Forest lands, particularly in the Sierra Nevada and Cascade Mountain Ranges. There has been a major shift to using the clearcutting or shelterwood systems over the last two decades. The primary reason is that the selection cuttings caused significant understocking in many stands, thereby reducing productivity. There are many examples of poor selection cuttings in California, under the guise of the single-tree selection system. High quality, large trees were cut, leaving inferior, small trees. Genetic principles were ignored, and many stands were left understocked, with slow-growing, small trees that are more susceptible to attacks by insects and diseases. In these situations, establishing a new even-aged stand typically is the most efficient way of regaining desired productivity levels and other stand qualities.

The group selection system requires harvesting trees in small groups (usually less than two acres). The opening created in the stand resembles miniature clearcuts. The uneven-aged stand consists of a mosaic of even-aged groups. Thus, the group selection method uses the principles of even-aged systems described above to manage much smaller units of land.

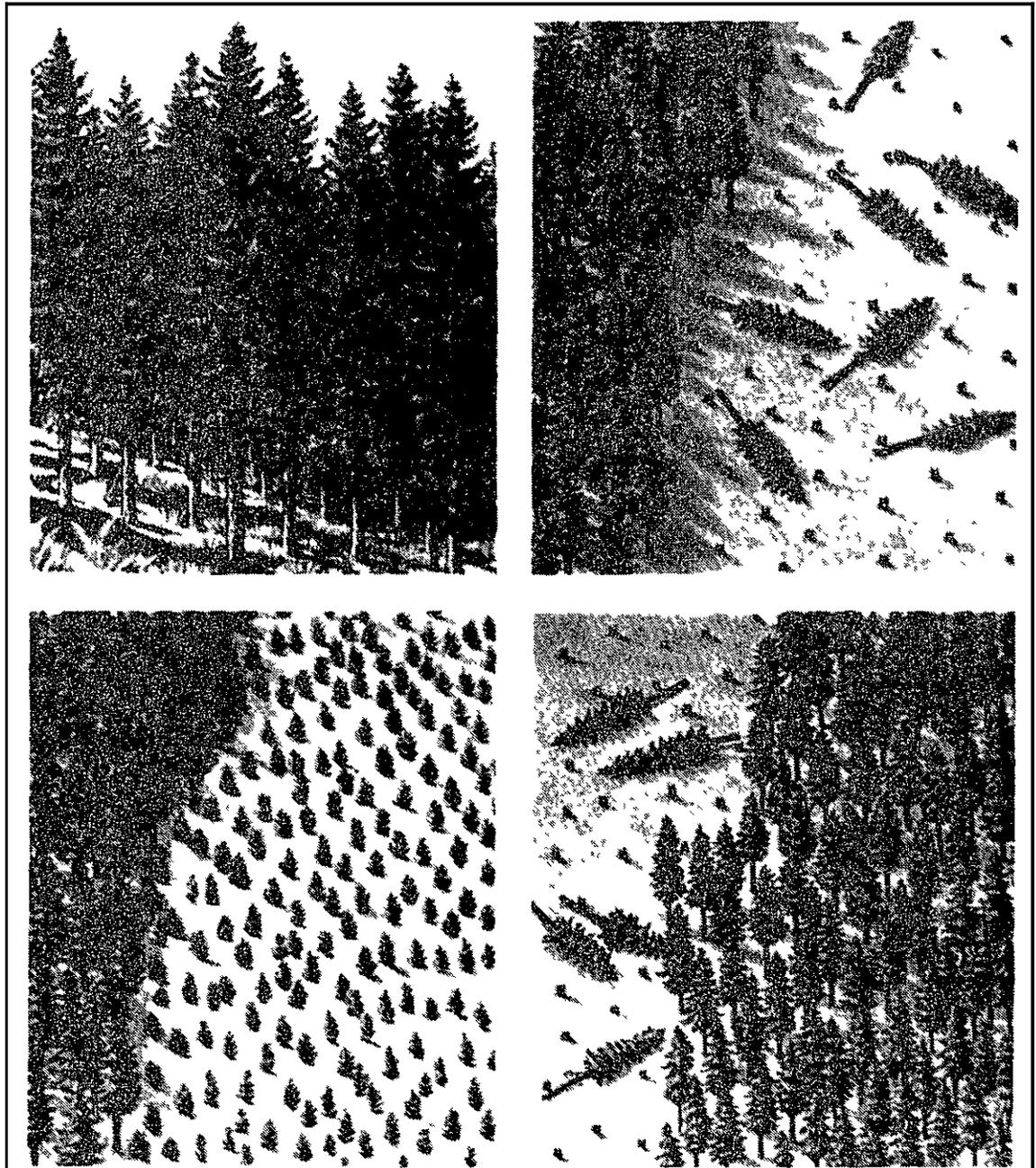
Even-aged systems are more practical than uneven-aged systems for intensive management of wood products. The reasons are explained in Section E, "Managerial Contrasts Among Forests and Stands Managed by Different Silvicultural Systems."

C Timber Yield and Regulation of Forests and Stands

Timber yield is the amount of wood that is harvested from a specified forest area. The maximum yield allowed from the Shasta-Trinity National Forests for a planning period (typically one decade), is called the allowable sale quantity (ASQ). By Federal law, the ASQ generally cannot exceed the long-term, sustained capacity of the Forests to grow wood. Within each National Forest, stands are managed by silvicultural systems to achieve a continuous production of the ASQ.

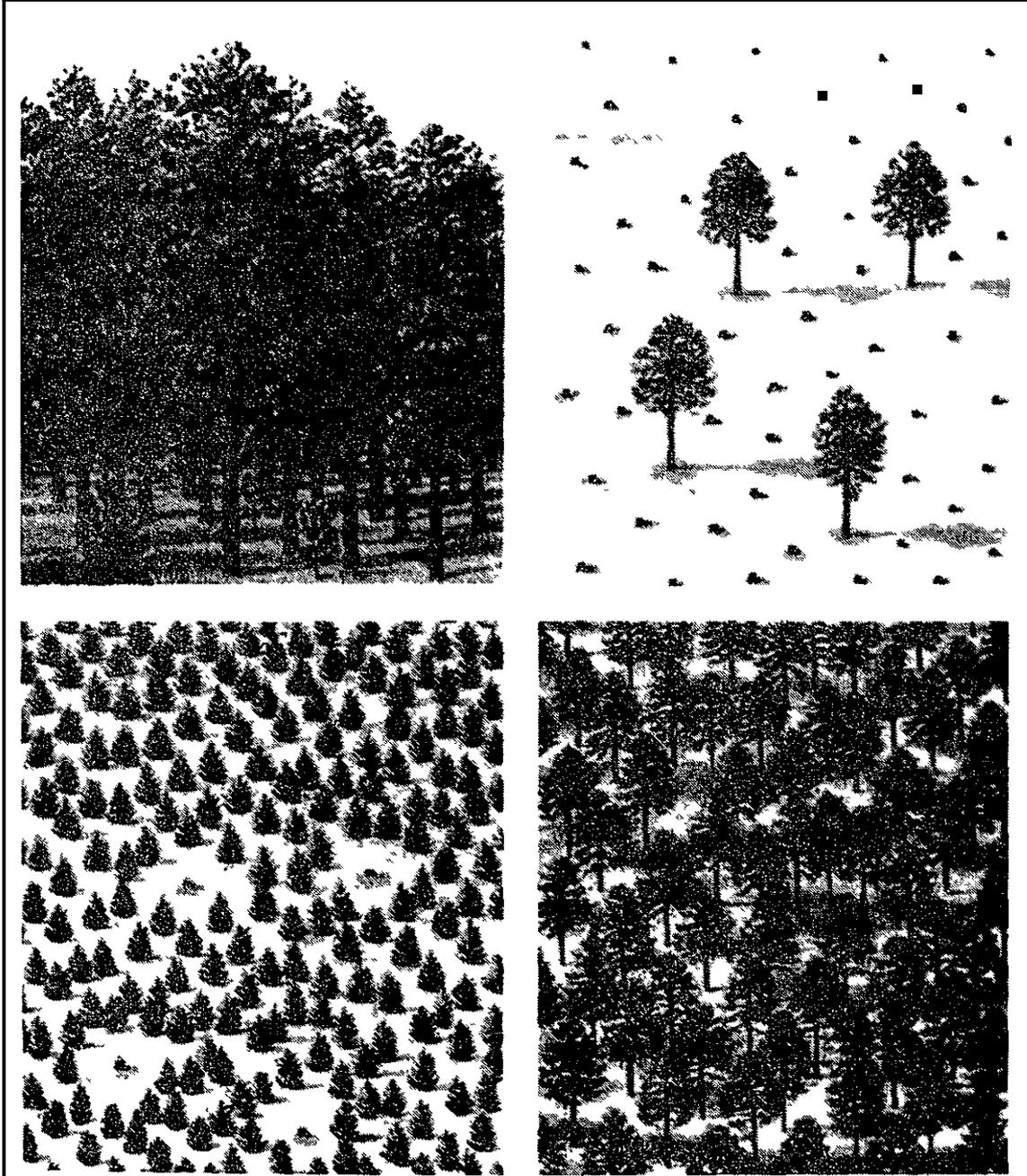
When this continuous production level is achieved, the forest and stands are said to be "regulated." Where the single-tree selection or group selection silvicultural sys-

FIGURE J-1 CLEARCUTTING SYSTEMS



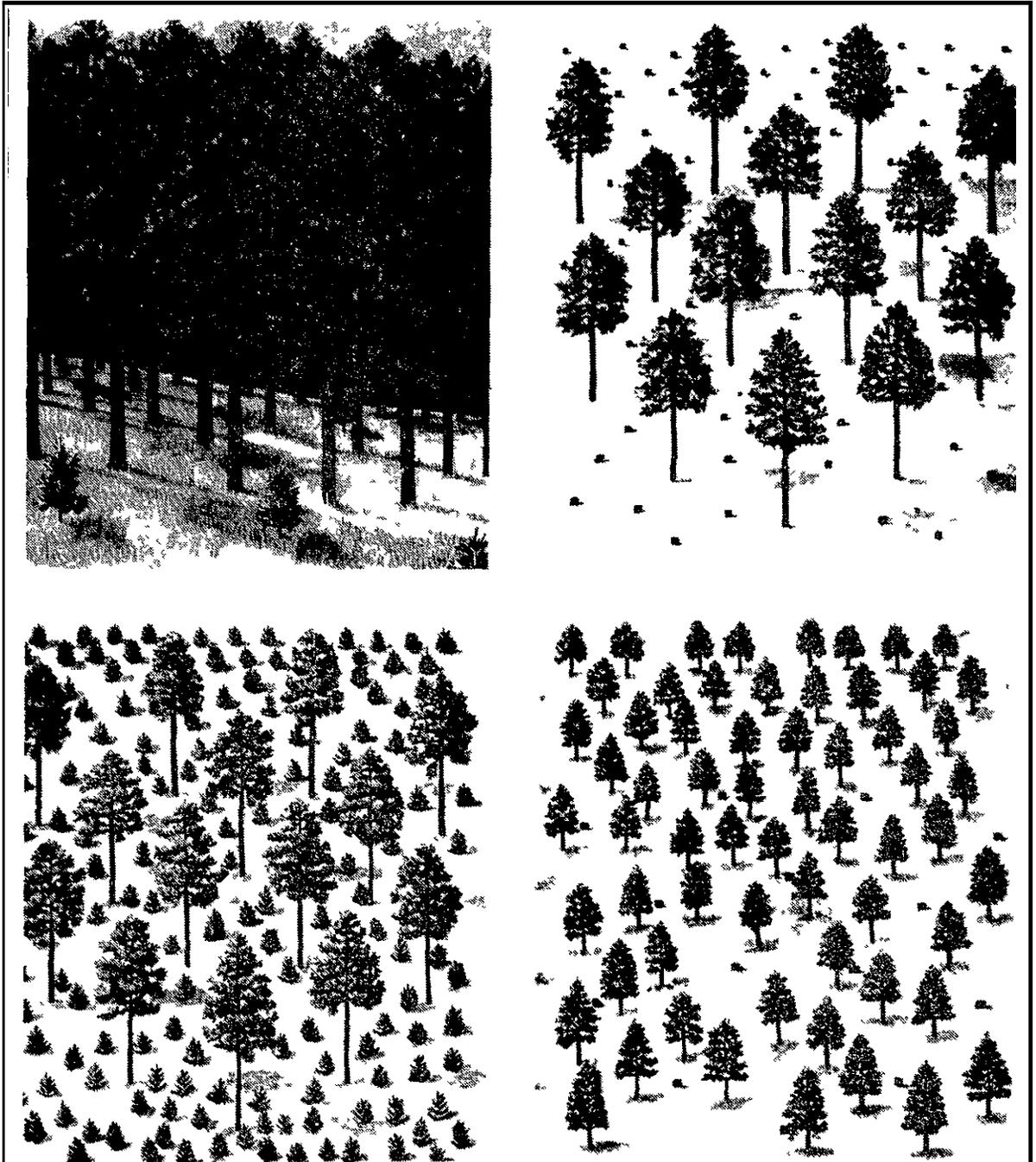
Clearcutting. Part of a mature stand is cut, removing all trees. A new stand arises from seeds of surrounding trees or from sprouts sent up by roots or stumps. Seedlings may also be planted or seeds broadcast. When the new trees are well on their way in the unobstructed light of the clearing, a neighboring stand of mature trees is cut in turn. (The illustration is from *The Secret Life of the Forest* by Richard M. Ketchum, copyright 1970 by American Heritage Press, and is used with the permission of McGraw-Hill Book Company.)

**FIGURE J-2
SEED-TREE SYSTEM**



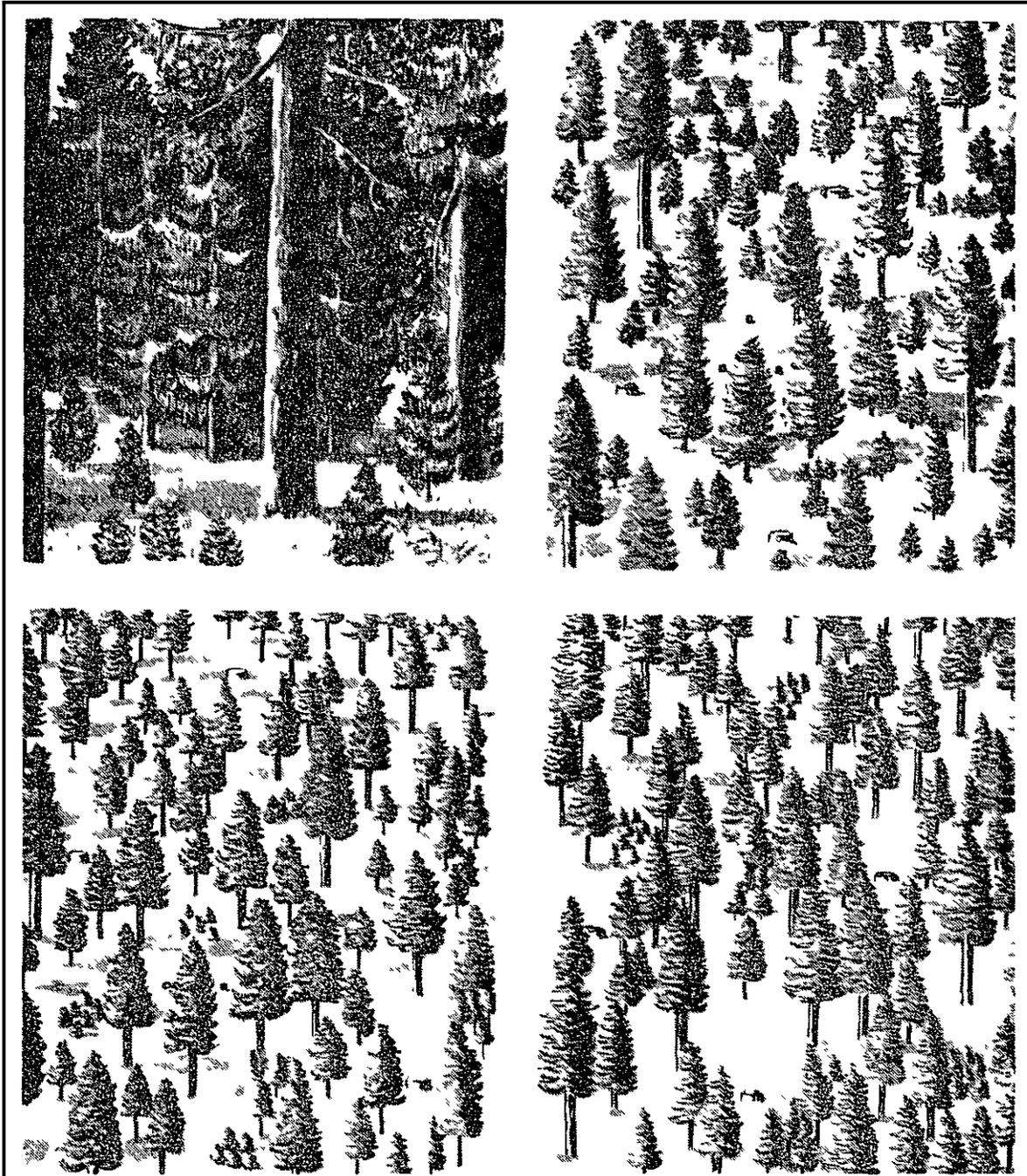
Seed-tree System. *The mature stand is logged, but enough trees are left to reseed the area. The seed trees usually are large and valuable, and may be harvested when they have fulfilled their purpose. Like clearcutting, the system favors light-demanding species. (The illustration is from *The Secret Life of the Forest* by Richard M. Ketchum, copyright 1970 by American Heritage Press, and is used with the permission of McGraw-Hill Book Company.)*

**FIGURE J-3
SHELTERWOOD SYSTEM**



Shelterwood System. *A mature stand is partially cut, leaving some of the better trees of desired species to grow, cast seed, and provide shade and perhaps other shelter for the new stand. Usually more trees are left per acre than in the seed-tree system. These shelter trees will be harvested after seedlings have become established and no longer need protection.*

**FIGURE J-4
SINGLE-TREE SELECTION SYSTEM**



Single-tree Selection System. *Cuts are made more often than in other systems, but since the entire stand is never removed, appearances are not much affected. Undesirable trees are removed, overly dense areas are thinned, and mature trees are harvested during each cut. Seedlings of shade-tolerant species develop wherever they can find room. The stand contains trees of many ages.*

tems are used, each regulated stand would produce approximately the same yield from each harvest. This would occur about every 10 years. By contrast, where the even-aged systems are used, yields from each harvest in a regulated stand would not be equal, but the average yield for the forest would be the same.

The conversion of wild stands to regulated stands has just begun. The goal of regulation will take many decades to achieve. No National Forest in California has been regulated yet.

Biological Contrasts among Forests and Stands Managed by Different Silvicultural Systems

The key biological contrasts are summarized in **Table J-1**.

Appearance

Variation in tree age. A forest managed by even-aged silvicultural systems consists of a mosaic of even-aged stands. Every age class would be represented in a regulated forest, and each age class would be represented by approximately the same number of stands. A regulated forest managed by the group selection system would resemble forests managed by the even-aged silvicultural systems, except that the even-aged components (groups) would be much smaller and more numerous. By contrast, each stand in a regulated forest, managed by the single-tree selection system, would have trees of many ages (perhaps all ages).

The oldest (or largest) trees in any managed forest depend primarily on the management objectives, not on the silvicultural systems. In particular, the amount of large trees or old-growth to be produced or maintained depends more on the willingness to forego yields than on the kinds of silvicultural systems used to manage stands.

Variation in developmental stages. In the even-aged and group selection systems, all stages of forest development are present in the forest, including grasses, forbs, shrubs, tree seedlings, and larger trees. Each stage is represented by entire stands or groups. By contrast, in the single-tree selection system the areas dominated by small plants, such as grasses, forbs, or shrubs are commonly very small (for example, less than one-hundredth of an acre), but they typically occur somewhere in every stand. In a regulated forest, the total area occupied by each stage should be about the same, regardless of the silvicultural system used.

Occurrence of shade-tolerant and intolerant plants. Even-aged and group selection systems favor plants that can readily be established and which grow well in full sunlight (shade-intolerant plants). These include grasses, most forbs and shrubs, and many of the most valuable commercial tree species, such as ponderosa pine and Douglas-fir. The single-tree selection system favors plants that can readily be established and grow well at low light levels (shade-tolerant plants). Examples are many ferns, few grasses, forbs, and shrubs, many non-commercial hardwood tree species, and a few commercial conifer tree species, such as white fir and incense-cedar.

However, on low-quality forest lands, where lack of soil moisture or other soil conditions cause low plant densities, shading by trees is greatly reduced. There, shade-intolerant plants will persist if the single-tree selection system is used.

Diversity of plant species. Species diversity depends on the biological and physical environments, how diversity is evaluated, and how the stands are managed under the different silvicultural systems.

On moderate- to high-quality lands, stands managed by the single-tree selection system shift toward shade-tolerant species. In California, many stands and forests, which were previously dominated by more valuable pine and Douglas-fir, now have large components of less valuable tanoak, madrone, or white fir due to single-tree selection. This process could reduce tree species diversity in such stands, compared with management by other silvicultural systems. The shift towards more shade-tolerant species also means that the species diversity of plants near the ground would eventually be lower in stands managed by the single-tree selection system.

The species composition of commercial tree species may be significantly increased or decreased during stand regeneration, depending on the environmental conditions, availability of natural seed, selection of species to be planted, and the success of the plantings. If artificial regeneration fails in stands with mixed species, the diversity in the naturally-regenerated stand may be reduced significantly. Potential seed trees of some species could have been harvested, or certain species (for example, white fir) could regenerate naturally under the brush that rapidly occupies newly harvested areas.

If artificial and natural regeneration fail, the species diversity of commercial trees is significantly reduced. The risk of a complete regeneration failure is least for the single-tree selection system. There is a high probability of successful natural regeneration of all species where openings are

small, seed sources are present, and environmental conditions are suitable for tree seedling establishment. The risk of loss of diversity in large openings can be reduced by planting all appropriate species or by designating appropriate seed trees or shelterwood trees of mixed species.

Vertical diversity. The vertical diversity in stands managed by the even-aged or group selection systems can be limited. Typically there is a single dominant layer of seedlings, saplings, or larger trees. However, there is usually considerable diversity in stands with the larger trees because some trees are significantly taller and have fuller crowns than others. Full vertical diversity still occurs, but not in each stand or group. By contrast, in the single-tree selection system, the vertical diversity within each stand should be much greater. Seedlings, saplings, and trees in larger tree classes should be seen from any point in the stand.

Tree vigor. If the stands are well managed, tree and stand vigor should be independent of silvicultural systems, with three exceptions. First, new seedlings in openings (particularly shade-tolerant species such as red fir and white fir) are heavily stressed by heat and lack of adequate water until they develop good root systems. These stresses often cause heavy mortality (especially of natural seedlings, or of low-quality or mishandled or poorly planted seedlings from nurseries). Second, seedlings in openings are more susceptible to damage or mortality from frosts, particularly at high-elevation sites. Where seedling mortality (even of high-quality or properly handled and planted nursery seedlings) is expected to be excessive, use of the single-tree selection, shelterwood, and group selection (where groups are small) systems are favored. Third, maintaining good vigor of small shade-intolerant species, such as ponderosa pine, can be very difficult in stands managed by the single-tree selection system. To promote vigor and growth of these trees, tree density may have to be reduced. This can significantly reduce timber yields.

Many stands are severely infected with certain root diseases or dwarf mistletoes. It would be very difficult and costly to maintain or improve tree vigor and productivity on these stands if the single-tree selection system were used. These root diseases and dwarf mistletoes infect other trees more easily when this system is used.

Genetic Resources

Conservation of genes. Genetic diversity is basically unaffected when natural or artificial regeneration of commercial tree species is successful. (Successful artificial

regeneration means that appropriate procedures were used during seed collection to ensure a large genetic diversity in the collected seed.) However, if regeneration of a particular species were to fail repeatedly over broad areas, genetic diversity would be reduced.

Quality of genes. Where improperly applied, the single-tree selection system can lead to "high-grading", which in turn reduces genetic quality for wood production. High grading is the selective removal of the best trees (most rapidly growing, largest, and most valuable for wood), so that most regeneration comes from seed produced by the lower-quality, remaining trees.

The average genetic quality may be significantly lowered in a stand managed by the single-tree selection system because of higher rates of inbreeding. Some forest geneticists theorize that inbreeding may also increase under the shelterwood or seed-tree systems. Nearby trees of the same species are usually closely related, and they can pollinate each other. The natural seedlings can become even more inbred. By contrast, artificial regeneration or natural regeneration from edges of large openings reduces the probability of significant inbreeding. Large openings facilitate pollen movement from more distant, less closely related trees, thus promoting genetic quality.

Productivity

No scientific long-term comparisons of wood production, using the different silvicultural systems, have been made anywhere in the world. This comparison will be possible many decades from now at Blodgett Forest, a University of California research facility. Theoretically, the total biological productivity (biomass) may be greatest for stands managed by the single-tree selection system. This is because of more continuous tree cover, compared to the other systems. However, merchantable stand growth and timber yields may not be higher for the single-tree selection system. Merchantable yields are strongly influenced by managerial factors.

E Managerial Contrasts Among Forests and Stands Managed by Different Silvicultural Systems

The major managerial contrasts described in this section are summarized in **Table J-2**.

Public Concerns

In the last two decades the clearcutting system, and to a lesser extent the shelterwood and seed-tree systems, have generated controversy in the United States and Europe

There are at least six major concerns in California

- Clearcut areas are regarded as visually unattractive
- The risks of significant soil erosion and loss of soil productivity are thought to be much greater for the clearcutting system
- Regeneration of clearcut stands is thought to be unreliable
- The risks of significant genetic losses are thought to be much greater for the clearcutting system because new stands may be monocultures
- The use of chemical herbicides (strongly opposed by some groups and individuals) is thought to be much greater if even-aged systems are used, particularly the clearcutting system
- Artificial regeneration, particularly of even-aged stands, is thought to be too costly

All of these undesirable effects can occur under any silvicultural system. However, the risks of some are significantly different among certain systems. The concerns about genetic losses were addressed earlier in the sections on Diversity of Plant Species and Genetic Resources. The other five concerns are discussed in the following sections on Effects on Scenic Quality, Risks of Adverse Effects on Watersheds and Soils, Scientific Knowledge Base, Management Experience, and Wood Production

Other managerial aspects of the silvicultural systems are also discussed in the sections below. They cover risk of major wildfires, risk of damage by insect, disease, or wildlife pests, production of livestock forage, protection of archeological resources, administration of silvicultural projects, timber harvesting efficiency, genetic improvements in forests, and effects on fisheries and wildlife

Effects on Scenic Quality

It is usually easier to create or maintain naturally-appearing landscapes with uneven-aged systems rather than even-aged systems. Uneven-aged systems are usually less noticeable because they create less contrast and are more

flexible in design. However, long-term maintenance of natural appearing landscapes can be more difficult under the uneven-aged systems, particularly for the single-tree selection system, because the inevitable natural wildfires are more difficult to control (see the section on Risk of Major Wildfires)

Depending on circumstances, all silvicultural systems may achieve visual quality objectives, whether the emphasis is on wood production or natural-appearing landscapes. Regeneration cutting in some situations can meet retention or partial retention objectives, for example, partial cuttings, such as shelterwood or single-tree selection, or openings that emulate and blend with natural conditions. Which alternatives are optimal, or even feasible, depend on factors such as location relative to the viewer, slope steepness, and available topographic or vegetative screening

Risks of Adverse Effects on Watersheds and Soils

These risks depend more on the characteristics of the watershed and soils, and on the care and quality of work, than on the kind of silvicultural system used. Adverse effects associated with any silvicultural treatment can usually be avoided or mitigated. The major possible adverse effects are erosion, sedimentation in waterways, soil compaction, and loss of soil productivity through soil or nutrient loss

The risks of significant, cumulative erosion and sedimentation effects in watersheds usually depend more on road quality and location than on silvicultural treatments

The risk of significant erosion within stands depends on how much protective vegetation and litter cover is removed, as well as on road quality and location. This risk is generally higher for the clearcutting system than for other silvicultural systems, because more cover is removed. The risk is least for the single-tree selection system

Extensive and frequent use of heavy machines can cause significant compaction of some soils. The risk of this occurring should not be significantly different among the silvicultural systems

The risk of soil nutrient losses is increased where vegetation or litter is cleared or high-intensity fires occur. Again, the risk due to clearing vegetation or litter is greater for the even-aged silvicultural systems. High-intensity fires

may occur in any stand if controlled fires are used improperly. However, the risk of high-intensity fires is greater for the single-tree selection system because crown wildfires are more likely (see the section on Risk of Major Wildfires)

Scientific Knowledge Base

There is less knowledge about the single-tree selection system than other silvicultural methods for National Forest lands in California.

Biological. Considerable research has been completed on the biological foundations for all of the silvicultural systems. Planting, natural regeneration, and genetic principles have been studied extensively for all systems. Research is more complete on early growth of young potential crop trees and control of competing plants for the even-aged and group selection systems. Similarly, stand growth model research is more complete for the even-aged and group selection systems. There are no major differences in the knowledge base about intermediate cuttings or about insect and disease pest management, among the silvicultural systems.

Managerial aspects. Research on the managerial aspects of California's Forests has focused on the even-aged and group selection systems. Only in the last decade have concerted efforts been made to research the long-term practicality of the single-tree selection system. Earlier studies were not completed because of difficulties with controlling regeneration of some desired species, controlling stocking, or sustaining the desired stand structures and merchantable yields. This resulted in strong recommendations against the single-tree selection system by many forest research scientists. New interest has been generated by demands for continuous forest cover, maintenance of an unmanaged appearance, and an alternative to management by the even-aged systems. However, several decades of management will be required before analyses of overall effectiveness can be made.

Research in the group selection system is also underway in California. It, too, will require several decades of treatments to achieve regulated stands.

Management Experience

Timber harvesting has occurred in California for over 140 years. However, experience with managing forests with the goal of regulating potential yields, has been limited to

the last several decades. Regulation of National Forest lands has involved only the even-aged silvicultural systems, particularly clearcutting. However, extensive experience has been gained with all of the silvicultural systems in managing certain stands.

Single-tree selection. Most of the harvesting from National Forest lands and many private timber lands in California has been selection cuttings of large trees. These cuttings were typically made with no long-term plan for managing the stands by the single-tree selection system. This system can require cutting trees in all size classes during each operation. Regeneration from natural seeding was usually counted on. Also, growth of the young trees and the uncut smaller merchantable trees was counted on to offset the reduction in the forest inventory due to harvesting the largest trees. Unfortunately, repeated harvests of the largest trees have often caused undesirable results: understocked residual stands with lower quality, lower value trees. These stands will have to be regenerated using one of the even-aged silvicultural systems or the group selection system, so as to re-establish full stocking levels of desired species.

Group selection. The group selection system was tried extensively on National Forest land in the Pacific Southwest Region about 20 years ago. Small openings were made to encourage natural regeneration, particularly of sugar and ponderosa pines. Special cutting guidelines were developed for different kinds of naturally-occurring groups of trees. The system, called Unit Area Control, failed for three reasons. First, the many small groups of natural regeneration could not be managed efficiently. They could not be monitored. The necessary subsequent treatments were not made. The young trees did not grow well or died. Some groups could not be treated due to the higher costs of treating small areas. Second, the cutting guidelines could not be used consistently. There was great difficulty in determining which kinds of groups were actually present in the stand and the location of their boundaries. Third, many of the small groups were unavoidably destroyed when large trees in adjacent groups were felled or when logs were moved out of the stand in later harvesting projects. It is difficult and costly to save small groups of trees on steep slopes from excessive damage during harvesting or site preparation.

Even-aged systems. The oldest plantations on National Forest lands in the Pacific Southwest Region are about 60 years old. Some are to be harvested soon and replanted, thus completing the cycle of an even-aged silvicultural system. Extensive experience has been gained in the promotion of young tree growth, intermediate cutting, and regeneration cutting treatments for even-aged systems in all major timber types in the Region. Overall,

artificial regeneration following clearcutting has been very reliable in ponderosa pine, Douglas-fir, and mixed conifer stands. Artificial regeneration has been significantly less reliable in red or white fir stands. The primary causes of planting failures are: (1) difficulties with consistently producing high-quality seedlings in the nurseries, and (2) planting when the environmental conditions are inappropriate. The shelterwood system, with natural or artificial regeneration, is presently used in red or white fir stands where regeneration after clearcutting is expected to be unreliable.

Wood Production

Need for the control of competing vegetation (including the use of herbicides). Control of competing vegetation is needed in all of the silvicultural systems to ensure establishment and good growth of tree seedlings or sprouts. Some have theorized that less control is needed in the single-tree selection system. Under this system tree cover is more continuous, resulting in fewer competing grasses, forbs, and shrubs. However, these competitors cause significant moisture stress in the seedling and sapling potential crop trees (in addition to the substantial moisture stress caused by the larger trees), thereby reducing their survival and growth. There is no compelling theoretical basis for concluding that the need for control of competing vegetation should be reduced if the single-tree selection system were used. Certain commonly-occurring, major competing plants can retain good vigor when shaded by most conifers (such as manzanita, bear clover, tanoak, or madrone). Using the single-tree selection system would definitely not reduce the need for controlling competition from such plants.

Frequency of control treatments varies by silvicultural system. Treatments under the single-tree selection system could be needed somewhere in every stand as often as every 5 to 10 years. The average treatment frequencies in the other systems are much lower. For example, in any of the even-aged systems, up to about three treatments could be needed in the first ten years of a new stand. No additional treatments may be needed until the stand is regenerated - a period that could exceed 50 years. Thus, the average period between treatments would be greater than 20 years. Regardless of the silvicultural system used, the total acres treated (and the total pounds of herbicide applied per acre, if herbicides were used) should be about the same over the long term.

The aerial application of herbicides (usually the most cost-effective and frequently the most controversial method of applying herbicides) could not be used in the single-tree

selection system. Depending on topography and vegetation structure, it could also be impractical in the group selection system.

Treatment costs. The size of a treatment area is a major factor in determining treatment costs and managerial feasibility. Generally, costs per acre in intensively managed forests are higher when the treatment units are smaller. Therefore, the even-aged systems are the most cost efficient, and the group selection and the single-tree selection system (in that order) are the least cost-efficient.

Regeneration by clearcutting is the most cost-efficient among the even-aged systems. Shelterwood and seed tree systems are less so, in that order. The removal of shelterwood trees or seed-trees, after the seedlings are established, is a second cost not required in the clearcutting system.

In theory, the total cost of natural regeneration should be less than for artificial regeneration. The costs of seed collection, nursery operations, seedling handling, and planting are eliminated. However, these savings are often offset by increases in pre-commercial thinning costs. Natural regeneration often results in much greater densities of trees than would be planted, or are desirable. Also, unreliable seed production by many commercial tree species often delays natural regeneration. This reduces wood productivity. When natural regeneration is delayed, the sites are occupied by competing plants, the control of which can be costly. Overall, artificial regeneration insures prompt reforestation of preferred species at desirable densities. If natural regeneration is to be used, the shelterwood and seed-tree systems are usually more cost-efficient than the uneven-aged systems. The reason is the economic savings associated with larger scale treatment areas. Where artificial regeneration is to be used, the clearcutting and shelterwood systems are more cost-efficient, for the same reason.

Achieving regulated forests, while maintaining Forest timber harvest levels. Regulation can be accomplished most easily with the even-aged or group selection silvicultural systems. There are two critical disadvantages of the single-tree selection system. First, foresters lack the knowledge about trees that is needed for cutting on a stand-by-stand basis. There are tens of thousands of stands on a typical National Forest in California, with up to about 10,000 potential crop trees per stand. Currently, inventory data needed for the single tree selection system are lacking for about two-thirds of these stands. Second, in the Mediterranean climate in California, large forest wildfires are inevitable. Reforestation after these fires creates many, new even-aged stands. It is very difficult to regulate a forest

under a single-tree selection system when substantial acreages of unplanned even-aged stands occur

Planning, contracting, and record keeping. The many small units used in the uneven-aged systems makes for ineffective and costly operation and administration. If stands in a typical Ranger District were managed by uneven-aged systems, in excess of 50,000 separate areas would have to be inventoried, planned for, treated, and monitored. Even with computers the management complexity would be excessive. Therefore, the extent to which uneven-aged management systems are used for intensive timber management are necessarily very limited.

Timber harvesting. Five important aspects of timber harvesting are strongly influenced by the choice among silvicultural systems: (1) variability in the sizes of harvested trees, (2) area to be harvested, (3) complexity of the harvesting treatments, (4) the probability of causing significant damage to trees left in the stand, and (5) the probability of causing long-term root disease problems. The first three aspects influence harvesting efficiencies, and the other two affect the vigor, tree stocking, and value of the residual stand.

There is wide size variation in trees harvested in each operation under the single-tree selection system. This reduces harvesting efficiency because logging equipment is size-dependent. However, this disadvantage could be insignificant in young-growth stands.

Harvesting in the single-tree selection system is much less efficient than for the other systems because more land must be treated in each operation to harvest the desired yield from the forest.

The complexity of harvesting treatments is also greatest in the single-tree selection system. Identifying which trees to cut, determining where they are to be felled, felling the trees in the designated areas, and removing the trees or logs out of the stand without damaging the residual trees can be very difficult and costly. In the single-tree selection system, cuttings occur as frequently as every five to ten years. In the other systems, only the intermediate cuttings are as complex. The regeneration cuttings in the other systems are more straightforward operations. Group selection and clearcutting are the most efficient.

Logging damage to trees left in the stand is typically greatest for the single-tree selection system. It is very difficult to selectively harvest trees in dense stands without damaging many residual trees, particularly on steep slopes. Damaged trees are often infected by wood-decaying fungi that can persist in the soil for long periods, thus retaining

the capacity to infect new trees. The fungi reduce the windfirmness, vigor, commercial value, and stocking of residual trees. This characteristic is a particular concern in developed recreation areas where selection systems are often applied. Stands with red or white fir have an especially high probability of being infected with wood-decaying fungi when damaged.

Genetic improvements in Forests. Genetic improvements to increase timber growth, improve tree form and wood quality, or increase resistance to disease and insect pests, depend primarily on planting trees with desirable genetic characteristics. Therefore, the potential for genetic improvement is greater for silvicultural systems that use artificial regeneration. The clearcutting, group selection, and shelterwood systems (if artificial regeneration is used) have the greatest potential for improving the genetic quality of forest trees. The single-tree selection system, with its natural regeneration and higher rates of inbreeding, has the least potential.

Risk of Major Wildfires

The even-aged systems (clearcutting in particular) are best for reducing the risk of major wildfires because the greater control of fuel distribution makes wildfire prevention and suppression easier and less costly. The single-tree selection system is least desirable because fires burn intensely and are more difficult to control. Openings, which can serve as fuel breaks, occur less frequently in forests or stands managed by this system. Also, the multiple tree layers create "ladders", permitting ground fires to spread into the crowns of the large trees. Crown fires are more destructive and more difficult to control than ground fires. Finally, the use of controlled fires to reduce the risks of large wildfires is most difficult and costly in the single-tree selection system.

Risk of Significant Pest Damage

Silvicultural treatments reduce risks by selecting appropriate tree species, by diversifying within and among stands, and by maintaining tree vigor. Diversification within stands is increased through use of multiple species or uneven-aged silvicultural systems. Vigor is promoted by preventing the trees and other plants from becoming too dense. Competing plants also provide habitat for animal pests such as pocket gophers and rabbits. Well managed stands in all systems reduce the risk of significant pest damage. However, there are exceptions.

Risk of significant insect or disease damage to trees increases if the trees have been wounded. Many wounds occur during silvicultural treatments. Accidental scarring of trees can be caused by felling nearby trees, or by bumping them with machines or logs moving through the forest. Risk increases with frequency of stand treatments, particularly cutting. Cutting frequency is much higher for the single-tree selection system than for others, so the risk of significant insect and disease damage is highest.

Two serious diseases, dwarf mistletoes and some root rots, can be difficult, costly and, in some cases, impossible to control under selection systems. Damage from these diseases is most easily controlled by managing the entire stand. Dwarf mistletoe plants can project seeds down on trees within about 100 feet horizontally, thereby infecting nearby susceptible species. Even-aged systems allow the manager to control damage from this pest through cutting treatments.

Many root disease fungi infect susceptible trees by root-to-root contact. Some root diseases start at harvest time and spread to other trees in the stand. Control may require killing trees in a zone around the infected area. Uneven-aged management, particularly the single-tree selection system, can perpetuate root disease "centers" and spread infection.

Generalizations about wildlife pest damage and silvicultural systems are difficult. The major potential wildlife pests in the Region include pocket gophers, deer, porcupines and rabbits. These animals feed in vegetation dominated by grasses, forbs, shrubs, or tree seedlings. Use of the even-aged or group selection systems can create large areas temporarily dominated by this kind of vegetation. This can cause higher densities of potential pests which increase the risk of significant damage to potential crop trees. However, the actual damage levels are not increased where this occurs.

Production of livestock Forage and Browse

Even-aged systems and the group selection system are best for livestock production. Grasses, forbs, and shrubs used by livestock occur in the greatest quantity in openings. Management efficiency increases in large forage areas because livestock control and access is easier and less costly.

Protection of Archaeological Resources

There should be no significant differences among the silvicultural systems in their risk of damage to undetected archaeological resources. Damage depends more on the intensity and frequency of management treatments than on the kind of silvicultural system, particularly when large machines are used.

Effects on Fisheries and Wildlife Habitat

Fisheries habitat is most easily protected where the water quality is high, stream temperatures are kept moderate through shading, and where the runoff quantity is sufficient to maintain spawning areas. The single-tree selection or group selection systems are usually more advantageous than the even-aged systems for managing the vegetation in riparian management zones. However, the silvicultural systems used outside these zones do influence the amount of sediment in the water (see the discussion in the section titled Risks of Adverse Effects on Watersheds and soils).

The choice of silvicultural systems to best manage wildlife habitat depends on which species are to be emphasized. Regardless of which treatment is used in a stand, some species will benefit and others will not. Most wildlife species are adapted to thrive in specific structures and species of forest vegetation. For example, the use of the even-aged or group selection systems favors deer, quail, and rabbits that use herbaceous and shrubby vegetation most abundant in large openings in the forest. The single-tree selection system may favor animals that need vertical diversity, such as spotted owls and tree squirrels.

Almost all forest wildlife species could use a particular young-growth stand at some time in its development regardless of the silvicultural system. (The exceptions are the few species that may be totally dependent on very large, decadent trees for habitat.) The kind of silvicultural system used would influence the proportions of wildlife species and when and how they could use the stand as habitat. A significant exception is single-tree selection management applied to large areas. The absence of large openings could prevent use by wildlife adapted to this kind of habitat, such as soaring hawks. Overall, a mix of the silvicultural systems would probably best meet most wildlife management objectives.

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Table J-1
Ratings of the Major Silvicultural Systems by Principal **Biological** Attributes

LOGICAL ATTRIBUTES	CLEAR-CUTTING	SHELTER-WOOD	SEED-TREE	GROUP SELECTION	SINGU TREE SELECTION
<p> is Good, Excellent, or many</p> <p> is Good to Moderate</p> <p> is Moderate or Few</p> <p> is Poor or None</p>					
Appearance					
a. Diversity of treesizes in a stand:					
(1) Vertical					
(2) Horizontal					
b. Number of openings in a forest:					
(1) Larger than 2 acres					
(2) 1/10th to 2 acres					
(3) Smaller than 1/10th acre					
c. Potential for conserving or improving plant species diversity in a stand.					
Genetics					
a. Resistance to inbreeding effects;					
b. Resistance to degradation by "high-grading";					
c. Potential for conserving genes in a forest ³ .					
Productivity (potential for producing biomass)					
<p>Exclusive of roads and natural openings such as meadows or rock outcrops.</p> <p>Assumes no major fires; otherwise "Poor."</p> <p>Assumes all harvested species are planted successfully, or will regenerate naturally; otherwise "Poor."</p>					

Table J-2
Ratings of the Major Silvicultural Systems by Key Managerial Attributes

MANAGERIAL ATTRIBUTES	CLEAR-CUTTING	SHELTER-WOOD	SEED-TREE	GROUP SELECTION	SINGLE TREE SELECTION
Overall Public Acceptance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Natural Appearance	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Soil Protection in Stands					
Soil stability where soils have high erosion potentials.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Scientific Knowledge Base and Management Experience	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wood Production					
a. Cost efficiency of treatments:					
(1) General (based on treatment unit size)	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(2) Regeneration	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(3) Feasibility of aerial application of herbicides	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
(4) Harvesting	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
b. Potential for regulating the forest, while maintaining harvest levels.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
c. Administrative efficiency (planning, contracting, and record keeping).	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
d. Need for control of competing vegetation.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
e. Potential for retaining vigor and value of residual trees.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
f. Potential for genetic improvement of trees by planting.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Controlling Wildfires in a Forest					
a. Potential for controlling major wildfires.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ²	<input checked="" type="checkbox"/> ³
b. Potential for using controlled fires to manage fuels.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> ²	<input type="checkbox"/> ³
Risk of Significant Pest Damage					
Potential for controlling damage from dwarf mistletoes and certain tree root diseases.	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> ²	<input type="checkbox"/>
Livestock Production Potential in a Forest	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/> ²	<input type="checkbox"/>

Table J-2 (continued)
 Ratings of the Major Silvicultural Systems by Key Managerial Attributes

MANAGERIAL ATTRIBUTES	CLEAR-CUTTING	SHELTER-WOOD	SEEP TREE	GROUP SELECTION	SINGLE TREE SELECTION
<p>  is <i>Good</i>, Excellent, or many  is Moderate or Few  is <i>Poor</i> or None </p>					
Streamside Management Zones					
Potential for protecting fish habitat					
Wildlife Habitat in a Forest					
a. Potential for deer, rabbits, and quail					 ³
b. Potential for spotted owls and tree squirrels					
c. Potential for soaring hawks and eagles.				 ²	 ³
<p>Assumes gentle slopes; otherwise "Moderate", but "Poor" for the Group and Single-tree selection systems.</p> <p>Assumes openings of about 1-2 acres; "Poor" if smaller.</p> <p>Assumes highly productive land; otherwise "Moderate" or "Good".</p>					

Appendix K

Response to Public Comment

Appendix K

Response to Public Comment

Introduction

The public comment period for the Shasta-Trinity National Forests Draft Environmental Impact Statement (DEIS) and Proposed Forest Land and Resource Management Plan (Proposed Plan) began on September 29, 1993 and closed January 6, 1994. Agencies, government officials, private industry, private organizations, and the public were invited to comment on the DEIS and Proposed Plan. Public briefings were held in Weaverville, Redding, and Weed, California. Numerous other briefings were given upon request from interested groups, including county boards of supervisors for Shasta, Tehama, Trinity, Siskiyou and Humboldt counties, local chapters of the League of Women Voters, the Society of American Foresters, and the California Native Plant Society, the Shasta Alliance for Resources and Environment (SHARE), the Mount Shasta and Dunsmuir Rotary Clubs, College of the Siskiyou, local offices of the California Department of Fish and Game, USDI Bureau of Land Management, and the California Department of Fish and Game; the Trinity Bio-Region Planning Group, the Shasta-Tehama Bio-Regional Group, the Interagency Adaptive Management Area Group, and the Northern California Bio-Regions Group.

During the 90 day public comment period, 394 letters were received containing a total of approximately 1,403 written comments. Of the 394 letters, 147 were form letters or modified form letters. States responding included California (84%), Illinois (2%), and the remaining states included Georgia, Iowa, Minnesota, Montana, North Carolina, Nevada, New York, Oregon, Virginia and Washington. Within California, cities with 5 or more respondents included Mt. Shasta, San Diego, Hayfork, Redding, Menlo Park, San Francisco, Sacramento, Weaverville, Los Angeles, Hyampom, Mad River, Oakland, and Yreka.

Organizations responding included 32 environmental groups, 15 recreation oriented groups, 7 forest products groups, 2 professional societies, 1 church, 1 newspaper and 1 Indian tribe.

Government responses included the U.S. Department of Energy, the U.S. Department of Interior (Office of Environmental Affairs), Region IX, EPA, Congressman Wally Herger, the Resources Agency of California, the California Department of Fish and Game, the California Department of Forestry and Fire Protection,

the Siskiyou Board of Supervisors, the Siskiyou County Farm Bureau, the Tehama County Board of Supervisors, and the Trinity County Board of Supervisors. Copies of these letters are also included following the comments and responses.

The largest volume of comments were related to timber, water and fisheries resources, wilderness and roadless area management, Mt. Shasta, wild and scenic rivers designation, and old-growth ecosystems.

Organization of Appendix K

This appendix contains the responses to public comments. After analyzing the substantive comments described above, the Shasta-Trinity National Forest Land Management Planning Team grouped related topics to avoid cumbersome text duplication, then responded to the concerns expressed in the comments. The comments and responses are intended to be only explanatory in nature. If there are any apparent contradictions between Appendix K and the text of the Final EIS and Forest Plan, the Final EIS and Forest Plan direction prevails.

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 Draft EIS and Proposed Forest Plan appears following the comments and responses.

The acronym, ROD, used in Appendix K references the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl, April, 1994. The term Forest Plan or Final Plan refers to the Shasta-Trinity National Forests Forest and Land and Resource Management Plan. FEIS refers to the Shasta-Trinity National Forests' Final Environmental Impact Statement for the Land and Resource Management Plan.

Air Quality

Comment: The EIS must commit to using the best methodology available to maintain air quality standards.

Response: The Forest is committed to maintaining or exceeding air quality standards as required by the Clean Air Act and through compliance with local air pollution control district standards and requirements.

Appendix K - Response to Public Comment

Comment: The EIS must provide more information, including the identification of air pollution control districts, the location/description of Class I and II airsheds, and the identification of non-attainment areas, by pollutant, on the Forest

Response: These items have been addressed in Chapter 3 of the Final EIS and Forest Plan

Comment: The EIS should include a discussion of particulate matter (PM 10) from direct emissions, including mitigations, and a discussion of particulate matter historical averages and future estimates

Response: There is no available data for this topic

Comment: The EIS should identify applicable Prevention of Significant Deterioration (PSD) Class I areas

Response: PSD's are typically associated with coal-burning utility powerplants, and there are none of significance within the Forest's scope of consideration

Comment: The EIS fails to evaluate air quality degradation associated with a wildfire

Response: The EIS recognizes the potential adverse effects of wildfire to air quality. However, because of the unplanned nature of wildfire, it is exempt from air quality standards prescribed by the Clean Air Act

Comment: 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. We recommend 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

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 has coordinated with the Siskiyou County Air Pollution Control District, and other APCD's during the development of this Forest plan. These agencies are also contacted on an on-going basis prior to and during project implementation

Comment: The EIS must display the effects of management activity upon air quality, and provide specific air quality standards and guidelines

Response: Chapter IV of the FEIS provides an alternative comparison of four management activity criteria. The Forest Plan displays specific standards and guidelines. Ia - Id, which provide management direction

Comment: How is it possible to have less prescribed burning in the future as stated in the EIS?

Response: The FEIS anticipates a substantial reduction in regeneration harvest acres from current levels, thus a substantial reduction in the use of prescribed fire for site preparation in the future. However, the Final Plan estimates non-timber related fuels treatment to increase beyond previous levels as a result of ecosystem needs

Biodiversity

Comment: The objective of maintaining a minimum of 5% of each forest seral stage is an arbitrary standard inadequate to the maintenance of biodiversity

Response: The requirement of a minimum five percent for each timber type/seral stage ensures that an adequate distribution of biodiversity will be available on the Forest. The ecosystem management process provides for additional biodiversity opportunity when planning at the landscape level

Comment: The influence of private lands and past management activities upon biodiversity has not been discussed or evaluated

Response: The forest does not control actions on non-federal land and it is often difficult to obtain accurate information on conditions on private property. The viability analysis at the Forest level assumes that private activities would neither be beneficial nor detrimental and that NFS land must adequately provide for species viability alone. The Regional viability analysis in the FSEIS (President's Plan) which covers the entire northern spotted owl range has been incorporated by reference in the Final EIS. Landscape patterns will be analyzed during ecosystem analysis at the watershed/landscape level

Comment: The viability analysis presented in the EIS is inadequate, and needs to be more like the analysis presented in the FEMAT report

Response: The viability analysis presented in the FEMAT report, further refined in the ROD and FSEIS, is incorporated into the ecosystem management approach of the Preferred Alternative. The land allocation decisions and application of the standards and guidelines of the ROD and FSEIS, tied to by the Preferred Alternative, are designed to ensure continued species viability

Comment: Treatments should be allowed within the late-successional reserves in stands of over 80 years old

Response: The ROD for the FSEIS provides direction for the Forest Plan. The Forests within the California Cascades and California Klamath Provinces. The Guidelines to Reduce Risks of Large-scale Disturbance apply within these provinces, and have been incorporated into the LSR Standards and Guidelines for the Forest Plan. Generally, stands over E0 years old will not be treated.

Comment: Biodiversity needs to be analyzed in terms of species and habitat, not just in the context of conifer-based seral stages.

Response: The "Timber" inventory is an acceptable proxy when the level of analysis deals only with Forest-wide averages, with the objective being programmatic direction. Additional inventories, specifically Ecological Unit Inventories (EUI), may be conducted to assist in the analysis for ecosystem management planning.

Comment: The EIS should provide for the enhancement and reclamation of natural openings.

Response: The Forest Plan, Standard and Guideline 2a, provides for the management of natural openings to be determined at the project level.

Comment: The EIS does not adequately describe forest diversity. Describe how biological diversity will be obtained as required by Option 9.

Response: Chapter 3 of the Forest Plan, specifically the sections of Biological Diversity, Botany, Fisheries, Timber, and Wildlife describe the variety and richness of the biological environment, as well as the presence of unique, endemic species. The Forest Plan and EIS tiers to and is provided management direction by the ROD and FSEIS (Option 9).

Comment: Terminology such as "over-mature" and "high levels of decadence" is inappropriate.

Response: This terminology has application when describing timber management attributes, and will be retained where appropriate. When not specific to timber management considerations, these terms have been changed in the Forest Plan and EIS.

Comment: The SAT and FEMAT reports emphasize the protection of biological diversity and the restoration of natural ecosystems. The EIS is still timber commodity oriented, and ambiguously applies the term biological diversity.

Response: The Forest Plan and EIS tier to and incorporate the Standards and Guidelines of the ROD and FSEIS. Ecosystem management principles will guide

the management of affected Forest resources, including commodity outputs. The definition and application of the term biological diversity used within the context of Forest resource management is evolving. The Forest Plan, EIS, and Appendix G describe components of biological diversity which may assist the Forest during Ecosystem Management analysis.

Comment: The EIS must provide specific standards and guidelines for the spatial, temporal, and corridor habitat needs of wildlife. Corridors must be more specifically addressed, including connectivity across non-federal lands and matrix areas.

Response: The Forest Plan and EIS are programmatic documents which provide management direction for site-specific plans, such as ecosystem management planning. Ecosystem management planning will provide for a site-specific analysis of affected resource considerations, including spatial and temporal habitat requirements, and corridor connectivity. The standards and guidelines of the FSEIS (ROD) are designed to provide corridors and connectivity.

Comment: If only 15% of the Forest is available for management, how can it be called biodiversity?

Response: The ROD and FSEIS provided land allocation decisions which were tiered to by the Forest Plan and EIS. The intent was to provide for multiple use, with an emphasis on providing for aquatic and late-successional species habitat needs.

Comment: The Forest Plan must provide for a viability analysis of aquatic and riparian species.

Response: Viability analysis was used to guide the development of land allocations, and the Aquatic Conservation Strategy, contained in the ROD and FSEIS and allocation decisions and the Aquatic Conservation Strategy have been incorporated into the Forest Plan and EIS. Watershed Analysis is required to adjust Riparian Reserve boundaries and to harvest in key watersheds and roadless areas. Watershed Analysis will eventually be done for all watersheds on the Forest.

Comment: Public lands should be managed to emphasize the preservation of late seral stage habitat.

Response: Land allocation decisions in the ROD and FSEIS provide for late-successional reserves (LSR). LSRs were created with the objective of protecting and enhancing conditions of late-successional and old-growth forest ecosystems. The Forest Plan and EIS incorporate these land allocation decisions.

Appendix K - Response to Public Comment

Comment: The standard and guideline for the reduction of biodiversity deficits must be strengthened to emphasize the restoration, not just maintenance, of native plant and animal diversity

Response: The Ecosystem Management process provides an opportunity to address a variety of resource issues, including biodiversity. Ecosystem Management and subsequent NEPA processes allow for site-specific remedy and management alternatives in response to native plant and animal diversity

Comment: The EIS inadequately addresses chaparral management considerations. Potential adverse effects to native plants and animals during chaparral management activities was not addressed. The potential value of older seral stages of chaparral was not addressed.

Response: The Forest Plan and EIS are programmatic documents which provide management direction for site-specific plans, such as ecosystem management planning. Ecosystem management planning will provide for a site-specific analysis of affected resource considerations, including botanical and wildlife values.

Biomass

Comment: A standard and guideline should be developed to allow for the retention of areas within biomass projects that provide a shrub layer or a secondary tree layer to provide for nest, feeding, and escape cover for numerous species.

A standard and guideline is needed that states that biomass can only be removed in a manner that does not cause soil compaction.

Response: Standards and guidelines which address wildlife and soils needs during biomass operations are included in Chapter 4 of the Final Plan. Wildlife and soils, along with other resource needs, would be addressed during site-specific project analysis as part of ecosystem management planning.

Comment: The Draft Plan does not address the need for biomass thinning nor does the plan establish an on-going biomass thinning program.

Response: The need and benefits of a biomass program are included in the Forest Goals and Standards and Guidelines. In addition, the current management situation and management opportunities dealing with the biomass issue are included in Chapter III of the FEIS.

The biomass thinning program is included in the timber program as commercial thinning.

Comment: Describe the role of biomass in undisturbed forest ecology and discuss how the loss of biomass is considered acceptable.

Response: The importance of biomass in forest ecosystems, particularly in old-growth ecosystems, is documented in the FEMAT Report and the FEIS on Management of the Northern Spotted Owl. Biomass within late-successional reserves and other areas withdrawn from timber production will remain undisturbed. Within the matrix lands (15-20% of the Forests), biomass would be available for removal only after meeting other resource needs (see Standards and Guidelines in the Final Plan).

Botany

Comment: While the DEIS indicates the need to manage sensitive plants to provide disturbance, where necessary, it does not adequately discuss the long-term consequences of near total fire suppression on biodiversity (Ch III-24).

Response: See the Chapter 4, Final Forest Plan, Forest-wide Standards and Guidelines, 8 Fire and Fuels, which addresses the issue of fuel treatment and the natural role of fire in the ecosystem. In addition to this direction, disturbance as it relates to biodiversity will be considered at the watershed analysis and landscape analysis level. Conservation strategies, as they are developed, will also address the relationship of fire to individual species. A Forest-wide GIS layer for fire history is currently being developed to assist these analyses.

Comment: Management Prescription VII and Forest-wide standards and guidelines for sensitive plant species often lack time frames or other specifics that would make them much easier to interpret and implement.

Response: Schedules and monitoring plans will be developed locally during ecosystem planning/watershed analysis.

Comment: Suggested S&G, Sensitive Plants. Projects will be managed to maintain or increase sensitive and Forest endemic plant populations and communities as well as to improve their habitat.

Response: The new survey and manage standards and guidelines from the ROD are incorporated in the Preferred Alternative and address this concern. See Chapter 4, Final Forest Plan, Standards and Guidelines from the ROD That Apply Forest-wide, Survey and Manage.

Comment: Suggested S&Gs, Coordinate sensitive plant inventory and protection efforts with the CDFG,

USFWS, TNC, CNPS and other concerned agencies and groups. Provide reports of new and existing sensitive plant populations to the CDFG Natural Diversity Database and the CNPS inventory annually

Response: The Forest Plan contains these standards and guidelines See Forest Plan, Chapter 4, Standards and Guidelines, 4. Botany e and d

Comment: The CNPS Inventory yielded more than 90 plants known to occur on the Forests or in the immediate vicinity which meet the criteria for CNPS lists 1b, or 2, which denote a high degree of sensitivity The STNF sensitive plant list contains 42 species. Please consider surveying to determine the occurrence of these species and evaluating them as candidates for the STNF sensitive list The STNF's sensitive species list should be reviewed and updated annually We suggest contacting the FWS and other knowledgeable agencies, organizations, academics, and individuals for input

Response: Watershed analysis includes survey of these species and other species of concern The Forest Supervisor has recommended several species for listing to the Regional Forester based on Forest surveys See Table P- I for those species recommended and not yet listed The Regional Sensitive Species List is updated by authority of the Regional Forester every 2 or 3 years The Regional Office does the outreach to other agencies and organizations for input

Comment: Include discussion and/or standard and guideline for the collection of other forest products such as mushrooms, toyon berries, bear grass, ladybugs and decorative plant materials.

Response: Standards and guidelines were considered for miscellaneous products and not written due to the lack of sufficient Forest-wide data and analysis However, a grant has been awarded to Trinity County to begin inventory of special forest products on the Hayfork and Weaverville Ranger Districts When enough information is available from this and other studies, standards will be set and an amendment will be made to the Forest Plan

Comment: Practice the use of native species for all revegetation and erosion control projects (recommended Forest Goal) The Forest Botanist and/or Ecologist should determine the varieties, planting or seeding rate and methods to be used in revegetation projects, particularly post-wildfire rehabilitation Maintain a bank of local seeds and cuttings from a range of ecosystems in each Forest to be used for revegetation.

Response: On June 30, 1994 the Regional Forester issued a letter on the subject "Policy on the Use of Native Plant Material in Restoration and other Revegetation Projects" Page I of this letter states. "to the extent practicable, seeds and plants used in erosion control, tire rehabilitation, riparian restoration, forage enhancement and other vegetation projects shall originate from genetically local sources of native plants " It also states on page I "Prescriptions for use of plant materials for revegetation must be developed by knowledgeable plant resource specialists prior to implementation to ensure that the project is feasible and suitable plant material is used Banking local seed is not possible for every revegetation project, e g , fires Policy is being formed to use local seed banks for restoration projects Banking would be addressed during the early planning stages of watershed analysis

Comment: The STNF DEIS botany and biodiversity section do not contain specific discussions of the current or projected status of native plant communities Suggested S&G, Every species noted in the field will be investigated to the extent necessary to ensure that it is not a sensitive species

Response: It is standard practice on the Forest to conduct floristic surveys at the project level From these surveys a comprehensive species list is included with the Biological Evaluation for each project In addition, the new Survey and Manage standards and guidelines from the ROD, incorporated in the Preferred Alternative, are designed to conduct broad surveys as well as to protect known sites. Conservation strategies address the current and projected status of native plant communities

Comment : Suggested S&G, 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

Response: Based on staffing and funding, the Forest is currently producing one conservation strategy per year See Forest Plan, Chapter 4, 4 Botany f To-date, one strategy is completed and three are in draft The Forest has adopted the "associations of co-occurring species" concept for future strategies The decision of which species to schedule next has always been flexible depending on current issues and needs

Economic/Social

Comment: Will there be sufficient funding to ensure the Forest will fully implement ecosystem management as described in the Preferred Alternative?

Response: The Forest Plan and EIS designate land allocations and establish limits to management activities through the application of standards and guidelines. The success of this aspect of the Forest Plan is not dependent upon the level of funding. The Forest Plan and EIS 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 this EIS. A general discussion of how budget allocations are made when the budget is less than fully funded is contained in Chapter III of the EIS, and Appendix H of the Forest Plan.

Comment: Below-cost timber sales should be a thing of the past.

Response: Under an ecosystem management approach that considers multiple resource values, timber sales represent only one of these values that continues to have a place in the broad spectrum of management practices and tools available to implement sound ecosystem management. Timber sales can be an efficient and effective means of achieving not only silvicultural goals, but other, nontimber resource management goals. In these cases, timber sales may occur, even though the value of the timber does not exceed the cost of the entire ecosystem management project.

The Forest has traditionally been funded and evaluated based on its ability to economically sell timber. Current planning approaches generate additional costs attributable to management of the intangible or difficult-to-quantify values that are equally important components of the ecosystem. Managing ecosystems strictly for a positive return would limit opportunities to maximize the intangible benefits of nonquantifiable resource values, resource protection, and provision of overall ecosystem management. These factors will be considered when evaluating the below-cost question in the future.

Comment: The use of 1991 as a baseline year against which to compare economic consequences distorts the true historic perspective of timber sale levels and economic effects.

Response: In preparation of the Forest Plan and EIS, the best available information was used in the analysis. Chapter II Part F, Chapter III, Chapter IV, and Appendix I of the

EIS provide historic economic perspective, including anticipated economic cumulative effects analysis.

Comment: There was inadequate consideration of the potential impacts to state and local governments resulting from actions proposed by the EIS and Forest Plan.

Response: The EIS considered five elements of the role the Forest has in the economy of locally-affected counties. These elements include economic efficiency, shared receipts with counties, employment, local unemployment and NF budget levels. Where applicable, two general time frames of reference are considered, including "historical" and post-Northern spotted owl listing. Also where applicable, direct, indirect, and induced economic effects are considered in the analysis. These discussions are found in Chapters III and IV of the FEIS.

Comment: The EIS gave inadequate consideration to direct and indirect social and economic impacts of job loss attributable to scientific decisions.

Response: The Forest Plan and EIS tie to land allocation decisions provided by the ROD and FSEIS. Those documents provided direction that social and economic considerations be given high priority consideration in the ROD and FSEIS. The intent is to provide for the greatest possible human, social, and economic benefits consistent with agency conservation mandates while providing for long-term health of late-successional and old-growth forest ecosystems in the Forest Plan and EIS.

Comment: The economic discussion does not accurately reflect the impact of the forest on the regional economy.

Response: The Forest Plan and EIS provide a detailed discussion of potential economic effects associated with the alternatives considered in Chapter II of the FEIS. Economic factors considered were those which would provide for a reasoned, informed decision by the @-e-ciding Official.

Comment: Non-commodity economic revenues need to be fully considered.

Response: An array of commodity and non-commodity costs and revenues are considered in detail in the Forest Plan, Chapter II of the FEIS, and Appendix B of the FEIS.

Comment: A large portion of timber sales sold on the Forest should be sold to and processed by local mills to benefit the local economy.

Response: Forest Service timber sales are sold through a competitive bidding process. Forests, in coordination with the Small Business Administration, also provide for small business set-aside offerings. Federal law provides for the domestic processing of National Forest timber. Most local mills are actively involved in the bidding process for National Forest timber, but they still must be successful in the competitive bidding process to be awarded the contract to harvest National Forest timber.

Comment: The Forest Service should require as a condition of agreement or permit that any new powerlines built across National Forest land require that a substation capable of handling electricity produce both a local market for thinnings and a source of employment for McCloud.

Response: It is outside the scope and authority of the Forest Plan and EIS to require such a condition. Cogeneration plants within the sphere of influence of the Forest are currently providing a market for non-traditional forest products, such as biomass.

Comment: The management of local forest reserves for values other than agriculture, lumbering, mining, and livestock undermines the economic stability of Siskiyou County and the security and prosperity of local resource-dependent industries. The EIS must give commensurate management consideration to valuing and protecting the viability, diversity and uniqueness of local human communities and cultural lifestyles as is given to the non-human communities on the Forest.

Response: The alternatives present different management scenarios, each makes a contribution to the maintenance of social and economic stability as well as maintenance of biological diversity and providing recreational opportunities. Each alternative would provide for different levels of outputs. Many approaches were explored to try to find creative ways of providing for all the conflicting demands on the Forest. Members of the public helped develop alternatives. As demonstrated in the EIS, Chapter II, Direction Common to All Alternatives; the space for making decisions is very constrained after compliance with all environmental laws and regulations which are designed to protect the environment.

Comment: Revenue generated from the sale of commodity yields is still the best way to provide funding for non-revenue generating projects.

Response: Most of the revenue generated by the sale of National Forest commodities is sent directly to the U.S. Treasury. However, the Knudsen-Vandenburg (KV) Act provides for the collection and expenditure of timber sale-generated funds to be used within

project areas under specific requirements. Under prescribed conditions, this is still anticipated to be a partial source of project funding for some ecosystem management projects.

Comment: I want to see our forests preserved for my grandchildren and their grandchildren through sustained yield timber harvesting. The Draft Forest Plan is and will remain deficient until management direction is changed from preservation to pro-active vegetation management.

Response: Alternative RPA was developed in response to those concerns. Species viability analysis was used to guide the development of land allocation decisions by the President's Plan. Those land allocation decisions were incorporated into the Forest Plan and EIS. The intent was to provide for multiple use, with an emphasis on providing for aquatic and late-successional species habitat needs.

Ecosystem Management

Comment: Use of the term overmature is inappropriate.

Response: This term has application when describing timber management attributes, and will be retained where appropriate. When not specific to timber management considerations, this term has been changed to "Late-Successional" in the Forest Plan and EIS.

Comment: The President's Plan incorporates an ecosystem approach to Forest planning that should be incorporated into the Forest Plan and EIS.

Response: Direction provided by the ROD and FSEIS have been incorporated into the Forest Plan and EIS.

Comment: The EIS must distinguish between the terms "ancient forest" and "old growth" in the context of planning and direction.

Response: An effort to provide for consistent application of the use of ecosystem management terminology was done throughout the Forest Plan and for the Preferred Alternative of the EIS. Refer to the Glossary for definitions. The Commentor's position that "ancient forest" is a more apt description of pre-settlement forest stands and not a description of stand age, is noted.

Comment: The reserve system proposed in the LMP is too large.

Response: The ROD and FSEIS provided for land allocation decisions which were tiered to by the Forest Plan and FEIS. Species viability analysis was used to

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guide the development of land allocations. The intent is to provide for multiple use, with an emphasis on providing for aquatic and late-successional species habitat needs.

Comment: The LMP should provide an adequate data base indicating precisely which resources are available on the Forest, as well as coordinate information from environmental organizations and the scientific community.

Response: The Forest is continually improving and updating resource databases and baseline data. Ecological Unit Inventories are currently being conducted on selected areas of the Forest to assist with ecosystem management planning. Public involvement is a key element of the site-specific NEPA project planning process. Publicly-provided information is often useful, and can be used by the interdisciplinary team during the analysis process for NEPA projects.

Comment: The Plan should display ecosystem management planning units and display a schedule for prioritizing and completing ecosystem management plans.

Response: Identification of formal ecosystem management planning units has not yet been determined for the Forest. The scheduling of ecosystem management planning is beyond the scope of the Forest Plan and EIS.

Comment: The Forest Plan should provide for a standard and guideline requiring that ecosystem management practices reflect historic patterns of forest structure and seral stage distribution be experimented on areas not having significant environmental issues, that management activities in late-seral/old-growth stands be tried first in the Matrix, and that silvicultural prescriptions or practices having other than timber management objectives be tried experimentally first in non-sensitive areas.

Response: Forest-wide Standards and Guidelines and specific land allocation standards and guidelines provide Forest direction for site-specific project analysis. The Commentor's proposed S&Gs are factors which need to be considered by affected project-level interdisciplinary teams and line officers, but are not appropriate to adopt as formal S&Gs.

Comment: Forest ecosystem management and forest health are not really defined well. Ecosystem management should be an integrated system of management tools and practices across resource disciplines.

Response: The application and use of these terms has been incorporated into the Forest Plan. Ecosystem management principles will guide Forest resource management activities using an interdisciplinary, integrated approach.

Comment: Provide for the development of individual project standards and guidelines during project NEPA analysis.

Response: Site-specific project NEPA analysis will tier to Forest Plan Standards and Guidelines, apply Management Area supplemental direction, and provide for project-specific management requirements and mitigation measures. If S&G's proposed at the project level are inconsistent with the Forest Plan, a Plan amendment may be considered as part of the Adaptive Management Process.

Comment: The EIS should develop the criteria, outcomes, management goals, and protocol for developing partnerships with local agencies and consensus-based working groups.

Response: The development and function of partnerships is an evolving process on the Forest. Partnerships provide an important link in Forest planning to affected and potentially affected groups. The Forest is in the process of developing guidelines which provide for partnership development and application under the guidelines of the Federal Advisory Committee Act (FACA).

Comment: Agency policies solidified as "prescriptions" have had a devastating effect on the ecological health of the forest. "Put objectives in the plan and leave it to the managers on the ground to achieve those objectives with various tools."

Response: The EIS and Forest Plan provide programmatic management direction. Ecosystem management planning and site-specific NEPA analysis using an integrated resource management approach are the responsibility of the authorized line officer. Part of the Adaptive Management Process is to amend the Plan prescriptions when ecosystem analysis determines they are inappropriate.

Comment: Fragmentation of forest ecosystems are the chief ecological problem for the region.

Response: The issue of fragmentation and connectivity of habitat were primary concerns in the development of ROD and FSEIS land allocation decisions. The EIS and Forest Plan tier to those land allocation decisions.

Comment: Forest Service land has to justify itself with a saleable product as a primary goal, which is not ecosystem management.

Response: Ecosystem management is an ecological approach in land management to sustain diverse, healthy, and productive ecosystems. Site-specific application of ecosystem management practices are

guided by Forest-wide standards and guidelines, land allocation direction, and management area direction. Commodity products may or may not result from application of the process.

Comment: The management of the National Forests should be focussed on maintaining a healthy, productive forest.

Response: These are two of the guiding principles of ecosystem management, which will provide the basis for management under the direction of this Forest Plan and EIS.

Comment: For ecosystem management to be successful it must be practiced on all acres, not just what is left over after single uses have been removed from the management base.

Response: The ROD and FSEIS provided for land allocation decisions which were tiered to by the Forest Plan and EIS. Species viability analysis was used to guide the development of land allocations. The intent is to provide for multiple use, with an emphasis on providing for aquatic and late-successional species habitat needs.

Comment: Potentially destructive management activities should be deferred or limited to non-sensitive areas. Locate resource extraction and other potentially damaging or disturbance-promoting activities away from areas with high levels of biological diversity.

Response: Application of Forest Plan direction, and subsequent ecosystem management and NEPA analysis will provide for an integrated, interdisciplinary approach to resource management. The identification of affected resources and resource values and anticipated environmental consequences will be determined prior to initiating project implementation.

Comment: Provide for FEMAT mitigation measures in Matrix lands.

Response: FEMAT provided most of the framework for the ROD and FSEIS, which in turn were tiered to by the Forest Plan and EIS. Specific management direction for Matrix lands is described in Chapter 4 of the Forest Plan.

Comment: The Forest should establish control plots in each vegetation and soil type within each managed watershed.

Response: Chapter 5 of the Forest plan describes the Forest Monitoring Action Plan, which details monitoring methodology, standards, frequency, precision, and needs for further evaluation/corrective action.

Comment: Establish the Desired Future Condition with public input, and provide for biological diversity goals, timelines, and monitoring for all watersheds.

Response: The Desired Future Condition has been developed for all 22 Management Areas on the Forest, and was influenced by public involvement. Biodiversity goals are described in Chapter 4, and biodiversity monitoring is described in Chapter 5 of the Forest Plan. The Desired Future Condition will be further refined, with public involvement, at the watershed/project level. If Watershed Analysis discovers that the Forest Plan DFC is inappropriate, a Plan amendment may be triggered.

Comment: Emphasize management activities that promote the increase of desirable native plant species and communities.

Response: Chapter 4 of the Forest Plan provides for Botany Standards and Guidelines which emphasize protection and monitoring of sensitive and endemic plant species. The ecosystem management analysis process will provide additional opportunities.

Comment: We need more old-growth on high productivity sites.

Response: An estimated 75% of the Forest land base is reserved from timber management. Though Old-Growth stands are located on a variety of site classes, a large percentage of stands are located on average or better than average site class lands.

Comment: The EIS should include recommendations for the management of non-federal lands as necessary to ensure forest ecosystem integrity and species viability.

Response: Direction for management activities on non-federal land are beyond the scope of this FEIS. However, impacts from past and future anticipated management activities on non-federal lands were considered as part of the cumulative effects analysis.

Comment: If preservation is the goal, the Forest Service should be disbanded and the land turned over to the National Park Service.

Response: The Forest Service will continue to redeem management responsibilities on National Forest System Lands as provided for by statutory requirements and within the context of Ecosystem Management, an integrated resource management system.

Facilities

Comment: Forest roads should be closed, decommissioned, and/or obliterated. Construction of new roads and overall road density should be decreased.

Response: Expected new road construction is reduced from 22 to 3 miles per decade in the Alternative PRF. Roads will be retained in the transportation system which will be needed for future management activities. Uninventoried roads will be analyzed to determine whether they should be added to the transportation system or obliterated.

Comment: Eliminate dams

Response: The regulatory agency responsible for water impoundments such as dams is the Federal Energy Regulatory Commission (FERC).

Comment: How will road maintenance needs be met in lieu of reduced funding levels? Roads should be maintained.

Response: Maintenance of roads will continue to emphasize the prevention of resource damage, user safety, contractual and legal obligations, and to provide an efficient transportation system. The objective is to maintain all Forest roads to at least Maintenance Level 1. The annual program of road maintenance is dependent upon funds and resources available.

Fire/Fuels

Comment: There is no effective direction to accommodate naturally-occurring fires.

Response: Chapter 4 of the Forest Plan, Management Area Direction, provides for the development of fire management plans for designated wilderness areas. Fire management plans can provide for planned and unplanned ignition to restore and maintain natural conditions within designated wilderness areas. If provided for by watershed analysis, ecosystem planning, and/or late-successional reserve plans, some natural fires may be allowed to burn under prescribed conditions within late-successional reserves and in Matrix and AMA.

Comment: Language should be added to the Forest Plan which allows for the use of fire as an appropriate management tool.

Response: The Forest Plan and EIS recognize the use of prescribed fire and mechanical fuels treatment as appropriate management tools. Language incorporating land allocation decisions and standards and guide-

lines contained in the ROD and FSEIS have been incorporated into Chapter 4 of the Forest Plan concerning the application of fuels treatments.

The FEIS and Plan encourage returning fire to its natural role in the ecosystem, to the extent possible.

Comment: Fuels reduction activities should be the focus of Forest Service management activities.

Response: The Forest Plan contains standards and guidelines (Chapter 4 of the Plan) which provide for the treatment of fuels surplus to other resource management needs. Fuels management is a component of integrated resource management and will be emphasized under this Plan.

Comment: The FEIS only discussed prescribed fire, with no discussion of steps to reduce wildfire.

Response: Wildfire control will continue to be the primary suppression response with limited exceptions, as provided for by the Forest Plan Standards and Guidelines, Chapter 4.

Comment: With road closures, reduced timber harvest, and a large percentage of lands devoted to late-successional reserves, what provisions were made to provide for fire management activities?

Response: Guidelines to reduce risks of large-scale disturbance within the late-successional reserves were provided for by the ROD and FSEIS. The Forest Plan, Chapter 4, details these guidelines.

Comment: Provide evidence to support your statement that the negative consequences of burnings, such as smoke, energy waste, loss of soil protection and modification of wildlife habitat as stated in the Forest Plan have significant, long-term, and irretrievable environmental consequences.

Response: These were publically-identified concerns used to develop the public issue regarding fire and fuels "Disposition" which immediately follows, discusses possible management activities which may be taken in response to the public issue.

Comment: The EIS fails to acknowledge the wildland/urban interface situation which exists on the Forest.

Response: The Forest recognizes management complexities caused by the wildland/urban interface. The Forest Service and California Department of Forestry, in coordination with affected volunteer fire departments, provide for cooperative fire suppression management.

through applicable Memorandum of Understanding and Operating Plans. The Standards and Guidelines (Chapter 4 of the Plan) prioritize the use of prescribed fire, and public safety is number 1. This suggests that the public risk associated with the wildland/urban interface is acknowledged and will be addressed.

Comment: The Standard and Guideline detailing application of the fuels photo series is overly restrictive.

Response: The Standard and Guideline references to the use of the fuels photo series has been deleted from the Forest Plan.

Comment: The Forest Plan should include a 10 year fuel-reduction plan to return the Forest to more natural fuels conditions.

Response: Ecosystem management analysis will identify fuels surplus to other resource considerations as part of an integrated resource management approach. It is estimated that 30,000-90,000 acres of fuels treatment per year may be necessary as a part of ecosystem management.

Comment: The EIS and Forest Plan are deficient in the analysis of how fire disturbance regimes relate to ecosystem management.

Response: The FEIS and Forest Plan is based on the premise natural fire regimes will be a main component of ecosystem management. Detailed analysis and development of fire management direction will occur at the landscape level through watershed/landscape-level analysis, Late-Successional Reserve Assessments, and Adaptive Management Areas plans.

Comment: The EIS offers conflicting statements regarding the use of prescribed fire. Under Air Quality, statements support the continued application of prescribed fire, while under Biomass it states "there is concern that prescribed burning of logging debris is detrimental to other resource values and should be reduced."

Response: The statement following the Biomass heading was a publicly-identified concern used to help focus the analysis of the fire/fuels issue. As part of ecosystem management it is expected that an important component of fuels treatment will be to leave enough dead and down woody debris behind to satisfy other resource requirements.

Comment: The merits of uneven-aged forests in slowing fires has been overlooked.

Response: Wildfire risk and hazard is a complexity of inter-related environmental and biological factors, including stand structure and composition. Fire plans developed during ecosystem management analysis will recommend management actions which best meet wildfire risk and hazard objectives while meeting other integrated resource management objectives.

Comment: The generic prescriptions and standards specified within Option 9 that will be incorporated into the Forest Plan are not compatible with re-establishment of the natural role of fire in the ecosystem.

Response: The Forest Plan will provide for some natural fires to be allowed to burn under prescribed conditions after completion of, and in compliance with, ecosystem plans and/or Late-Successional Reserve assessment.

Comment: The proposed annual fuel treatment program of 8,400 acres should be increased to allow for the treatment of backlog acres in need of fuel reduction.

Response: The proposed fuel treatment program has been increased to 30,000-90,000 acres per year. This level of fuels treatment is expected to occur as a result of ecosystem planning.

Comment: Fire management complexities caused by checkerboard land ownership patterns needs to be addressed.

Response: Checkerboard land ownership patterns do provide for fire management complexities. These factors were taken into account during application of the "Balance of Acres" concept applied by the Forest Service and California Department of Forestry in determining primary fire suppression response areas.

Comment: The Forest Service's fire liability caused by its lack of management should be identified and displayed.

Response: The Forest Plan provides for fuels management activities under prescribed conditions after completion of, and in compliance with ecosystem plans and/or late-successional reserve assessments.

Comment: The acreage displayed in Appendix M, Table Y-2, are the same through Decade 5. Thus it appears the fire and fuels program will be ineffective in reducing losses to wildfire.

Response: Table M-2 displays historical fire intensity levels for the Forest. Modeling limitations make out-year extrapolations speculative, but a continuation of

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historical trends are anticipated for wildfire effects. While the acres burned may not decrease measurably because of the fuels management program, the intensity of fires and related resource loss should decrease.

Comment: Biomass thinning should be used pro-actively to provide for fuelbreaks in high fire-risk areas.

Response: Fire plans developed during ecosystem management analysis will recommend management actions which best meet wildfire risk and hazard objectives while meeting other integrated resource management objectives.

Comment: The Forest Plan should provide data, standards and guidelines which restrict prescribed burns to specific time periods. Prescribed burns can damage native plants and wildlife which reproduce and grow during typical prescribed burn time periods.

Response: Resource management objectives are defined in advance of the use of prescribed fire by an interdisciplinary team working through the ecosystem management assessment process. Objectives, benefits, and risks are considered, and provide for an integrated resource management prescription. It is expected that in the future much prescribed burning will need to occur during fire season, if ecosystem objectives are to be met.

Comment: Prescribed burning should be prohibited on National Forests because of air pollution, climate destabilization, the creation of water-impervious soil, the creation of nutrients not readily available to plants, and by drying the soil.

Response: An interdisciplinary team of resource professionals consider the interaction of a complexity of environmental and biological factors relating to the use of prescribed fire. The interdisciplinary recommendations are considered by a deciding official, who makes a decision. The decision then allows for development of a prescribed burn plan, which provides for environmental and physical attributes which must be met prior to implementing a prescribed burn action. When making a decision about the use or non-use of prescribed fire, the burn effects of wildfire need to be compared with what is expected to occur from prescribed fire.

Comment: The recognition of the role and management support for the use of prescribed fire is lacking in the Forest Plan.

Response: The natural role of fire in ecosystem function and how that might translate into fuels treatment

and prescribed fire, is an integral part of the Final Forest Plan.

Comment: The prescribed use of fire should be timed to augment grazing, and not to replace grazing or conflict with the availability of forage.

Response: Fire plans developed in conjunction with ecosystem management analysis will consider integrated resource management objectives, including range.

Fisheries

Comment: The Forest Plan statement concerning fish kills in West Squaw Creek from acid mine waste is incorrect because, while improving, it is a continuing problem.

Response: This statement is a "Desired Future Condition", not a statement of the current situation. A Desired Future Condition (DFC) is a description of desired future conditions for resource, social, economic and/or cultural elements. Implementation of the Forest Plan will help direct management activities toward attaining described DFCs.

Comment: Analysis comparing 5th decade PRF and CUR fish pounds of output is ludicrous.

Response: As discussed in Chapter II of the EIS, outputs are planned for decade 1, potential outputs are shown for decades 2 through 5 for long-term comparisons and disclosure of environmental consequences. The National Forest Management Act requires the consideration of a 50 year base period for Forest land management plans. Potential effects were quantified, where possible, to aid in long-term alternative comparison.

Comment: Impacts from all aspects of artificial fish propagation in Forest watersheds was not disclosed. The proper role of fish hatcheries must be integrated into management and the NEPA process.

Response: Stocking hatchery-reared fish into suitable waters is the responsibility of the California Department of Fish and Game, and not within the scope of this EIS.

Comment: Because of the low numbers of spring-run chinook, the measurement of impacts is no longer necessary. The time has come to make land management decisions that will improve its habitat and provide for its viability.

Response: The Aquatic Conservation Strategy adopted by the ROD, which has been incorporated into this

Plan, includes the designation of Key Watersheds, the requirement for watershed analysis, the establishment of Riparian Reserves, and the expectation for watershed restoration. Except for the mainstem of the Trinity River, the lower portion of Big French Creek, and some of the mainstem's smaller tributaries, most of the Trinity River Basin has been designated as Key Watershed. The New River, North Fork of the Trinity River, and Canyon Creek are viewed as refugia watersheds for maintaining wild stocks of spring chinook and summer steel head. The South Fork Trinity River is a working watershed where watershed restoration activities are key to the recovery of these two species.

Comment: We believe NEPA and NFMA require the Forest Service to recognize a relationship between naturally inherent problems such as flooding, fires, unstable soils, to Forest Service activities, such as logging. Without recognizing the relationship, the DEIS seriously underestimates the habitat constraints.

Response: The EIS recognizes the relationship between physical, environmental, and biological factors. For the purposes of analysis, only those human-induced activities within the administrative purview of the Forest were considered in the EIS.

Comment: The Forest Plan does not appear to provide for the protection of intermittent or headwater streams, thus it is doubtful that steelhead habitat will be maintained.

Response: The Aquatic Conservation Strategy, as detailed in the ROD and FSEIS, has been incorporated into the Preferred Alternative of the Forest Plan. As described in Chapter 4 of the Forest Plan, "intermittent streams are defined as any nonpermanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria." Areas meeting these criteria are accorded riparian management zone standards and guidelines.

Comment: Fisheries are cited as an "output" on page B-7 but the only type of information mentioned includes "fish user days" and "direct habitat improvement programs." Ten percent of the background fish user days are "assumed to be produced from anadromous fish." How do these figures relate to the actual conditions of fish in the water?

Response: The information cited is contained in Appendix B, the Modeling and Analysis Process, detailed in the Forest Plan. Two models were used to analyze fishery parameters for the alternatives considered in detail, FORPLAN and Wildlife and Fish Habitat Rela-

tionship (WFHR) system models. Model outputs and assumptions are described in Appendix B. Our estimated outputs are based on the best information we have about what the habitat could support. Actual numbers of fish both now and in the future are based on habitat and other factors which our beyond the scope of this EIS.

Comment: Key watersheds and strategies should be embodied into a Fisheries goal. Restoration activities mentioned in item #15 need to be expanded to other streams. Management direction for high mountain lakes should be embodied in a Fisheries goal.

Response: The Aquatic Conservation Strategy provided for by the ROD and FSEIS and incorporated into the Forest Plan and EIS, provides for key watersheds and strategies. Restoration activities not specifically addressed as a Forest Goal may be provided for through application of the watershed analysis and/or ecosystem management processes. Management direction for high mountain lakes is provided for within Recreation, Riparian Area, and Wilderness standards and guidelines.

Comment: Trinity and Shasta Lake FHI plans, and an inland fisheries standard and guideline should be added.

Response: Over the past 6-8 years, annual fishery habitat improvement plans were developed for each lake and implemented with CDFG concurrence. New policy direction directs that Trinity and Shasta Lake Fishery Habitat Improvement plans should more appropriately be addressed in ecosystem management/site specific NEPA analysis projects. Inland fisheries standards and guidelines are embodied in current Fisheries, Riparian Areas, and Soils and Water standards and guidelines.

Comment: In the Monitoring Action Plan, "Key watersheds" should be incorporated into the "Riparian habitat condition goals" and "Anadromous fish population surveys" under the "Techniques and/or Data Sources" heading.

Response: As indicated in the Monitoring Action Plan, specific assessment watersheds/streams have not been determined. This allows for a full range of management factors, including key watersheds, to be considered in prioritizing monitoring areas.

Comment: The subject heading "Enhancement" is more accurately labeled "Rehabilitation" under Inland Coldwater Fish Assemblage in Chapter III of the EIS.

Response: Enhancement is used in a general term. It refers to either (1) biological enhancement, i.e. the natural or artificial propagation of fish or (2) physical

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enhancement, i.e. rehabilitation or restoration or replacement of habitat elements deemed as lacking and essential for the proper functioning of the riparian ecosystem.

Comment: The proposal to add fertilizer to lakes to increase fish production seems questionable

Response: The Forest Plan does not propose to add fertilizer to lakes to increase fish production. The statement appears to be a reference to Appendix B, the Modeling and Analysis Process, which discusses "inland coldwater lakes would be improved through lake enrichment techniques (improvement of nutrient levels)

Comment: Can make no sense of the explanation of FUDs and acres in Appendix B

Response: This discussion was contained in Appendix B, the Modeling and Analysis Process. Several computer models were used to simulate outputs for the alternatives considered in the EIS. FUD is a fish user day, twelve hours of recreation use oriented to fish. In the context of modeling for fisheries outputs, 'acres' refers to the number of fish habitat improvement structures constructed per acre of habitat.

Comment: There seems to be conflicts in desiring the enhancement of introduced warmwater fish, and the survival of native coldwater fish. You need to establish priorities.

Response: These goals are not mutually exclusive. The Forest has substantial habitat for both "types" of fish, and can provide for management activities which enhance the habitat for each.

Comment: You need to address the long-term problems associated with diversions and impoundments to fisheries habitat conditions.

Response: Chapter 4 of the Forest Plan details Forest-wide Standards and Guidelines applicable to Hydroelectric Power Projects.

Comment: To request the Bureau of Reclamation to manage water levels to benefit an introduced species to the detriment of downstream natives seems inappropriate.

Response: As described in Chapter III of the EIS, "State Fish and Game Code 1743 states that, 'The department [DFG] shall improve shoreline habitat for black bass in waters where insufficient habitat exists and shall encourage reservoir operating agencies to carry out shoreline habitat improvement projects.' This has been the emphasis at Shasta Lake since 1982 and at Trinity Lake since 1989."

Comment: While building instream structures has become popular, it does not necessarily address the limiting factors in a given watershed. Provide special protection for entire watersheds which sustain at risk (fish, amphibian) species.

Response: As stated in Chapter III of the EIS, "[t]he purpose of installing log structures is to create instream structural complexity." Adoption of the Aquatic Conservation Strategy, as provided for by the ROD and FSEIS and as incorporated into the Forest Plan and EIS, addresses watershed considerations which may affect fisheries habitat.

Comment: Fish biologists agree that hatchery fish can seriously undermine the genetic integrity of wild stocks. The DEIS fails to reveal [this] issue, rendering its analysis insufficient to support public understanding and agency decision making.

Response: The Forest has management responsibility to provide for fisheries habitat upon National Forest System lands. The California Department of Fish and Game has management responsibility for the fish. The consideration of hatchery/wild stock is outside of the management responsibility/authority of the Forest.

Comment: How can you not project additional increases in pounds of anadromous fish over the next 50 years resulting from the direct and indirect improvements to water quality and fish habitat that is the essence of the Forest Plan?

Response: Currently, the Salmon and Steelhead populations returning to the Shasta-Trinity National Forests are at an ebb. Several stocks of fish listed as "at risk of extinction" are found within the Trinity River basin. The basin's stocks have been impacted by a variety of internal and external impacts. It would be extremely optimistic to predict a major upswing or significant increases when cumulative impacts have existed for so many years. Even with watershed rehabilitation, ecosystem restoration, and better recovery efforts for salmon and steelhead stocks it may well take 100 to 150 years for the species to recover to near historic levels, if that high. Meanwhile we need to cooperatively manage for what the impacted individual systems will yield naturally with the thought in mind that any additional impact(s) will lengthen the recovery period.

Comment: Your desire to emphasize sport fisheries as a major recreation activity by expanding recreational fisheries opportunities is in conflict with your statement that increased recreational sport fishing could be detrimental to certain declining or sensitive fish stocks.

Response: These statements are not in conflict Chapter IV of the EIS, Fisheries, under Recreation Management, details the anticipated affects of recreational sportfishing upon a variety of fishery resources.

Comment: We urge your final draft to downplay additional structure implementation and instead, feature maintenance of selected existing structures as justified through fish utilization monitoring.

Response: As detailed in Chapter III of the EIS, Fisheries, under Habitat Improvement, "[t]he effectiveness of habitat improvement structures may not be readily apparent due to other short term influences. These influences may include annual and seasonal natural watershed variations, complications within the lifecycle of an anadromous fish species, or human-induced fisheries which may constrain the returns of fish to a stream which cannot be effectively qualified or quantified. For example, the Klamath-Trinity River basin, after four drought years, is experiencing its lowest recorded anadromous fish returns. Therefore, someone could conclude, erroneously, that installed structures are ineffective in increasing fish numbers because of the low numbers of adults or juveniles using the structures. To determine structural effectiveness considerable long term monitoring and extensive documenting is necessary"

Comment: While a variety of factors share responsibility for the dire conditions of anadromous fish in California, degradation of spawning and rearing habitat quality on federal lands is clearly an major cause of the crisis

Response: The Aquatic Conservation Strategy as provided for by the ROD and FSEIS has been incorporated into the Forest Plan and EIS. The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems, and to protect salmon and steelhead habitat. The degradation of habitat on federal land is a contributor to the problem, but there are currently miles of stream with good habitat that are not being utilized. This suggests that other factors may be involved.

Comment: The wild trout gene pool was not completely eliminated by the Cantera incident. Progeny from the survivors are expected to repopulate the entire river over a period of years.

Response: Reference is made in Chapter IV of the EIS that "Fishing diversity would be enhanced as the wild trout population rebounds from the disastrous chemical spill of July, 1991." This statement is in keeping with the intent of the comment.

Comment: The names Dolly Varden and Dolly Varden Trout should be changed to bull trout in Appendix N of the Forest Plan.

Response: Appendix N, the McCloud River Coordinated Resource Management Plan was included in the appendix of the draft Forest Plan as an informational item. This plan will not be included within Final Forest Plan appendices.

Comment: There is concern that there is significant risk of damage to anadromous fish producing streams inherent in construction activities in and near streams. Plans for artificial habitat improvement structures should be evaluated and developed in coordination with the DFG prior to implementation to avoid potential adverse impacts to stream ecosystems.

Response: The Forest frequently consults and coordinates with other agency representatives, including the Department of Fish and Game.

Comment: Make categorization of the redband trout as a sensitive species consistent in both the Forest Plan and EIS.

Response: The inconsistency, as cited, was not found. The redband trout is an emphasis species. The management goal for an emphasis species is to maintain or improve habitat capability where economically and biologically feasible. Confusion may come from the fact that Redband Trout is listed under the general category of Threatened/Endangered/Sensitive fish species in the Forest Plan in Chapter 3. Currently, the Shasta-Trinity National Forests have recommended to the Regional Forester that the McCloud Redband Trout be listed as sensitive. Action is pending.

Comment: With the redband being listed as a state threatened species, there should be no more management, including grazing, until the viability of this species can be insured. Supplemental Management Direction should also include a goal to implement substantial changes in grazing management practices to bring an end to the serious damage currently occurring to redband trout streams on both public and private lands. Reference to redband trout should be made in Supplemental Management Direction for the McCloud River Management Area. The FS should work with DFG on seeking wild trout stream designation and management for the mainstem Upper McCloud from Upper Falls upstream.

Response: A Redband Trout advisory committee has been established to address the major concerns with low population numbers, degraded or potentially impacted habitats, and introgression with hatchery-reared Rainbow Trout. Membership includes the Forest Service, the U.S. Fish and Wildlife Service, the California Department of Fish and Game, Private Timber Indus-

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try, and several other interested parties. The intent of the committee is to complete a draft conservation strategy plan for the management of the McCloud Redband Trout by early summer of 1995.

Comment: In order to provide alpine lake fishing opportunities in the Trinity Divide area, the Forest Service should work with DFG to achieve wild trout designation and management for Toad and Dobkins Lakes.

Response: Both lakes are found within the currently identified headwaters watershed analysis area of the South Fork Sacramento River and will be evaluated as part of the fisheries focus for the area. Currently, both lakes receive supplemental fish plantings by the California Department of Fish and Game. In 1994, Toad Lake received 4,000 Brown Trout and 2,000 Rainbow Trout fingerlings while Dobkins Lake received 2,000 Brown and/or Rainbow Trout fingerlings. No decisions will be made on wild trout status designations and management for either lake until watershed analysis and the associated NEPA documentation is completed. Fisheries status and management decisions will be developed in cooperation with the Department of Fish and Game.

Forest Pests

Comment: Pests are a problem only in disturbed forests where there is slash and logging debris to act as host for pests. I recommend that logging cease - thus eliminating slash, pests, damaged trees and chemical treatments.

Response: Insects, pathogens, animals, and vegetation are only considered pests when they interfere with defined management objectives. This is part of the integrated pest management (IPM) approach that the Forest follows. Properly implemented management activities do not increase the levels of these organisms to damaging levels, and often aid in reducing their current or future impact. Properly treated slash is not a reservoir for damaging agents and does not necessarily result in increased pest activity. Chemicals will be used to control pests only when essential to achieve the land management objectives. Alternative methods will be evaluated on a project specific basis.

Comment: Stands containing Port-Orford-cedar shall not be entered until control of mortality from Port-Orford-cedar root disease is known and available.

Response: Port-Orford-cedar root disease is not present on or within the Shasta-Trinity National Forests. Prior to any management activity in areas with Port-Orford-cedar a risk analysis will be performed to assess the risk of introduction of the disease, to determine if the activity

can be implemented within an acceptable risk, and to determine if special mitigation measures are needed. This is part of the Supplemental Management Direction for Management Areas 4 and 5.

Comment: The Forest is obsessed with dwarf mistletoe. This obsession jeopardizes true landscape management and justifies the arbitrary 180 year rotation on matrix lands.

Response: The Forest-wide standards and guidelines that addressed dwarf mistletoe have been changed to more accurately reflect the ecological role of these plants. In the absence of natural fire, however, some actions directed at their control may be necessary to provide long-term, sustainable forest stands.

Comment: Research is necessary on genetic variation in sugar pines in different locations within the Trinity NF. The trees aged 200 plus years should all be left unlogged, since they appear unaffected.

Response: Genetic analysis of sugar pine for resistance genotypes has been done rangewide, including on the Trinity NF. The level of dominant gene resistance, what is currently employed, was found to be low. Efforts are continuing to search for and identify sugar pines that carry this type of resistance to the blister rust fungus, as well as other forms of resistance. This is part of the Forest's sugar pine management plan. Regional policy for sugar pine management requires that apparently rust-free sugar pine will only be harvested or thinned if it is essential to meet management objectives.

Geology/Soil

Comment: Much of the erosion in South Fork is due to badly designed and implemented roads.

Response: Forest Service system roads are designed to minimize off-site effects. Routine maintenance provides for the continuing function of design features. The watershed analysis process identifies roads no longer needed for management activities which may be contributing to adverse off-site effects. The subsequent NEPA process provides for the closure or decommissioning of roads as necessary to meet ecosystem management objectives.

Comment: A Standard and Guideline is needed to require that the existing sediment load for all stream classes be determined prior to the implementation of soil-disturbing activities.

Response: The Forest is moving toward the development of sediment yield models, but they are not yet

available for planning purposes. The use of applicable Best Management Practices, Appendix E of the Forest Plan, the Soil Quality Standards, Appendix O of the Forest Plan, and site-specific mitigation measures provide for protection of the soil resource during the implementation of management activities.

Comment: To consider a clearcut where the soil has been pulverized by heavy equipment the same as a fire is absurd. The Plan lacks analysis of how the alternatives would address areas with high to very high erosion potential.

Response: Ecosystem analysis and subsequent NEPA process provide for site-specific analysis of proposed management activities upon the soil resource. The application of Best Management Practices, Soil Quality Standards, and site-specific mitigation measures provide for protection of the soil resource during the implementation of management activities.

Comment: Logging and roadbuilding activity will disturb vast areas of unstable land which will degrade stream ecosystems and aquatic habitat. Remove all forest land on steep and moderately steep slopes from the suitable timber base until specific sites are certified as having low landslide risk.

Response: General slope stability hazards have been completed for Forest areas with the greatest hazard. These areas have been mapped and are tracked in Forest databases. Watershed analysis, and site-specific project analysis provide for future identification of, and management requirements for, other areas of high slope stability hazard.

Comment: How will soil productivity standards be monitored?

Response: Chapter 5 of the Forest Plan describes the monitoring plan that will be applied to affected management activities.

Hazardous Materials

Comment: The EIS fails to address air and water pollution associated with asbestos aggregate surfaced roads.

Response: Site-specific operating plans and NEPA analysis will identify mitigation measures, where needed, for identified affected areas.

Herbicides

Comment: Herbicides should not be used on National Forest lands under ecosystem management.

Response: Management direction for the use of herbicides is already covered in agency manuals and handbooks, and regional guidance (EIS) for vegetation management, and will be considered and analyzed in the environmental analysis for projects where their use is possible. Forest standards and guidelines in the Final Plan limit the potential use of herbicides, except in special cases.

Comment: The Forest should prepare documentation for each vegetation management project where herbicide use is an alternative, with specific guidelines and information of effects and consequences.

Response: Forest standard and guidelines addresses the need for site specific analysis during the environmental analysis process for each project that considers possible herbicide use.

Comment: Specific methods and timing of application, effects on sensitive plant populations, and mitigation measures pertaining to pesticide use should be assessed in the EIS.

Response: Specific measures will be addressed in site specific, project level environmental documents. Mitigation guidelines are found in manuals and handbooks, and the regional EIS for vegetation management.

Comment: The Forest should discuss whether specific lands have been classified as capable or suitable because herbicides have been authorized.

Response: There would be no change in the suitable timber land base for any alternative, because all lands are assumed to be regenerable to minimum stocking standards within five years after harvest, using methods other than herbicides (Chapter II, FEIS).

Comment: Have understocked lands been scheduled for full timber yields based upon the authorization of herbicide use?

Response: No. Potential timber yields are based on data collected from forest stands and projected into the future. The yield tables have not been adjusted based upon the authorization of herbicide use. As noted in the Monitoring Action Plan in the Final Plan, yield tables will be adjusted if new inventory data indicates an adjustment is necessary.

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Comment: Have nonstocked lands, where reforestation has been unsuccessful to date, been scheduled for ASQ contributions because of the authorization of the use of herbicides?

Response: No. The suitability of land for timber production, based on regenerability, is determined by factors which do not include the use, or non-use, of herbicides (see Appendix I of the Final Plan). If regeneration cannot be reasonably assured within five years of harvest, for any reason, then the land is considered to be unsuitable.

Comment: Manual control of vegetation, while more costly on a per acre basis, may ultimately prove cheaper than herbicides when all the hidden costs and benefits are factored in.

Response: Economics is one of several factors considered when assessing alternative methods of vegetation control. Effectiveness and environmental factors are other important considerations.

Comment: Herbicides should only be used when their use is consistent with the biological diversity standards and guidelines, essential to meet management goals that include maintenance and enhancement of native plant communities, and only after all alternative methods have been considered with appropriate NEPA analysis.

Response: All forest activities must meet the Forest Standards and Guidelines. Herbicides would be used only when essential to achieve the assigned land management objectives, which may include the protection of native plant communities. As noted in Forest Standard and Guidelines the method selected would be determined at the project level by site specific analysis during the environmental analysis process.

Comment: If all herbicide applications to control forest pests are conducted under the FEIS for Vegetation Management for Reforestation, this should be clearly stated.

Response: Most proposed herbicide applications would be done for reforestation purposes, and conducted under the direction found in the FEIS. Herbicide use for any other purpose would require additional environmental analysis and documentation.

Heritage Resource

Comment: Priority should be given to completing a comprehensive research design and plan to replace the ineffective policy of FIND-FLAG-AVOID. The four Forests should cooperate in this effort. The current policy of find-flag-avoid needs to be evaluated for

compliance with 106 requirements. Illegal MOUs should be renegotiated. Executive Order 11593 should be followed.

Response: The Forest has been working for many years with the State Historic Preservation Office's general concurrence of the avoidance method for site protection. While the Forest agrees a more comprehensive evaluation and protection plan is desirable, funding levels have not been sufficient to implement such a program. With the implementation of watershed analysis, however, Prescription XI (Heritage Resource Management) has been modified to include Native American participation early in the watershed/project planning process which will encourage more thorough evaluation of sites. See Forest Plan, Chapter 4, Administratively Withdrawn Areas, Prescription XI, Standards and Guidelines. The Forest doesn't have any MOUs dealing with SHPO or ACHP.

Comment: The impacts of LIVESTOCK on heritage resources has not been analyzed. Grazing permits should be reviewed for 106 compliance.

Response: The Forest agrees with this statement. Beginning in 1995 the Forest will be funding Section 106 compliance review for allotment renewals. See also the new standard and guideline under Prescription XI that deals specifically with Section 106 compliance and Special Use Permits (Forest Plan, Chapter 4, Administratively Withdrawn Areas, Prescription XI, Standards and Guidelines).

Comment: Native Americans and other affected cultural groups and experts have not been adequately consulted to assess the value of heritage resources. A programmatic agreement for assessing value should be developed that includes the concurrence of the Native Americans and other cultural groups which would be affected. Where project overviews indicate that the site may be significant, consultations should ascertain whether this is so. Native American should also be consulted to assist in locating heritage resources that can't be "physically located with any degree of precision" according to Chapter III of the DEIS.

Response: One of the Forest-wide goals listed under Heritage Resources is to "Develop partnerships with Native American tribes and organizations to enhance those cultural resources that reflect their heritage" (Forest Plan, Chapter 4, Forest Goals). In addition, Prescription XI (Heritage Resource Management) now addresses the need to consult with Native Americans at the watershed/project planning level to assure that Native American concerns are addressed in the process. See Forest Plan, Chapter 4, Administratively With-

drawn Areas, Prescription XI, Standards and Guidelines Recently, the Forest has consulted with Native Americans in several proposals of high public interest such as the Mt Shasta Ski Area Proposal, reforestation proposals, group-use permits and the Butter Creek Watershed Analysis Hundreds of letters have been sent out to those people and organizations who have shown interest in a particular area. These letters ask for comments and encourage participation in the planning process Anyone who has an interest in a particular area should write or call the Forest and ask to be put on the appropriate mailing list

Comment: What assurance is there that the Goals, Standards and Guidelines under Prescription XI will be applied in practice)

Response: Forest-scale monitoring plans are designed to ensure that standards and guidelines are being met During the monitoring process, if it is determined that standards and guidelines are not being met, corrective action will be taken or the Forest Plan will be amended, if appropriate See Forest Plan, Chapter 4, Administratively Withdrawn Areas, Prescription XI, Standards and Guidelines, #3 that covers protection plans and monitoring

Comment: The following studies should be referenced in Chapter III of the EIS and the bibliography

STATEMENT OF FINDINGS - NATIVE AMERICAN INTERVIEW AND DATA COLLECTION STUDY OF MOUNT SHASTA, by Theodoratus and Evans, Theodoratus Cultural Research, 1991, NATIVE AMERICAN HISTORIC CONTEXT - MOUNT SHASTA, CALIFORNIA, by Winfield Henn, Shasta Trinity NF, 1991; and MOUNT SHASTA IN LATE 19TH AND EARLY 20TH CENTURY NON-NATIVE AMERICAN HISTORY, by Conners and Elliott, Shah-Trinity NF, 1992

The College of the Siskiyou's Mount Shasta Collection and the extensive 1200-source ANNOTATED BIBLIOGRAPHY OF THE MT SHASTA SPECIAL COLLECTION, by William C Miesse (College of Siskiyou, 1993) should also be consulted and listed as an information source.

Response: The USDI, National Park Service letter and Determination of Eligibility Notification (EO 11593) dated March 11, 1994 signed by the Keeper of the National Register is made part of the Forest Planning Record This letter contains references to the many studies that provide background to the Determination including the three references listed above

Comment: Quantitative rather than site specific comparisons are not fully appropriate with regard to cul-

tural resources, since aboriginal traditional cultural values are closely linked to specific places Basing the risk of adverse effects on cultural resources on acres of timber management only partially compares the alternatives What would be more significant would be to compare how specific sites of importance to native people, such as Mount Shasta, are treated in the alternatives On those grounds, Alternative CBF, which allocates important places on Mount Shasta to primitive recreation, would come closer to true management for cultural resources

Response: Prescription XI, Heritage Resource Management, is applied specifically to protect the 300-400 eligible sites of importance on the Forest This prescription provides direction Forest-wide More detailed analysis and evaluation will occur at the watershed analysis and project planning levels See Forest Plan, Chapter 4, Prescription XI, C Description of Where Prescription XI Will Be Applied

Comment: The LMP DEIS ignores the Forests' own Multiple Property designation for Mount Shasta and the Advisory Council's advice that all of Mount Shasta be considered eligible for the National Register of Historic Places while the determination of eligibility is being decided by the Keeper of the National Register (see letter of October 8, 1993 from the Advisory Council to the Forests) Even though we disagree with the Multiple Property designation, the Forests have the obligation under its provisions to at least evaluate whether projects will have an effect on historic properties and abide by their own statements until eligibility is determined for all of Mount Shasta

Response: The Mt Shasta Historic District has been determined to be eligible for the National Register of Historic Places If this decision is reaffirmed after an additional comment period all proposed projects must include an expanded consultation process with all interested parties For a complete discussion on historic status of the Mt Shasta area please refer to the FEIS, Chapter III, Recreation

Comment: Need a Standard to prioritize sites eligible for the National Register of Historical Places and to write up and submit 20 sites per year

Response: Prescription XI, Heritage Resource Management, has already prioritized sites based on eligibility, scientific value, interpretative potential and importance to Native Americans Specific sites have not been submitted for listing due to limited staffing and funding.

Comment: PLAN, Chapter 3, Page 7, Cultural Resources, paragraph 4 Portions of the Shasta Unit of

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the National Recreation Area have been heavily surveyed and the majority of it has been surveyed in the more sensitive areas and in the vicinity of human activity

Response: The Forest recognizes that many smaller areas have been surveyed in the Shasta Unit of the NRA, especially in the more developed areas. These acres, however, constitute a relatively small portion of the entire area. In general, most of the area of the Shasta Unit of the NRA has not been surveyed.

Comment: DFC for heritage needs to be included in the Pit, Nosoni, and Front Management Areas

Response: Prescription XI provides Forest-wide direction for Heritage Resource Management for all Management Areas. The watershed/project planning process will look at specific sites of importance in each management area of a watershed or project area and consult with Native Americans to assure that Native American concerns are addressed.

Comment: The Tsnungwe Council of Humboldt and Trinity Counties strongly objects to the proposed management plans for the Shasta-Trinity and Six Rivers forests. We object because

1 We were not consulted or even contacted at any time during the development of the plans EVEN THOUGH OUR TRIBE IS OBVIOUSLY LOCATED WITHIN THE BOUNDARIES OF BOTH FORESTS

2 There is discussion of native cultural and historical resources, in the Shasta-Trinity plan, HOWEVER, OUR TRIBE ONCE AGAIN HAS HAD NO INPUT IN ANY OF THESE DISCUSSIONS. THIS DOES NOT MAKE SENSE ON ANY LEVEL BECAUSE THE DISCUSSION WAS REGARDING RESOURCES AND HISTORICAL SITES RELATIVE TO OUR PEOPLE!

The Tsnungwe Council insists that you consult with our elders as soon as possible to correct these oversights!

Response: The Tsnungwe Council was not intentionally overlooked. The Forest has been consulting with Federally recognized tribes from the early years of the planning process. With the new standard and guideline to consult with Native Americans at the watershed/project planning level we expect to have more contact with all tribes including the Tsnungwe.

Lands

Comment: Specific land adjustment comments
a The Crane Mills parcel at Ney Springs should be targeted as a high priority for acquisition.

b As a stipulation of a land exchange with Dave Frase for a parcel in the vicinity of Mott, keep steeper portions of this parcel closest to the river as open space.
c Hearst is opposed to land adjustment with the Forest Service that involves Forest Service acquisition of the Big Springs area.

Response: a The Crane Mills parcel is a high priority for acquisition. b The Forest Service cannot impose this type of stipulation as a condition of a land exchange. c The Big Springs area is a high priority for acquisition. Supplemental Management Direction for Management Area 10, number 7 is revised to read "Where the opportunity arises, the Forest will seek to acquire public access along the McCloud River and Squaw Valley Creek."

Comment: What Standards and Guidelines are specific to powerlines?

Response: See Forest Standards and Guidelines for Transportation and Utility Corridors.

Comment: The Plan should not preclude future electric facility expansion, including utility rights-of-way, and that existing permits are not superseded by the Plan.

Response: The Plan does not supersede any existing permits and rights-of-way including reasonable access. The designation of utility corridors is regulated by Section 503 of the Federal Land Policy and Management Act of 1976 which discourages the proliferation of rights-of-way. The reference in the Forest Standard and Guideline under Transportation and Utility Corridors is consistent with this direction, while recognizing that there may be overriding economic and environmental reasons to designate new corridors.

Comment: The Plan directs that new telephone and power lines less than 35 KV are to be buried underground. This is an unrealistic economic burden to PG&E and its customers.

Response: Forest Standard and Guideline under 12 Lands (b) is directed by Forest Service Manual (R5 Supplement 2700-92-4) direction which states at 2726.43 (a) Powerlines Up To and Including 35KV "Place all new powerline installations underground, except where the environmental analysis indicates that aerial construction provides better protection for National Forest resource and environmental values." In cases where utility companies have entered into MOUs with the Forest Service, the agreements of the MOUs will supersede the direction at FSM 2726.43(a).

Comment: Withdrawals under Section 24 of the Federal Power Act should be included in the Plan.

Response: All proposed projects related to Section 24 of the Federal Power Act are subject to the regulations of the Act. Section 24 Withdrawals have been inventoried and displayed on the land status maps at the Forest.

Comment: Eliminate the "checkerboard" landholding patterns. It is unclear what lands the Forest Service is considering for exchange.

Response: The discussion in Chapter III FEIS under Lands explains the land adjustment policy related to "checkerboard" ownership. An ownership map and land adjustment guide is included with the FEIS and Forest Plan publication.

Law Enforcement

Comment: The Forest Service contributes to fish poaching by constructing roads into formerly inaccessible areas.

Response: Enforcement of fish and game laws are principally the statutory responsibility of the California Department of Fish and Game, though the Forest Service provides cooperative enforcement activities on National Forest System lands. Ecosystem management analysis and subsequent NEPA assessments provide the opportunity to address a variety of resource issues, including roading, to provide for integrated management activities.

Comment: Law Enforcement Standards and Guidelines need to include the Forest Service will investigate all possible violations of law including resource theft and fraud, and prosecute when sufficient evidence is obtained, and the Forest will ensure that all labor laws for contractors are enforced.

Response: Forest goals, detailed in Chapter 4 of the Forest Plan, provide for management direction for Forest law enforcement priorities, including the protection of resources, property, and public safety through prevention of law violations and associated loss and damage. The Service Contract Act and Migrant Seasonal Protection Act provide most of the statutory authority for contract labor. Contracting officers are responsible for ensuring contract provisions are enforced. Cooperative law enforcement involvement with other agencies, or at the request of the Contracting Officer, is provided as requested within Forest Service statutory authority.

Comment: Increase patrol and apprehension of violators.

Response: The Forest Service fully redeems law enforcement responsibilities within budgetary constraints.

and statutory responsibilities. The USDA Forest Service law enforcement program was reorganized in 1994 with an objective of providing more efficient and responsive service.

Management Areas

Comment: Within Mount Shasta Management Area 3, management prescriptions III and VII threaten the mountain's integrity and value as a cultural resource. These prescriptions should be changed to prescription XI. The allocations of the mountain can best be met through a separate management plan. This management area should be placed into prescription XI, I or X for areas designated Prescription I in the CBF alternative, and into prescription XI or II for areas that extend to the multiple property boundary. The boundary of the Management Area should coincide with the multiple property boundary. The unroaded, non-motorized recreation designation should be extended to preserve a park-like Shasta red fir stand along the trail to Shasta Alpine Lodge, which is inadequately protected by prescription VII.

Within Management Area 8, to protect salamander habitat change the management prescription from 3 to 7 or 10 in the Marble and Potter Creek areas.

Within Management Area 9, land designated by T&E preservation are directly adjacent to areas of timber harvest, which is a concern.

Within Management Area 20, these areas are designated for timber harvest. This area has already suffered extreme damage from over cutting on both private and public land, and should not be entered for this purpose.

Response: As detailed in Chapter II of the EIS, a Management Prescription is an overall strategy for managing the resources of a specific area of land in order to address issues and obtain desired goals and objectives. The specific piece of land to which prescriptions are tied is the Management Area. The Forests have been divided into 22 Management Areas, and their boundaries are constant in all alternatives.

The boundaries of the Management Areas follow definite topographic features where possible and are generally consistent with Ranger District boundaries. Management Area boundaries are shown on the map of the Preferred Alternative (PRF). Several prescriptions may be applied to different parts of each Management Area depending on land capability and alternative theme.

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Management Prescription write-ups consist of a stated objective, management practices that are to be emphasized or permitted, a description of the areas where the prescription can be applied; and a list of standards and guidelines that apply to the prescription. The Management Prescription S&Gs are in addition to the Forest-wide Standards and Guidelines. Eleven Management Prescriptions have been developed for use in the Forests. These prescriptions contain 'emphasized' and 'permitted' practices (see Chapter 4 of the Forest Plan). A suitability analysis, using resource suitability models, was then conducted to determine which activities were feasible on specific units of land. This analysis also identified the best resource opportunities for applying the prescriptions depending on the theme of an alternative.

Minerals

Comment: Eliminate all mining. Eliminate all mining in wilderness.

Response: Minerals development is permitted on all lands not withdrawn from mineral entry. United States Mining Laws (30 USC 2 1-54) confer a statutory right to enter upon public lands to search for minerals. Regulations in 36 CFR 228 Subpart A set forth rules and procedures designed to minimize adverse environmental impacts on National Forests resources. Mining in wilderness may only be conducted on claims with valid existing rights.

Comment: Discourage mineral exploitation where in conflict with wildlife, watershed, or general ecosystem concerns. Minerals development plans must weigh the perceived benefits of any mining operation against costs to the environment. Mineral management monitoring must be provided for.

Response: Mining operations are conducted on National Forest lands in conformance with appropriate portions of the code of Federal Regulations (36 CFR 228). Those operations with the potential for significant disturbance require an environmental analysis before any activities can begin. Administrative controls, mitigation measures, and a reclamation plan are developed for each specific project. Operations are monitored, as appropriate, to assure compliance with the terms of the operating plan.

Comment: The EIS should discuss the impacts of the President's Plan on mineral entry and leasing and indicate whether any late-successional reserves or riparian reserves are withdrawn from mineral entry.

Response: The President's Plan does not withdraw LSRs and Riparian Reserves from mineral entry. While

locatable minerals will continue to be available, there will be more emphasis placed on minimizing potential impacts to surface resources in the LSRs and Riparian Reserves. Salable minerals are sufficiently common so as to be generally available outside reserved areas or available without significantly affecting Aquatic Conservation Strategy objectives. Leasable minerals will be, as they are now, subject to case-by-case review that considers all environmental factors. Environmental review in conformance with NEPA is completed before the Forest Service makes leasing recommendations to the BLM.

Comment: The Forest Service encourages mining, then places so many restrictions on it that exploration and production of minerals is practically impossible.

Response: United States Mining Laws (30 USC 2 1-54) confer a statutory right to enter upon public lands to search for locatable minerals. Regulations in 36 CFR 228 Subpart A set forth rules and procedures designed to reasonably minimize adverse environmental impacts on National Forest resources.

Comment: Why were there no specialists from the field of mining shown in the list of preparers?

Response: The Forest has on staff a geologist who specializes in mineral resource management.

Comment: You are proposing areas of mineral withdrawal in Management Areas 17 and 19 in proposed Wild & Scenic River areas. You have regulated the Bureau of Land Management to withdraw from mineral prospecting and development areas in Management Areas 20 and 21. Mining should be as important, or more important, than any other Action Plan. Why does the Monitoring Action Plan show annual cost for mining to be a mere \$7,500?

Response: Access for mineral exploration and development is generally unrestricted, subject to the mitigation of adverse impacts to surface resources. Exceptions to unrestricted access are wilderness, Wild portions of Wild and Scenic River, botanical areas, Research Natural Areas (RNAs), the National Recreation Area (NRA), and areas which are withdrawn from mineral entry. Minerals in the NRA are not open to location but are available through the solid leasable regulations.

Comment: Within the Minerals Standards and Guidelines, we question under a what you mean by exception, under c reword to "minimize adverse impact of mineral related activities on surface resources and the administration of plan of operations leaving lease stipulations on such minerals as gas, oil, and geothermal," under e why can't mining industry do the same as the

timber industry for federally listed threatened or endangered species, under g reword to "maintain an inventory of common variety mineral sites, specify which are available for public minerals that are not viable at present may later become important enough to mine", under j: reword to "Restrict access & development in legally designated areas (areas withdrawn from mineral entry where valid existing rights are may be exercised) " If valid existing mineral rights are held prior to withdrawal, they also have the right to existing roads and trail for development of the mineral claims, so access had to be allowed

Response: The Standards and Guidelines were carefully worded to provide management direction consistent with US Mining Laws and regulations "Exceptions" refers to unique resource values The Forest must recommend denial if the operation would jeopardize the survival or recovery of a Federally-listed Threatened or Endangered species or cause a species to become a candidate for listing as per the Endangered Species Act Access is considered during the preparation of the Plan of Operation

Comment: What happened to the modifications proposed by the Shasta-Trinity Miners Advisory Committee?

Response: United States Mining Laws (30 USC 21-54) establish statutory authority for mining activities on National Forest System lands 36 CFR 228 Subpart A provides regulations for rules and procedures Any actions promulgated by the Forest must be as per statutory authority and regulation

Comment: As per the Forest Plan Chapter 4, Riparian Management, will RMZ designation be initiated by proposed Plan of Operation or as a routine inventory What will be the consequences? Can the affected party challenge the determination? Acceptable activities within the RMZ must allow for discretion

Response: Riparian Management Zones (RMZs) are areas established by the Forest where special management consideration are provided for riparian-dependent resources RMZ size and management varies, and is primarily a function of stream class and aquatic ecosystem type Particular RMZ guidelines are provided for on a site-specific basis For mineral leases, they "may adversely affect" determination will be taken into consideration by the Bureau of Land Management in making a mineral lease decision. Standards and Guidelines concerning mineral activities were intended to allow for mineral activities while protecting from adverse environmental effects The Plan of Operation will provide for specific mitigation measures

Comment: To assure proper mineral performance up to and including rehabilitation, a performance bond should be used

Response: Regulations provided by 36 CFR 228 Subpart A allow for the use of reclamation bonds in some cases prior to approval of a plan of operation. Subpart A regulations do not give authority to use "performance" bonds, only reclamation bonds

Comment: You need to address the issue of valid existing rights where pertinent throughout the Forest Plan

Response: Statements to that effect are discussed in the EIS and Forest Plan where appropriate

Modeling and Analysis

Comment: Are the modeling/simulating tools used appropriate for making management decision in the planning process? They are only simplified versions of the underlying complexity and, unless thoroughly tested and carefully used, cannot be trusted to give the kind of results that would allow management decisions to be made for a 150 year time span

Response: Many factors besides modelled outputs affect long-term planning decisions Outputs generated by models used in the FEIS help to provide the decision maker with a relative picture of some of the effects of the alternatives being considered Models are built with the best available data and are frequently updated as new information is acquired The Forest Plan will guide direction of the Forest for the next 10 to 15 years, not 150 years

Comment: The rationale used in Appendix B-15 to assign dollar values to water is inadequate

Response: Water values used in the model are taken from the 1990 RPA recommended market clearing prices. It is noted in the report that prices are for consumptive or withdrawal uses of water only and that data is not sufficient for estimating the total social benefit value of water

Comment: How will the growth and yield projections be evaluated against actual outputs?
I have no confidence in the Forplan model

Response: Existing yield tables were developed from a Forest timber inventory completed in 1980 and updated in 1990 Future inventories will evaluate current projections and the need to adjust current tables.

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Comment: The model (ERA) doesn't seem to include any provision for variation in soil type, slope, or other impacts like grazing. nor is there any overriding reason why the new roads will magically go away as planned, or the old ones in place now disappear

Response: The model does use slope gradient and soil erodibility, amongst other properties, to define each watershed's sensitivity to cumulative watershed effects. Slope gradient is also used to define the disturbance coefficients, to distinguish between tractor harvest and cable harvest systems. There was no attempt to model all disturbances such as grazing, since it is somewhat site specific and beyond the the scope of this analysis. Following implementation of the ROD, there is little likelihood of a net increase of roads on the Forest. The Forest is well-roaded and in areas such as Key Watersheds the management emphasis is to reduce road density and attendant erosion and sedimentation through closure and obliteration

Monitoring

Comment: What is the purpose of the monitoring plan? It should focus on accurately determining the response of ecological systems, biodiversity and vegetation changes and set standards of threshold

Response: The monitoring plan provides the basis for evaluating the Forest Plan implementation process, effects, and outputs to determine how well the Forest Plan objectives are being met and how closely standards and guidelines are being followed. Resources will be evaluated against a standard that may trigger further action. including, no action (standards and guideline met), refer action to the appropriate line officer for improved application of management area direction, modify standards and guidelines or change allocation of prescriptions in the form of a Plan amendment, revise the projected schedule of outputs, or initiate revision of the Plan (refer to Chapter 5, Forest Plan for more discussion on monitoring)

The Research and Monitoring Committee, a staff group that reports to the Regional Interagency Executive Committee. is preparing new monitoring guidelines for the entire range of the northern spotted owl. These guidelines will address both aquatic and terrestrial concerns. After these guidelines are released, it could result in a modification of the Monitoring Plan. These monitoring guidelines are expected to address the response of ecosystems at all scales

Comment: Monitoring has been inadequately executed in the past. Projects should not proceed without adequate programs for monitoring. Monitoring has been inadequately funded for in the past

Response: Monitoring is built into program budgets. Costs have been eliminated from Table 5-1, Forest Plan because all projects should contain appropriate levels of monitoring funds in their costs or they should not be undertaken. Monitoring at the project level is an on-going process where the majority of activities occur. This type of monitoring will be used to check for trends of environmental improvement/degradation and attainment/non-attainment of Forest objectives. Significant changes may trigger an administrative review and reevaluation of the Forest Plan

Comment: Monitoring should be accomplished through outside contractors, universities, research and/or other non-Government agents

Response: Monitoring may be implemented through a variety of techniques including service contracting and cooperative efforts with other organizations

Comment: How will the growth and yield projections be evaluated against actual outputs. I have no confidence in the Forplan model

Response: The monitoring plan provides for evaluation of growth and yield assumptions. see Table 5-1 under Timber in the Monitoring Plan, Chapter 5-Forest Plan. FORPLAN is a linear programming model used to predict output schedules for alternatives and benchmarks. The estimated outputs will be compared with the actual Forest program through the planning period rather than to individual projects

Comment: A monitoring report should be prepared that documents the findings and evaluations from monitoring. The report should be available to the public

Response: Resource evaluation monitoring results will be periodically documented in an annual evaluation report available to the public (see Plan Chapter 5, C Evaluation Reports)

NEPA/NFMA

Comment: How can the public provide substantive comment to the Forest Plan and EIS when it is not clear how it will be affected by the President's Plan. A supplemental draft EIS and Forest Plan should be developed incorporating the President's Plan with the Preferred Alternative. An additional comment period should be provided to allow for public input to the supplemental draft EIS and Forest Plan

Response: How the draft Forest Plan would be affected by the draft President's Plan was disclosed by the following methods,

A The draft President's Plan was referenced in the DEIS and was made available to the public. The draft President's Plan was described in the draft SEIS, which described the relationship to the draft Forest Plan.

B The DEIS included an Addendum that described the relationship to the draft President's Plan.

C 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 (SEIS ROD) for the final President's Plan was signed on April 13, 1994. Changes made between the draft and final President's Plan were described in the SEIS and the SEIS ROD. The changes made between draft and final versions of the President's Plan were relatively minor and did not warrant issuance of another supplemental 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 SEIS and the SEIS ROD. The SEIS supplemented the DEIS for the draft Forest Plan (SEIS ROD, page 12) and provided direction for completion of the final Forest Plan (SEIS ROD, Appendix A, page A-2). That direction has been fully incorporated in the final Forest Plan.

Based on the opportunities for comment already 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: We urge the Forest to expand the opportunity for the public to become involved and comment on the Forest Plan.

Response: Opportunity for public comment was provided on both the draft President's Plan and the draft Forest Plan (see response to comment above). Changes made as a result of comment on the draft Forest Plan, and as a result of finalization of the President's Plan, were relatively minor and did not warrant an additional opportunity for formal public comment. Issuance of a Record of Decision simultaneously with the FEIS for the Forest Plan is permitted by Council on Environmental Quality regulations [40 CFR 1506.10b] when there is an established appeal process. The Forest Plan decision is appealable under 36 CFR 2.17.

Comment: How will the President's Plan be implemented at the Forest level?

Response: The ROD and FSEIS, commonly referred to as the President's Plan, provide for land allocation decisions and management direction which were incor-

porated into the Forest Plan and EIS. Ecosystem management planning will provide for broadly-defined goals and objectives using an Interdisciplinary, integrated approach. Site-specific projects resulting from ecosystem analysis will require application of the NEPA process.

Comment: The comparison of alternatives should provide for quantifiable comparisons of alternatives, and not just be a detailed impact analysis.

Response: Where applicable and relevant, quantifiable comparisons of alternatives are displayed in the EIS. Notwithstanding the relative abundance of information upon which the analysis is based, it is acknowledged that a great deal of professional judgement was relied upon in assessing the effects of the alternatives. Contrary to the suggestion in the comment, however, this reliance is not a fatal flaw. First, the judgements generally are well informed, at least relatively speaking, given the data upon which they are based. Second, the judgements are of scientists who are among the foremost in their respective fields. Third, a degree of professional technical judgement is inevitable in evaluations and predictions made in the sciences primarily relied upon in conducting the assessment of effects in this EIS. Finally, this plan results in no actual action on the ground, prior to project implementation: there will be ecosystem analysis and project NEPA analysis which provides more quantifying of effects.

Comment: The sections "Consequences Common to All Alternatives" and "Consequences Specific to An Alternative" are misnamed. Neither presents a discussion of consequences. Conclusory statements which do not refer to scientific or objective data supporting them do not satisfy NEPA's requirements for a detailed statement. Mere listing of mitigation measures is insufficient to qualify as the reasoned discussion required by NEPA. The DEIS fails to present sufficient scientific data as required by NEPA.

Response: Although the Interdisciplinary Team used the best information and research results available at the time, it is true that much information that would have been useful simply does not exist or is unusable in its current form. Nonetheless, NEPA acknowledges the inevitability of incomplete information, and the environmental analysis may be considered by the decision maker if the gaps in information are disclosed within the EIS (40 CFR 1502.22).

The Interdisciplinary Team examined the data and relationships used to estimate the effects of the alternatives. There is a substantial amount of credible information about the topics addressed in the EIS, the basic data and the central relationships are well established. The teams determined that, while the missing

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information would frequently add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established in the respective sciences, and filling those information gaps would not likely reverse or nullify understood relationships. Though acquisition of new information was considered, the team determined that the new information was not essential for the decision makers to make a reasoned choice among alternatives.

There appears to be an implicit assumption in the comment that such sciences should produce precise or "certain" results. But this assumption fails to account for the fact that not all sciences share the same certainty of knowledge and predictive capability. That is, while some so-called "hard sciences" are more or less characterized by precise quantitative data, widely accepted theories, and research based on experiments capable of being repeated and conducted in controlled environments, the sciences utilized in the EIS do not generally fall into such a category. Indeed, ecology, sociology, and economics generally are not as deterministic, are more complex (in large measure because they address living organisms vis-a-vis inanimate units), rely on more subjective assumptions, and ultimately yield less certain results than those normally possible in physics or chemistry, for example.

Finally, the alternative analyzed in the EIS each include an adjustment process (adaptive management) that provides for modification of habitat management should new information warrant a change in management. This adjustment process is guided by monitoring and research and provides the flexibility to adjust the management direction of the selected alternatives in the future.

Comment: The seven page addendum incorrectly asserts that the President's Plan is within the range of alternatives considered in the DEIS.

Response: The statement about the President's Plan falling within the range of alternatives considered is a qualitative assessment of all of the features of the alternatives -- not just a single measure. The range of alternatives considered in the DEIS is also not limited to the alternatives considered in detail, but also includes those that were considered but eliminated from detailed study shown in the DEIS.

This comment is directed at a single measure - the allowable timber sale quantity. However, when this single measure is examined, the President's Plan ASQ of 60 MMBF for the Shasta-Trinity shown in the addendum compares to ASQs of 65, 3, 55, and 36 for alternatives CBF, LBU, and 12C at the bottom of the range and ASQs of 236, 5, 134, 129, and 112, 4 for alternatives 1990 CUR, CEE, CEF, and RPA at the top of the range.

Comment: The Forest is open to litigation by admitting human-induced activities have led to a decline in fish population levels.

Response: There are a number of variables which may have led to the decline, including "[o]ver fishing of major basin fish stocks, inundation of limited critical spawning and rearing habitats, poor water release schedules at dam sites, and terrestrial habitat alteration in sensitive watersheds are contributing factors to this decline" as stated in the EIS. The Forest Plan and EIS address those management activities within the scope of influence of Forest interdisciplinary teams and deciding officials. The Forest Plan and EIS incorporate the Aquatic Conservation Strategy, as detailed in the ROD and FSEIS, to restore and maintain the ecological health of watersheds and aquatic ecosystems.

Comment: Alternative 12C (Late Successional Forest Management) was eliminated from detailed study because it was not considered responsive to local social/economic needs. This should be carefully examined on the local level, not accepted without question.

Response: The land allocation decisions and management direction contained within the President's Plan were incorporated into the Preferred Alternative of the Forest Plan and EIS. The intent of the Preferred Alternative is to provide for multiple use, with an emphasis on providing for aquatic and late-successional species habitat needs.

Comment: The Forest's stated policy of good will and cooperation with Native Americans requires consultation with Native Americans as required by the American Indian Religious Freedom Act, the National Historic Preservation Act, the Secretary of the Interior's Guidelines for Preservation Planning, and the Advisory Council's Guidelines for Public Participation.

Response: Consultation with Native Americans has occurred during the development of the Forest Plan and EIS consistent with the scoping process outlined in Appendix A of the EIS.

Comment: The Draft Forest Plan should be withdrawn pending reissuance of the Mount Shasta Ski Area EIS to properly consider the effects of the ski area. The Draft EIS land allocation to downhill skiing on Mount Shasta is premature.

Response: The Forest Plan provides for management prescriptions which describe permitted management practices. The site-specific Mt Shasta EIS considers a range of alternative management strategies which may occur within the parameters of permitted management.

practices. The land allocation decisions of the Forest Plan provides management guidance for, and is not a result of, the site-specific Mt. Shasta Ski Area EIS

Comment: Your proposal violates the Constitution of the United States and the Constitution of the State of California. What you propose constitutes a "taking" for which we hold you fully accountable. Assess proposed "taking" with respect to mining and grazing.

Response: The Forest Plan and EIS were prepared in full compliance with applicable Federal laws and regulations. Primary guidance was provided by the National Forest Management Act and the National Environmental Policy Act. With respect to minerals management, the Forest Plan and EIS defer to existing laws and regulations pertaining to mining activities, as detailed in Chapter III, Minerals, of the EIS. With respect to range management, implementation of the Forest Plan and EIS will provide for standards and guidelines necessary to ensure range management is integrated with other resource needs and objectives.

Comment: The Organic Act recognized the states retain both civil and criminal jurisdiction in the administration of National Forests.

Response: The Organic Administration Act states "[t]he jurisdiction, both civil and criminal, over persons within National Forests shall not be affected or changed by reason of their existence, except so far as the punishment of offenses against the United States therein is concerned, " The Forest Plan and EIS are consistent with this Act.

Comment: The Forest Plan and DEIS appear to be in potential conflict with the Siskiyou County Interim Land Management Plan.

Response: Chapter IV of the EIS, Possible Conflicts with Federal, Regional, State and Local Land-use Plans, discusses "possible conflicts between the proposed action and the objectives of Federal, regional, State, and local land use plans, policies, and controls for the areas concerned." The EIS and Forest Plan provide a vehicle to resolve problems with public agencies should a conflict result from any of the direction contained in the various alternatives, including the Forest Plan.

Comment: The EIS must reveal the environmental effects of the proposed action. By incorporating Option 9, the DEIS fails to fulfill the requirement.

Response: The Forest Plan and EIS have fully integrated land allocation decisions and management direction provided by the ROD and FSEIS. The environmental effects of the Final Plan are within the

range described in the DEIS, therefore, the changes in the final do not violate the requirement of the DEIS to reveal the consequences of the proposed action.

Comment: The EIS does not consider a reasonable range of alternatives.

Response: NEPA requires the agency to explore and evaluate "all reasonable alternatives" which respond to the "underlying purpose and need" (40 CFR 1502.14(a) and 1502.13). The alternatives presented in this EIS meet these requirements, and respond to the purpose and need defined in Chapter I of the EIS. Several other alternatives were initially considered, but were not given detailed analysis because they were not consistent with the purpose and need, as detailed in Chapter II "Alternatives Considered and Eliminated from Detailed Study" of the EIS.

Comment: Adoption of the Preferred Alternative would violate at least five environmental statutes, including the National Forest Management Act, the Clean Water Act, the Endangered Species Act, the Wild and Scenic Rivers Act, and the National Environmental Protection Act.

Response: The Forest Plan and EIS are in compliance with those acts as required by law, regulation, or policy.

'Option 9' (President's Plan)

Comment: How will hardwoods be managed on a 100 year rotation?

Response: Currently, hardwood stands are not a regulated component of the ASQ calculation for the Forest. The ecosystem management process will identify hardwood management objectives and opportunities using an integrated resource management approach.

Comment: If the goal is the development of old-growth characteristics, treatment limited to stands of less than 80 years is too rigid.

Response: The President's Plan FSEIS and ROD provided the 80 year direction for Late-successional Reserves which were incorporated by the Forest Plan and EIS. If that standard is too rigid, provisions for adjusting S&Gs are available through the adaptive management process and if necessary, a Forest Plan amendment.

Comment: Oversight should be decentralized to the province level.

Response: Appendix E of the President's Plan displays a copy of the Memorandum of Understanding between

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affected federal entities and agencies detailing the structural hierarchy for implementation of, and oversight for, Forest Ecosystem Management within the Pacific Northwest. Oversight will occur at the appropriate level depending on the resource

Comment: The objectives, standards, guidelines, and components of the Aquatic Conservation Strategy should be retained

Response: Management direction and standards and guidelines provided by the Aquatic Conservation Strategy have been incorporated into Chapter 4 of the Forest Plan

Comment: What will happen to late seral and old-growth stands outside reserves? What process and criteria will be used to select stands for timber cutting?

Response: Late seral and old-growth stands outside reserves would be managed as per the standards and guidelines and management direction provided by the land allocation area they are located within. The process used to select stands for timber 'cutting' will be a function of the objectives determined for the assessment area through ecosystem management analysis toward obtaining a desired future condition

Comment: Matrix lands should be managed using the ecosystem management approach. Timber management in matrix should include NEPA analysis and an assessment on connectivity between late-seral /old-growth habitat

Response: Matrix lands are to be managed using an ecosystem management approach as described in Chapter 4 of the Forest Plan. NEPA analysis will be accomplished prior to implementing site-specific management activities

Comment: Creative management should extend to all areas of the Forest, including riparian reserves

Response: The Aquatic Conservation Strategy provides the basis for riparian reserve management on the Forest. Watershed analysis focuses on implementing the Aquatic Conservation Strategy. The participation in watershed analysis of adjacent landowners, private citizens, interest groups, industry, government agencies, and other interested parties will be promoted

Comment: The only feasible defensible management prescription will be one that recognizes and attempts to emulate the historic norm

Response: Replicating the natural ecosystem function is a guiding principle of ecosystem management

Comment: Do not drop standards for Adaptive Management Areas. A provision to add AMAs where citizen/agency biodiversity councils exist should be added

Response: Land allocation decisions provided by the President's Plan, including AMAs have been incorporated into the Forest Plan. AMA areas were selected to provide opportunities for innovation, to provide examples in major physiographic provinces, and to provide a range of technical challenges. The President's Plan provided for allocation of specific Adaptive Management Areas. The Forest Plan allows for management of the AMA under Matrix S&G's until AMA planning, in cooperation with research, develops new, or modified, S&G's

Comment: Management activities in stands adjacent to reserves must provide for "feathering" of activities at the boundary

Response: A concern such as this would be better addressed through ecosystem analysis directed toward obtaining a described desired future condition. Ecosystem analysis will not stop at LSR or any other land allocation boundary

Comment: The plans fail to disclose which lands designated as administratively withdrawn in Option 9

Response: Chapter 4 of the Forest Plan, and the Management Prescription for the Preferred Alternative map will describe/display administratively withdrawn areas for the forest

Comment: Expand the old-growth reserve system to protect all remaining stands of old-growth forests. Allow no thinning salvage, road development, or logging activity in reserves

Response: Species viability analysis was used to guide the development of land allocation decisions, including late-successional reserves, as incorporated by the Forest Plan and EIS from the President's Plan. Silvicultural treatments inside reserves must ensure they are beneficial to the creation of late-successional forest conditions

Range

Comment: Eliminate all grazing. Phase out grazing

Response: With application of the Range Standards and Guidelines as detailed in Chapter 4 of the Forest Plan, livestock grazing can continue to be a compatible, integrated resource management practice

Comment: Increase the amount livestock owners must pay for grazing. Require owners to pay private landowners when their cows graze on private land.

Response: The consideration of user fees is outside the scope of the Final EIS and Final Forest Plan.

Comment: Reduce or eliminate livestock use where riparian systems are being adversely impacted. Provide for monitoring.

The EIS should describe how range management would be adjusted to meet the Aquatic Conservation Strategy objectives.

Proper utilization standards must be developed.

Use the process presented in the R5 direction for TES species.

Utilization guidelines must be developed by ecological type, condition, and seral stage.

Riparian standards for range management do not meet FEMAT.

There should be no grazing in riparian areas.

There needs to be a biological evaluation of the effects of grazing on the entire forest.

A Desired Future Condition needs to be written for each allotment, along with a stepwise timetable for its attainment.

The STNF LRMP contains few timelines and delegates most of the regulation of use and environmental condition to the AMP.

Provide for more specific range standards and guidelines to provide for the protection of riparian areas and to be consistent with the President's Plan direction.

Response: Application of the Range Standards and Guidelines as detailed in Chapter 4 of the Forest Plan will provide for livestock grazing compatible with other resource values, as well as providing for range management consistent with the Aquatic Conservation Strategy proposed by the President's Plan and incorporated into the Final EIS and Final Forest Plan.

Comment: Forest representatives should work with appointed members of the Siskiyou County Grazing Advisory Board to overcome policy conflicts and develop a coordinated rangeland resource management plan for the rangeland portions of the Preferred Alternative.

Response: Coordination of Forest range management personnel with affected range permittees and representatives will help ensure continued range management compatibility with other integrated resource objectives.

Comment: Ecological rite inventories are irrelevant to carrying capacity. Your methods for evaluating rangeland conditions should include scientifically sound methods to estimate forage production. Native grasses from Siskiyou County are inherently shorter and recover more quickly.

Response: The Range Standards and Guidelines detailed in Chapter 4 of the Final Forest Plan describe methodologies which will be used to evaluate range and condition.

Comment: We are disappointed that in light of apparent under-utilization of rangeland potential that greater efforts have not been made to offer expansion of existing allotments.

4 large percentage of livestock inventory in Siskiyou County is dependent upon continued availability of public range.

Our analysis indicates that the STNF should plan for a significant decrease in AUMs if it intends to rehabilitate riparian areas and poor and fair conditions rangelands and respond to the reduction in transitory range.

Response: As described in Chapter III of the Final EIS, "It is expected that the demand for Forest range lands will remain at, or decrease slightly from, current levels over the next decade. If increased demand for range and should occur, it could be accommodated in some areas by the development of suitable range that would not be in conflict with other resource uses. Costs of development could be shared between the permittee and the government, thereby increasing the feasibility of such improvements."

Comment: We are greatly concerned with any potential delays in the NEPA process and in preparation of range assessment work that could jeopardize preparation of Allotment Management Plans and the continuous utilization of existing allotments.

NEPA analysis of the grazing program is required by both regional policy and federal law.

Response: Range Standards and Guidelines detailed in Chapter 4 of the Forest Plan, describes Rangeland Project Decision documents which provide for a site-specific NEPA analysis process and elements which are to be addressed.

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Comment: Threshold utilization standards for livestock must be in the Final Plan

Response: A table describing "Percent Allowable Utilization Levels by Ecological Condition" has been provided within the Range Standards and Guidelines in Chapter 4 of the final Forest Plan

Comment: Why does cutting of "X" MMBF necessarily result in 50 X AMs of grazing?

Response: Timber harvesting generally allows for increased levels of sunlight, moisture, and other site resources to be available for the increased development of rangeland browse species such as grasses, forbs, and brush. A general correlation between harvest volume and rangeland development can be inferred, and can be a good indicator of predicting rangeland response to a variety of considered harvest levels

Comment: Do not burn grazed areas for a minimum of three years following wild or prescribed fire to allow natural revegetation to take place

Response: Range Standards and Guidelines, detailed in Chapter 4 of the Forest Plan, provide range management direction for "the appropriate livestock stocking intensities to achieve a balanced ecological status, prevent over utilization of any desirable vegetative types and maintain good livestock distribution "

Comment: The LRMP and FEIS should have a map showing all allotments, a history of NEPA analysis for all allotments, and an allotment-specific schedule for AMP revision

Response: Range allotment maps, history of NEPA analysis and AMP scheduling is maintained by Ranger Districts on the Forest which are affected by range allotments

Recreation

Comment: What are "level 5 type of facilities" as discussed in the Recreation Standards and Guidelines?

Response: Level 5 type of facilities are as per Forest Service Manual 2330.3 Exhibit 01 "High degree of site modification. Facilities mostly designed for comfort and convenience of users and usually include flush toilets, may include showers, bathhouses, laundry facilities, and electrical hookups. Synthetic materials commonly used. Formal walks or surfaced trails. Registration of users is obvious. Access usually by high-speed highways. Development density 5 or more family units per acre. Plant materials may be foreign

to the environment. Formal interpretive services usually available. Designs formalized and architecture may be contemporary. Mowed lawns and clipped shrubs not unusual." The reference to 'level 5 type of facilities' has been changed in the final Forest Plan

Comment: Citizens of the United States should not subsidize recreation for local residents

Response: It is Forest Service policy to pass on the cost of providing services to those who use the services subject to provisions of the Land and Water Conservation Act. It is beyond the scope of the Forest Plan and EIS to consider user fee policy

Comment: The Forest Service should actively promote and participate in a master planning process for the Lake Siskiyou Area

Response: As part of the Desired Future Condition for Management Area 5 (Parks-Eddy), "[D]eveloped camping facilities complement the developments on surrounding private lands, including Lake Siskiyou." Lake Siskiyou is privately held, thus outside the scope of consideration of the Forest Plan and EIS

Comment: Recreation use projections are overstated significantly because you have less access through reduced road maintenance and new road construction

Response: FORPLAN models used to extrapolate recreation use make general projections, and are not directly sensitive to reduced road maintenance levels or new road construction. However, most of the projected increase would occur near already roaded areas where future allowance for road maintenance is expected

Comment: Information regarding visitor days is completely garbled with conflicting statements

Response: Recreation Visitor Days are anticipated outputs resulting from FORPLAN modeling, using assumptions as described in Appendix B of the Forest Plan. An attempt to provide consistent information throughout the EIS and Forest Plan has been accomplished

Comment: There is no management prescription for "primitive" recreation, even though primitive wilderness designation is recognized as a use under multiple use management

How are Recreation Opportunity Spectrum classes assigned?

Response: Within the Recreation Opportunity Spectrum (ROS) classes, Primitive is a defined class. Primitive

tive is not a management prescription. ROS classes are defined in the Glossary, Chapter VIII, of the EIS

Comment: We are against "Commercial Use Fees" imposed by the USDA Forest Service. Permit and user fees should be required of equestrian wilderness users.

Response: The consideration of user fees is beyond the scope of the EIS.

Comment: You need to prepare a management plan for the Pacific Crest Trail, and start it immediately.

Response: Appendix A of the Forest Plan, Required Resource/Implementation Plans, anticipates the preparation of the Pacific Crest National Scenic Trail (PCT) Development and Operation Plan to be completed during 1996.

Comment: How does designation of a scenic byway impact private land management activities affected by the byway?

Response: The Chief of the Forest Service initiated the National Forest Scenic Byways Program in 1988 with the intent to 1) showcase the outstanding scenery of National Forest system lands, 2) to interpret the various management activities of National Forests as well as the cultural and natural values and attractions, and 3) to cultivate partnerships with local communities and organizations to enhance rural economic diversity. Private land management activities will not be affected by the designation of a scenic byway.

Comment: Recreation S&G 'e' needs to include safety as a reason to exclude mountain bikes from trails.

Response: NEPA analysis will provide for compatible and incompatible activities for specific trails.

Comment: Recreation S&G 's' should read "encourage the private sector to help provide needed recreation sites, facilities, and services with a development level consistent with the environmental setting and studies performed as part of an EIS or EA."

Response: This Recreation Standard and Guideline has been reworded in the final Forest Plan.

Comment: Secure a comprehensive trails plan and program for the National Forest. Turn abandoned roads into trails. Build foot and horse trails throughout non-wilderness portions of the forest to more evenly distribute recreationists and protect designated wilderness from overuse.

Response: Trail maintenance and development plans are developed by the Forest administrative units re-

sponsible for trails. These plans prioritize current and future trail needs. The appropriate level of NEPA documentation is provided for by the responsible administrative unit. Public involvement helps to determine trail needs and appropriate uses.

Comment: Off-Road-Vehicle Use

Eliminate all OHV uses on National Forests

Any closures on public lands would not be appreciated. I would like to see the trails remain open for everyone to visit by foot, horse, ATV, motorcycle, and 4x4. We are interested in working with the Forest Service in keeping the forest maintained and open.

Response: The Off Highway Vehicle (OHV) Management Plan map, included with the map package to the Forest Plan and Final EIS, displays Forest OHV policy. OHV use restrictions are provided for on the map legend. It is expected that OHV use will be modified over time through the ecosystem planning process.

Comment: The issue of downhill skiing on Mt. Shasta was conveniently not mentioned. No mention is made of the existence of the old ski area or the history of the conflict to renew that development. Conveniently missing also was any discussion of the economic results of downhill ski development to the local area, the increasing public interest in downhill skiing, and the lack of other northern California ski resorts. The DEIS/DLRMP simply ignores the whole issue and recommends designation.

I am writing to express my deep disappointment with the Shasta-Trinity National Forests complete disregard for the Mount Shasta Ski Area in its draft plan. There is nothing shown on the plans' map which would indicate a clear desire by the Forest Service to develop a downhill ski resort on National Forest Service lands in Ski Bowl.

The Forest appears to be developing the LMP with the assumption that the Mount Shasta Ski Area will be build, even though the EIS for the proposed MSSA is not complete, and Mount Shastas' eligibility to the National Register of Historic Places has not been fully determined. Development to support downhill skiing would have significant adverse environmental consequences on important resources in the region if conducted in an environmentally irresponsible manner.

Response: Chapter 3 of the Forest Plan, Summary of the Analysis of the Management Situation, Recreation, discusses the status of the Mount Shasta Ski Area. Site-specific environmental analysis and decisions will determine the course of actions associated with the

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Mount Shasta Ski Area The Forest Plan and Final EIS respond to programmatic requirements which allow for the range of alternatives considered in the site-specific environmental analysis, but do not provide for pre-selection of any alternative

Comment: You didn't mention "spelunking" as a form of recreation—a significant activity on our Forest. You need to provide for cave monitoring to determine if any environmental changes are occurring. Putting any cave name on the map brings undue attention to the caves. Caves in high recreation use areas should be managed with low visibility. A full inventory of each cave must be considered before a collective or site-specific management plan is made.

Caves should be evaluated for significance with appropriate protection under the Forests' Cave Management Plan. Caves should be managed primarily for resource protection and secondarily for recreational caving where such activities do not significantly impact the resource. Lava tube visitor sites be carefully chosen. A public cave safety and awareness program should be developed.

Response: Spelunking as an increasing recreational activity is being recognized by the Forest. A Recreation Standard and Guideline has been added to the final Forest Plan which provides for the initiation of a "significant caves" listing process.

Comment: There needs to be a clarification between stock and equestrian or recreational stock use in your draft plan.

Response: Consideration of distinguishing between stock and equestrian, or recreational stock use, would be more appropriately considered during site-specific NEPA analysis.

Roadless Areas

Comment: The Mt Eddy further planning area should be designated as wilderness.

Response: The Preferred Alternative does not recommend the inclusion of the Mt Eddy Further Planning Area (RARE II - #05229) into the National Wilderness Preservation system. As described in Chapter IV of the Final EIS, wilderness attributes will be retained on an estimated 90 percent of the Mt Eddy area through allocation to Unroaded, Non-motorized Recreation (Prescription I) and Research Natural Area (Prescription X).

The remaining estimated 10 percent of the Mt Eddy area is allocated to Roaded Recreation (Prescription

III). As per the Aquatic Conservation Strategy, provided for by the Presidents' Plan and incorporated into the Final EIS and Final Forest Plan, watershed analysis must be conducted before any management activities may occur within inventoried roadless areas.

Comment: Appendix C of the Draft EIS shows both Prescription I and II as applying to the Preferred Alternative. How can that be?

Response: Appendix C describes not only how prescriptions I and II, but how all prescriptions are applied to roadless areas, would effect wilderness characteristics.

Comment: There is no reason to keep over-the-snow vehicles out of Zone A in the OHV plan. Zone A should have the same over-the-snow regulations as Zone C.

Response: Most of Zone A are designated wilderness areas, which are included within the National Wilderness Preservation system, where motorized vehicles are prohibited. The remaining Zone A areas are locations where motorized travel would be inconsistent with management objectives or resource protection needs.

Comment: Why is the Mt Eddy area being considered as a potential ski area when the Mt Shasta EIS eliminated it from consideration?

Response: The Preferred Alternative of the Final Forest Plan and Final EIS provides for the Mt Eddy area being allocated to Unroaded, Non-motorized Recreation (Prescription I) and Research Natural Area (Prescription X), which preclude the development of a ski area.

Comment: Preserve all existing roadless areas. Recommend all of the Forest's roadless areas be designated wilderness. No new roads and no logging should occur in roadless areas. All remaining roadless areas should be designated for some level of semi-primitive, non-motorized management.

Response: Chapter IV of the Final EIS, Wilderness and Roadless Areas, discusses land allocation effects upon wilderness attributes for the four alternatives considered in detail. With implementation of the Preferred Alternative, an estimated 81 percent of the 29 released areas acreage would retain wilderness attributes through allocation to Prescription I (Unroaded, Non-motorized Recreation), II (limited Roaded Motorized Recreation), VII (Threatened, Endangered, and Selected Sensitive Species) and X (Special Area Management). Additionally, as provided for by the President's Plan and incorporated into the Final Forest Plan and Final EIS, no new roads are to be constructed in inventoried roadless areas in key watersheds, and

watershed analysis must be conducted in all non-key watersheds that contain roadless areas before any management activities may occur

Comment: Restrict ORV use to established roads and designated routes, and prohibit their entry into roadless areas

Response: The Off-Highway Vehicle (OHV) Management Plan provided with the map package to the Final EIS and Final Forest Plan provides for OHV uses and restrictions by zone for the Forest. Most of the Zone A areas, outside designated wilderness areas, are portions of released roadless areas. No motorized travel is permitted within Zone A.

Comment: Require an EIS for first project entry into roadless areas. Describe the process used to determine whether or not to do an EIS in released roadless area. The impacts of new roads and forest management activities on water quality in released roadless areas should be assessed as specifically as possible.

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.

The impacts of new roads and forest management activities on water quality in released roadless areas would be assessed during site-specific NEPA analysis. The intensity of analysis is primarily a function of statutory and policy requirements, and project-level issues.

Comment: Little consideration had been given to the effect roadless area development would have on the Pacific Crest National Scenic Trail.

Response: The preponderance of the Pacific Crest Trail, as it traverses the Forest, crosses Administratively Withdrawn, Congressional Reserve, and Late-Successional Reserve land allocation areas. The Pacific Crest Trail is a National Scenic trail authorized and designated by Congress as part of the National Trails System Act of 1968. As per Section 7(a)(2) of the Act, "[d]evelopment and management of each segment of the National Trails System shall be designed to harmonize with and complement any established multiple-use plans for that specific area in order to insure continued maximum benefits from the land." Site-specific NEPA analysis, and application of the Recreation Standards and Guidelines applicable to the Pacific Crest Trail, as detailed in Chapter 4 of the Final Forest Plan,

would provide for sections of the Pacific Crest Trail potentially affected by management activity where it crosses National Forest System lands through land allocations other than Administratively Withdrawn.

Comment: The EIS should incorporate the Presidents' Plan management prescriptions for roadless areas.

Response: It did. The Presidents' Plan provided guidance for inventoried roadless areas within the context of the Aquatic Conservation Strategy. Specifically, no new roads are to be constructed within inventoried roadless areas within key watersheds, and watershed analysis must be conducted within non-key watershed inventoried roadless areas prior to implementing management activities. The Aquatic Conservation Strategy guidelines have been incorporated in Chapter IV of the Final Forest Plan.

Comment: Roadless areas should become the core for a wildlife habitat/wildlife corridor system that focuses on true ecosystem protection, blending commodity extraction with full protection for important wildlife areas.

Response: Watershed Analysis and Ecosystem Management planning will provide for and identify wildlife habitat and wildlife corridor needs and analyze how roadless areas contribute toward meeting those needs.

Comment: The Shasta-Trinity can now again consider and recommend released roadless areas for inclusion as wilderness as per the California Wilderness Act and National Forest Management Act.

Response: The Forest is satisfied that the Final EIS, through analysis of land allocation decisions as they affect wilderness attributes, has provided sufficient opportunity to determine additional wilderness inclusion needs during the current planning period.

Special Areas (RNAs and SIAs)

Comment: Only one RNA has been established on the Shasta-Trinity National Forest. Alternative CBF identifies thirteen. All thirteen areas should be included in the Final Plan. It is important to save the last fragments of old-growth vegetation.

Response: The Shasta-Trinity evaluated thirteen areas. The final plan allocates 8 new RNAs which are identified in Chapter 4 of the FEIS. These areas represent the Shasta-Trinity's contribution to the regional allocation of RNAs that reflect a variety of ecosystems/vegetation types to be preserved for research.

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Comment: A taking implementation should be completed prior to RNA establishment as effects water rights, grazing, and mining claims

Response: The RNA establishment report requires such an assessment as described above

Comment: Smoky Creek RNA is placed back in Matrix in Option 9 This is a serious mistake

Response: Smokey Creek is allocated to RNA in the Forest Plan Preferred Alternative

Comment: There should be a timeline established for the creation/management/study of Special Interest Areas

Response: The Preferred Alternative of the Final EIS proposes the classification of 19 Special Interest Areas as described in Appendix A Required Resource/Implementation Plans, Special Interest Area Management Plans are proposed to be developed between the years 1995 through 2000

Comment: Cultural sites should be evaluated for their importance as Biological Special Interest Areas

Response: Heritage resource sites which meet the criteria as Special Interest Areas may be considered for classification

Comment: Several biological and cultural interests would be served by some or all of the vernal meadows supporting small to medium population of sensitive plant species *Calochortus longbarbatus* on the eastern edge of the McCloud Ranger District being designated Special Interest Areas

The following additional SIA candidates should be recommended for designation Hall City Cave, Hirz Mountain, Potem Falls, Potter Creek Cave, Tombstone Peak, Tilted Rock Lava, Twin Cakes Basin. and Wells Creek Falls

Table IV-9 lists potential SIA's Del Loma Cave, Hall City Cave, Potter Creek Cave, and Tombstone Peak as being at high risk due to mining/geothermal activities, off highway vehicles. and logging We request these sites be included as recommended SIA's

Response: Twenty two other areas, which may qualify to be classified as Special Interest Areas, will be analyzed for possible classification under the Preferred Alternative Management direction will be provided to evaluate each potential area with implementation of the Preferred Alternative

Comment: It is not clear who will take responsibility to establish and administer SIA's and RNAs

Response: Each established or potential area will be recognized in the Forest Plan They will be recognized as a special management zone (FSM 2124) A special zone plan will set forth the management requirements Planning will be conducted in the same general manner as prescribed for Primitive Areas and Wilderness (FSM 2322) Approval of the plan will also constitute classification of the areas and the plan will so provide The Forest Officer authorized to classify an area (FSM 2360 4) is authorized to approve the plan

Comment We recommend that all SIA's be managed for a VQO of retention, that they be withdrawn from mining, and that proposals for hydroelectric development be recommended for denial to FERC

Prohibit OHV access, grazing, mining, and other harmful activities for Prescription X (Special Areas) Locate high-intensity campgrounds away from Special Areas

Management Plans for recommended SIA's such as Giant Crater Lava Tube System and Natural Fridge should include seasonal monitoring for bats, discouraging visitation during critical periods for bats, and encourage public awareness and conservation of geological features and biota

Response: Chapter 4 of the Final Forest Plan, under Special Areas Management (Prescription X) describes Standards and Guidelines which provide for management of Research Natural Areas and Special Interest Areas Additional measures may be provided for specific RNAs or SIA's during the development of Special Area Management Plans

Timber

Comment: Logging should be eliminated in the National Forests immediately

Response: Timber production is one of the mandates of the federal forests and changing it would require congressional action. which is beyond the scope of this Plan

Comment: Timber harvesting should be eliminated in "wild" areas

Response: Most of the remaining "wild areas" on the Forests are protected through Congressionally designated wildernesses or through other designations, such as late-successional reserves The disposition of inventoried roadless areas is discussed in Appendix C of the FEIS

Comment: Defining sawlog products in terms of cubic feet alone is not appropriate

Response: In most cases, timber volume data in the DEIS and Plan are expressed in both cubic and board feet. Cubic foot measure is becoming increasingly important and will be the primary unit of measure in the near future.

Comment: A timber sale program that is only slightly higher than the annual mortality of 64.2 million board feet is not managing the forest wisely.

Response: Timber is only one of many resources which are managed on the national forests. In order to meet multiple resource objectives, it is necessary to manage the timber resource at less than the maximum level.

Comment: It may not be possible in some areas to "provide a sustained supply of firewood for personal use" due to available land base, environmental constraints, and budgets.

Response: Providing a sustained supply of firewood for personal use is a forest goal, or desired condition, in the Plan. This means that every attempt should be made to meet this objective, while meeting other resource goals, subject to the standards and guidelines in the Plan. This does not mean that we will always be able to meet the demand for firewood.

Comment: Under the Preferred Alternative, about 70% of the Forest would be excluded from timber production. This does not meet the purpose for which the Forest was established so far as insuring "a continuous supply of timber for the use and necessities of the United States citizens".

Response: The Forest was established to provide a continuous, sustained supply of many resources found on the Forests, subject to existing laws and regulations.

Comment: Even-aged timber management (i.e. clearcutting) should be de-emphasized or eliminated and uneven-aged management (i.e. selection cutting) should be emphasized.

Response: Silvicultural systems and their application are discussed in Appendix J of the FEIS. This discussion includes ratings of the major systems for various important biological and managerial attributes (pros and cons).

Standards and guidelines pertaining to silvicultural systems are provided in Chapter 4 in the Plan. The silvicultural system selected for a specific area is determined through an interdisciplinary process under an ecosystem management approach. A description of when a particular system might be most appropriate is found in Appendix C of the Final Plan. Given the ecological diversity in the Forests, limiting harvest to any single method is not recom-

mended. The use of clearcutting will be considered only when other silvicultural methods will not meet management objectives, which will be minimal.

Comment: Specific standards and guidelines for Green Tree Retention (GTR) should be adopted in the Forest Plan.

Response: Specific standards and guidelines for GTR from the ROD have been incorporated into the Final Plan. Deviations from these standards and guidelines may be considered on a site-specific basis, subject to approval by the Regional Ecosystem Office.

Comment: Project level silvicultural analysis should include historical data as much as possible.

Response: Under an ecosystem management approach, historical information is one of many factors which will be considered in developing a silvicultural prescription. Some of the key items to consider in determining the appropriate silvicultural system for an area is discussed in Appendix C of the Forest Plan.

Comment: The Forest Plan needs to show how much non-chargeable volume is expected from sanitation and salvage cutting from late-successional reserves and other areas withdrawn from regulated timber production.

Response: Sanitation and salvage cutting from these areas is subject to specific standards and guidelines designed to meet other objectives not related to timber production. Therefore, an estimate of timber volume from these areas is not possible. The conditions under which sanitation and salvage cutting would be considered are specified in Chapter 4 of the Plan under Late-Successional Reserves.

Comment: The Forest should emphasize practices that thin stands and reintroduce very light intensity fire. More extensive use of biomass harvesting should be incorporated into silvicultural treatments to enhance forest health and vigor.

Response: Timber stand improvement activities, such as thinnings, and the utilization of excess material for biomass, are emphasized through the goals and objectives, and standards and guidelines, in the Final Plan.

Comment: We disagree with the fixed 180 year rotations in the Draft Plan. The rotations should vary depending on biological factors and management objectives.

Response: In the Final Plan, the rotations will be allowed to vary based on ecosystem analysis. This follows the standards and guidelines from the ROD.

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Comment: Longer rotations (180-250+ years) should be established in order to grow older forests

Response: Rotations apply only to regulated timber lands, such as the Matrix. where growing older forests is not an objective. However, the Matrix includes only about 15-20% of the total area on the Forests Reserves, and other lands withdrawn from regulated timber production, occupy 80-85% of the Forests. Older forests will be maintained in these areas and in 15-40 % of the Matrix and AMA land

Comment: 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 should be 100% of CMAI not 95%

Response: Many factors are considered when establishing rotation age, including biological, economical, managerial, etc. Culmination of mean annual increment (CMAI) is only used to establish minimum legal rotations as required by the National Forest Management Act (NFMA). Rotation ages established in the Final Plan are always longer than the minimum requirement due to other land management objectives, such as diversity and wildlife habitat needs

Comment: Lands should be reforested with a diverse mix of plant species native to the area

Response: Specific standards and guidelines for reforestation, including the need for a diversity of native plant species, are included in Chapter 4 of the Final Plan

Comment: Natural regeneration should be the preferred method (instead of artificial regeneration) where the regulation of stocking levels and species composition is easy to achieve

Response: Usually a combination of both artificial and natural regeneration is preferred because natural regeneration is not always reliable. However, natural regeneration is appropriate and will be more of a factor in reforestation due to the shift from clearcutting to GTR and selection cutting

Comment: Tilling, as used in site preparation for reforestation, may accelerate soil erosion and damage the watershed

Response: Tilling is used primarily on areas with shallow hardpan soils, such as volcanic soils on the McCloud Flats, to facilitate planting. Tilling breaks up the hardpan soils and facilitates water penetration, thus reducing potential erosion. Soils and Water standards and guidelines in the Final Plan must be followed whenever ground disturbing activities such as tilling are proposed.

Comment: There is no discussion of what will be done to reforest understocked and non-stocked lands, and lands with inappropriate species

Response: The regeneration of understocked and non-stocked lands is emphasized in the Final Plan. Standards and guidelines in the Plan address this issue. Site specific analyses conducted through ecosystem planning will address issues such as appropriate species

Comment: What monitoring and reporting process is planned to assess reforestation success or failure, especially where natural regeneration is planned?

Response: The Monitoring Action Plan (Chapter 5 of the Final Plan) includes a monitoring item to determine if reforestation efforts are meeting the Forest standards and guidelines. This includes both artificial and natural regeneration methods

Comment: The use of any site preparation method for reforestation purposes should be determined through a site specific analysis

Response: Standard and guideline #201 in the Final Plan has been revised to include all site preparation methods, not just terracing

Comment: Lands identified as suitable for timber production contain many cutover areas with no standing timber inventory. I think you have over estimated your timber resource and your allowable cut (ASQ) should be reduced until you have made a new field inventory of your timber resource

Response: The timber inventory was revised and updated in 1990 to include recently cutover areas and the ASQ was adjusted accordingly. Ecological Unit Inventories (EUI) have been conducted over much of the suitable timber land base over the last four to five years that will provide up-to-date timber inventory information for ecosystem planning under the Plan

Comment: The ASQ projected in the Draft Plan is predicated on a proposed annual budget of \$43.2 million dollars. Realistically, the Forest is not likely to receive the necessary budget from Congress and, therefore, the ASQ will not be as stated in the Plan

Response: Budgets, and how they might affect outputs in the Forest Plan, are discussed in Appendix H of the Final Plan. The ASQ represents the volume the Forests are capable of producing. However, the actual volume sold in any given year is determined by a number of factors, including the budget. Therefore, reduced budgets could result in less outputs, such as volume sold

Comment: Volume from salvage and thinnings should count towards the ASQ

Response: All timber volume sold within the Matrix and AMA is included in the ASQ, including salvage and thinnings. Since timber production is not a planned, scheduled output in reserves and other withdrawn areas, any salvage or thinning volume removed does not count towards the ASQ.

Comment: Forest regulation should be on a separate watershed basis.

Response: Forest regulation is determined on a Forest basis, according to applicable laws and regulations. In order to assure that individual watersheds are not overcut, measures such as watershed analysis are implemented at the ecosystem planning level.

Comment: Key watersheds should not be included in the timber base for ASQ calculations until a watershed analysis has occurred. The ASQ calculated from these watersheds should be non-interchangeable with the ASQ from other areas.

Response: The ASQ from Key Watersheds is an estimate based on the best information available at this time. The ASQ will be modified if watershed analysis/ecosystem analysis/project planning results in a different ASQ level.

Comment: The ASQ needs to be revised when unplanned events occur, such as catastrophic fire, and cuttings are made to recover mortality.

Response: The ASQ is expressed as an average annual volume for the 10-year period of the Plan. Volume sold in any one year of the Plan may be higher or lower than the ASQ. According to the Monitoring Action Plan (Chapter 5 of the Forest Plan), the ASQ would be monitored and any significant deviations from the ASQ could result in a Plan Amendment revising the ASQ.

Comment: Volume harvested from unsuitable timber lands should not be scheduled. However, this volume should be estimated.

Response: The volume from unsuitable lands is difficult to estimate due to a variety of unknown factors. Any estimate would be totally subjective and not very reliable. However, the ROD estimates that an additional 10 percent (of the ASQ) may be available from these lands.

Comment: If the Forest is implementing ecologically sound management principles, how can you pre-establish an ASQ of 87 MMBF? Why does the ASQ increase in decades 4 and 5?

Response: The ASQ only establishes the capability of the Forests, subject to all applicable laws and environmental regulations. It is not a target or a goal. The ASQ is subject to change through Plan Amendments based on site-specific ecosystem analyses.

The ASQ is projected to increase in later decades due to expected yields from plantation thinnings.

Comment: Volume from thinnings of over-stocked stands should result in a substantially higher ASQ.

Response: Volumes from thinnings of merchantable sized trees (over 10 inches DBH) in the Matrix and AMA are already included in the ASQ. Volume from smaller material is not presently included in the ASQ, due to unpredictable market conditions and economic uncertainty. However, this smaller material could be included in the ASQ at a later date if market conditions change.

Comment: The ASQ should be higher, closer to the long-term sustained yield (LTSY).

Response: The LTSY level is the highest sustainable yield in a perfectly regulated forest, where a uniform distribution of size and age classes of timber exists. Due to unplanned events, beyond the control of the Forest Service, this condition is never reached, at least not for a long time. Currently, a very uneven distribution of size/age classes exists on the Forests, which results in a lower ASQ. The ASQ will increase in the future as this distribution becomes more uniform.

Comment: No further old-growth forests should be considered for cutting under any circumstances. Excessive emphasis on preservation and retention of old growth reduces the opportunities to improve forest health and reduce the risk of loss to fire, insects, and disease.

Response: Most of the forests considered to be old-growth are included in the late-successional reserves or other areas withdrawn from timber production. Any proposed silvicultural treatment inside these areas would be subject to review to ensure that the treatment is beneficial to the creation of late-successional forest conditions. Both salvage and thinning treatments may be considered in reserves.

Comment: Sanitation and salvage cutting should be discontinued, particularly within wilderness areas, riparian reserves, roadless areas, and wild and scenic river areas.

Salvage and utilization of tree mortality from both routine and catastrophic causes should be emphasized.

Response: Sanitation and salvage cutting is guided by the Standards and Guidelines for a particular area and subject to site specific NEPA analyses consistent with ecosystem management planning

Comment: Salvage should not include live trees

Response: Salvage cutting is designed to remove only dead and down trees killed by fire, insects, disease, wind damage, or other events. It is often very difficult to determine if a tree is dead or alive and, occasionally, live trees are inadvertently removed in a salvage operation. However, guidelines are available for most tree species to assist in this determination and the removal of live trees is not prevalent in salvage operations

Comment: Survey all cutover areas from the past decades to assess regrowth

Response: Regenerated stands will be inventoried for stocking and growth as part of the Monitoring Action Plan (Chapter 5 of the Final Plan)

Comment: How much of the existing old growth supply would be removed under the Forest Plan?

Response: An estimated 210,000 acres of old-growth are currently found on the Forests. Approximately 85-90% of these acres are within reserves or other areas withdrawn from timber production. The remaining old-growth within the Matrix lands may be removed only after meeting the standards and guidelines set forth for the area

Comment: Table D-2 in the Draft Plan indicates that replacement stands will be averaging about 65-70 cf/ac/yr. This is not consistent with Table D-3 which indicates a net growth of about 45 cf/ac/yr

Response: Table D-3 is the predicted actual growth, as determined by FORPLAN modelling, while Table D-2 is the potential growth estimated in the timber yield tables used in FORPLAN. This apparent discrepancy is clarified in the Final Plan

Comment: While the DEIS acknowledges that below cost timber sales have been extremely rare in the past, with the amount of additional work mandated under the President's Plan, the potential for below cost sales becomes a very real possibility

Response: Under an ecosystem management approach that considers multiple resource values, timber sales represent only one of these values that continues to have a place in the broad spectrum of management practices and tools available to implement sound ecosystem

management. Timber sales can be an efficient and effective means of achieving not only silvicultural goals, but other, nontimber resource management goals. In these cases, timber sales may occur, even though the value of the timber does not exceed the cost of the entire ecosystem management project

The Forest has traditionally been funded and evaluated based on its ability to economically sell timber. Current planning approaches generate additional costs attributable to management of the intangible or difficult-to-quantify values that are equally important components of the ecosystem. Managing ecosystems strictly for a positive return would limit opportunities to maximize the intangible benefits of nonquantifiable resource values, resource protection, and provision of overall ecosystem management

These factors will be considered when evaluating the below-cost question in the future

Comment: There should be an alternative displaying the full potential production of wood products, which will be socially necessary to keep pace with a growing nation. None of the alternatives considers this approach

Response: The RPA Alternatives primary objective would be to provide products and services at levels expected to help satisfy current and future demands stated in the 1990 RPA program

Visual Resource

Comment: The Public is concerned about Visual Quality for the entire land base, not just scenic highways. There is an objection to visual corridors with near natural appearance in the foreground and middleground and the suggestion that the background will not be protected

Response: Management for visual quality, a resource that is based on individual perception rather than biological science, is based on the concept that visuals will be emphasized in areas most likely to be viewed. This plan is based on ecosystem management which is modified for visuals in areas that are visually sensitive. These areas are listed in the Forest-wide Standards and Guidelines and identified by those areas allocated to Prescription III. Even though according to the VQOs there could be many acres of Maximum Modification and/or Modification, actual acres will not meet those levels because of final Plan land allocations and ecosystem related Standards and Guidelines preclude that level of disturbance. It is expected that visuals will be well protected across the landscape by 1) the Visual Quality Objectives, 2) the allocations to LSR, Riparian Reserve, Administratively Withdrawn

Areas, and Congressional Reserves which restrict the amount and kinds of land management activities that can occur, and 3) the restrictions within AMA and Matrix which limit the amount and kinds of activities that can occur as compared to past practices

Comment: Wood production should be a subordinate activity and multi-resource management with recreation and visual quality should be emphasized on the Mt. Shasta Ranger District. Diller Canyon and other sensitive view areas from Mt. Shasta are proposed for visual modification

Response: Wood fiber production in the Mt. Shasta area is subordinate to other resource/ecosystem management goals due to the land allocations and standards and guidelines. Most of the Mt. Shasta Ranger District that is not allocated to Congressional Reserve, Late-Successional Reserve, Administrative Withdrawn areas, or Riparian Reserves is in Matrix/Prescription III which emphasizes visuals

Comment: There will be serious impacts to visual quality in the South Fork of the Trinity River, Black Rock Lake, and Pettijohn Basin.

Response: Serious impacts will not occur to visuals in the above referenced areas due to 1) the South Fork is bounded by LSR and Key Watershed/Matrix and areas harvested will be in accordance with Key Watershed/Matrix Standards and Guidelines which restrict the intensity of vegetation management, and 2) Black Rock Lake and Pettijohn Basin are in the Wilderness and have LSR to the north and Key Watershed to the west

Comment: The Plan should have more goals for the visual resource. Areas not meeting VQOs should be actively rehabilitated

Response: Goals for visual resource management are found in Chapter 4 of the Plan under Forest-wide goals and are further refined by the Forest-wide Standards and Guidelines. As part of watershed/ecosystem planning, areas in need of visual rehabilitation will be identified and integrated ecosystem management projects could be proposed that would in part rehabilitate visually degraded areas

Comment: There is a need to better understand the methodology of how VQOs are established. The Draft EIS is weak on visual quality analysis and could violate NFMA. The Desired Future Condition should be in two components, desired landscape character and desired scenic character

Response: The methodology of how VQOs were es-

tablished is described in Chapter III of the FEIS. According to policy VQOs were established according to the accepted methodology and meet the requirements of NFMA. The adopted VQOs constitute a description of the desired visual condition for visual quality

Comment: Are there 0 acres of Visual Condition Class VI. Are not geometric clearcuts, roads, and landings unacceptable scenic conditions

Response: The above mentioned practices would not necessarily be unacceptable under any VQO. They would likely be unacceptable under retention or partial retention but would likely be acceptable, if properly done, under modification and maximum modification

Comment: Identical VQOs for all alternatives, how can this be?

Response: This was an error and has been corrected in the Final EIS

Watershed

Comment: The DEIS does not adequately address the cumulative effects of over harvesting. The DEIS uses existing conditions, which are degraded as the only benchmark upon which to compare alternatives. The DEIS assumes that Standards and Guidelines assure no extreme environmental consequences would occur, but BMPs do not equate with compliance with the Clean Air Act. How does the Plan address cumulative offsite watershed effects? Describe how the Forest will implement the "far share" policy for cumulative effects. The cumulative effects analysis does not adequately address sediment load that is in place on ephemeral and intermittent streams

Response: The Cumulative Watershed Effects Analysis (CWE) in the FEIS does evaluate all past activities and their effect on water quality. Existing condition is used as a benchmark for comparative purposes only, to indicate trends away from a situation we can relate to. It is the most logical condition to compare change to Standards and Guidelines, in conjunction with BMPs are the mechanism for forest and land management activities to be in compliance with Section 103 of the Clean Water Act. BMPs are certified for effectiveness by the State Water Quality Control Board. Off site cumulative effects are addressed in Appendix H. Through the process of Watershed Analysis, we will evaluate the conditions on all lands and make recommendations to the land managers, public and private. We do not intend to pursue harvesting or managing for our "far share" if that will lead to potential cumulative effects and/or water quality degradation. Detailed

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analysis of sediment loads in drainages is addressed at more specific levels, such as watershed analysis. This issue is too specific to address at the Forest Plan level.

Comment: The DEIS should explain how watershed improvement will total 300 acres while water yield will decrease by 12-17 thousand acre feet. Timing of water yield runoffs is important.

Response: Water yield is calculated for the plan based on average annual precipitation and runoff. Changes in water yield occur when there are changes in the average values of components that enter into the water yield model. Decreases in water yield are forecast because, compared to the 1989 base year, there will be more vegetation (less timber harvest) in the decade to come. More vegetation means more evaporation and transpiration of incoming precipitation and therefore, less water available to occur as runoff. Twelve to 17 thousand acre feet is a very small amount compared to the average runoff of over 4 million acre feet.

Comment: In 1990 there were 7 class 3 watersheds and in 1993 there were 5. What is the basis for the change? There seems to be a problem with the criteria developed to evaluate watershed condition. Why are the rivers, fish, and riparian areas in such poor condition?

Response: The decrease in number of watersheds considered to be in condition class 3 has decreased due to the natural recovery of the watersheds through time. There has been lower disturbance levels from timber harvest activities over the past 6 years, which has allowed some recovery for certain watersheds. The general condition of the river systems are relatively good. Where degraded, a variety of causes are responsible including the effects of the 1964 flood. The decrease in fish population levels is partially due to habitat impacts, but also decreased water flows from 7 years of drought, poaching, and commercial harvest of the ocean.

Comment: Private land activities must play a role. The FEIS should provide processes that will result in cooperative conservation strategies with neighboring landowners. The Forest Service should delay activities in mixed ownership until a Coordinated Resource Management Plan (CRMP) is in place.

Response: We work closely with adjacent landowners in mixed ownership watersheds, and believe that more cooperative efforts are needed. We will seek CRMPs as appropriate, and if other landowners are interested.

Comment: What plan measures have been developed to implement the watershed and water quality requirements of fish habitat?

Response: The adoption of the Aquatic Conserva-

tion Strategy which includes Key Watersheds and BMPs work together to meet the water quality requirements of fish.

Comment: Assurance that you will meet State water quality guidelines is not adequate. What happens if you don't? The DEIS fails to consider compliance with the California Porter-Cologne Act and the water quality control plan for the North Coast Basin. What about site specific compliance?

Response: Site specific compliance will be accounted for with the site-specific plan and NEPA documentation, not at the Forest Plan level. We will meet water quality guidelines for non-point source pollutants by implementation of BMPs. The North Coast Board certified our BMPs. Not meeting water quality objectives on a site specific basis is under the authority of the Regional Boards, as always.

Comment: The 1995 tentative timber sale program list includes Prospect, Wilcox, and Black Rock, all in Class 3 watersheds.

Response: The list has been adjusted in the FEIS. The list, as always, is tentative and actual sales in class 3 watersheds would only occur after much analysis and there would be assurances that the disturbance would not adversely impact an already degraded watershed.

Comment: The Siskiyou County Farm Bureau is concerned with types of planning that extend to private lands. They are opposed to such processes that purport to be binding on non-participants without legal authority and proper provision for due process. It's alright to describe areas where non-federal activities are important, but do not assume that State regulations completely ineffective.

Response: All direction in the FEIS and Plan applies to National Forest Land only. The forest is always willing to cooperate with willing partners to implement ecosystem management across the landscape, regardless of ownership. We do not assume that state regulations are ineffective, but cannot count on them when determining the National Forest share of allocations for healthy, functioning ecosystems.

Comment: The FEIS should explain the Watershed Improvement Needs Inventory (WIN) and discuss how it would be used under the President's Plan. Standards and Guidelines should include scheduling watershed improvement projects based on WIN and specified priorities.

Response: The WIN inventory referred to is available for review. How it will be used under the President's

Plan has not been determined to date. Scheduling of site specific watershed improvement projects will be done at the watershed scale, not the LMP scale

Comment: The Shasta-Trinity is using outdated methodology. This places the forest in jeopardy of insufficient data to reach its conclusions. Without the inclusion of a sediment model and coefficients capable of looking at things besides silvicultural activities, this model will not suffice to meet the intent of the Clean Water Act.

Response: The methodology used is appropriate for this level of planning, and is only meant to raise "red" flags about what watersheds may have problems which may require additional analysis such as watershed analysis. Sediment models are no more accurate than management models if their coefficients are not locally calibrated over a representative time period. Sediment models and coefficients developed in other areas have no basis for reality in Northern California. It remains a long term goal to have a quantitative sediment yield model for the Forest. However, no such model exists today. The model utilized on the forest is capable of evaluating other disturbances besides silvicultural activities, such as wildfires. We believe that Cumulative Watershed Effects Analysis, performed at the watershed level, will meet the intent of the Clean Water Act if it is specific to local conditions and processes.

Comment: 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 of the Trinity River. Watershed analysis needs to be defined at the forest level. Watershed analysis needs to be expanded to all rivers, not just the highlighted key watersheds. Non-anadromous fisheries should be considered key watersheds (McCloud River, etc.)

Response: This scale of analysis is really basin or sub-basin analysis, and will be done. Watershed analysis will eventually be done for all watersheds on the Forest.

Comment: In Appendix H-I the location of impacts relative to hazardous areas was not even considered. The reliance on Threshold of Concern (TOC) is partially unfounded.

Response: We did not consider the location of impact relative to hazardous areas at the Forest Plan scale. It is critical to do this but at the watershed/project planning scale. TOC is a very good tool at the LMP scale of analysis to stratify out watersheds which may have a cumulative effect risk. This helps direct project or watershed analysis to more closely evaluate the issue.

Comment: Watershed restoration should be the focus

of the Forest Service. Don't look to restoration as a means to allow existing timber harvest practices to continue. The Plan doesn't give adequate priority or dollar values to correcting past mistakes (road building), which will continue to degrade instream conditions.

Response: Watershed restoration is a major focus of this Plan and other activities will be planned consistent with watershed needs, especially in Key Watersheds. Watershed restoration will be the major focus within Key Watersheds.

Comment: Independent hydrologic analysis of the South Fork of the Trinity River shows that it is beyond the TOC and will be for many years. Prescriptions and Management area Direction should be adopted for the entire area which prohibit disturbance and restore watershed values. protect every watershed which sustain salmon and steelhead fish.

Response: The value of the South Fork of the Trinity River and three other watersheds was recognized by their designation as Key Watersheds. Emphasis within these watersheds is on the salmon and steelhead stocks, protection of their habitat, and restoration of the watershed as a whole.

Comment: There should be a network of Key Watersheds and they should be off limit to extractive management. The Plan is deficient in documenting how Key Watersheds are defined. French Creek, South Fork of the Trinity, Lower Hayfork Creek, and the McCloud River should be Key Watersheds. The Plan will fail because they do not focus on linkages between up slope and up stream management and down stream responses.

Response: This Plan has a large network of watersheds which are off-limits to management, RNAs and Wildernesses. Key Watersheds as defined by the President's Plan comprise nearly 500,000 acres of the forest. LSRs, while not off-limits to management, have severely restricted management options. This plan requires Watershed Analysis which will determine the linkages alluded to.

Comment: Provide maximum protection for riparian zones, perennial and ephemeral/intermittent streams. Prohibit logging and roads 300 feet from perennial streams. Usefull Scientific Analysis Team Guidelines rather than the proposed forest Standards and Guidelines.

The provisions are arbitrary, why are the requirements the same for California as the Olympic Peninsula?

Response: The Forest Plan defines interim riparian reserve widths as follows: 300 feet on each side or two site potential trees for fish bearing streams. 150

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feet on each side or one site potential tree for non-fish bearing perennial streams, 100 feet for intermittent, ephemeral, and wet areas (see Chapter 4 of the Plan for a complete description of Riparian Reserves and their S&Gs) Unstable areas are also protected Watershed Analysis is the vehicle to specifically study terrestrial and aquatic processes where recommendations are made to modify riparian widths if appropriate Watershed Analysis will evaluate local processes and set riparian widths based on local conditions

Comment: With the vast number of species of fish and wildlife present on this forest it seems that they should take a closer look at maintaining the viability of these versus trying to increase commodity extraction through timber harvest, etc

Response: The allocations, standards and guidelines, and analysis processes adopted by this plan are aimed at allowing extractive activities only when they are consistent with ecosystem objectives and associated species viability

Comment: Alternatives that prohibit logging where fish habitat has been impacted from Sedimentation and roading should be considered Key watershed lands should not be within the timber base

Response: A key component of the President's Plan is the Aquatic Conservation Strategy (ACS) The ACS was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems The ACS has been incorporated into the Forest Plan and EIS, as detailed in Chapter 4 of the Forest Plan

Wild and Scenic Rivers

Comment: Include the following rivers in our National scenic rivers system as Wild and Scenic Beegum, Canyon, Hayfork, McCloud, Squaw Valley Creek, Sacramento River, North Fork of the Trinity River, South Fork of the Trinity River, Virgin Creek

Response: The Preferred Alternative recommends all or portions of 6 of the eleven study rivers They include Beegum Creek, Canyon Creek, Hayfork Creek, North Fork of the Trinity River, South Fork of the Trinity River and Virgin Creek The McCloud River and Squaw Valley Creek are not recommended and are being managed under a CRMP that intends to protect the rivers at the same level as W&S classification would. The Sacramento River below Box Canyon is not recommended because it is 85% in private ownership The upper portions of the Sacramento River are not recommended because they do not meet suitability criteria

Comment: The Forest has failed to comply with re-

gional direction requiring a "comprehensive, forestwide assessment" of potential Wild & Scenic Rivers, despite previous public comments

Response: The Forest has followed Washington office and Regional office direction for considering potential Wild and Scenic Rivers as per FSH 1909 12, the Land and Resource Management Planning Handbook (WO Amendment 1909 12-92-1), Chapter 8 14-Wild and Scenic River Studies Included in the Land Management Planning Process, "Forest planning must address all rivers designated by Congress for study, in the Nationwide River Inventory, or identified as a potential wild and scenic river by a National Forest, wholly or partially on National Forest System lands. Treatment may vary, but except as noted in this section, the planning teams should evaluate each river to verify that it meets the eligibility criteria specified in sections 1(b) and 2(b) of the Wild and Scenic Rivers Act Document the finding of eligibility or noneligibility and the river's potential classification in the forest plan" Supplemental Regional direction in 1990 providing for further Wild and Scenic river considerations was assessed by the Forest, and it was determined that additional analysis would not change Forest Wild and Scenic River recommendations

Wildlife

Comment: The FEIS and Forest Plan should provide for levels of snags and down woody debris, and hardwoods needed by wildlife especially within land allocations where timber harvest is planned

Response: The Forest Plan provides for snags, and coarse woody debris, including green trees to provide a source of replacement Standards and guidelines in the Final EIS and Plan have been adjusted to incorporate the requirements from the ROD Where timber harvest is permitted snags are managed to provide at least a 40 percent population level of cavity dweller species Retention of green trees in the amounts required by the Plan should provide adequate numbers for recruitment of snags Land allocations withdrawn or reserved from timber harvest will provide for higher levels The Plan provides for retention of hardwood types and hardwoods occurring in conifer types, (1) timber harvest is not planned within hardwood types, (2) timber harvest is not planned on 75 percent of the Forests, and (3) hardwoods are retained within areas where timber harvest is planned consistent with ecosystem management, determined at the ecosystem planning/ project planning level

Comment: The Plan should provide standards and guidelines to protect declining habitats associated with old growth, including dispersal

Response: About 75 percent of the Forests are reserved from planned timber harvest. The amount of land in late seral stage/old-growth habitat will increase under this plan. The Plan provides for old-growth habitats and related species and their dispersal through specific land allocations and standards and guidelines. As required by the ROD a network of Late-Successional Reserves (LSRs) is established that emphasizes "old-growth and later seral stage forest ecosystems on about 25 percent of the Forests. Activities within LSRs are restricted to those that will maintain or benefit old-growth ecosystems. A system of Riparian Reserves provides for a network of corridors dissecting about 34 percent of lands within Matrix and AMA lands. These riparian corridors provide connectivity between Late-Successional Reserves and provide terrestrial dispersal

Comment: The proposed Forest Plan and DEIS does not adequately provide for early seral stage habitats

Response: Habitats for early seral species will be provided for by management activities within Matrix and AMA areas. Additional early seral stage habitat occur within other land allocations as a result of natural disturbances such as fire, disease, blowdown, and silvicultural activities associated with development of late-successional habitat. Additionally, Forest-wide standards and guidelines require retention of a minimum 5 percent per seral stage

Comment: Reintroduce Roosevelt Elk on the Shasta-Trinity National Forests

Response: A goal of this Forest Plan is to take advantage of management opportunities to maintain and/or increase populations of game species including elk. Forest standards and guidelines specify coordination with other agencies, such as CDFG, and the public when considering introductions and reintroductions or wildlife species. Supplemental management direction specific to the Trinity Alps Wilderness and Yolla Bolly-Middle Eel Wilderness directs the Forest to assess the opportunity to reintroduce Roosevelt elk in cooperation with the CDFG. Any decision to implement the reintroduction of Roosevelt elk will be made in a site specific environment assessment at the project level

Comment: The Forest Plan should provide for protection of raptors from accidental electrocution from high voltage power lines

Response: The Plan provides standards and guidelines to minimize accidental electrocution of raptors by specifying that newly constructed overhead power lines meet safe design standards.

Comment: Request that the Shasta salamander be listed as a management indicator species.

Response: Shasta salamander is listed in the Wildlife Species Assemblages as a Management Indicator, Table G-3 of the FEIS

Comment: The Plan should provide protection of cliffs, taluses, caves and rock outcrops and associated species

Response: Forest standards and guidelines provide direction to protect cliffs, taluses, caves and rock outcrops. The Plan directs management of these areas to protect their existing micro environments and viability of dependent animal and plant species, and nearby water sources to perpetuate natural cave processes. Additionally, the Plan incorporates standards and guidelines from the ROD that provide protection for caves, mines, and abandoned wooden bridges and buildings that are used as roost sites for bats.

Comment: Is one of the goals of the Forest Service to provide for recovery of Threatened, Endangered and Sensitive (TES) species. The Forest Plan should provide protection for Federally and State listed TES including the northern goshawk

Response: The Forest Plan provides specific standards and guidelines for protection of TES species in Forest Standards and Guidelines and in Land Allocations and Management Prescriptions, particularly Prescription VII, Late-Successional Reserves and Threatened, Endangered and Selected Sensitive Species. In addition, the Forest Service will continue to comply with recovery plans prepared by the U.S. Fish and Wildlife Service (USFWS) as directed by the Federal Endangered Species Act (ESA), and consult with USFWS in accordance with Section 7 of ESA

Comment: Will implementation schedules, such as the "Shasta-Trinity National Forests - Wildlife, Fish, TES, Botany - Five Year Program Strategy" be consistent with the Forest Plan?

Response: Planned projects scheduled for implementation must be consistent with or otherwise amend the Forest Plan prior to implementation

Comment: The 50-1 1-40 rule is not in the President's Plan, but is a standard and guideline in your DEIS. What standard and guideline will apply to Matrix lands, and what effect will this have on late seral dependent species and communities

Response: In lieu of the 50-1 1-40 rule, the President's Plan concluded that Riparian Reserves, green tree retention, and Administratively Withdrawn Areas would contribute to the dispersal of late-successional associated species in the Matrix. Standards and Guidelines applicable within the Matrix are detailed in Chapter 4

of the Forest Plan

Wilderness

Comment: Provide for large buffer zones around all designated wilderness areas to rehabilitate these zones for eventual inclusion into expanded wilderness areas

Response: As stated in Chapter 4 of the Forest Plan, "[t]he overall management philosophy of the Shasta-Trinity National Forests is to realize integrated multiple resource land management in the context of Ecosystem Management. This goal is to be achieved through the implementation of an environmental agenda that has three major facets

Preservation—the protection of unique landscapes and their wild and scenic characteristics for the indefinite future

Biodiversity—at all ecosystem scales, the maintenance of a rich diversity of plants, fish, and wildlife

Sustainable Development for People—providing high quality recreational experiences, a long-term sustained yield of timber, forage and other resource products, and services consumed by society. This last facet will be compatible with the Preservation and Biodiversity goals."

Comment: Remove all structures and garbage from wilderness areas

Response: Wilderness Standards and Guidelines and Supplemental Management Direction provides for the development of Wilderness Management Plans. Within these plans, considerations of the historical/cultural significance of structures may be properly addressed. The removal of garbage is an on-going process conducted by Forest visitors and Wilderness Rangers

Comment: To consider present wilderness designations adequate given the striking population increases in the state is both naive and short-sighted

Response: As discussed in Chapter 3 of the Forest Plan, under Wilderness and Roadless Areas, "[p]ublic demand for the existing wildernesses, as measured through recreation use, is low to moderate. Projected demand for wilderness and roadless recreation opportunities is expected to increase significantly in the next five decades. The 1989 RPA document An Analysis of the Outdoor Recreation and Wilderness Situation in the United States 1989-2040' projects increases in wilderness demand, based on projected future demand for activities commonly occurring in Wildernesses. Day hiking is projected to increase 193 percent, backpacking 155

percent, general outdoor photography 105 percent, and wildlife observation and photography 74 percent"

Chapter IV of the Final EIS, Wilderness and Roadless Areas, discusses land allocation effects upon wilderness attributes for the four alternatives considered in detail. With implementation of the Preferred Alternative, an estimated 81 percent of the 29 released areas acreage would retain wilderness attributes through allocation to Prescriptions I (Unroaded, Non-Motorized Recreation), II (Limited Roaded Motorized Recreation), VII (Threatened, Endangered and Selected Sensitive Species) and X (Special Area Management). Additionally, as provided for by the President's Plan and incorporated into the Final Forest Plan and Final EIS, no new roads are to be constructed in inventoried roadless areas in key watersheds, and watershed analysis must be conducted in all non-key watersheds that contain roadless areas before any management activities may occur. For these reasons, no new wilderness designations were proposed during this planning period.

Comment: Eliminate private land ownership in designated wilderness areas

Response: The Land Adjustment Guide map, included as part of the map package with the Final Forest Plan and Final EIS, displays lands of a high priority to acquire. Private parcels within designated wilderness areas are lands of a high priority to acquire, based upon the "willing seller-willing buyer" concept.

Comment: The Wilderness Act is to be implemented with respect for preexisting rights and historic use. This includes water use rights secured by stock watering and preference right through established use of customary range.

Response: As per Sec. 4(d)(4)(2) of the Wilderness Act (1964), "the grazing of livestock, where established prior to the effective date of this Act, shall be permitted to continue subject to such reasonable regulations as are deemed necessary by the Secretary of Agriculture." There are currently nine livestock grazing allotments within, or partially within, the Trinity Alps Wilderness. Livestock grazing on these allotments is a continuation of use that predates the establishment of the Trinity Alps Wilderness.

Comment: Add wolverine to 16. Modify 19 to use signing in primitive and pristine opportunity classes only where it is necessary for safety and to protect wilderness values. In 22 add use photo points and other monitoring methods to measure resource inputs and determine when the impacts exceed pre-established limits and mitigate.

Response: The Standards and Guidelines addressing Wilderness Management apply to Prescription V areas. The suggested changes to Wilderness standards and guidelines are more appropriately addressed during site-specific analysis, as in the development of specific wilderness management plans.

Comment: Reduce maximum group size to 12 individuals, and no more than 8 head of stock.

Response: Site-specific issues such as this are more appropriately considered in the development of individual wilderness management plans.

Comment: Take steps to patrol/outlaw the use of automatic weapons in the wilderness.

Response: The lawful use of firearms within designated National Wilderness Preservation Areas is not specifically prohibited, so long as the use is consistent

with applicable Federal, State, and Local laws and regulations concerning firearms and firearm use.

Comment: Do not charge user fees for wilderness.

Response: The recommendation of user fees is outside the scope of this Final EIS and Final Forest Plan.

Comment: Designate Mendocino National Forest as the administrator of the Yolla Bolly-Middle Eel Wilderness, and other National Forests coordinating their YBME activities through Mendocino.

Response: The Mendocino National Forest is currently taking the lead in developing a Wilderness Management Plan for the Yolla Bolly-Middle Eel Wilderness. Currently, there are no plans to change the administrative responsibility for the Yolla Bolly-Middle Eel to any single administrative unit of the National Forests.

Copies of letters from Government and/or agencies follow:

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United States Department of the Interior



OFFICE OF THE SECRETARY
Office of Environmental Affairs
600 Harrison Street, Suite 515
San Francisco California 94107 1376

ER 93/834

January 10, 1994

Steve Pitch, Forest supervisor
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Mr. Fltch

The Department of the Interior (Department) has reviewed the Draft Environmental Impact Statement (DEIS) for the Shasta-Trinity National Forest (STNF) Land and Resource Management Plan, Humboldt, Modoc, Shasta, Siskiyou, Tehama, and Trinity Counties, California. The following Comments are provided for your consideration when preparing the final documents

Fish and Wildlife Resources

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 Shasta-Trinity National Forest Land and Resource Management Plan (STNF) 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.

The Department also recommends that the STNF conduct surveys for Federal category 2 candidate species. The STNF should determine their status and distribution, and develop standards and guidelines for their protection. The Fish and Wildlife Service (FWS) is available to provide guidance to the STNF on survey protocol, methods, and data interpretation.

wild and scenic Rivers

As stated in prior reviews of this draft plan, the National Park Service (NPS) supports the Preferred Alternative proposal because it extends the existing 1981 Wild and Scenic River designation on the North Fork and South Fork Trinity Rivers to their respective headwaters. In addition, the proposed designation of Virgin and Hayfork Creeks would further enhance the existing designation.

We continue to urge the designation of both the upper Sacramento

and McCloud Rivers as wild and Scenic rivers. As Appendix F of the DEIS indicates, the Upper Sacramento River has long been recognized as a potential addition to the National Wild and Scenic Rivers System, and the McCloud River also has values which highly qualify it for inclusion.

The draft plan for the STNF does not delineate management corridors and prescriptions for the existing designated rivers. In reviewing the draft plan for the Klamath National Forest, the NPS finds that delineation of management corridors and prescriptions for the existing designated rivers have been incorporated.

The Department realizes that a separate plan already has been completed for the South Fork Trinity River. However, it seems logical to incorporate the south Fork Trinity River plan, the management corridor delineation, and prescriptions for the remaining designated rivers into the current draft plan for the STNF, rather than letting the plans lapse for completion at some indeterminate future time.

Whenever these plans are completed, the Department recommends that the existing "recreational" classifications be checked to determine if some of these plans might now qualify as "scenic" based on the 1982 National Wild and Scenic Rivers: Guidelines for Eligibility, Classification, and Management of River Areas. The 1981 designation was based on the 1970 version of these guidelines which contained more stringent requirements for the "scenic" classifications.

Forest Pests

The Preferred Alternative presents strategies to manage forest pests. If all herbicide applications are conducted under Vegetation Management Plan guidelines, this should be clearly stated. The Department further recommends that this discussion include the following: 1) timing and methods of herbicide applications; 2) effects on sensitive plant populations; 3) proposed mitigation strategies, if adverse effects are possible.

The Department has concerns that aerial applications, at certain herbicide concentrations, could potentially contaminate surface waters and adversely affect fish, wildlife, and other biota unless provisions are made to protect the health of these resources.

Biomass

The DEIS discussion of biomass is inadequate, and needs expansion. The Department recommends defining biomass, as the term is used in forestry. Briefly describe the role of biomass in undisturbed forest ecology and discuss how the loss of biomass over time may affect the forest environment. How much biomass degradation is considered acceptable, and how is this determined?

Does existing timber policy encourage energy production from biomass at lumber mills? Is this practice sustainable?

Timber

Please explain further the decision to designate 4/5 of the timber base for "Intensive timber management " Please describe possible alternatives to clear-cutting

soils

The Department recommends that each project delineate how soils productivity standards will be met If soil erosion is expected, and livestock grazing allowed, for example, what system is in place to monitor these effects and mitigate appropriately?

LRMP and the owl Plan

The impact of the draft President's Plan on the Preferred Alternative is unclear A detailed analysis Of the Plan should be added to the DEIS to support the proposed changes.

Minerals

Minerals development plans must weigh the perceived benefits of any prospecting operation against the costs to the environment. Prospecting has impacts on the environment, minerals development should therefore offer a reasonable mitigation plan. For example, would the economic benefit of cyanide heap leaching justify its cost to the environment" Are there alternatives that would not result in an unacceptable release of toxic metal byproducts onto public lands?

Non-mineral resources should also be addressed. For example, would the development of iron in the Shasta Unit of the NRA adversely affect the scenic value of the area? Would there be an irreversible negative impact on the area economy or on the intrinsic Value of the land itself?

SPECIFIC COMMENTS

Page 4-4. 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 Management Plan and Draft Environmental Impact Statement, should be improved in the final documents Because 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, past-fledgling family areas, and foraging territory characteristics on a landscape basis is a preferred management strategy. The northern goshawk management strategies recommended in the Southwest Region (reference. USDA 1992) should be followed

Page 4-6 Wildlife The management of wildlife habitat on the STNF Should include provisions for a range of natural variability in habitat conditions over the forest landscape. These provisions should be discussed in the final documents.

Page 4-11 Natural Op Decades of fire suppression probably has allowed the encroachment of trees and Shrubs. This encroachment has probably resulted in reducing the number and size of natural openings The final document; Should provide provisions for enhancing and reclaiming natural openings on the STNF.

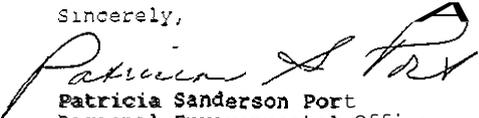
Page 4-12 Botany (Plants), Item G The STNF'S sensitive species list should be reviewed and updated annually. We suggest contacting the FWS and other knowledgeable agencies, organizations, academics, and individuals for input.

maps and Cartography

The location maps provided are useful to the reader. However, a single-sided format is preferred.

Thank you for the opportunity to comment.

Sincerely,



Patricia Sanderson Port
Regional Environmental Officer

cc:

- Director, Office of Environmental Policy and Compliance
- w/original incoming
- Regional Director, NPS. WR
- Regional Director, FWS, Portland

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



United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Affairs
600 Harrison Street, Suite 515
San Francisco, California 94107-1376



Thank you for the opportunity to make these corrections and expand our letter of January 10, 1994. If you have any questions, please Contact this office directly.

Sincerely,,

Patricia Sanderson Port
Patricia Sanderson Port
Regional Environmental Officer

ER 93/834

January 11, 1994

Steve Pitch, Forest supervisor
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Mr. Fitch:

After further review, the Department wishes to correct and add additional information to our letter dated January 10, 1994.

Timber

The Department recognizes that 4/5 of the timber base is designated for yields above 70%, but that only about 5% of the timber land base will be clearcut. We suggest, however, that plans to clearcut slopes exceeding 40% be carefully considered and fully evaluated in the FEIS. The risk of a dramatic mass wasting event and subsequent soil loss could greatly outweigh potential benefits.

Many regions in the Forest designated for timber management are adjacent to Threatened and Endangered habitat. What guidelines are in place to ensure that potentially destructive timber practices do not impact this protected wildlife? Are safeguards in place to prevent clearcutting right up to the border of spotted owl habitat?

Additionally, we have concerns about taking of Threatened and Endangered habitat. In many areas, such as Management Area 9, slivers of land designated for T&E preservation are directly adjacent to areas of timber harvest.

The Department also recommends that the Forest explore all opportunities to reduce that visual impacts of even-aged management. We suggest you carefully consider reducing the number of acres clearcut, reducing the size of clearcut openings, and increasing the number of standing trees after a harvest.

Perhaps opportunities to expand uneven-aged management could be expanded. As stated in the DEIS, this may be an excellent opportunity to try out hitherto under-utilized management practices.

CC:

- Director, Office of Environmental Policy and Compliance
- w/original incoming
- Regional Director, NPS, WR
- Regional Director, FWS, Portland



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IX

75 Hawthorne Street
San Francisco, Ca 94105.3901

January 6, 1994

Steve Fitch, Forest Supervisor
Shasta-Trinity National Forests
Attn. Land Management Planning
2400 Washington Avenue
Redding, CA 96001

Dear Mr. Fitch.

The Environmental Protection Agency (EPA) has reviewed the Draft Environmental Impact Statement (DEIS) for the proposed Shasta-Trinity National Forests 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 four management alternatives which have a different mix of resource activities and which display specific practices and management direction. The LRMP 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 Shasta-Trinity National Forests. 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 Shasta-Trinity National Forests 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 Shasta-Trinity National Forests must adhere to the direction set out in the President's Plan, 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

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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 Shasta-Trinity National Forests. 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 Shasta-Trinity National Forests 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 analysis, in general, regarding environmental consequences and monitoring and because of the lack of specific discussion of air quality, biodiversity and mineral management. 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, Chief
Environmental Review Section
Office of Federal Activities

Enclosure
MI# 000647 Shastrin LMP

- cc. Ronald E. Stewart, USFS, San Francisco
- Jack Glpsman, USDA, Office of General Counsel (S.F.)
- CA Dept. of Fish and Game, Region 1, Redding
- RWCQB, Region 5, Redding
- APCD, North Coast Region, Yreka

SUMMARY OF RATING DEFINITIONS AND FOLLOW-UP ACTION

Environmental Impact of the Action

LO-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 Statement

Category 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-Indequate

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 SHASTA-TRINITY NF IRMP - DECEMBER 1993

1

General Comments

1 Alternatives A5 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 the President's Plan will require in Shasta-Trinity National Forests (Shasta-Trinity) in regard to management area direction, land allocations (including specific boundaries of administratively withdrawn areas), standards and guidelines and key watershed delineations and guidelines.

We suggest that the environmentally preferable alternative be clearly identified. In the DEIS, it appears that Alternative CBF, Citizens for Better Forestry, may be such an alternative. Also, we believe it is important to recognize the role of 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 Environmental Consequences. The DEIS focuses on a comparison of alternatives **as** opposed to presenting detailed impact analysis for each alternative. More specific details on specific adverse impacts (e.g., sediment production) should be presented in the EIS. Such impact assessment is a requirement of NEPA and would also allow the reviewer to better gauge the different degree of environmental impacts of each alternative and allow for a more helpful discussion of mitigation plans. For instance, the discussion of air quality on p. IV-7 DEIS, should not just state that the Preferred Alternative is environmentally superior to the Current Alternative, but should also attempt to gauge the actual impacts of prescribed burning in the Preferred Alternative as well.

Another example of not listing environmental consequences occurs when the DEIS treats existing conditions - which are degraded conditions - **as** the only benchmark upon which to compare alternatives. On p. 11-40 of the DEIS it states that water quality would be improved by use of BMPs. The EIS should describe the existing conditions **as** well as the degraded state of watercourses that could occur even where BMPs are used **as** mitigation measures.

Also, the DEIS appears to be based on the assumption that the Standards and Guidelines assure that no extreme environmental consequences would occur. But a **listing** of plans to implement BMPs, for example, does not equate with compliance with the Clean Water Act. The EIS should set out specific mitigation measures that can be assessed by the public and followed as appropriate in project actions.

3. 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 interested 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?

While forest planning documents generally need to include large amounts of industry and timber management related terminology, the Shasta-Trinity Plan and DEIS vocabulary is especially technical. Terms such as "indirect habitat manipulation," "wildlife assemblages" and "vegetative treatments" are often not clear to those unfamiliar with such jargon. We recommend using terms that are more clear, especially where they are not included in the glossary.

4. Cumulative Impact Assessment. Cumulative impact assessment must be carried out for all federal activities at the Forest Plan level (Tanakee Springs v. Clouah, 915 F. 2d 1308, 1312 (9th Cir. 1991)) 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, the cumulative impacts of the 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. ESDs. The EIS should identify Prevention of Significant Deterioration Class I Areas (i.e., wilderness areas, National Parks, e.g. Trinity Alps and Yolla Bolly Wilderness), which receive special protection for particulates, Sulfuric Oxide (SO₂), Nitrous Oxide (NO),

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.

On p. 3-5 of the Plan, it states that less burning will be emphasized. The EIS should explain how this will be done. The only method mentioned is removal of biomass. This method, however, may have impacts on biodiversity. Also, we recommend that the EIS 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.

4. Monitoring. There is insufficient information on monitoring and mitigation. For instance, p. 4-11 of the Plan mention only four very general concepts as the standards that will be relied upon for air quality. P. 5-4 of the Plan also says that variability in standards which would require corrective action will be determined with the local APCD. The EIS, however, should set out applicable standards, especially if any inconsistencies (e.g., variability) exist. [40 CFR 1506.2]

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. 4-21 to 22 of the Plan discusses BMPs for protection of water quality yet does not mention any specific monitoring programs for BMP implementation nor are there any references under Chapter 5 (Monitoring) of the Plan other than "field review identifies mitigation measures missing from any project" (p. 5-12).

It should be noted 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, create 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. 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 non-point source pollution prevention, see Guidance Specifying Management Measures For source 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 reconstruction in previously designated roadless areas. The EIS should indicate the management prescriptions for roadless areas on the forest under the President's Plan. Under Alternative 9 for Instance, 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 E-79). The Shasta-Trinity 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 (4-14), the DEIS contains little information regarding how adverse effects on beneficial uses will be measured or assessed. Also, on p IV-16 of the EIS it is stated that little arterial road construction would be anticipated under any alternatives yet road construction ranges from 28 to 40 acres. The EIS does not mention what is perhaps more important, where those roads will be. The EIS should more clearly describe road reconstruction, its locations and possible impacts. 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, are the Trinity, and McCloud Rivers presently being dredged for gold? Although mining 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. 5-11 of the Plan says that "non-compliance with operating plans" will be used to establish further evaluation or corrective action regarding mining impacts. The EIS should set out how non-compliance will be determined. Is there adequate staff for observation and monitoring of conditions in operating permits? The EIS should set out the monitoring system for these 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. 4-41 of the Plan there are goals listed for riparian management zones and 4-21 lists specific guidelines which are clear and well-described (e.g. 13j and 13k). EPA recommends that this Section include discussion of priorities, methodologies, timetables and budget estimates for restoration. Certain Standards and Guidelines, however, should be more specific, such as 13b and 13c. Also, 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.

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 the President's Plan.

The EIS should explain how watershed improvement will total 300 acres while water yield will decrease by 12 to 17 million acre feet. (DEIS, P. 11-45).

vegetation Management

1. Biodiversity/Connectivity. Connectivity corridors are briefly discussed on p. 4-12 of the Plan. Yet there is little discussion of the needs, location or size requirements of the corridors. 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.

The EIS should provide. (1) a description of the the President's Plan "Ecosystem" approach to land management and how this will affect corridors in Shasta-Trinity 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 that is retained.

The explanation of natural cycling on p 10-8 of the Plan is well presented but the section as on p. II-35 of the DEIS seems to address "biological diversity" only in the context of seral stage diversity of marketable conifers. The EIS Should expand this analysis to discuss biological diversity of species and habitat Also, mitigation measures regarding wildlife need to be discussed more fully. While Appendix G of the DEIS and the Standards and Guidelines at pp. 4-11, 4-26 do set out some general programs for wildlife management and provide species lists, the EIS does not analyze the specific impacts that could occur because of road building and logging While site specific impacts cannot be measured here, the EIS, as a programmatic level document should set out the type of impacts and the specific measures that can be used to mitigate the impacts of activities

In general, the EIS is an opportune document in which to set out how Shasta-Trinity will improve the availability of information on the status and distribution of biodiversity and the techniques for managing and restoring it (see Integrating Biodiversity Considerations Into Environmental Impact Analysis under NEPA, CEQ, January, 1993

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 Shasta Trinity 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.

All of the Standards and Guidelines under Timber (p 4-22) are oriented at regeneration and timber stand improvement. There are no specific measures for mitigating impacts to fish and wildlife except for # 20(b)(4) regarding habitat objectives. The Timber, Biodiversity and Wildlife sections should be reexamined on a broader scale to incorporate and refer to those actions in the other sections which are related.

4. Pesticides. The DEIS at p. 11-21 references the Forest Service FEIS for Vegetation Management (VM EIS) During the period from 1986 to 1989, EPA corresponded with the Forest Service on the VM EIS and earlier associated NEPA documents. We noted then that these documents did not address the effects of the cumulative impacts of herbicide use on water quality and beneficial uses (including aquatic, riparian and fisheries resources) that could result from herbicide application in several areas within the same watershed or that could result from successive sprayings over several years in a given watershed. EPA reiterates its request the Forest Service prepare documentation for each vegetation management EIS which should include description of the process for assessing cumulative impacts resulting from herbicide use, use of watershed-wide analyses, specific guidelines for herbicide use based on environmental considerations, and specific information on the Best Management Practices related to herbicide use.

On pp. 11-15, 11-24 of the Plan, the description of the consequences of the PRF alternative only list the positive consequences of the use of pesticides. Non-point source pollution from pesticide application and mitigation measures to reduce this pollution should be assessed in the EIS. Mitigation measures should be explained specifically enough so that there is a basis for review For instance, mitigation measures for sensitive watercourses or those that are adversely affected by other projects should be assessed



Department of Energy
Western Area Power Administration
Sacramento Area Office
1825 Bell Street Suite 105
Sacramento California 95825

JAN 6 1994

Mr Steve Filch
Forest Supervisor
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, CA 96001

Dear Mr Fitch

This letter Contains the comments of the Sacramento Area Office of the Western Area Power Administration (Western) on the Shasta-Trinity National Forests Proposed Forest Land and Resource Management Plan and accompanying Draft Environmental Impact Statement

Within the Shasta-Trinity National Forest, Western maintains a small number of low voltage distribution power lines associated with the station service for hydroelectric generation plants and many miles of high voltage (230- to 500-kV) interregional power transmission lines. Our extensive facilities within the Shasta-Trinity area, as well as our long history of cooperative relations managing these facilities in harmony with Forest Service goals give us reason to comment on potential changes in operating conditions that may affect Western's future ability to carry out its mission, such as with the adoption of a new Land and Resource Management Plan

As drafted, the Plan recognizes the ongoing economic value of hydroelectric generation and electric power transmission facilities, as well as the possibility that there may be need to expand such facilities in the future (see Forest Goal 20 on page 4-5 of the Plan, and Environmental Consequence? Chapter IV - Lands, Transportation and Utility Corridors on page IV-28 of the EIS). Although the standards and guidelines in the Plan and mitigation measures in the EIS do not appear to preclude future electric facility construction except in Wilderness Areas, Western is concerned that the standards not be interpreted to preclude future electric facility expansion outside Wilderness Areas when social and economic benefits outweigh the anticipated adverse environmental consequences of such facility construction. New corridors may be necessary to maintain reliability of the regional transmission lines. Western is also concerned that as facilities reach scheduled dates for relicensing, the public economic investment in those facilities must be protected and allowed to continue in place without relocation or undergrounding

As an example, Forest Standards and Guidelines 12 b (Lands--Special Uses) on page 4-16 of the Plan reads

- "b. Bury new telephone lines and new or reconstructed power lines less than 35 KV, unless (1) Visual Quality Objectives (VQOs) can be met without burying; (2) geologic conditions make burying infeasible; and (3) burying would produce greater long-term site disturbance "

Western is concerned that existing overhead power lines in this voltage category be subject to maintenance and relicensing without meeting the criteria applicable to new projects.

Forest Standards and Guidelines 12 r 1) and 2) (Lands--Transportation and Utility Corridors) on page 4-18 of the plan read as follows:

- i. (1) "Establish transportation and utility corridors as needed to accommodate existing and planned facilities. Future rights-of-way would be confined to existing corridors unless there are overriding economic or environmental concerns
- (2) Major power transmission lines, from the north and south, would be confined to an eastern corridor within or in close proximity to existing intertie lines."

Western's concern with this standard relates to reliability. Intertie electric power transmission lines carry a substantial portion of the power used in different regions of California and the Pacific Northwest. If there is damage or loss of power transmission capability over an intertie, backup facilities can be over-stressed with blackouts possible. If two interties are cascading blackouts could cause power loss in large segments of the Western United States. Accordingly, prudence dictates that interties should not be constructed in close proximity, so as to avoid the possibility of a natural or man-made disaster (such as a forest fire or plane crash) affecting two interties at the same time. Increased reliance on the interregional transmission and exchange of power has changed the requirements for high voltage transmission line siting. Common mode failure in a corridor affecting two interties at the same time poses potential for extremely high economic losses, and this potential must be considered in Corridor selection.

Thank you for this opportunity to comment on the Plan and EIS. Please contact Earl Nelson, Environmental Planning Coordinator, at 649-4529 for further information or clarification

Sincerely,

James C. Feeder
James C. Feeder

WALLY HERGER
29 DISTRICT CALIFORNIA

PLEASE REPLY TO

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Congress of the United States
House of Representatives
Washington, DC 20515-0502

January 5, 1994

Mr. Steve Fitch
Forest Supervisor
USDA Forest Service
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Steve-

A number of my constituents residing in the area surrounding the Shasta-Trinity National Forest have contacted me regarding their strong opposition to its draft management plan. I share many of their concerns and would like to go on record by highlighting several

As it is currently written, the plan fails to provide the biodiversity that it claims. Far too many areas have been placed into reserves. Under the plan, 85 percent of the area forests will be left unmanaged. Only 15 percent of the remaining forests may be available for timber management.

Given the region's high susceptibility to fire, disease, and insecticide due to its warm, dry climate, an overwhelming majority of the people affected by this plan believe it places far too much of the forest in "reserve" areas. A reduction in reserves and an increase in forest management will create a healthier forest.

Of these occurrences, fire is the most likely. When it occurs in an old-growth, unmanaged stand of California timber, it will often proceed in an uncontrollable fashion. By leaving this old growth forest in reserve status, we will be dooming the very wildlife habitat this plan intends to protect.

The Shasta-Trinity National Forest must be protected against the likelihood of wildfire. The development of shaded fuel breaks, strips of intense thinning strategically located throughout the old growth, and access roads within the old growth reserves are the two most effective ways to accomplish this. Unfortunately, the current plan prohibits these two vitally important mechanisms from occurring. By not allowing fuel breaks

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COMMITTEE ON
WAYS AND MEANS

COMMITTEE ON
THE BUDGET

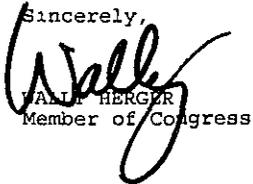
Mr. Steve Fitch
January 5, 1994
Page 2

or access roads, fire fighters will be able to reach the scene promptly and many acres of our most pristine forest land will be tragically lost.

Finally, under the provisions of Option 9 which have been incorporated into the Shasta-Trinity Land Management Plan, the plan will be managed by a group of scientists, many of whom have never visited or spent any significant amount of time in this area. I urge you to improve the scientific quality of this group by including local citizens, scientists, Forest Service employees, and others with direct knowledge of local conditions.

While I have barely scratched the surface of the problems that many of my constituents have with this plan, I wanted you to be aware of these specific problems and the suggested resolutions for them. I hope you will seriously look at all the comments from local residents who have concerns with the high percentage of land held in reserve.

Thank you for your consideration of this important matter. I look forward to hearing from you at your earliest possible convenience.

Sincerely,

WALLY HERGER
Member of Congress

WHA/bb

235

COMMITTEE ON
WAYS AND MEANS

COMMITTEE ON
THE BUDGET

WALLY HERGER
20 DISTRICT CALIFORNIA

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Congress of the United States
House of Representatives
Washington, DC 20515-0502

January 5, 1994

Mr. Steve Fitch
Forest supervisor
USDA Forest Service
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Steve

I am writing to express *my* deep disappointment with the Shasta-Trinity National Forest's complete disregard for the Mount Shasta Ski Area in its draft plan. Since the comment period for this Plan ends at the end of this week, I would like to state some *specific* reservations on the plan as it applies to the issue of skiing on Mount Shasta.

As YOU are well aware, the Forest Service has consistently supported the creation of a downhill ski resort at the Ski Bowl on Mount Shasta. In 1984, when Congress designated the Mount Shasta Wilderness, it specifically excluded Ski Bowl, Shastarama Point, Sun Bowl, Powder Bowl, and Giddy-Giddy Gulch from the Wilderness to allow for the development of downhill skiing. In addition, the Wilderness boundary was dropped down into Avalanche Gulch to include Shasta Alpine Lodge (Horse Camp) and to accommodate in Wilderness the most popular climbing routes to the peak.

Throughout the 1980's, the Forest service clearly made it a top priority to reintroduce downhill skiing in Ski Bowl through the development of a moderate sized ski resort in Ski Bowl. From 1986 to the present, all documentation has confirmed the Forest Service's desire to have Mount Shasta Ski Area, Inc develop the ski resort on National Forest Service lands

After reviewing the Preferred Alternative, I was surprised to find that the zoning language for Mount Shasta runs counter to the Forest Service's previous commitments to develop the Mount Shasta Ski Area. In particular, the upper portion of the Ski Bowl, all of Powder Bowl and Sun Bowl, and also Giddy-Giddy Gulch are zoned "Unroaded Non-Motorized Recreation." This section of the plan is inconsistent with the original plans of the Forest

Mr. Steve Fitch
January 5, 1994
Page 2

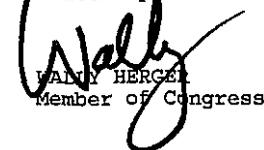
Service to build a ski area because such an area would require motorized snow cats and ski lifts as well as requiring narrow, low impact service roads.

In addition, there is nothing shown on the plan's map which would indicate a clear desire by the Forest Service to develop a downhill ski resort on National Forest Service lands in Ski Bowl.

With the closure of downhill ski facilities at Mount Lassen, Mount Shasta Ski Park is currently the only ski resort in northern California. Clearly, the development of the Ski Bowl for downhill skiing would go a long way toward meeting the growing demand in our area for this fine recreational sport. It is unbelievable to me that the Shasta-Trinity Management Plan backs away from the Forest Service's historically strong commitment for developing this important capacity. I hope you will reexamine this serious error in the plan and amend it accordingly.

Thank you for your assistance in this matter. I look forward to hearing from you at your earliest possible convenience.

Sincerely,


WALLY HERGER
Member of Congress

WH/bb

000188

The Resources Agency

Pete Wilson
Governor



Douglas P. Wheeler
Secretary

of California

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 4, 1994

USDA, Forest Service
ATTN: Forest Plan, Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Mr. Fitch:

The State has reviewed the Proposed Forest Land and Resource Management Plan, and Draft Environmental Impact Statement for Shasta-Trinity National Forest, in Shasta, Siskiyou, Tehama, and Trinity Counties, submitted through the Office of Planning and Research.

We coordinated review of this document with the Air Resources, Central Valley Regional Water Quality Control, and State Water Resources Control Boards; the State Lands Commission; and the Departments of Conservation, Fish and Game, Forestry and Fire Protection, Transportation, and Water Resources.

None of the above-listed reviewers has provided a comment regarding this document. Consequently, the State will have no comments or recommendations to offer.

Thank you for providing an opportunity to review this project.

Sincerely,

A handwritten signature in cursive script, appearing to read "William G. Shafroth".

for William G. Shafroth
Assistant Secretary
Land and Coastal Resources

cc: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814
(SCH 93104005)

The Resources Building Sacramento, CA 95814 (916) 657-5656 FAX (916) 657-8102

California Coastal Commission • California Labor 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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STATE OF CALIFORNIA—THE RESOURCES AGENCY

PETE WILSON, Governor

DEPARTMENT OF FORESTRY AND FIRE PROTECTION

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SACRAMENTO CA 94244 2460

(916) 227-2654
FAX (916) 227-2672



SP4

Mr. Steve Fltch
JAN 6 1994
Page Two

JAN 6 1994

Mr. Steve Fltch
Forest Supervisor
Shasta-Trinity National Forests
2400 Washington Avenue
Redding, California 96001

Dear Mr. Fltch:

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 addresses the cumulative impacts of all forest plans within the regional context but also draws distinctions between individual forests as warranted.

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 forest; finalize the EISs. 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 EISs to address the CDF and Forest Service concerns. We welcome your comments on these analyses and look forward to a collaborative relationship between the Forest Service and the Department.

Sincerely,

Richard A. Wilson
Director

cbc

Attachment

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

page 1

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

page 2

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 far 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

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

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.

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.

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 DEISs 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 (IIRICC), Humboldt State University and the USFWS Ecosystem Restoration Office, and the University of California and the Trinity Sioregion 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 Sioregion Group, the Shasta-Tahama 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.

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 timber harvest at large scale is needed. These agencies would cooperate with or any federal rulemaking efforts to ensure adequate monitoring and assessment of impacts.

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.

DEPARTMENT OF FISH AND GAME

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December 23, 1993



Mr Steven Fitch, Forest Supervisor
Shasta-Trinity National Forest
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Dear Mr. Fitch

SCH 93104005 - Draft Environmental Impact statement
(DEIS) and Land and Resource Management Plan (LMP),
Shasta-Trinity National Forest (STNF)

The Department of Fish and Game (DFG) has reviewed the subject LMP and DEIS. The LMP identifies the preferred alternative for managing lands and resources within the STNF. 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 draft 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 LMP that are 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 previously indicated our 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 very 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 LMPs so that issues and concerns can be dealt with prior to the issuance of a final document.

Mr. Steven Fitch
December 23, 1993
Page TWO

We would like to compliment the STNF Staff. The DFG has reviewed numerous forest plans and we have found this LMP to be progressive, well done and one of the best we have seen. It is with this in mind that we have included what we hope are constructive ideas that we can pursue together to help provide resolutions to various issues of concern.

If you have any questions regarding these comments, please contact Mr. Don Koch at (916) 225-2305.

Sincerely,

Richard L. Elliott
Regional Manager

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GENERAL COMMENTS

2

Issue - Key Watersheds

Comment - Regardless of what changes, if any, are made to the President's forest plan preferred alternative (Option 9), we believe it imperative that all objectives, standards, guidelines, and components Proposed for the Aquatic Conservation Strategy be retained. Specifically, we endorse provisions for riparian reserves on all fish bearing streams, nonfish bearing streams, and intermittent streams, and the establishment of Key Watersheds. These Key Watersheds are necessary to reverse the serious decline of anadromous salmonids and to begin recovery of salmonid habitats degraded by past management practices.

Issue - Monitoring

Comment - The monitoring program presented in chapter five of the LMP is intended to "determine how well the Forest Plan objectives are being met and how closely standards and guidelines are being followed" (Page 5-1). Forest goals are to provide "integrated multiple resource land management in the context of ecosystem management" (page 4-4). Monitoring, then, becomes one of the most crucial aspects of the management of the STNF because it develops the databases needed to inventory and assess ecological condition. The FEMAT report (chapter 8) provides some direction and definition of ecosystem management and the application of that management on the STNF. Further, the FEMAT report identifies the need for a monitoring system to be objective driven and that it needs to be considerably more than a list of things to do. An effective monitoring program should also result in the development of local or regional data that can be integrated into a common regional database that will have utility beyond the site at which it was developed. The FEMAT report (page VIII-21) recommends "The federal agencies through the interagency coordination effort, should develop a multiorganizational resource monitoring system. Standards and guidelines that address design and quality control should be included. The agencies should strive to ensure activities are adequately funded and that organizational roles and responsibilities are clearly identified".

A monitoring program that is presented in the LMP fails to meet requirements presented in the FEMAT report. The standards and guidelines should be included but fail to provide the data for a monitoring program that will develop regional databases. For the most part the monitoring program is a list of things to do which is largely focused on project scale activities and will not provide needed information or be sensitive enough to determine responses of ecological systems which are needed to facilitate ecosystem management.

Recommendation - If ecosystem management is going to be implemented on the STNF, the monitoring program needs to be responsive to the needs of that management. Forestwide, and where necessary, prescription specific standards and guidelines need to develop direction for the development of databases as well as the implementation of a monitoring program that will truly determine the responses of ecological systems to management programs.

Existing technology such as geological information system (GIS) applications to determine ecological conditions over large areas are relatively easily applied and provide a great deal of information. This same technology can be used to conduct change detections and develop a more sensitive monitoring program than is currently proposed. That same technology can start to develop the type of databases envisioned in the FEMAT report as well as monitor responses to management actions.

The DFG has utilized this technology and we are encouraged by its utility both as a monitoring and planning tool as well as a database. We would be interested in cooperatively applying this technology over the STNF as well as participating in the development of definitions of ecological conditions along with determination of variables to be measured.

COMMENTS RELATING TO TERRESTRIAL RESOURCES

Issue - Grazing

Some riparian habitats on the STNF are degraded and in need of restoration. Past land management activities have been inconsistent in the application of riparian area management (Summary of the Analysis of Management Situation, page 3-16). Some of this degradation has resulted from overuse by livestock. Livestock use should be reduced or eliminated on those allotments where riparian systems are being adversely impacted by grazing.

The STNF LMP predicts average annual outputs by decade for the preferred alternative (Table 4-2, page 4-9) to maintain existing levels of animal months (AM). The DFG believes this output is inconsistent with the need to restore riparian ecosystems.

Comment - The DFG supports the standards and guidelines for range management if the annual monitoring of a grazing allotment indicates that riparian condition goals have not been met and grazing practices are adjusted to eliminate the adverse impacts.

Average annual outputs by decade (Table 4-2, page 4-9) show no significant changes in thousand animal unit months (AUM) over five decades that would accommodate the standards and guidelines

to protect riparian environments. Furthermore, the monitoring AM's will be measured yearly but reported only each five years for selected allotments only.

Outputs of AM's for the next five decades have been predicted. Option 9, figure VIII-3, page 7, illustrates the future process where issues are resolved and then commodity outputs are calculated based on the need to resolve resource issues.

Recommendation - We recommend that all range allotments and affected riparian areas be monitored to identify problem areas. Livestock use of these allotments should be eliminated or reduced until the problems are resolved. We concur that areas determined to be in adequate condition can be monitored and reported less frequently than on an annual basis. However, we recommend that degraded allotments be monitored and reported on an annual basis.

Issue - Biomass

Observations on the STNF and adjacent forests indicate that biomass projects, particularly those involving precommercial thinning, often result in large continuous blocks of land that lack diversity. These stands lack both cover and vertical structure and, in some cases, dead and down woody material, snags and old trees. The DFG has concluded that these projects result in adverse impacts to a wide variety of wildlife species.

Comments - Biomass thinning of forest stands may have numerous consequences. In many areas, it appears that the lack of soil disturbance (because of the use of rubber tired equipment) will preclude the regeneration of shrubs. This observed lack of regeneration may also result from the failure to adequately open the canopy. The lack of structural diversity in the form of a shrub layer results in a significant reduction in the habitat capability of the stand. A wildlife habitat relationship (WHR) analysis of a mixed conifer habitat on the STNF indicates that 55 species have a secondary life requisite dependency on a shrub layer in the stand. Eleven species cannot utilize the stand without the shrub layer. Standards and guidelines deal with snags, dead and down and hardwoods. There appears to be no standard/guideline for vertical structure, particularly a shrub layer.

In chapter 3 - Summary of Analysis of the Management Situation under Timber on page 3-18, the LMP indicates that about 34,000 acres are in need of release and an additional 22,000 acres need thinning. It is anticipated that much of these acres will be treated using biomass thinning.

comments on page 4-12 under Biomass, item b. indicate that removal of only material that is in excess of that required to meet the standards for soil quality and wildlife diversity and natural fire regimes will occur. The DFG supports this standard/guideline.

We believe there is a need for additional standards for biomass projects.

Recommendation - The DFG recommends that an additional standard/guideline be developed to allow for the retention of areas within biomass projects that provide a shrub layer or a secondary tree layer. This would provide nest, feeding and escape cover for numerous species. In addition, we recommend that the potential for opening the canopy in selected areas be evaluated. This may allow the natural regeneration of shrubs in prescribed areas scattered throughout a project. We suggest that prescribed burning be tried in selected areas to test the feasibility of generating shrubs following biomass thinning.

The DFG would be happy to work with STNF personnel to explore these ideas.

component of biodiversity and importance to deer and other early seral stage species.

Comment - Considerable evidence exists to support the conclusion that plant succession throughout much of the western United States of America (USA) is favoring conifers (primarily second growth stands) at the expense of early seral stage habitats with a young shrub layer (Longhurst, et al. 1976, Gruell 1983 and Gruell 1986). This trend is largely due to increased fire suppression and modification of silvicultural practices.

The Wildlife Habitat Relationship Program (WHR) indicates that 56 species of wildlife have a secondary life requisite level far habitats containing a shrub layer element in sapling stage habitats of mixed conifer on the STNF. A secondary life requisite means that the species requires the element (shrub layer) but another element can be substituted. Eleven species are totally dependent on shrubs in early seral mixed conifer habitats (WHR).

Deer populations (and probably other early seral dependent species) continue to decline on the STNF. Photographic and empirical evidence indicate that this decline is due largely to loss of habitat quality and quantity, primarily on high elevation summer deer ranges. Longhurst (1976) found this to be the primary cause of the deer decline occurring in California. Specifically, this loss of habitat is believed to be related to the lack of regeneration of young, preferred shrubs, in conifer

dominated habitat, primarily those in the genus *Ceanothus*. This loss of regeneration is due to the long-term reduction in fire and to a lesser degree the conversion of brush fields to conifers.

The LMP predicts a Stable deer population over the next five decades but indicates a probable reduction in early seral species due to increases in old-growth habitats.

Table 4-2 on page 4-10 of the LMP predicts a stable deer population for the STNF through five decades. On page 6 of the Addendum in the DEIS it is stated "because reserved area (late seral habitat management areas) increases by 5 to 20 percent on individual National Forests, there would be a corresponding reduction in early seral stages over time. This may decrease species populations which use these habitats".

The above comments are contradictory.

The LMP does not describe how the ongoing decline in deer habitat will be addressed. There is no specific direction to manage critical summer deer habitat by providing key shrub species in young age classes on timber producing soils over time.

On page 4-11 Forest Standards and Guidelines, 2. d. Natural openings provides for "natural openings equal to or greater than 1 acre" for wildlife. These may or may not provide conditions suitable for producing needed shrub component and may not be in the appropriate locations. In addition, this standard/guideline excludes the McCloud Flats, one of California's largest deer summer range complexes. Failure to provide deer forage areas on large deer producing areas like the McCloud Flats will result in continuing deer declines on the STNF.

Prescription 6, wildlife Habitat Management, appears to provide some general flexibility to allow management of key summer deer habitat components by modifying timber management and defer the control of competing vegetation, e.g., browse and forbs. However, in most management areas, critical summer ranges exist in significant acreages in areas designated for prescriptions not conducive to managing for early seral habitats. The following management areas contain significant acres of summer deer habitat that will require specific management designed to create forage areas.

Management Area	Percent Area in Prescriptions 16 and #9
1) Porcupine Butte	38.5
2) McCloud Flats	10.5
3) Mount Shasta	2.5
4) Trinity Alps	0

Management Area	Percent Area in Prescriptions #6 and #9
5) Yolla Bolly-Middle Eel	0
6) Parks-Eddy	7.6
7) Upper Trinity	17.9
8) Slate-Delta	26.2
9) McCloud River	1.3
10) Pit	2.0
11) Corral Bottom	11.8
12) Hayfork	26.3
13) Indian Valley-Rattlesnake	5.9
14) Wildwood	6.0
15) Beegum	31.5

Note - the above percentages were calculated using both Prescription 6 and 9 acreages. Prescription 9, riparian management, is considered beneficial to early seral species including deer.

Each of the above management areas contain considerable summer deer habitat. The prescriptions that appear to allow for the long-term management of early seral habitats with a young shrub component (Prescription 6 and possibly 9) have been established on a relatively small portion of these units. It appears, however, that other management prescriptions, such as roaded recreation, may allow for the management of shrubs.

Deer summer range areas may or may not be located within management prescription areas that will allow for their maintenance and or enhancement. An example is the McCloud Flats Management Area, perhaps the largest summer deer complex in California. Many of the critical deer fawning areas in this management area are proposed for Management Prescription 8 which limits the ability to specifically manage for the production of young shrub habitats.

Recommendation - We recommend that the DPG and USFS develop a cooperative management plan that identifies critical summer fawning habitats on the STNF. Much of this can be done with existing data. Presently ongoing Landsat Imagery/GIS analysis can be used to help identify critical habitats. Data gaps can be filled with cooperative projects between the STNF and the DPG.

Following the critical habitat identification process, it is recommended that prescriptions in each management area having significant deer summer fawning habitats be modified, where necessary, to allow for the production and maintenance of strategically located foraging habitats, while providing for other necessary deer habitat components. The Cooperative

management plan would attempt to identify innovative ways to provide the necessary habitat components Without Significantly compromising the primary management direction.

This action is particularly important given that less early seral habitat will occur on public lands due to the increase in acreage reserved for timber management.

Issue - Fire and Fuels Management.

Historically, fire has played a key role in the evolution of forest ecosystems and ultimately many of the forest plants and wildlife.

Martin and Sapsis (1991) assessed early fire regimes and conclude that fire occurred in diverse reg. i for a continuum in environmental characteristics that mot di nota. They further conclude that modern : itrol s attempted to remove fires from wildland; Instead the result has been a grass distortion in frre regimes removing most low and intermediate intensity fires and increasing the proportion of large fires, thus reducing "pyrodiversity" which in turn reduces biodiversity.

The paradox Of the STNF LMP is that its primary direction is toward "ecosystem management" and biodiversity while there appears to be no effective direction in the LMP to accommodate naturally occurring fires that will be necessary to maintain either the ecosystem or the desired diversity.

For example, the disposition of Issue #5, Fires and Fuels on page 2-2 of the LMP, indicates that standards and guidelines will emphasize utilization of activity fuels over prescribed burning Fuel treatments would emphasize biomass utilization and firewood availability In other words, the resolution to the issue appears to be one of fire prevention through the "management" of fuels rather than allowing fire to naturally reduce fuel loads, and thus promote biodiversity There is, however, no evidence that mechanical manipulation can effectively replace the powerful and important ecological effects of fire

Biomass utilization is described as providing a "benefit" by reducing the "loss" from wildfires and "increase wildlife and range browse". Preliminary studies of biomassed areas on adjacent forests indicate that shrub regeneration following thinning of dense conifer stands is very limited and that in fact adequate wildlife cover is lacking in biomassed areas and the probability of fire in these stands is likely to be greatly reduced, thus precluding shrub rejuvenation.

In the Management Direction section of the LMP on Page 4-4 under Fire and Fuels, direction proposes to: 10) return fire to its natural role in the ecosystem; and 11) achieve a balance of fire suppression capability and fuels management investments that are cost effective and able to meet resource objectives and protection responsibilities. Again, these may be conflicting directions. Fire's natural role was largely uncontrolled and unregulated. Direction number 11 above appears to attempt to prevent fires through suppression and fuels management.

Page 4-8, Table 4-2 predicts that 1,500 acres per year per decade will receive fire-related treatment and expected acres per decade of wildfires are 11,000 acres. Assuming 12,500 acres burned, approximately .006 percent of the 2.1 million-acre forest would burn per year. Martin and Sapsis (1991) used various fire history studies to estimate that prehistoric fires in California, excluding the southern desert, burned between 5.6 and 13 million acres per year, a rate as much as 2,200 times greater than predicted for the STNF during the next 50 years. While this rate is obviously not desirable under today's conditions, it points out the utter futility of a plan goal of 'restoring fire to its natural role in the ecosystem'. These authors also provided evidence that a broad diversity between fire periods allows for plants of widely different regeneration requirements to propagate. In contrast, regimes with a narrow range but long period between fires would tend to exclude those plants with a short life and short propagule endurance. Thus it would appear that the predicted fire regime for the STNF cannot result in the maintenance of natural biodiversity.

Under standards and guidelines, Chapter 4, page 4-15, #8. a through g., all items provide for fire suppression and fire prevention through fuels management. These directions, while perhaps necessary, preclude "management of natural ecosystems" and "maintenance of biodiversity"

The relatively low level of fire predicted to occur in the STNF over the next 50 years will not allow the "natural ecosystem" to function, nor can natural diversity be maintained. The need to protect the STNF lands from damaging fires is obvious, therefore creating the dilemma of how to manage on an ecosystem basis

Recommendation - Although this is a difficult issue to resolve, we are relatively certain that the solution is not to try to "mimic" the role of fire with mechanical fuel management designed to prevent wildfire. The complex and necessary processes of fire cannot be duplicated by simple mechanical clearing. Martin and Sapsis (1991) concede that we cannot return to natural fire regimes and that we need fire suppression now more than ever. The authors recommend a new policy on fire management that address the extent and role of fires in each vegetative type

followed by a plan and Strategy to meet that role. It makes no biological sense to have the same policy for all vegetative types. They recommend a combination of fuels management and aggressive prescribed fire with the long-term goal of more safely and frequently introducing prescribed fire into the routine management of the STNF systems.

The DFG Supports this concept and recommends that the STNF LMP significantly change its direction from attempting to eliminate the natural occurrence of fire by using fire and fuels management in combination to "prepare the forest for a more natural and beneficial fire regime". Without such an approach, we do not believe the goal of maintaining biodiversity can be achieved.

Issue - Range.

Standards and guidelines item 15c, page 4-19, states the "Management of forage resources for big game would take preference Over livestock use an designated elk and deer winter range."

Comment - Big game as well as other wildlife species should take preference over livestock on all federally owned lands Wildlife is part of the ecosystem, not a competitor. No Winter ranges have been designated in this plan.

Recommendation - Deer winter ranges, holding areas and summer ranges within management prescriptions 11, 111, VI and VIII should be mapped and special management prescriptions developed to provide protection for critical habitat components Within these areas

Using existing information, map deer and elk Winter ranges and holding areas. Manage hardwood and understory Components in these areas to provide for maximum forage potential for deer and elk. Hardwoods Within holding areas should be managed for 30 square feet basal area or more. Understory vegetation should be managed for maximum forage and adequate cover

Issue - Threatened, Endangered and Selected Sensitive Species.

Recommendation - The DFG recommends that the following additions and clarifications be included in the final LMP and EIS: (1) the list of representative species (page 3-23, Riparian Wildlife Assemblage) should include the yellow-breasted chat, a California species of Special Concern. (2) The Hardwood Wildlife Assemblage list of representative species should include the gray squirrel. (3) The Chaparral Wildlife Assemblage list should include the blue-gray gnatcatcher, a Species of Special concern. (4) page 3-24, 2nd column, paragraph 5, some discussion of why the other sensitive species are not being addressed would be appropriate.

(5) page 4-1, site-specific projects, the last sentence should include the Statement "and with the California DFG where State-listed species are involved" (6) page 4-11, natural openings, this paragraph needs clarification with regard to what will be maintained. how long it will be maintained and the creation of new openings (7) page 4-12, sensitive and endemic plants, paragraph d, requires submission of Natural Diversity Data Base (NDDB) forma for sensitive plant occurrences. The Same wording should be provided for sensitive animals as well. Conservation strategies should be developed as per paragraph f for sensitive animals. (8) "Unnatural lass" (page 4-37. standards and guidelines, paragraph 8, should be defined as it seems incongruous to call a loss from insects in a wilderness unnatural. (9) The responsible units for Cave Management Plans (page A-1, Appendix A) should include wildlife and the DFG to evaluate management effects on sensitive wildlife species such as bats and salamanders.

COMMENTS RELATING TO AQUATIC RESOURCES

Issue - Key watersheds.

Comment - The LMP implies only anadromous drainages can be considered key watersheds and recommends none such areas but no resident fish waters. However, the President's DSEIS States such watersheds can also include resident fish species habitat, especially for stacks at risk (DSEIS, page 8-79).

Summer steelhead and spring chinook salmon will benefit from Management Prescription VII Which encompasses much of the New River and South Fork Trinity River drainage because timber management on very steep or very unstable Slopes near these rivers will be substantially reduced Additional protection will be afforded these Streams under "key" watershed management proposals which include eliminating or stabilizing falling logging roads.

Recommendation - We suggest three key watersheds: (1) the Upper McCloud River Drainage, including all tributaries, especially those containing redband trout. This is the only drainage containing Upper McCloud River redband trout, a yet undescribed subspecies within the rainbow trout series (*Oncharhynchus*). This sensitive subspecies has become depleted and is considered worthy of listing by some researchers. Designation of this drainage as a Tier 1 key watershed would provide refugial conditions for this subspecies, facilitating population recovery and enhancement. (2) The Lower McCloud River Drainage The upper 10.5 miles of the Lower McCloud River is a State designated wild trout water. The Lower McCloud at one time Supported California's only known population of bull trout, a State endangered species. Designation of this watershed as a Tier 1 key watershed would both protect the wild trout fishery and help recover the bull

trout. (3) Lower Squaw Valley creek. This stream is a major tributary of the Mccloud River and flows through the West Girard (formerly) Rare II area. Designation as a Tier II key watershed would protect the water quality of this important area. All three of these watersheds are within the boundaries of the Mccloud River Coordinated Resource Management Plan (MRCRMP) process or objectives. Logging and road construction practice restrictions designated in the MRCRMP (LMP, Appendix N, page 26), especially as they apply to riparian zones, shall be of a standard at least as protective as that found in the LMP (they presently are weaker).

This activity should be given priority over instream habitat improvement structures since the value of such structures to fisheries has been frequently negated by sedimentation from failing roads.

Issue - Late successional reserves

Comment - Option 9 provides a network of late successional reserves where only minimal watershed disturbance would be permitted on reserve lands.

Recommendation - Proposed reserves would also provide significant protection for the following: (1) McCloud River downstream from McCloud Reservoir, a blue ribbon wild trout and "catch and release" water. (2) Hawkins Creek, a tributary to the McCloud River providing an important source of cold, high-quality water and rainbow trout recruitment. (3) Squaw Valley Creek, the largest tributary to the Mccloud River and special regulation water. (4) The Pit River between Pit 4 Dam and Pit 4 Powerhouse. a trophy rainbow trout stream and designated "catch and release" water.

Issue - Trinity River Basin salmonid Population

Comment - The statement regarding salmonid populations in the Trinity River Basin (page 3-9, Fisheries, paragraph 7) is misleading in that it gives the impression that salmon and steelhead populations in the Trinity River Basin are increasing when actually they are not.

Recommendation - Modify this statement to accurately present the trend in salmonid populations in the Trinity River Basin.

Issue - Effect of Cantara incident on wild trout gene pool.

Comment - The wild trout gene pool of the Sacramento River was not completely eliminated by the Cantara incident (page 3-11, Fisheries, paragraph 1). That part of the wild trout population

that existed upstream from the spill site was not affected by the chemical. The progeny from these survivors are expected to repopulate the entire river over a period of years.

Recommendation - Modify this paragraph to reflect the fact that the progeny from trout not affected by the spill are expected to eventually repopulate the river.

Issue - Wild and scenic rivers.

Comment - The DFG supports the recommendations included in the preferred alternative for 62 miles of additional wild and scenic rivers.

Recommendation - Since existing wilderness designation already provides a high degree of protection, river reaches outside existing designated wilderness should be given priority for designation.

Issue - State designated "wild Trout" and "Catch and Release" waters.

Comment - We were pleased with the proposal for Management Prescription VII IMP VII (threatened and endangered [T&E] and late seral stage management) for lands along such prime trout fishing streams as the McCloud River below McCloud River Reservoir, its largest tributary, Squaw Valley Creek, and the Pit River between Pit 4 Dam and Pit 4 Powerhouse. The proposed designation will provide a high degree of watershed protection and maintain high visual quality levels for anglers and other recreationists using the waterways.

Recommendation - If boundary modifications should be proposed in the future for areas managed under MP VII, we urge that canyon slopes along the Pit River, McCloud River and Squaw Valley Creek be maintained in late successional forest reserve status.

Issue - Fish kills at Shasta Lake.

Comment - The statement concerning fish kills at Shasta Lake (page 4-147, desired future condition, paragraph 3) and recovery of tributary streams from acid mine waste is not correct. While considerable progress has been made toward eliminating the problem, fish kills still occur in the West Squaw (Little Squaw) Creek inlet.

Recommendation - Modify this statement to reflect that fish kills from acid mine waste is a current problem in the West Squaw Creek inlet.

EDITORIAL COMMENTS

Issue - Dolly Varden/Dolly Varden Trout.

Comment - The names "Dolly Varden" and "Dolly Varden Trout" (Appendix N, Pages 17, 19) should be changed to "bull trout".

Issue - Item 11. page 4-144

Comment - Item 11 appears to be a needless repetition of item 6.

COMMENTS ON THE DEIS

Issue - Fire and fuels.

Comment - Page 111-24 of the DEIS in the Botany Section indicates that about 20 percent of the sensitive plants on the STNF rely on wildfire or other disturbance for maintenance. There are undoubtedly numerous other plants, not listed as sensitive that also evolved under diverse fire regimes. While the DEIS indicates the need to manage sensitive plants to provide disturbance, where necessary, it does not adequately discuss the long-term consequences of near total fire suppression on biodiversity.

Page IV-17, Section 7 Fire and Fuels in the DEIS, describes effects of wildfire and fuels management. The section focuses on the effects of fire both positive and negative but does not discuss the more critical effects of long-term exclusion of fire from most of the STNF. Such effects are incredibly profound and have not adequately been dealt with either in the STNF LMP or the DEIS

Issue - State-listed species.

Comment - The willow flycatcher (page G-4, Table G-2 - birds) is a State-threatened species. The McCloud River redband trout (Table G-2 - fishes) is also a State-listed species.

Issue - Inland warmwater fish (page 111-37, paragraphs 1, 2).

Comment - Alabama Spotted bass should also be mentioned since they are now more important in the catch than smallmouth and largemouth bass combined. Spotted bass were introduced in the early 1980's and are believed to be a reason for the decline in smallmouth bass and they may also be affecting largemouth bass abundance as well.

Issue - Habitat Improvement (page III-38, paragraph 4).

Comment - We agree that there is no evidence to indicate that installed structures are effective in increasing anadromous fish numbers. It is possible that this is because the structures only affect one element - cover, which is not as much a limiting factor to fish productivity as excessive sediment, which usually has long-term adverse impacts on the entire stream ecosystem, following watershed disturbances, such as logging and road building.

Issue - Bull trout (page 111-42, paragraph 3).

Comment - The bull trout disappeared from the McCloud River soon after the construction of McCloud Dam. This project resulted in reduced flows and consequently a significantly warmer temperature pattern than before. This environmental change may be the primary reason for the extinction of the bull trout. Under natural environmental conditions, bull trout coexisted with brown trout and squawfish and they existed for many years in the absence of chinook salmon.

Issue - Habitat improvements (page IV-19, paragraphs 6, 7).

Comment - We are concerned that there is a significant risk of damage to anadromous fish producing streams inherent in construction activities in and near streams. There have been instances where well intentioned efforts to improve fish habitat actually resulted in negative impacts. Plans for artificial habitat improvement structures should be evaluated and developed in coordination with the DFG prior to implementation to avoid potential adverse impacts to stream ecosystems.

Issue - Range (page IV-33, paragraph 6).

Comment - We are in agreement with the stated plan to phase out grazing in wilderness areas under the PRF and CBF alternatives but note that this plan is not mentioned in the Management Prescriptions or in the Management Area Directions of the STNF LMP.

Issue - Redband trout.

Comment - There is inconsistency between the Statement that the redband trout is categorized as sensitive (LMP, page 3-10) and is no longer classified as a sensitive fish species (DEIS, page III-80).

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The subject table (Table V-10, page 3, 4-98) notes that redband trout in the McCloud River were not considered for special management because of "Insufficient information on ecology." A considerable amount of data has been collected on Mccloud River redband trout ecology by the DFG.

Recommendation - Make categorization as a sensitive species consistent in both documents. The column headed by "limited distribution on Federal lands" (Table V-10) should be marked since most of the habitat occupied by these fish is privately owned.

Board of Supervisors
of

SISKIYOU COUNTY

P O Box 338

Yreka, California 96097

CLERK
Lisa Chandler
Phone 916 842-8081

Mr. Steven Fitch
December 8, 1993
Page 2

characteristic development, there will be additional funding available to support local communities. Other forest programs which would support bio-diversity and appropriate ecosystem management could also be funded.

December 8, 1993

Mr. Steven Fitch, Forest Supervisor
Shasta-Trinity National Forest
2800 Washington Avenue
Redding, California 96001

Dear Mr. Fitch.

Subject, Draft Environmental Impact Statement and Land and Management Resource Plan for the Klamath National Forest/Shasta-Trinity National Forest

The County of Siskiyou, as a vitally affected agency and representative of broad interests both throughout and adjacent to the National Forest, offers the following Comments on the above-referenced Draft Environmental Impact Statement and Land and Resource Management Plan

- 1 The Plan, consistent with option 9, requires 180 year rotations. As we have previously discussed, the county disagrees with the proposed 180 year rotations. Clearly, there are areas within the forests that 180 year rotations are neither necessary nor desirable. Further, it appears this 180 year rotation applies regardless of species or stand condition. It is believed the biologic, hydrologic and geographic data should be the driving forces in setting rotations
- 2 Treatments within late seral reserves are limited to stands less than 80 years in age. This absolute limit is counter-productive for a number of reasons
 - a. Not all designated stands are of high sight condition. Remedial work within designated stands would enhance the development of old growth characteristics.
 - b. Due to the poor condition of many of the designated stands, these areas are at risk for catastrophic fires.
 - c. By allowing some treatments appropriate for old growth

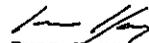
Recommendation. The plan should add language which would allow upon demonstration of complying with specific criteria the habitat improvement within stands in excess of 80 years of age.

- 3. The County has previously recognized the need of fire as a management tool and has commented about the lack of recognition of fire in the option 9 directive. If the use of fire is allowed at the forest level in conjunction with the Option 9 directives, no further action is necessary. However, if there is any doubt, language should be added to this forest plan which clarifies the ability to use fire as an appropriate management tool.
- 4. The use of adaptive management areas (AMA) is an example how flexible management can provide for new and different solutions to old problems. This willingness to provide for creative management should be extended to all areas of the forest, including the riparian reserves to allow true problem solving and increased forest productivity.
- 5. There appears to be an outstanding question of adequacy of funding in order to accomplish even the broad goals as set forth in these plans. If forest revenues continue at their depressed level, it is questionable whether the funding necessary to implement these plans will be available. Clearly, there must be an economic commitment to the management of these lands consistent with these plans or the planning effort will never be implemented.

In closing, we would like to restate our belief that our forests are dynamic resources, which must be subject to dynamic management. Inflexible planning and management practices create undesirable results. As a dynamic resource, we must manage the forest within the forests' capacity to accomplish the end results desired without becoming enslaved by a regulatory process.

Your consideration of our concerns is respectfully requested.

Yours truly,
Siskiyou County Board of Supervisors


Ivan Young, Chairman

Board of Supervisors
COUNTY OF TEHAMA

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District 1 - Barbara McIver
District 2 - Shirley M. Mareth
District 3 - Floyd A. Hicks
District 4 - JoAnn Landingham
District 5 - Kathleen Rowen



Tehama County Courthouse

Richard Robinson
Administrative Assistant
to the Board of Supervisors

January 4, 1994

Mr Steve Fitch, Forest Supervisor
Shasta-Trinity National Forests
1400 Washington Avenue
Redding, CA 96001

RE: Draft Environmental Impact Statement (DEIS)
Land and Resource Management Plan.
Shasta-Trinity National Forests 1993

Dear Mr Fitch

We appreciate the time your staff members, Mr Steve Clauson and Mr Robert Ramirez, have spent with the Tehama County Board of Supervisors in delivering the DEIS documents and for their enlightening presentation. Thank you for this opportunity to respond.

Clearly, the management plans for national forests in Northern California must be consistent with, and even reflective of, President Clinton's Option 9 (or Alternative 9) plan, released in July of 1993 for purposes of habitat management in old growth forests. Key components include ecosystem management approach to forest plan implementation, protection and enhancement of late-successional vegetation and old growth reserves, protection of riparian areas, maintenance and enhancement of habitats for threatened, endangered and sensitive species, overall scenic quality, and land allocations to prohibit or severely reduce harvest and logging.

The Hay Preferred Alternative (Hay 93PRF) approximates some modifications to Option 9 which are highly necessary to demonstrate to this body that there is a true recognition and appreciation of Northern California's diverse forest ecosystem as being very different from those of the Pacific Northwest. The centralized oversight proposed in the overlay of Option 9 presents a rigid and inflexible standard for management in that categorical policies and practices based upon Washington and Oregon's old growth forests and habitat cannot be imposed upon Northern California forests and bioregions. This presents a serious conflict with desired practices of adaptive management, which this body supports.

Adaptive management practices are based on current societal and scientific information, and we centrally recognize the role of people and economies in ecosystems, and create a viable model for federal, state, and local agencies to work together to determine successful plans of action. The goals of old growth restoration, riparian management and protection, vegetation management, and watershed analysis and management are fine and honorable if (and only if) they are accurately diagnostic, appropriately prescriptive, socially acceptable in local society, and effective.

We would very much prefer that the DEIS would state criteria, desired outcomes, and measurable management goals for the purpose of partnership with local agencies and, "sensus-based working groups to ensure the success of the management plan and a

responsiveness to local environments and economies. Although the prospect may present bureaucratic difficulties, which we appreciate, true adaptive management will reduce risks and allow for the correction of errors through an active and continuing cycle of planning, implementation, monitoring, and adjustment. Local data and participation are essential. The rigidity and inflexibility of centralized agency management is clearly problematic in these times. Witness the confusion, frustration, and negative response of local entities included in the broad-brush prescriptives of Option 9, given the great variations in bioregions from the Pacific Northwest to the four Northern California forests. We would strongly support a decentralization of management agencies and the implementation of provincial management processes and the inclusion of local data inventories, based on scientifically sound and uniform methodology, allowing information and appropriate prescriptions for future biological and landscape management to be accessed and exchanged between resource management agencies. A trunk cable line extension from Sacramento to the affected Northern California forest areas would greatly improve our collaborative capabilities.

We wish to register a negative response to the following specific elements of Option 9 precedence over any DEIS alternatives, again supporting the need for more localized and realistic management alternatives.

---Singular riparian standards for reserves (buffers), inconsistent with the dramatic differences in each watershed,

---Singular standards for treatments within late seral reserves, regardless of sites or conditions:

---Severe restrictions in land allocations which prevent adaptive management techniques, monitoring, and any resource usage of 85% of forest lands, absent evidence of scientific analysis for this formula,

---Potential for unmanageable forest fires due to "hands-off" management policy for California stands. Closure of access roads and lack of fuel breaks should be addressed,

---Baseline data relating to economic and societal impacts do not address long-term and cumulative effects of timber management decisions,

---Implementation of 180 year rotation age for tree harvest, rather than the Hay 93 PRF recommended 70-160 year rotation directly conflicts with sound resource management with no apparent justification,

---Loss in harvest levels resulting in loss of direct and indirect timber jobs, loss in timber receipts and revenue to schools and local governments, related loss in sales tax revenue, and increased public costs associated with increased public assistance, economic recovery initiatives, and demand for job retraining must be recognized as seriously impacting local economies, and therefore considered in management decisions.

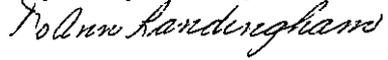
We members of the Tehama County Board of Supervisors look forward to working together with your agency to enhance the future of resources, biodiversity, and economic recovery in Northern California. We recognize the need for greater public interest, education, and involvement by citizens within this county to achieve true adaptive management strategies, and we are willing to lead in that effort.

We perceive much of the spirit of President Clinton's Option 9 plan, as well as the spirit

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of the May 93 PRF. to be cooperation between federal, state, and local agencies and working groups to achieve our resource goals. We are hopeful these comments will be considered in your decisions, and that local data and expertise will be fully utilized as we move forward into final documents and implementation

Respectfully submitted,



JoAnn Landingham
Chairman

/bgm

cc: Hon Vic Fazio
Secretary of the Interior Bruce Babbitt
Shasta Tehama Bioregional Council
Tehama County Planning Department
Tehama County Farm Bureau
Tehama County Cattleman's Association



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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

Mr Steven Fitch. Forest Supervisor
Shasta-Trinity National Forest
2400 Washington Ave
Redding, CA 96001

Re. Comments on Draft Land Management Plan

Dear Steven.

At our regular meeting of December 21. 1993, the Trinity County Board of Supervisors agreed that re are unable to submit any meaningful Comments on the draft plane when eo 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 ve ere 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 plene are made as the details of Option 9 become more clear. and would retain our right to comment on these amendments or any pert of the plan as appropriate end 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
Matthew Leffler, Chairman

OFF-HIGHWAY MOTOR VEHICLE RECREATION

(916) 653-8244



A DIVISION OF DEPARTMENT OF PARKS AND RECREATION

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JAN 6 1994

Mr. Steve Fitch, Forest Supervisor
Page Two

Thank you for the opportunity to comment on your plan, and please contact Lowell Landowski at (916) 653-9596 if you have any questions about these comments

Sincerely,


Gerald I. Johnson
Acting Deputy Director
Off-Highway Motor Vehicle Recreation

Mr. Steve Fitch, Forest Supervisor
Shasta-Trinity National Forest
2400 Washington Avenue
Willows, California 95988

Dear Mr. Fitch

Comments on the Shasta-Trinity National Forest Draft Land Management Plan and EIS

Road access and motorized trail access needs to be given key consideration in the implementation of the plan. The economic benefit of recreational access needs to be viewed as an asset, particularly in the light of the trend to reduced resource based economic activities such as timber harvesting, domestic livestock grazing, and mining. The indication in the plan that roads will be closed if they are not fulfilling their original intended purpose is unacceptable in this context, because it means timber and mining roads could no longer be used for hunting, fishing, wilderness trail heads, viewing scenery, four-wheeling etc, etc. The plan points to an economic plan, and preserving and maintaining existing recreational access routes is a key to any such plan.

Roads and motorized trails should only be closed if there is a well-justified reason to do so, not for the mere sake of closing roads. Priority should be given to closing roads where significant unmitigatable environmental impacts are occurring. Roads that are not well used but are in little conflict with environmental values should be a low priority for closure. In some cases a road or motorized trail may be of great recreational significance, while at the same time be in conflict to a significant degree to some resource value. In these instances it may require a higher level of mitigation, but resource conflicts should not automatically be resolved by closing the road.

Continued public involvement and informing the public before a decision is made to close any established route of travel is a necessity. The final plan should explicitly provide for this need.

Finally, it is difficult to comment on this draft plan and Environmental Impact Statement (EIS), because it is so subject to change based on the Final President's Plan. It cannot be said this draft plan and EIS contains sufficient information to adequately define the preferred alternative. The Final President's Plan by admission would become the preferred alternative, thus the true preferred alternative has not yet been presented to the public for comment as required under current law, policy, regulation, and practice.

